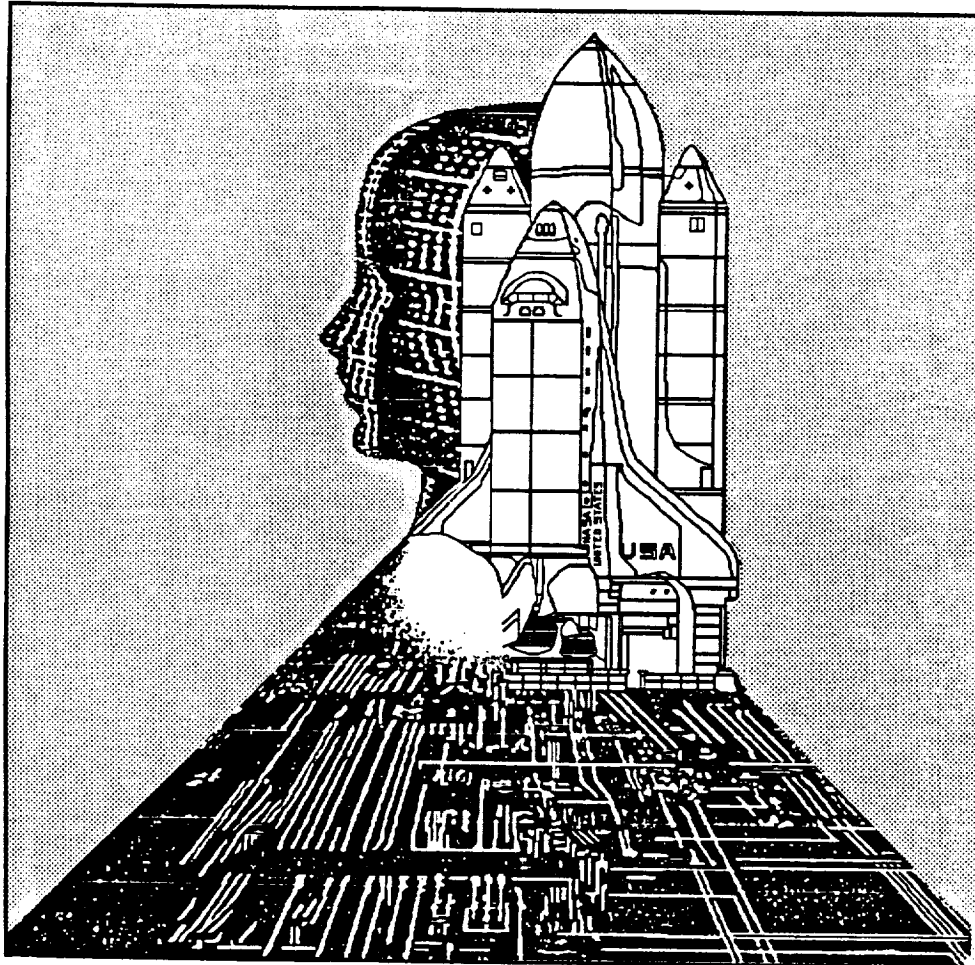


# BOEING Shuttle Ground Operations Efficiencies/Technologies Study

AEROSPACE OPERATIONS



PRELIMINARY ISSUES DATABASE (PIDB)  
CATALOG  
VOLUME 4 of 5

**FINAL REPORT - Phase 1**

KENNEDY SPACE CENTER

NAS10-11344

May 4, 1987

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# Report Documentation Page

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15. Supplementary Notes * 16. (Continued) These additional benefits include items such as: a smaller chance for "human error" through automation, reduced number of people required for operations, smaller number of documentation changes, and an increase in test-to-test consistency. Document these findings and capabilities for use as guidelines for use on STAS and other future programs for both manned and unmanned vehicles.					
16. Abstract Using the current STS as a working model: identify existing, or new technologies, changes to flight hardware, or changes to processing methodologies that would reduce the processing time and program manpower costs of space vehicle processing. Document methods of improving efficiency of ground operations and identify technology elements that could reduce cost. Study emphasis is on: 1) Identification of specific technology items. 2) Management approaches required to develop, operate, support and control operationally efficient ground processing activities. Prime study results are: 1) Identification of existing, or new technology that would make vehicle processing less costly. 2) Recommendations for the use of selected technology items in the current STS program. 3) Recommendations for the research and/or development of specific technology items for use on future programs to make their processing (and operation more efficient. 4) Identification of new management techniques necessary to achieve and control these more efficient operations. Increased use of automation to provide current and more comprehensive managements reports, operational analysis support, evaluation of systems, conduct of operations and other ways to cut costs and provide additional benefits. *see 15					
17. Key Words (Suggested by Author(s)) Ground Operations: Life Cycle Cost; Operational Issues; CALS; Paperless Processing; ULCE; Shuttle;			18. Distribution Statement Unclassified - Unlimited		
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**SPACE SHUTTLE GROUND OPERATIONS  
EFFICIENCIES/TECHNOLOGIES  
STUDY  
PHASE 1 FINAL REPORT**

The final report for the Shuttle Ground Operations Efficiencies/Technologies Study is made up of five volumes.

Volume 1	Executive Summary
Volume 2	Ground Operations Evaluation
Volume 3	Final Presentation Material
Volume 4	Preliminary Issues Database (PIDB)
Volume 5	Technology Information Sheets (TIS)

**Volume 1**

The Executive Summary volume provides a brief overview of the major elements of the Study, reviews the findings, and reflects the development of the recommendations resulting from the Study.

**Volume 2**

The Ground Operations Evaluation volume describes the breath and depth of the various Study elements selected as a result of an operational analysis conducted during the early part of the Study. Analysis techniques used for the evaluation are described in detail. Elements selected for further evaluation are identified; the results of the analysis documented; and a follow-on course of action recommended. The background and rationale for developing recommendations for the current Shuttle or for future programs is presented.

**Volume 3**

The Final Presentation Material volume contains the most recent version of the charts used in the Final Phase 1 Oral Briefing at KSC on April 6, 1987, and to the STAS (Space Transportation Architecture Study) IPR-5 (Interim Program Review) held at MSFC on April 8, 1987. The KSC, April 6 notation in the title block was used for both packages because the reviews were held so closely together. This volume contains all charts in their final form and any differences from charts presented are minor.

**Volume 4**

The Preliminary Issues Database (PIDB) was assembled very early in the Study as one of the fundamental tools to be used throughout the Study. Data was acquired from a variety of sources and compiled in such a way that the data could be easily sorted in accordance with a number of different analytical objectives. The system was computerized to significantly expedite sorting and make it more usable. This volume summarizes the information contained in the PIDB and provides the reader with the capability to manually find items of interest. How that information was used in this Study is explained in greater detail in Volumes 2 and 3.

**Volume 5**

The Technology Information Sheet volume was assembled in database format during Phase 1 of the Study. This document was designed to provide a repository for information pertaining to 144 OMI (Operations and Maintenance Instructions) controlled operations in the OPF, VAB and PAD. It provides a way to accumulate information about required crew sizes, operations task time duration (serial and/or parallel), special GSE required, and identification of a potential application of existing technology -- or the need for the development of a new technology item.

SHUTTLE GROUND OPERATIONS  
EFFICIENCIES/TECHNOLOGIES  
STUDY

PRELIMINARY ISSUES DATABASE CATALOG

FINAL REPORT - VOL 4  
- PHASE 1 -  
MAY 4, 1987

KENNEDY SPACE CENTER  
NAS10-11344

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# PRELIMINARY ISSUES DATABASE CATALOG

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Issue Sort	ix
Preliminary Issue Catalog	1-704

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## INTRODUCTION

The overall objective of this Study is to determine high payoff, innovative methodologies and technologies to reduce STS ground operations, manpower, and life cycle costs. These objectives shall be accomplished through an overall analysis of the current Shuttle ground operations functions including but not limited to: assembly, test, and checkout, logistics, recovery, refurbishment, servicing, payload integration, launch operations, operations management, and ground systems operations and maintenance.

Our study approach is structured to satisfy the requirement of finding better ways of accomplishing Shuttle ground processing. This approach takes into account the current processing constraints resulting from the flight hardware design, the existing ground system facilities, GSE and software, and the present methods of operation. Our time phased study approach is geared to: 1) make maximum use of prior and current Shuttle processing assessments, 2) concentrate on the major Shuttle processing issues, 3) focus on those areas that have the maximum potential for high payback, and 4) provide rapid identification of existing and emerging technologies to reduce processing costs. This document presents the first listing of Study Issues taken from the initial array of source documents (page v). This listing will be expanded and statused as additional documentation becomes available and by operational issues, identified during our operational flow analyses.

This printout is from an AT&T 6300 plus, using DATAFLEX on a XENIX operating system. Initially, this database information was assembled for the analyses being conducted in support of the Study but is available for limited use by others. It is planned to make a later version of this database available to others on a NASA network. In the interim, selected data sorts can be obtained by contacting Tom Feaster, KSC PT-FPO, (305) 867-2780.

This document consists of items collected from many sources. The data was reviewed by Study Team members and input to the database management system in accordance with a series of pre-established "key words". Primary elements and their respective sub-elements, displayed on page vi, very rapidly narrows the available references down from the current 2022 issue descriptions, to a small, manageable number that the analyst can easily review manually to obtain references pertinent to the particular issue being analyzed.

A field is also provided for the description of each "issue". A "string search" can be made of each line in the description if a particular phrase is being sought although this will slow the "sort" activity significantly. This type of "sort mode" would not normally be used unless it was necessary to sort to special words or phrases not in the "key words".

A sample page showing all the information contained in a entry for a single issue is included on page vii of this document as an example showing the types of information contained in the database for each catalog entry. Page viii shows the number of references (citations) for each issue currently in the database.

Pages ix through xvii are an alphabetical sort of the issues with the numbers of all associated catalog entries. (The decimal portion shows up in the computer only, the printout eliminates the duplication and prints only the "whole" numbers.)

It is important that the information available for analysis be as complete and current as possible. If data available to you has not been entered into the database, or data herein is not the most current, please bring it to the attention of the Boeing Study Manager, A. L. Scholz. He may be reached by commercial telephone, (305) 867-2334, or by FTS 823-2334. Copies of any "new" material should be forwarded to him at KSC M/S FH-80 so that it can be incorporated into the database. Your assistance is essential to assure a mutually useful database tool.

- NOTE:**
- (1) Information from STAS IPR's is intentionally excluded from this database until permission is provided by the responsible agencies to include it.
  - (2) Reports of the Shuttle Paperwork and Preparedness Review Teams will be included when available.
  - (3) Other source material will be included as it becomes available.

## ISSUE SOURCE ID NUMBERS

<u>SERIES</u>	<u>SOURCE</u>
100	Presidential Commission Report (Vol. I, II)
200-400	Post 51-L Findings
500	Aerospace Safety Advisory Panel (ASAP)
600	AFOTEC Reports (Air Force Operational & Test Evaluation Center)
700	NSTS (National Space Transportation Strategy)
900	Lucas Letter to Headquarters
1000-1600	Maintenance Technology Study, Ph. III Summary Report (RI)
1700	AFSC/NSIA Space Transportation Panel
1800-2100	PEO Post 51-L Return-to-Fit-Status Mod List
2200-2600	DE Post 51-L Return-to-Fit-Status Mod List
2700-2800	PEO Post 51-L Return-to-Fit-Status Mod List
3000	Space Station Maint. Planning & Analysis Study (Boeing)
3100	SSME GSE Review
3200	KSC Shuttle Paperwork & Preparedness Review Team Reports
3900	NASA Headquarters, Misc.
4100	GO-MPO Shuttle Ground Operations Briefings
4800**	Boeing STAS
4900**	GDA STAS
5000**	MMC STAS
5100**	RI STAS

Note:

\* KSC "Shuttle Paperwork & Preparedness Review" Team Reports not yet available.

\*\* STAS IPR information excluded until permission granted to include it.

# LIST OF SEARCH KEYS

<u>ISSUES</u>	<u>HARDWARE/SOFTWARE</u>	<u>ISSUE SOURCE</u>	<u>REFERENCE DATA</u>	<u>OPERATION</u>	<u>LOCATION</u>
ACCESSABILITY	APU	51-L FINDINGS			
AUTOMATION	AVIONICS	AFOTEC			
CANNIBALIZATION	BR	AFSC/NSIA			
CHANGE CONTROL	ECLSS	ASAP			
COMM'LIZATION	ET	BOE SS MT PLNG			
COMMONALITY	FACILITIES	DE PROPOSED MODS			
CONSTRAINTS	FCE	DE RTN FLT MODS			
COST/MANHOURS	FLT KIT	FLORIDA TODAY			
DESIGN	GOAL	KSC GO-MPO			
DESIGN CRITERIA	GSE	LSOC			
DISCIPLINE	LANDING	LUCAS LTR TO HQ			
DRAWING SYSTEM	LPS	NASA HQ			
EFFICIENCY	LSDN	NE-PEO MOD LIST			
EXPERT SYSTEM	MPS	NSTS			
FAULT DETECTION	N/A	PC REPORT			
INTEGRATION	ORBITER	SPPR(CHANGES)			
INTERFACE	PECS	SPPR(CONSTRAINT)			
ISOLATION	POWER	SPPR(MGMT)			
LOGISTICS/SPARES	PV&D	SPPR(OMI)			
MAINTAINABILITY	SCAN	SPPR(QA)			
MANAGEMENT	SCAR	SPPR(RD&I)			
METHODS	SOFTWARE	SPPR(STD)			
MISSION	SRB	SPPR(TRNG/CERT)			
MODULARIZATION	SSME	SSME GSE REVIEW			
PAPERWORK	STRUCTURE	STAS			
PLANNING	STS	STS MT STDY (RI)			
PROCEDURE	TPS				
QA					
REDUNDANCY					
RELIABILITY					
REQUIREMENTS					
SAFETY					
SECURITY					
STANDARDS					
SURFACE TRANSP					
TECHNOLOGY					
TIME/CYCLE					
TIME/OFF-LINE					
TIME/ON-LINE					
TRAINING/CERTIF					
WAIVERS					
	CCB		ASSEMBLY		ALL
	COSTS		COUNTDOWN		JSC
	DATABASE		FAULT ISOLATION		KSC
	ESR		FERRY		LCC
	JOB CARD		FLIGHT		LDG
	LMR		FRR		LETF
	MANIFEST		GENERIC		LV
	MCR		HAZARDOUS		ML
	MEMO		INSPECTION		MLP
	N/A		LANDING		MSFC
	OMI		MAINTENANCE		MST
	OMRSD		MANIFESTING		N/A
	PRACA		N/A		OPF
	PSP		NDT		ORBITR
	REPORT		POWER-ON		PAD
	SCHEDULE		PROPELLANT		PCR
	WA		REPAIR		PPR
			REPLACEMENT/LRU		RSS
			SCHEDULING		SAB
			SWITCHING		SC
			TEST		VAB
			WORK CONTROL		VLS
					VPF





## NUMBER OF CITATIONS vs ISSUES

<u>ISSUE NAME</u>	<u>OCCURRENCES</u>
ACCESSABILITY	104
AUTOMATION	27
CANNIBALIZATION	14
CHANGE CONTROL	30
COMM'LIZATION	11
COMMONALITY	45
CONSTRAINTS	18
COST/MANHOURS	101
DESIGN	750
DESIGN CRITERIA	298
DISCIPLINE	125
DRAWING SYSTEM	30
EFFICIENCY	30
EXPERT SYSTEM	16
FAULT DETECTION	54
INTEGRATION	11
INTERFACE	42
ISOLATION	24
LOGISTICS/SPARES	81
MAINTAINABILITY	226
MANAGEMENT	82
METHODS	17
MISSION	38
MODULARIZATION	8
PAPERWORK	104
PLANNING	39
PROCEDURE	94
QA	107
REDUNDANCY	33
RELIABILITY	51
REQUIREMENTS	167
SAFETY	250
SECURITY	20
STANDARDS	33
SURFACE TRANSP	15
TECHNOLOGY	91
TIME/CYCLE	3
TIME/OFF-LINE	8
TIME/ON-LINE	22
TRAINING/CERTIF	31
WAIVERS	10
TOTAL:	3260 (2022 DIFFERENT DESCRIPTIONS)

<u>ACCESSABILITY</u>	<u>ACCESSABILITY</u>	<u>ACCESSABILITY</u>	<u>CANNIBALIZATION</u>	<u>COMM'LIZATION</u>	<u>COMMUNALITY</u>	<u>CONSTRAINTS</u>
ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID
274.10	1592.10	2465.10	112.20	1320.30	500.00	152.10
1003.10	1594.10	2466.00	119.10	1356.30	1013.00	155.10
1005.00	1600.00	2467.00	158.20	1368.10	1014.00	159.00
1012.10	1602.10	2468.00	200.10	1716.00	1016.00	160.00
1015.00	1606.10	2470.10	200.11	1716.01	1062.00	235.20
1017.00	1615.10	2471.00	412.10	1717.00	1084.10	281.20
1031.00	1619.00	2487.00	602.10	1718.00	1086.00	293.30
1032.00	1620.00	2648.00	608.10	1738.00	1090.00	337.30
1036.00	1622.00		620.10	1740.20	1198.00	338.10
1039.00	1623.10	<u>AUTOMATION</u>	626.10	1796.10	1200.00	1280.00
1043.00	1624.00		1000.00	1797.00	1203.00	1786.20
1044.00	1649.10	ISSUE ID	1707.10		1207.00	1786.21
1048.00	1660.00		2734.10		1215.00	1789.20
1084.00	1666.00	151.20	4102.20		1223.00	2053.10
1085.00	1730.10	151.21			1251.00	2548.10
1109.00	1781.10	1101.20	<u>CHANGE CONTROL</u>		1289.00	4106.00
1138.20	1800.00	1122.10			1297.00	4107.10
1149.00	1859.00	1138.10	ISSUE ID		1308.10	4108.00
1169.10	1860.10	1141.10			1311.00	
1215.20	1861.00	1153.10	151.30		1327.20	
1216.10	1862.00	1168.10	151.31		1332.00	
1290.20	1863.00	1171.10	172.10		1341.00	
1313.00	1864.10	1700.10	190.40		1345.00	
1314.10	1865.00	1727.00	208.20		1356.20	
1316.10	1866.10	1742.10	210.30		1366.00	
1327.00	1867.00	1743.10	212.10		1368.00	
1331.10	1868.10	1748.40	236.10		1373.10	
1336.00	1869.00	1749.00	261.20		1380.00	
1350.00	1871.00	1753.20	287.00		1385.10	
1356.00	1872.00	1754.00	289.10		1403.00	
1370.10	1875.10	1755.00	292.10		1405.00	
1518.10	1876.00	1767.30	293.00		1419.20	
1541.10	1920.00	1769.10	294.00		1429.00	
1543.10	1925.20	1775.20	360.30		1473.10	
1563.10	2095.10	1775.21	501.10		1480.00	
1564.10	2119.00	1816.10	505.00		1485.00	
1565.10	2120.00	1817.10	1116.10		1486.00	
1570.10	2124.20	1819.20	1117.00		1487.00	
1571.10	2200.10	1820.00	1136.10		1505.00	
1572.10	2203.10	2082.20	1186.00		1533.00	
1573.10	2274.30		1226.10		1539.00	
1575.10	2457.00		1256.00		1544.00	
1580.10	2458.10		1320.00		1547.00	
1582.00	2459.00		1348.00		1598.00	
1583.00	2460.00		1391.00		2642.00	
1584.10	2461.00		2082.10			
1585.00	2462.00		2121.10			
1586.10	2464.00		2151.20			
			2659.00			

<u>COST/MANHOURS</u>	<u>COST/MANHOURS</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>
ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID
155.20	1590.00	100.00	1807.00	1894.00	1994.00	2048.00	2122.00	2196.00	2305.00
158.10	1595.00	100.01	1808.00	1895.00	1997.10	2049.00	2124.00	2197.00	2306.00
327.00	1605.00	102.00	1809.10	1896.00	1998.00	2050.00	2125.00	2198.00	2308.00
328.00	1705.00	109.20	1810.00	1898.00	1999.00	2051.00	2126.00	2199.00	2309.00
329.00	1710.10	110.10	1811.00	1899.00	2000.00	2052.10	2127.00	2200.00	2310.00
330.00	1717.10	153.00	1812.00	1900.10	2001.00	2053.00	2139.00	2201.00	2311.00
331.00	1718.10	156.00	1813.00	1901.00	2002.00	2054.00	2140.00	2203.00	2312.00
332.00	1720.00	173.30	1814.00	1902.00	2003.00	2055.00	2141.00	2205.00	2313.00
333.00	1721.30	181.20	1821.00	1903.00	2004.00	2056.00	2142.00	2210.00	2314.00
334.00	1727.20	182.00	1822.20	1904.10	2005.00	2057.00	2143.00	2218.00	2315.00
335.00	1728.10	188.10	1823.00	1907.00	2006.00	2058.00	2144.00	2227.00	2316.00
336.00	1729.10	189.00	1824.10	1908.10	2007.00	2060.10	2145.00	2228.00	2317.00
354.00	1731.40	190.10	1829.10	1909.20	2008.00	2062.00	2147.00	2243.00	2318.00
428.00	1732.00	242.00	1836.00	1916.10	2009.00	2064.00	2148.00	2250.20	2319.00
700.00	1733.10	264.10	1837.00	1917.00	2010.00	2065.00	2149.00	2253.00	2320.00
701.00	1734.10	270.00	1840.00	1919.00	2011.00	2066.00	2150.00	2254.00	2321.00
701.01	1735.00	281.10	1841.00	1923.00	2012.00	2068.00	2151.00	2255.00	2322.00
702.00	1736.10	282.00	1842.00	1925.10	2013.00	2069.00	2152.00	2256.00	2323.00
709.00	1740.00	283.00	1844.00	1927.10	2014.00	2070.00	2153.00	2258.00	2324.00
710.00	1742.30	289.00	1845.00	1928.00	2015.00	2071.00	2154.00	2259.00	2325.00
711.00	1743.30	323.10	1846.00	1929.00	2016.00	2072.10	2155.00	2262.00	2326.00
712.00	1759.30	326.00	1847.00	1931.00	2017.00	2073.10	2163.00	2263.00	2327.00
713.00	1760.40	370.00	1848.00	1934.00	2018.10	2074.10	2165.00	2264.00	2328.00
714.00	1761.00	370.01	1850.00	1935.10	2019.00	2075.00	2171.00	2265.00	2329.00
715.00	1762.20	370.02	1851.00	1936.10	2020.00	2076.00	2172.00	2267.00	2330.20
716.00	1763.00	370.03	1852.00	1943.00	2021.00	2077.00	2173.00	2270.00	2331.00
717.00	1764.00	370.04	1853.00	1948.10	2022.30	2080.00	2174.00	2272.10	2332.00
718.00	1765.20	370.05	1859.10	1949.00	2023.00	2081.10	2175.00	2273.00	2335.00
719.00	1766.10	370.06	1860.00	1950.00	2024.00	2083.00	2176.00	2274.10	2336.00
720.00	1767.00	370.07	1864.00	1952.00	2026.00	2084.00	2177.00	2276.00	2337.00
1029.00	1776.00	370.08	1865.10	1953.00	2027.00	2088.10	2178.00	2278.00	2338.00
1068.00	1776.01	370.09	1866.00	1954.10	2028.00	2089.00	2179.00	2282.10	2339.00
1125.00	1778.10	507.10	1867.10	1957.00	2029.00	2090.00	2180.00	2284.00	2340.00
1166.00	1780.20	600.00	1868.00	1958.00	2030.00	2092.00	2181.00	2285.00	2341.00
1188.00	1781.00	601.00	1869.10	1959.00	2031.00	2093.00	2182.00	2286.00	2342.00
1325.10	1782.30	707.00	1874.00	1960.00	2032.00	2094.10	2183.00	2287.00	2343.00
1349.20	1783.00	708.10	1875.00	1961.20	2034.00	2095.00	2184.00	2288.00	2344.00
1365.00	1791.00	1018.00	1876.10	1962.00	2035.00	2096.00	2185.00	2293.00	2345.00
1393.20	1796.00	1028.00	1877.00	1968.00	2036.00	2097.00	2186.00	2294.00	2346.00
1398.00	1799.00	1045.00	1881.10	1976.10	2037.00	2098.00	2187.00	2295.00	2347.00
1447.00	1816.40	1050.00	1883.10	1985.10	2038.00	2100.00	2188.00	2296.00	2348.00
1455.10	1817.00	1197.00	1884.00	1986.00	2039.00	2102.00	2189.00	2297.00	2349.00
1474.00	1818.20	1215.00	1885.00	1987.00	2041.20	2105.10	2190.00	2298.00	2350.00
1477.00	1819.00	1233.00	1889.10	1988.10	2042.00	2106.00	2191.00	2299.00	2351.00
1519.10	1820.10	1242.00	1890.00	1990.00	2043.00	2112.00	2192.00	2301.00	2352.00
1532.00	1856.10	1295.00	1891.00	1991.00	2045.00	2113.10	2193.00	2302.00	2353.00
1542.10	1893.10	1495.00	1892.00	1992.00	2046.00	2114.00	2194.00	2303.00	2354.00
1589.00	2051.10	1805.00	1893.00	1993.00	2047.00	2115.00	2195.00	2304.00	2355.00
	2110.10								
	2123.10								
	2244.20								
	2245.20								
	4101.20								

<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN</u>	<u>DESIGN CRITERIA</u>	<u>DESIGN CRITERIA</u>
ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID
2356.00	2412.00	2480.10	2554.00	2620.00	2738.00	2789.00	2838.00	171.10	1138.00
2357.00	2413.00	2482.00	2555.00	2621.00	2740.00	2790.00	2840.00	295.10	1144.00
2358.00	2415.00	2483.10	2556.00	2623.00	2741.00	2791.00	2841.00	705.10	1148.00
2359.00	2417.00	2484.20	2558.00	2624.00	2742.00	2792.00	2842.00	1002.00	1161.00
2360.00	2418.00	2486.00	2561.00	2625.00	2743.00	2793.00	2843.00	1003.00	1162.00
2361.00	2419.00	2490.00	2562.10	2626.00	2744.00	2794.00	2844.00	1005.10	1166.20
2362.00	2420.00	2492.00	2563.00	2627.00	2745.00	2795.00	2846.00	1007.00	1171.20
2363.00	2422.00	2493.00	2564.00	2647.00	2746.00	2796.00	2847.00	1008.00	1187.00
2364.00	2423.00	2496.00	2565.00	2649.00	2747.00	2798.00	2848.00	1009.00	1194.10
2367.00	2424.00	2498.00	2566.10	2650.00	2748.00	2799.00	2849.00	1011.10	1202.00
2368.00	2425.00	2500.00	2567.00	2651.00	2749.00	2800.00	2850.00	1013.10	1211.00
2369.00	2426.00	2501.00	2574.00	2652.00	2750.00	2801.00	2851.00	1016.10	1212.00
2370.00	2427.00	2502.00	2575.00	2653.00	2751.00	2802.00	2852.00	1020.00	1213.00
2371.00	2429.00	2503.00	2582.00	2700.00	2753.00	2803.00	2853.00	1021.10	1214.00
2372.00	2430.00	2508.10	2583.00	2701.00	2754.00	2804.00	2854.00	1022.00	1218.00
2373.00	2431.00	2514.10	2584.00	2702.00	2755.00	2805.00	2855.00	1035.10	1219.00
2374.00	2432.00	2515.00	2585.00	2703.00	2756.00	2806.00	2856.00	1037.10	1220.00
2375.00	2433.00	2516.00	2586.00	2704.00	2757.00	2807.00	2857.00	1039.10	1221.10
2376.00	2434.00	2517.00	2589.00	2705.00	2758.00	2808.00	2858.00	1040.00	1222.00
2377.00	2435.00	2518.00	2590.00	2706.00	2759.00	2809.00	2859.00	1041.00	1224.00
2378.00	2436.00	2519.00	2591.00	2708.00	2760.00	2810.00	2860.00	1046.00	1227.10
2379.00	2440.00	2522.00	2592.00	2709.00	2761.00	2811.00	2861.00	1051.10	1228.00
2380.00	2441.00	2523.00	2593.00	2710.00	2762.00	2812.00	2862.00	1052.00	1233.10
2383.00	2442.00	2524.00	2594.00	2711.00	2763.00	2813.00	2863.00	1057.00	1235.00
2384.00	2443.00	2525.00	2595.00	2712.00	2764.00	2814.00	2865.00	1058.00	1236.00
2385.10	2446.00	2526.10	2596.00	2713.00	2765.00	2815.00	2866.00	1059.00	1242.10
2386.00	2447.00	2527.00	2597.00	2714.00	2767.00	2816.00	2867.00	1060.00	1244.00
2387.00	2448.00	2528.00	2598.00	2715.00	2768.00	2817.00	2868.00	1061.00	1245.00
2388.00	2449.00	2529.00	2599.00	2717.00	2769.00	2818.00	2869.00	1063.00	1252.00
2389.00	2450.00	2530.00	2600.00	2718.00	2770.00	2819.00	4103.10	1065.00	1256.20
2390.00	2451.00	2532.00	2601.00	2719.00	2771.00	2820.00		1066.00	1260.00
2391.00	2452.00	2533.00	2602.00	2720.00	2772.00	2821.00		1067.00	1261.00
2392.00	2453.00	2534.00	2604.00	2721.00	2773.00	2822.00		1069.00	1273.00
2394.00	2454.00	2536.00	2605.00	2722.00	2774.00	2823.00		1072.00	1276.00
2395.00	2457.10	2537.00	2606.00	2723.00	2775.00	2824.00		1073.00	1279.00
2396.00	2458.00	2538.00	2607.00	2724.00	2776.00	2825.00		1075.00	1280.20
2397.00	2462.10	2540.10	2608.00	2725.00	2777.00	2826.00		1077.00	1281.00
2398.00	2463.00	2541.00	2609.00	2726.00	2778.00	2827.00		1081.00	1282.10
2399.00	2464.10	2542.00	2610.00	2727.00	2779.00	2828.00		1083.00	1284.00
2400.00	2465.00	2544.00	2611.00	2728.00	2780.00	2829.00		1087.00	1286.10
2401.00	2466.10	2545.00	2612.00	2729.00	2781.00	2830.00		1091.00	1287.00
2402.00	2470.00	2546.00	2613.00	2730.00	2782.00	2831.00		1093.00	1288.00
2403.00	2471.10	2547.10	2614.00	2731.00	2783.00	2832.00		1099.00	1289.10
2404.00	2474.10	2548.00	2615.00	2732.00	2784.00	2833.00		1101.00	1290.00
2405.00	2476.10	2549.00	2616.00	2733.00	2785.00	2834.00		1102.00	1291.00
2406.00	2477.00	2550.00	2617.00	2735.00	2786.00	2835.00		1124.00	1292.00
2407.00	2478.10	2551.00	2618.00	2736.00	2787.00	2836.00		1135.00	1294.00
2411.00	2479.00	2552.00	2619.00	2737.00	2788.00	2837.00		1137.00	1297.10

<u>DESIGN CRITERIA</u>	<u>DESIGN CRITERIA</u>	<u>DESIGN CRITERIA</u>	<u>DESIGN CRITERIA</u>	<u>DESIGN CRITERIA</u>	<u>DISCIPLINE</u>	<u>DISCIPLINE</u>
ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID
1298.00	1434.00	1587.10	1833.00	2473.20	248.00	369.00
1299.00	1437.00	1588.00	1835.00	2481.00	249.00	371.20
1300.00	1440.00	1590.10	1843.00	2512.00	252.10	400.00
1304.00	1441.00	1592.00	1879.20	4106.10	253.00	402.10
1308.00	1445.00	1594.00	1905.00	4107.00	257.10	403.10
1313.10	1446.00	1595.10	1933.00	4108.10	258.10	404.00
1314.00	1456.00	1597.00	1974.10	4109.00	261.40	405.10
1316.00	1469.00	1599.00	1975.00	4110.20	262.10	406.00
1317.00	1470.00	1602.00	1983.00	4111.00	263.00	407.00
1320.10	1473.00	1603.00	1989.00	4112.00	264.00	408.00
1321.20	1479.00	1606.00	2202.00		265.10	409.00
1322.00	1498.00	1608.00	2204.00	<u>DISCIPLINE</u>	268.10	410.00
1325.00	1500.00	1611.00	2206.00		269.00	411.00
1326.00	1509.00	1612.00	2207.00	ISSUE ID	271.30	429.10
1331.00	1517.10	1615.00	2208.00		272.00	430.10
1334.00	1522.00	1619.10	2209.00	114.10	275.10	432.20
1335.00	1523.00	1622.10	2211.00	116.00	276.30	433.00
1336.10	1542.20	1623.00	2212.00	117.00	277.00	435.00
1342.00	1543.00	1624.10	2213.00	124.00	279.20	437.10
1343.00	1544.10	1649.00	2214.00	131.00	280.00	504.00
1346.00	1545.00	1650.00	2215.00	132.10	282.20	615.10
1348.20	1547.10	1654.00	2216.00	136.00	286.10	1361.10
1355.10	1548.10	1655.00	2217.00	138.00	290.20	1854.10
1356.10	1549.10	1712.10	2219.00	144.20	291.10	2109.00
1357.10	1550.00	1720.10	2220.00	146.20	292.00	2121.20
1359.00	1552.00	1721.00	2221.00	147.00	293.20	2132.00
1362.10	1553.10	1727.30	2222.00	148.20	294.20	2134.00
1369.10	1555.10	1731.00	2223.00	149.00	296.00	2257.10
1383.00	1556.10	1739.40	2224.00	150.10	297.00	2579.20
1388.10	1558.10	1739.41	2225.00	150.11	298.20	
1390.10	1559.10	1749.20	2226.00	154.10	299.10	
1402.10	1560.10	1763.20	2229.00	157.10	300.20	
1408.00	1563.00	1780.10	2230.00	201.00	301.00	
1409.00	1564.00	1786.10	2231.00	202.00	302.20	
1410.00	1565.00	1786.11	2232.00	203.00	303.00	
1411.00	1566.00	1789.40	2233.00	204.00	304.20	
1412.00	1567.00	1790.00	2234.00	205.00	305.20	
1413.00	1570.00	1790.01	2235.00	206.00	325.00	
1415.00	1571.00	1790.02	2236.00	207.00	346.20	
1416.00	1572.00	1792.10	2237.00	208.10	348.10	
1417.00	1573.00	1793.00	2238.00	209.00	349.20	
1418.00	1574.00	1800.10	2239.00	210.00	350.00	
1419.00	1575.00	1802.00	2240.00	211.00	351.00	
1422.00	1577.00	1804.00	2241.00	214.00	352.00	
1423.00	1578.00	1805.00	2242.00	215.00	355.10	
1425.00	1580.00	1822.00	2246.00	216.20	356.00	
1428.10	1584.00	1824.00	2251.10	217.20	358.10	
1431.00	1586.00	1832.00	2290.00	222.10	359.20	
				223.10	361.10	
				225.00	362.00	
				226.00	363.00	
				227.20	364.10	
				233.00	365.00	
				234.00	366.20	
				244.00	367.10	
					368.00	

<u>DRAWING SYSTEM</u>	<u>EFFICIENCY</u>	<u>FAULT DETECTION</u>	<u>FAULT DETECTION</u>	<u>INTERFACE</u>	<u>ISOLATION</u>	<u>LOGISTICS/SPARES</u>	<u>LOGISTICS/SPARES</u>
ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID
1027.00	150.20	327.10	2073.20	171.00	623.00	112.30	1887.10
1038.00	150.21	1010.00	2074.00	192.00	1110.00	119.00	1888.00
1105.00	337.40	1034.00	2075.20	235.10	1185.00	141.00	1965.00
1111.00	355.20	1049.00	2090.10	278.20	1194.00	158.00	1967.00
1114.00	438.10	1101.10	2097.10	283.10	1280.10	200.00	2017.10
1116.00	503.20	1104.00	2271.00	500.10	1342.10	200.01	2018.00
1118.00	607.10	1122.00		1115.00	1703.00	412.00	2025.00
1139.00	629.10	1129.00		1264.00	1704.00	427.00	2033.20
1189.00	1077.20	1138.30	<u>INTEGRATION</u>	1708.10	1722.00	503.00	2040.00
1201.00	1258.10	1141.00	ISSUE ID	1722.10	1725.00	506.00	2063.10
1320.20	1277.10	1142.00		1723.20	1725.01	607.00	2067.00
1333.00	1369.20	1146.00	1389.00	1725.10	1743.40	608.00	2082.00
1348.10	1429.10	1153.00	1700.20	1725.11	1319.10	615.30	2104.10
1360.00	1556.20	1157.00	1721.20	1729.00	1923.10	620.00	2108.00
1371.00	1724.00	1168.00	1723.10	1731.20	1934.20	626.00	2246.30
1384.00	1760.30	1170.00	1729.20	1739.20	1964.00	1000.20	2260.10
1393.00	1761.10	1171.00	1739.10	1739.21	1997.00	1001.00	2261.00
1419.10	1762.10	1172.00	1739.11	1742.20	2003.10	1002.10	2262.10
1526.00	1768.00	1193.00	1760.20	1743.20	2016.10	1004.00	2439.20
1854.00	1769.20	1195.00	1761.20	1787.10	2041.00	1006.10	2504.00
2121.00	1786.40	1206.00	1765.40	1787.11	2043.10	1023.00	2526.00
2151.10	1796.41	1276.10	1762.10	1788.00	2295.10	1029.10	2531.00
2257.00	1791.40	1284.10		1790.30	2298.10	1167.00	2553.10
2366.00	1798.00	1286.00		1790.31	2490.10	1217.00	2557.00
2381.00	2014.10	1287.10		1790.32		1279.10	2569.00
2382.00	2119.10	1319.00		1791.10		1319.10	2573.00
2587.00	2306.10	1322.10		1793.30		1349.00	2660.00
2607.10	4101.10	1324.10		1894.30		1361.20	2734.00
3104.00	4102.00	1328.00		2012.20		1391.20	2839.00
3105.00	4103.20	1330.00		2013.10		1393.10	2845.00
		1340.00		2027.10		1441.10	2864.00
		1357.00		2075.10		1451.00	3106.00
		1362.00		2080.10		1455.00	3106.01
	<u>EXPERT SYSTEM</u>	1381.00		2081.20		1466.00	
	ISSUE ID	1385.00		2100.10		1468.00	
		1528.00		2304.20		1516.00	
	1358.10	1612.10		2305.10		1517.00	
	1748.10	1742.40		2561.10		1518.00	
	1752.10	1748.20		2562.20		1535.00	
	1753.00	1773.10		2564.10		1707.00	
	1754.20	1773.11		4110.10		1759.10	
	1755.10	1775.40		4111.10		1760.10	
	1773.00	1775.41				1761.30	
	1773.01	1739.10				1767.20	
	1774.00	1915.00				1773.30	
	1774.01	1964.10				1773.31	
	1775.10	1969.00				1825.10	
	1775.11	1970.00				1870.30	
	1793.20						
	1820.30						
	2090.20						
	2437.10						

<u>MAINTAINABILITY</u>	<u>MAINTAINABILITY</u>	<u>MAINTAINABILITY</u>	<u>MAINTAINABILITY</u>	<u>MAINTAINABILITY</u>	<u>MANAGEMENT</u>	<u>MANAGEMENT</u>
ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID
112.10	1123.00	1442.00	1887.00	2630.00	103.00	1066.10
145.00	1126.00	1443.00	1888.10	2637.00	104.00	1256.30
167.40	1133.00	1450.00	1889.00	3000.00	105.00	1349.10
167.41	1136.00	1475.00	1922.00	3000.01	106.00	1372.00
168.10	1147.00	1493.00	1932.00	3000.02	108.00	1387.00
273.20	1149.10	1499.00	1953.10	3001.00	113.30	1536.00
274.00	1152.00	1516.10	1963.00	3001.01	118.00	1713.00
339.00	1154.00	1518.20	1980.00	3001.02	119.20	1714.00
614.20	1164.10	1523.10	1995.00	3002.00	122.00	1715.00
615.00	1169.00	1527.00	1996.00	3002.01	124.10	1719.00
704.00	1184.00	1530.00	2033.00	3002.02	131.10	1719.01
1000.10	1193.10	1538.00	2040.10	3003.00	132.20	1732.10
1004.10	1210.00	1542.00	2043.20	3003.01	133.00	1759.20
1005.20	1282.00	1546.10	2044.00	3003.02	134.00	1760.00
1006.00	1312.00	1548.00	2052.00	3004.00	135.00	1761.40
1009.10	1314.20	1549.20	2061.00	3004.01	137.00	1762.00
1011.00	1315.00	1553.00	2078.00	3004.02	142.00	1763.10
1012.00	1318.00	1555.20	2085.00	3004.03	149.10	1764.10
1021.00	1321.00	1556.00	2099.00	3005.00	150.00	1765.00
1024.00	1322.20	1557.00	2104.00	3005.01	150.01	1768.10
1025.00	1327.10	1558.00	2105.00	3005.02	151.00	1769.00
1030.00	1328.10	1559.00	2111.00	3005.03	151.01	1770.00
1032.10	1329.00	1566.10	2246.20	3006.00	152.00	1771.00
1034.10	1332.10	1573.20	2250.30	3006.01	155.00	1772.00
1035.00	1339.00	1578.10	2256.10	3006.02	157.20	1774.10
1036.10	1342.20	1580.20	2260.00	3007.00	161.00	1774.11
1037.00	1347.00	1588.10	2261.10	3007.01	162.00	1799.10
1038.10	1350.10	1589.10	2289.00	3007.02	163.00	2061.10
1042.00	1355.00	1599.10	2300.00	3008.00	185.00	2079.00
1044.10	1363.00	1603.10	2307.00	3008.01	192.10	2110.00
1046.10	1364.00	1605.20	2308.10	3009.00	203.30	2123.00
1047.00	1369.00	1606.20	2329.10	3009.01	235.00	2133.00
1052.10	1370.00	1636.00	2330.00	3009.02	236.30	2560.00
1058.10	1378.00	1654.10	2439.10	4101.40	312.10	2658.00
1059.10	1379.00	1730.00	2444.00		321.10	
1061.10	1388.00	1789.30	2445.00		342.10	
1063.10	1390.00	1791.30	2454.10		345.10	
1065.10	1392.00	1825.00	2472.40		352.10	
1075.10	1395.00	1834.00	2475.10		354.10	
1077.10	1400.00	1838.00	2489.00		357.20	
1081.10	1402.00	1839.00	2510.00		364.20	
1087.10	1404.00	1850.10	2520.00		404.20	
1088.00	1410.10	1853.20	2521.00		407.30	
1096.00	1415.10	1857.10	2543.00		409.30	
1103.00	1423.10	1870.00	2547.00		606.00	
1108.00	1427.00	1870.20	2559.00		612.10	
1112.00	1428.00	1878.40	2566.00		613.00	
1113.00	1432.00	1886.10	2610.10		614.10	



METHODS	MISSION	PAPERWRK	PAPERWORK	PLANNING	PROCEDURE	PROCEDURE	QA	QA	QA
<u>ISSUE ID</u>	<u>ISSUE ID</u>	<u>ISSUE ID</u>	<u>ISSUE ID</u>	<u>ISSUE ID</u>	<u>ISSUE ID</u>	<u>ISSUE ID</u>	<u>ISSUE ID</u>	<u>ISSUE ID</u>	<u>ISSUE ID</u>
178.20	1765.30	114.20	320.00	109.30	112.00	401.00	113.20	258.00	432.00
192.20	1774.20	140.10	337.10	111.00	136.20	410.10	138.10	259.10	433.10
239.10	1774.21	143.00	338.00	146.10	157.00	420.10	139.10	260.20	434.10
240.30	1781.20	144.10	341.00	151.40	167.10	431.00	140.00	262.30	436.00
241.00	1788.20	147.10	342.00	151.41	167.11	432.30	143.20	263.10	605.20
245.10	1790.10	151.10	343.00	167.00	201.30	433.20	144.00	264.30	1829.00
270.10	1790.11	151.11	344.00	167.01	202.30	437.20	146.00	265.00	1854.20
272.10	1790.12	154.00	345.00	168.00	211.40	1055.00	174.00	268.00	1878.30
273.10	3901.00	154.01	346.00	190.30	212.30	1071.00	175.00	274.20	1982.00
1714.10	3902.00	154.11	347.00	193.00	223.00	1107.00	177.00	275.00	2472.30
1724.10	3903.00	201.20	348.00	321.00	234.20	1108.10	178.00	276.10	2579.10
1782.20	3904.00	202.10	349.00	504.00	236.20	1164.00	201.10	277.20	
1972.00	3905.00	203.10	356.10	614.00	238.00	1226.00	202.20	279.10	
2063.20	3906.00	204.10	357.10	615.20	239.00	1233.00	203.20	281.00	<u>REDUNDANCY</u>
2118.00	3907.00	205.10	358.00	706.20	240.10	1237.00	204.20	282.10	<u>ISSUE ID</u>
2505.00	3908.00	206.10	360.00	1701.00	241.10	1239.00	205.20	284.00	
2553.20	3909.00	207.10	361.00	1702.00	244.10	1240.00	205.20	285.00	179.00
	3910.00	210.10	363.10	1715.10	246.20	1256.10	207.20	286.00	1195.10
	3911.00	211.10	364.00	1737.00	248.10	1258.00	208.00	290.00	1215.10
	3912.00	212.00	365.10	1739.00	249.10	1277.00	209.10	292.20	1251.10
	3913.00	213.10	366.10	1739.01	250.10	1278.00	210.20	293.10	1738.30
	3914.00	214.10	367.00	1741.20	251.00	1306.00	211.20	294.10	1909.30
	3915.00	215.10	368.10	1741.21	254.20	1321.10	212.20	295.00	1935.00
	3916.00	216.10	371.10	1741.22	255.00	1324.00	216.00	297.10	1961.10
	3917.00	217.00	413.00	1741.23	257.20	1337.00	217.10	298.00	1988.20
	3918.00	236.00	414.00	1748.30	259.00	1338.00	219.00	299.00	2029.10
	3919.00	248.20	415.00	1765.10	260.10	1351.00	220.00	300.10	2032.10
	3920.00	257.30	416.00	1766.00	261.30	1361.00	221.10	301.10	2037.20
	3921.00	258.20	417.00	1779.20	262.20	1364.10	222.00	302.10	2049.10
	3922.00	260.00	418.00	1816.20	265.20	1373.00	225.20	303.10	2057.20
	3923.00	261.00	419.00	1818.10	269.20	1377.00	226.10	304.10	2060.00
	3924.00	262.00	420.20	2244.10	271.10	1391.10	227.10	305.10	2068.10
	3925.00	269.30	421.00	2245.10	272.20	1404.10	234.10	318.10	2072.20
	3926.00	271.00	422.00	4100.00	273.00	1489.00	237.10	337.20	2073.00
	3927.00	273.30	424.00	4101.00	278.10	1519.00	239.20	340.00	2076.10
	3927.01	276.20	424.01	4102.10	279.00	1554.00	240.20	359.10	2083.10
	3928.00	277.10	425.00	4103.00	288.00	1555.00	241.20	363.20	2087.00
	3928.01	280.10	425.01	4104.00	296.20	2059.00	243.10	364.30	2131.00
		292.30	426.00	4105.00	298.30	2063.00	245.00	365.20	2164.00
		296.10	429.00		322.00	2134.10	246.10	366.00	2167.00
	<u>MODULARIZATION</u>	312.00	431.10		337.00	2553.00	246.30	367.20	2288.20
		313.00	432.10		345.20	2578.00	249.20	368.20	2484.30
	<u>ISSUE ID</u>	314.00	437.00		346.30	2579.00	250.00	369.10	2516.20
		315.00	605.10		348.20	2656.00	250.20	371.00	2537.10
	704.10	316.00	606.10		353.00	2657.00	252.00	402.20	2550.10
	1120.00	317.00	613.10		360.20	2752.00	253.20	403.00	2577.00
	1717.20	318.00	1769.30		367.30		256.00	420.00	2707.00
	1726.10	319.00	1774.40		371.30		257.00	431.20	2716.00
	1729.30		1774.41						2797.00
	1730.20		1775.30						
	1731.10		1775.31						
	1738.10		1792.20						
			1793.40						
			2079.10						
			2560.10						
			4102.30						

<u>RELIABILITY</u>	<u>REQUIREMENTS</u>	<u>REQUIREMENTS</u>	<u>REQUIREMENTS</u>	<u>REQUIREMENTS</u>	<u>SAFETY</u>	<u>SAFETY</u>	<u>SAFETY</u>	<u>SAFETY</u>
ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID
113.10	120.00	347.10	1856.00	2277.00	105.10	323.00	1880.00	2062.10
115.00	139.00	355.00	1878.10	2279.00	106.10	331.10	1881.00	2067.10
125.00	143.10	360.10	1884.10	2280.00	107.00	332.10	1883.00	2071.10
126.00	149.00	402.00	1897.10	2283.00	109.00	350.20	1885.10	2072.00
126.01	170.00	406.10	1899.10	2287.10	110.00	404.10	1886.00	2084.10
127.00	173.00	900.00	1902.20	2288.10	113.00	405.00	1890.10	2093.10
128.00	176.00	901.00	1906.00	2421.00	124.20	407.10	1894.20	2094.00
129.00	177.10	902.00	1909.10	2455.00	131.20	409.10	1895.10	2103.00
130.00	179.10	903.00	1910.00	2472.10	132.00	706.10	1897.00	2113.00
145.10	180.00	904.00	1911.00	2477.10	133.10	707.10	1899.20	2116.00
173.20	181.00	905.00	1912.00	2484.10	136.10	708.00	1900.00	2122.10
179.20	183.10	906.00	1913.00	2495.00	148.10	712.10	1902.10	2124.10
186.00	186.20	910.00	1918.00	2497.00	162.10	716.10	1903.10	2127.10
187.10	190.20	911.00	1924.10	2561.20	166.00	1128.00	1904.00	2128.00
243.00	213.00	912.00	1926.00	2562.00	167.30	1132.00	1907.10	2129.00
256.10	214.20	913.00	1929.20	2580.00	167.31	1166.10	1908.00	2135.10
507.00	215.20	920.00	1930.10	2628.00	168.20	1227.00	1925.00	2137.00
600.10	217.30	921.00	1937.00	3100.00	173.10	1290.10	1927.00	2139.10
618.00	218.00	922.00	1938.00	3101.00	181.10	1541.00	1928.10	2146.00
619.00	220.20	923.00	1939.00	3102.00	182.10	1546.00	1929.10	2156.00
703.00	221.00	924.00	1940.00	3103.00	183.00	1549.00	1930.00	2157.00
1066.20	222.20	930.00	1941.00	4102.40	184.00	1560.20	1934.10	2158.00
1587.00	224.00	931.00	1944.00	4112.10	186.10	1590.20	1935.20	2159.00
1636.10	225.10	932.00	1945.00		187.00	1596.00	1936.00	2160.00
1709.00	227.00	933.00	1946.00		188.00	1605.10	1942.00	2161.00
1829.20	228.00	934.00	1947.00		189.10	1736.20	1943.10	2162.00
1830.00	229.00	940.00	1948.00		190.00	1738.20	1954.00	2166.00
1853.10	230.00	941.00	1951.00		191.00	1805.10	1973.00	2168.00
1870.10	231.00	942.00	1955.00		211.30	1808.10	1974.00	2170.00
1878.20	232.00	950.00	1956.00		261.50	1809.00	1975.10	2200.20
1879.00	237.00	951.00	1960.10		264.20	1811.10	1976.00	2205.10
1908.20	238.10	952.00	1961.00		265.30	1815.00	1977.00	2242.10
1909.00	239.30	953.00	1962.10		271.20	1816.00	1978.00	2247.00
1914.00	240.00	960.00	1966.00		287.10	1822.10	1979.00	2248.00
2012.10	241.30	970.00	1971.00		298.10	1823.10	1981.00	2249.00
2033.10	242.10	980.00	2080.20		299.20	1824.20	1983.10	2251.00
2057.30	247.00	1448.00	2081.00		300.00	1826.00	1984.00	2252.00
2104.20	253.10	1719.10	2086.00		301.20	1827.00	1985.00	2263.10
2201.10	254.00	1719.11	2091.00		302.00	1828.00	1986.10	2274.00
2218.10	256.20	1730.30	2101.00		303.20	1833.10	1987.10	2276.10
2250.10	266.00	1741.10	2112.10		304.00	1849.00	1988.00	2281.00
2304.10	267.00	1741.11	2135.00		305.00	1858.00	1999.10	2282.00
2472.20	269.10	1741.12	2200.30		306.00	1868.20	2024.10	2290.10
2473.00	278.00	1741.13	2210.10		307.00	1872.10	2032.20	2291.00
2483.20	288.10	1779.10	2266.00		308.00	1873.00	2035.10	2292.00
2484.00	290.30	1788.30	2268.00		309.00	1877.10	2037.10	2333.00
2550.30	291.00	1789.00	2269.00		310.00	1878.00	2041.10	2385.00
2588.00	346.10	1855.00	2275.00		311.00	1879.10	2057.10	2393.00
2629.00								
2739.00								
2766.00								

<u>SAFETY</u>	<u>SAFETY</u>	<u>STANDARDS</u>	<u>TECHNOLOGY</u>	<u>TECHNOLOGY</u>	<u>TIME/CYCLE</u>	<u>TRAINING/CERTIF</u>	<u>WAIVERS</u>
ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID	ISSUE ID
2408.00	2638.00	114.30	1051.00	1773.41	246.00	111.10	112.40
2409.00	2639.00	172.00	1072.10	1774.30	254.10	114.00	152.20
2410.00	2640.00	259.20	1079.00	1774.31	4101.30	121.00	218.10
2414.00	2641.00	290.10	1100.00	1775.00		123.00	220.10
2416.00	2643.00	1304.10	1159.00	1775.01	<u>TIME/OFF-LINE</u>	144.30	230.10
2428.00	2644.00	1700.00	1165.00	1776.10	ISSUE ID	147.20	266.10
2438.00	2645.00	1706.00	1190.00	1776.11		148.00	276.00
2456.00	2646.00	1708.00	1197.10	1777.00	605.00	167.20	338.20
2465.20	2654.00	1721.10	1199.00	1778.00	610.00	167.21	402.40
2468.10	2655.00	1725.30	1204.00	1779.00	611.00	233.10	415.10
2469.00		1725.31	1208.00	1780.00	612.00	261.10	
2472.00	<u>SECURITY</u>	1727.10	1221.00	1782.00	612.00	349.10	
2473.10		1729.20	1244.10	1783.10	1453.00	350.10	
2474.00	ISSUE ID	1731.30	1358.00	1784.00	1722.20	357.00	
2475.00		1739.30	1367.00	1785.00	1723.00	358.20	
2477.20	124.30	1739.31	1375.00	1786.00	1728.00	362.10	
2478.00	124.00	1767.10	1483.00	1786.01		402.30	
2479.10	165.00	1773.20	1560.00	1795.00	<u>TIME/ON-LINE</u>	407.20	
2480.00	359.00	1773.21	1710.00	1795.01	ISSUE ID	409.20	
2482.10	701.10	1787.00	1711.00	1798.10		420.30	
2483.00	1725.20	1787.01	1712.00	1816.30		430.00	
2485.00	1725.21	1788.10	1733.00	1817.20	324.00	434.00	
2493.10	1818.00	1790.20	1734.00	1820.20	501.00	438.00	
2499.00	1921.00	1790.21	1735.10	1831.00	503.10	438.01	
2507.00	1924.00	1790.22	1736.00	1857.00	602.00	1525.00	
2509.00	1948.10	1792.00	1740.10	1854.10	603.00	1702.10	
2509.00	2087.10	1793.10	1741.00	1915.10	604.10	1790.40	
2512.10	2088.00	1794.00	1741.01	1916.00	609.00	1790.41	
2513.00	2115.10	1949.10	1741.02	1917.10	617.00	1790.42	
2514.00	2117.00	2070.10	1741.03	2102.10	621.00	1980.10	
2515.10	2130.00	4109.10	1742.00	2136.00	622.00	2510.10	
2516.10	2244.00	4110.00	1743.00	2202.10	624.00		
2522.10	2245.00	4111.20	1744.00	2223.10	624.01		
2530.10	2334.00		1745.00	2246.10	627.00		
2540.00	2488.00	<u>SURFACE TRANSP</u>	1746.00	2250.00	627.01		
2550.20		ISSUE ID	1747.00	2271.10	628.00		
2552.10			1748.00	2272.00	629.00		
2557.10			1749.10	2330.10	630.00		
2563.10		109.10	1750.00	2370.10	631.00		
2576.00		178.10	1751.00	2437.00	705.00		
2580.10		1726.00	1752.00	2439.00	706.00		
2584.10		1786.30	1753.10	2476.00	1121.00		
2631.00		1786.31	1754.10	2565.10	1724.20		
2632.00		1791.20	1755.20				
2633.00		1933.10	1756.00				
2634.00		1982.00	1757.00				
2635.00		2036.10	1758.00				
2636.00		2063.30	1773.40				
		2107.00					
		2511.00					
		2539.00					
		2553.30					
		2568.00					

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ID: < 100.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE 198, VOL 1  
Operation:     <FLIGHT            >  
Location:      <KSC            >  
Orb.No/Mission: <099/51-L       >  
Hardware/Software:<SRB           >  
Reference Data:    REPORT                    PRESIDENTIAL COMMISSION REPORT PP51-151  
Description:  
\*THE FAULTY SOLID ROCKET MOTOR JOINT AND SEAL MUST BE CHANGED. THIS COULD BE A  
NEW DESIGN ELIMINATING THE JOINT OR A REDESIGN OF THE CURRENT JOINT AND SEAL.  
NO DESIGN OPTIONS SHOULD BE PREMATURELY PRECLUDED BECAUSE OF SCHEDULE, COST,  
OR RELIANCE ON EXISTING HARDWARE. ALL SOLID ROCKET MOTOR JOINTS SHOULD SATISFY  
THE FOLLOWING REQUIREMENTS: --THE JOINTS SHOULD BE FULLY UNDERSTOOD, TESTED,  
AND VERIFIED. --THE INTEGRITY OF THE STRUCTURE AND OF THE SEALS OF ALL JOINTS  
SHOULD BE NOT LESS THAN THAT OF THE CASE WALLS THROUGHOUT THE DESIGN ENVELOPE.  
--THE INTEGRITY OF THE JOINTS SHOULD BE INSENSITIVE TO: -DIMENSIONAL TOLERANCES  
-TRANSPORTATION AND HANDLING -ASSEMBLY PROCEDURES -INSPECTION AND TEST  
PROCEDURES -ENVIRONMENTAL EFFECTS -(CONTINUED ID:100.01)

\*\*\*\*\*  
ID: < 100.01>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE 198, VOL 1  
Operation:     <FLIGHT            >  
Location:      <KSC            >  
Orb.No/Mission: <099/51-L       >  
Hardware/Software:<SRB           >  
Reference Data:    REPORT                    PRESIDENTIAL COMMISSION REPORT PP51-151  
Description:  
(ID:100.0 CONTINUED) -INTERNAL CASE OPERATING PRESSURE -RECOVERY AND REUSE  
EFFECTS -FLIGHT AND WATER IMPACT LOADS  
--THE CERTIFICATION OF THE NEW DESIGN SHOULD INCLUDE: -TESTS WHICH DUPLICATE  
THE ACTUAL LAUNCH CONFIGURATION AS CLOSELY AS POSSIBLE -TESTS OVER THE FULL  
RANGE OF OPERATING CONDITIONS, INCLUDING TEMPERATURE. --FULL CONSIDERATION  
SHOULD BE GIVEN TO CONDUCTING STATIC FIRINGS OF THE EXACT FLIGHT CONFIGURATION  
IN A VERTICAL ATTITUDE."

\*\*\*\*\*  
ID: < 102.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE 198, VOL 1  
Operation:     <FLIGHT            >  
Location:      <KSC            >  
Orb.No/Mission: <099/51-L       >  
Hardware/Software:<SRB           >  
Reference Data:    N/A  
Description:  
\*INDEPENDENT OVERSIGHT. THE ADMINISTRATOR OF NASA SHOULD REQUEST THE NATIONAL  
RESEARCH COUNCIL TO FORM AN INDEPENDENT SOLID ROCKET MOTOR DESIGN OVERSIGHT  
COMMITTEE TO IMPLEMENT THE COMMISSION'S DESIGN RECOMMENDATIONS AND OVERSEE THE  
DESIGN EFFORT. THE COMMITTEE SHOULD: --REVIEW AND EVALUATE CERTIFICATION  
REQUIREMENTS. --PROVIDE TECHNICAL OVERSIGHT OF THE DESIGN, TEST PROGRAM AND  
CERTIFICATION. --REPORT TO THE ADMINISTRATOR OF NASA ON THE ADEQUACY OF THE  
DESIGN AND MAKE APPROPRIATE RECOMMENDATIONS."

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ID: < 106.00>                    Issue(s): MANAGEMENT                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT            >            PAGE 199, VOL 1  
Operation:                    <N/A                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <N/A                    >  
Hardware/Software:<N/A                    >  
Reference Data:                    N/A

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Description:  
\*CRITICALITY REVIEW AND HAZARD ANALYSIS. NASA AND THE PRIMARY SHUTTLE CONTRACTORS SHOULD REVIEW ALL CRITICALITY 1,1R,2, AND 2R ITEMS AND HAZARD ANALYSES. THIS REVIEW SHOULD IDENTIFY THOSE ITEMS THAT MUST BE IMPROVED PRIOR TO FLIGHT TO ENSURE MISSION SUCCESS AND FLIGHT SAFETY. AN AUDIT PANEL, APPOINTED BY THE NATIONAL RESEARCH COUNCIL, SHOULD VERIFY THE ADEQUACY OF THE EFFORT AND REPORT DIRECTLY TO THE ADMINISTRATOR OF NASA.\*

\*\*\*\*\*  
ID: < 107.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT            >            PAGE 199, VOL 1  
Operation:                    <N/A                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <N/A                    >  
Hardware/Software:<N/A                    >  
Reference Data:                    N/A

Description:  
\*SAFETY ORGANIZATION. NASA SHOULD ESTABLISH AN OFFICE OF SAFETY, RELIABILITY AND QUALITY ASSURANCE TO BE HEADED BY AN ASSOCIATE ADMINISTRATOR. REPORTING DIRECTLY TO THE NASA ADMINISTRATOR. IT WOULD HAVE DIRECT AUTHORITY FOR SAFETY, RELIABILITY, AND QUALITY ASSURANCE THROUGHOUT THE AGENCY. THE OFFICE SHOULD BE ASSIGNED THE WORK FORCE TO ENSURE ADEQUATE OVERSIGHT OF ITS FUNCTIONS AND SHOULD BE INDEPENDENT OF OTHER NASA FUNCTIONAL AND PROGRAM RESPONSIBILITIES. THE RESPONSIBILITIES OF THIS OFFICE SHOULD INCLUDE: --THE SAFETY, RELIABILITY AND QUALITY ASSURANCE FUNCTIONS AS THEY RELATE TO ALL NASA ACTIVITIES AND PROGRAMS. --DIRECTION OF REPORTING AND DOCUMENTATION OF PROBLEMS, PROBLEM RESOLUTION AND TRENDS ASSOCIATED WITH FLIGHT SAFETY.\*

\*\*\*\*\*  
ID: < 108.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT            >            PAGE 200, VOL 1  
Operation:                    <N/A                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <N/A                    >  
Hardware/Software:<N/A                    >  
Reference Data:                    N/A

Description:  
\*IMPROVED COMMUNICATIONS. THE COMMISSION FOUND THAT MARSHALL SPACE FLIGHT CENTER PROJECT MANAGERS, BECAUSE OF A TENDENCY AT MARSHALL TO MANAGEMENT ISOLATION, FAILED TO PROVIDE FULL AND TIMELY INFORMATION BEARING ON THE SAFETY OF FLIGHT 51-L TO OTHER VITAL ELEMENTS OF SHUTTLE PROGRAM MANAGEMENT. --NASA SHOULD TAKE ENERGETIC STEPS TO ELIMINATE THIS TENDENCY AT MFSC, WHETHER BY CHANGES OF PERSONNEL, ORGANIZATION, INDOCTRINATION OR ALL THREE. --A POLICY SHOULD BE DEVELOPED WHICH GOVERNS THE IMPOSITION AND REMOVAL OF SHUTTLE LAUNCH CONSTRAINTS. --FLIGHT READINESS REVIEWS AND MISSION MANAGEMENT TEAM MEETINGS SHOULD BE RECORDED. --THE FLIGHT CREW COMMANDER, OR A DESIGNATED REP SHOULD ATTEND THE FRR, PARTICIPATE IN ACCEPT. OF VEHICLE FOR FLIGHT AND CREW CERTIF.\*

ID: < 109.00>            Issue(s): SAFETY                            : SURFACE TRANSP  
Issue(s) cont.: DESIGN    : PLANNING    :  
Issue Source: <PC REPORT    >            PAGE 200, VOL 1  
Operation:    <LANDING    >  
Location:    <LDG    >  
Orb.No/Mission: <G    >  
Hardware/Software:<STRUCTURE    >            TIRES, BRAKES, NOSEWHEEL  
Reference Data:    PRACA

Description:

"LANDING SAFETY. NASA MUST TAKE ACTIONS TO IMPROVE LANDING SAFETY. --THE TIRE, BRAKE AND NOSEWHEEL STEERING SYSTEMS MUST BE IMPROVED. THESE SYSTEMS DO NOT HAVE SUFFICIENT SAFETY MARGIN, PARTICULARLY AT ABORT LANDING SITES. --THE SPECIFIC CONDITIONS UNDER WHICH PLANNED LANDINGS AT KSC WOULD BE ACCEPTABLE SHOULD BE DETERMINED. CRITERIA MUST BE ESTABLISHED FOR TIRES, BRAKES, AND NOSEWHEEL STEERING. UNTIL THE SYSTEMS MEET THOSE CRITERIA IN HIGH FIDELITY TESTING THAT IS VERIFIED AT EDWARDS, LANDINGS AT KSC SHOULD NOT BE PLANNED. --COMMITTING TO A SPECIFIC LANDING SITE REQUIRES THAT LANDING AREA WEATHER BE FORECAST MORE THAN AN HOUR IN ADV. DURING UNPREDICTABLE WEATHER PERIODS AT KSC, PROGRAM OFFICIALS SHOULD PLAN ON EDM LANDINGS. THIS MAY NECESSITATE A DUAL FERRY CAPABILITY"

\*\*\*\*\*

ID: < 110.00>            Issue(s): SAFETY                            : DESIGN  
Issue(s) cont.:    :    :  
Issue Source: <PC REPORT    >            PAGE 200, VOL 1  
Operation:    <LANDING    >  
Location:    <ALL    >            INCLUDING ALTERNATE LANDING SITES  
Orb.No/Mission: <G    >  
Hardware/Software:<STRUCTURE    >            ESCAPE SYSTEM  
Reference Data:    N/A

Description:

"LAUNCH ABORT AND CREW ESCAPE. THE SHUTTLE PROGRAM MANAGEMENT CONSIDERED FIRST-STAGE ABORT OPTIONS AND CREW ESCAPE OPTIONS SEVERAL TIMES DURING THE HISTORY OF THE PROGRAM, BUT BECAUSE OF LIMITED UTILITY, TECHNICAL INFEASIBILITY, OR PROGRAM COST AND SCHEDULE, NO SYSTEMS WERE IMPLEMENTED. THE COMMISSION RECOMMENDS THAT NASA: --MAKE ALL EFFORTS TO PROVIDE A CREW ESCAPE SYSTEM FOR USE DURING CONTROLLED GLIDING FLIGHT. --MAKE EVERY EFFORT TO INCREASE THE RANGE OF FLIGHT CONDITIONS UNDER WHICH AN EMERGENCY RUNWAY LANDING CAN BE SUCCESSFULLY CONDUCTED IN THE EVENT THAT TWO OR THREE MAIN ENGINES FAIL EARLY IN ASCENT."

\*\*\*\*\*

ID: < 111.00>            Issue(s): PLANNING                            : TRAINING/CERTIF  
Issue(s) cont.:    :    :  
Issue Source: <PC REPORT    >            PAGE 201, VOL 1  
Operation:    <MANIFESTING    >  
Location:    <ALL    >  
Orb.No/Mission: <G    >  
Hardware/Software:<N/A    >  
Reference Data:    N/A

Description:

"FLIGHT RATE. THE NATION'S RELIANCE ON THE SHUTTLE AS ITS PRINCIPAL SPACE LAUNCH CAPABILITY CREATED A RELENTLESS PRESSURE ON NASA TO INCREASE THE FLIGHT RATE. SUCH RELIANCE ON A SINGLE LAUNCH CAPABILITY SHOULD BE AVOIDED IN THE FUTURE. NASA MUST ESTABLISH A FLIGHT RATE THAT IS CONSISTENT WITH ITS RESOURCES. A FIRM PAYLOAD ASSIGNMENT POLICY SHOULD BE ESTABLISHED. THE POLICY SHOULD INCLUDE RIGOROUS CONTROLS ON CARGO MANIFEST CHANGES TO LIMIT THE PRESSURES SUCH CHANGES EXERT ON SCHEDULES AND CREW TRAINING."

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ORIGINAL PAGE IS  
OF POOR QUALITY

ID: < 112.00>            Issue(s): PROCEDURE            : MAINTAINABILITY  
Issue(s) cont.: CANNIBALIZATION       : LOGISTICS/SPARES       : WAIVERS  
Issue Source: <PC REPORT       >       PAGE 201, VOL 1  
Operation: <MAINTENANCE       >       MAINTENANCE, TEST, ASSEMBLY  
Location: <ALL       >  
Orb.No/Mission: <099/51-L       >  
Hardware/Software: <SSME       >       CRITICALITY 1  
Reference Data: OMI  
Description:

"MAINTENANCE SAFEGUARDS. INSTALLATION, TEST, AND MAINTENANCE PROCEDURES MUST BE ESPECIALLY RIGOROUS FOR SS ITEMS DESIGNATED CRITICALITY 1. NASA SHOULD ESTABLISH A SYST OF ANALYZING AND REPORTING PERFORMANCE TRENDS OF SUCH ITEMS. MAINT. PROCED. FOR SUCH ITEMS SHOULD BE SPECIFIED IN THE CIL, ESPECIALLY FOR THOSE SUCH AS THE LIQUID FUELED MAIN ENGINES, WHICH REQUIRE UNSTINTING MAINT. AND OVERHAUL. WITH REGARD TO THE ORBITERS, NASA SHOULD: --DEVELOP AND EXECUTE A COMPREHENSIVE MAINT. INSPECTION PLAN. --PERFORM PERIODIC STRUCTURAL INSPECTIONS WHEN SCHEDULED AND NOT PERMIT THEM TO BE WAIVED. --RESTORE AND SUPPORT THE MAINT. AND SPARE PARTS PROGRAMS, AND STOP THE PRACTICE OF REMOVING PARTS FROM ONE ORBITER TO SUPPLY ANOTHER."

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ID: < 113.00>            Issue(s): SAFETY                        : RELIABILITY  
Issue(s) cont.: QA                                : MANAGEMENT                :  
Issue Source: <PC REPORT       >       PAGE 161, VOL 1  
Operation: <N/A                       >  
Location: <MSFC                       >       KSC AND HQ.  
Orb.No/Mission: <099/51-L       >  
Hardware/Software: <N/A                       >  
Reference Data: N/A  
Description:

"REDUCTIONS IN THE SAFETY, RELIABILITY AND QUALITY ASSURANCE WORK FORCE AT MARSHALL AND NASA HEADQUARTERS HAVE SERIOUSLY LIMITED CAPABILITY IN THOSE VITAL FUNCTIONS."

"ORGANIZATIONAL STRUCTURES AT KENNEDY AND MARSHALL HAVE PLACED SAFETY, RELIABILITY AND QUALITY ASSURANCE OFFICES UNDER THE SUPERVISION OF THE VERY ORGANIZATIONS AND ACTIVITIES WHOSE EFFORTS THEY ARE TO CHECK."

"AS THE FLIGHT RATE INCREASED, THE MSFC SAFETY, RELIABILITY AND QA WORK FORCE WAS DECREASING, WHICH ADVERSELY AFFECTED MISSION SAFETY."

\*\*\*\*\*

ID: < 114.00>            Issue(s): TRAINING/CERTIF            : DISCIPLINE  
Issue(s) cont.: PAPERWORK                        : STANDARDS                :  
Issue Source: <PC REPORT       >       PAGE 161, VOL 1  
Operation: <GENERIC                       >  
Location: <ALL                               >  
Orb.No/Mission: <099/51-L       >  
Hardware/Software: <N/A                       >  
Reference Data: N/A  
Description:

"PROBLEM REPORTING REQUIREMENTS ARE NOT CONCISE AND FAIL TO GET CRITICAL INFORMATION TO THE PROPER LEVELS OF MANAGEMENT."

\*\*\*\*\*

ID: < 115.00> Issue(s): RELIABILITY :  
Issue(s) cont.: : :  
Issue Source: <PC REPORT > PAGE 161, VOL 1  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: N/A  
Description:  
"LITTLE OR NO TREND ANALYSIS WAS PERFORMED ON O-RING EROSION AND BLOW-BY PROBLEMS"

\*\*\*\*\*  
ID: < 116.00> Issue(s): DISCIPLINE :  
Issue(s) cont.: : :  
Issue Source: <PC REPORT > PAGE 161, VOL 1  
Operation: <N/A >  
Location: <MSFC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: N/A  
Description:  
"FIVE WEEKS AFTER THE 51-L ACCIDENT, THE CRITICALITY OF THE SOLID ROCKET MOTOR FIELD JOINT WAS STILL NOT PROPERLY DOCUMENTED IN THE PROBLEM REPORTING SYSTEM AT MARSHALL."

\*\*\*\*\*  
ID: < 117.00> Issue(s): DISCIPLINE :  
Issue(s) cont.: : :  
Issue Source: <PC REPORT > PAGE 170, VOL 1  
Operation: <N/A >  
Location: <JSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
1985 CHANGES IN THE MANIFEST-- "-----THE REQUESTED CHANGES OCCASIONALLY SATURATE FACILITIES AND PERSONNEL CAPABILITIES. THE STRAIN ON RESOURCES CAN BE TREMENDOUS. FOR SHORT PERIODS OF TWO TO THREE MONTHS IN MID-1985 AND EARLY 1986, FACILITIES AND PERSONNEL WERE BEING REQUIRED TO PERFORM AT ROUGHLY TWICE THE BUDGETED FLIGHT RATE. IF A CHANGE OCCURS LATE ENOUGH, IT WILL HAVE AN IMPACT ON THE SERIAL PROCESSES. IN THESE CASES, ADDITIONAL RESOURCES WILL NOT ALLEVIATE THE PROBLEM, AND THE EFFECT OF THE CHANGE IS ABSORBED BY ALL DOWNSTREAM PROCESSES, AND ULTIMATELY BY THE LAST ELEMENT IN THE CHAIN."

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ID: < 132.00>            Issue(s): SAFETY            : DISCIPLINE  
Issue(s) cont.: MANAGEMENT            :  
Issue Source: <PC REPORT            >            PAGE 6-1, VOL.II  
Operation:   <GENERIC            >  
Location:    <LCC            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            LOX CONSOLE  
Reference Data:   N/A            LSOC INCIDENT REPORT

Description:

HUMAN FACTORS ANALYSIS -- SHIFTWORK, OVERTIME AND SAFETY  
"ONE POTENTIALLY CATASTROPHIC HUMAN ERROR OCCURRED 4 MINUTES, 55 SECONDS BEFORE THE SCHEDULED LAUNCH OF 61-C ON 1/6/86. ACCORDING TO A LSOC INCIDENT REPORT, 18,000# OF LOX WERE INADVERTENTLY DRAINED FROM THE ET DUE TO OPERATOR ERROR. FORTUNATELY, THE LOX FLOW DROPPED THE MAIN ENGINE INLET TEMP BELOW THE ACCEPTABLE LIMIT CAUSING A LAUNCH HOLD, BUT ONLY 31 SECONDS BEFORE LIFTOFF.-----THE INVESTIGATION REVEALED THAT CONSOLE OPERATORS IN THE LCC HAD MISINTERPRETED SYSTEM MESSAGES RESULTING FROM A FAILED MICROSWITCH ON A REPLENISHMENT VALVE.-----THE OPERATORS HAD BEEN ON DUTY AT THE CONSOLE FOR ELEVEN HOURS DURING THE THIRD DAY OF WORKING 12-HOUR NIGHT (8PM TO 8AM) SHIFTS."

\*\*\*\*\*  
ID: < 133.00>            Issue(s): MANAGEMENT            : SAFETY  
Issue(s) cont.:            :  
Issue Source: <PC REPORT            >            PAGE 6-4, VOL.II  
Operation:   <GENERIC            >  
Location:    <KSC            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A            >  
Reference Data:   N/A

Description:

HUMAN FACTORS ANALYSIS - INDIVIDUAL WORKERS:            "IN SUMMARY, THE AMOUNT OF OVERTIME AT KSC WAS OFTEN QUITE HIGH DURING THE TIME PERIOD EXAMINED. THE 20-HOUR OVERTIME LIMIT WAS EXCEEDED 400 TIMES BY MORTON THIKOL EMPLOYEES AND 2512 TIMES BY LSOC EMPLOYEES, WITH SOME INDIVIDUALS EXPERIENCING MUCH HIGHER LEVELS THAN OTHERS. THE CURRENT MGMT POLICIES DO NOT APPEAR TO BE EFFECTIVE IN MINIMIZING THIS PROBLEM. INTERVIEWS CONDUCTED BY THE COMMISSION SUGGEST THAT SENIOR MANAGEMENT BELIEVES THAT OVERTIME IS BEING EFFECTLY CONTROLLED AT THE WORKING LEVEL.-----THERE IS ALWAYS A TRADEOFF BETWEEN THE DESIRE TO KEEP ON DUTY THOSE PERSONNEL WITH THE GREATEST EXPERTISE AND THE NEED TO GUARD AGAINST THE UNDESIREABLE EFFECTS OF FATIGUE."

\*\*\*\*\*  
ID: < 134.00>            Issue(s): MANAGEMENT            :  
Issue(s) cont.:            :  
Issue Source: <PC REPORT            >            PAGE 6-4, VOL.II  
Operation:   <GENERIC            >  
Location:    <KSC            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A            >  
Reference Data:   N/A

Description:

HUMAN FACTORS ANALYSIS - OVERSEAS TRAVEL:  
SEVERAL OF THE DEPARTMENTS AT KSC ARE ALSO REQUIRED TO PROVIDE SUPPORT FOR CONTINGENCY LANDINGS DURING SHUTTLE MISSIONS. THE ASSIGNED INDIVIDUALS TRAVEL OVERSEAS TO ALTERNATE LANDING SITES IN AFRICA OR SPAIN. TYPICALLY THEY DEPART KSC SEVERAL DAYS BEFORE A SCHEDULED LAUNCH AND RETURN SOON AFTER COMPLETION OF THE MISSION. THE TRAVEL IS USUALLY BY COMMERCIAL AIRCRAFT ACROSS FIVE TIME ZONES.-----THIS RATHER LIMITED REVIEW OF CONTINGENCY SUPPORT TRAVEL SUGGESTS THAT MORE ATTENTION OUGHT TO BE PAID TO THE SCHEDULING OF SUCH TRAVEL IN RELATION TO SHIFTWORK AND OVERTIME BOTH AT KENNEDY AND OVERSEAS.

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ID: < 135.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE 6-5, VOL.II  
Operation:   <GENERIC            >  
Location:    <KSC            >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A            >  
Reference Data:    N/A

Description:  
HUMAN FACTORS ANALYSIS - MANAGERS AT RISK:THE HUMAN FACTORS OF LAUNCH PRESSURES  
"TIME PRESSURE, PARTICULARLY THAT CAUSED BY LAUNCH SCRUBS AND RAPID TURNAROUNDS  
, INCREASES THE POTENTIAL FOR SLEEP LOSS AND JUDGMENT ERRORS. THIS COULD BE  
MINIMIZED BY PREVENTING LAUNCH SUPPORT PERSONNEL, PARTICULARLY MANAGERS, FROM  
COMBINING LAUNCH SUPPORT DUTY WITH OFFICE WORK ON THE SAME DAY, THE WILLING-  
NESS OF NASA EMPLOYEES IN GENERAL TO WORK EXCESSIVE HOURS, WHILE ADMIRABLE,  
RAISES SERIOUS QUESTIONS WHEN IT JEOPARDIZES JOB PERFORMANCE, PARTICULARLY  
WHEN CRITICAL MANAGEMENT DECISIONS ARE AT STAKE."

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ID: < 136.00>                    Issue(s): DISCIPLINE                    : SAFETY  
Issue(s) cont.: PROCEDURE                    :                    :  
Issue Source: <PC REPORT        >        PAGE I-6, VOL.II  
Operation:   <ASSEMBLY            >  
Location:    <VAB            >  
Orb.No/Mission: <51-L            >  
Hardware/Software:<SRB            >  
Reference Data:    N/A

Description:  
INCIDENT: "DURING UNLOADING OPERATIONS OF THE LEFT FORWARD SRM SEGMENT ON 7 NOV  
85, RECEIVING INSPECTION INDICATED DEFECTS REQUIRING REPAIRS TO THE TANG. AFTER  
REPAIRS TO THE TANG WERE COMPLETED, THE NEXT OPERATION INVOLVED REMOVING THE  
LIFTING RING ATTACHED TO THE CLEVIS. APPROXIMATELY 85 SECONDS INTO THE LIFTING  
OPERATION, A SHARP BANG WAS HEARD AND AN EMERGENCY SHUTDOWN WAS INITIATED. IT  
WAS NOTED THAT THE LIFTING RING HAD SHIFTED APPROXIMATELY TWO INCHES ABOVE THE  
CLEVIS. -----AND AN INCIDENT REPORT FILED THAT INDICATED A FAILURE TO FOLLOW  
ESTABLISHED LIFTING PROCEDURES."

\*\*\*\*\*  
ID: < 137.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE I-6, VOL.II  
Operation:   <ASSEMBLY            >        SRB STACKING  
Location:    <VAB            >  
Orb.No/Mission: <51-L            >  
Hardware/Software:<SRB            >  
Reference Data:    N/A

Description:  
SRB STACKING: "THE CONCLUSION OF THIS STUDY WAS THAT NO OPERATIONS WERE FOUND  
WHICH CONTRIBUTED TO THE 51-L MISHAP. HOWEVER, FINDINGS WERE DOCUMENTED  
INDICATING SPECIFIC AREAS REQUIRING IMPROVEMENT IN FUTURE OPERATIONS. THESE  
FINDINGS ARE CONSISTENT WITH THE GENERAL FINDINGS CONTAINED IN THIS REPORT.

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ID: < 141.00> Issue(s): LOGISTICS/SPARES :  
Issue(s) cont.: :  
Issue Source: <PC REPORT > PAGE I-7, VOL.II  
Operation: <GENERIC > STS PROCESSING  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > STS  
Reference Data: N/A

ORIGINAL PAGE IS  
OF POOR QUALITY

Description:  
\*THERE ARE INSUFFICIENT SPARE PARTS TO MAINTAIN THE ORBITER FLEET IN AN OPERATIONAL CONFIGURATION. THEREFORE, THE PRACTICE OF PARTS CANNIBALIZATION HAS BEEN RESORTED TO IN ORDER TO MEET MANIFEST DEMANDS. THE LACK OF ADEQUATE SPARE PARTS CREATES MAJOR PERTURBATIONS TO MANPOWER REQUIREMENTS, NOT ONLY IN THE WORK REQUIRED, BUT IN THE DOCUMENTATION AND WORKAROUNDS ASSOCIATED WITH CANNIBALIZATION OF PARTS AND THE MULTIPLE INSTALLATION AND REMOVAL OF COMPONENTS FROM ONE FLIGHT VEHICLE TO ANOTHER. THIS PROCESS ALSO INCREASES THE DAMAGE EXPOSURE TO ELECTRICAL CONNECTORS, WIRE BUNDLES, DUCTS, ETC. MANY CRITICAL ITEMS ARE ONE OR TWO OF A KIND FOR THE ENTIRE FLEET SUCH AS FERRY TAIL COME, FERRY ELEVON ACTUATOR LOCKS, ENGINE HEAT SHIELDS(2 SETS) & CREW MODULE MPS METERS.\*

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ID: < 142.00> Issue(s): MANAGEMENT :  
Issue(s) cont.: :  
Issue Source: <PC REPORT > PAGE I-8, VOL.II  
Operation: <GENERIC > STS PROCESSING  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > STS  
Reference Data: N/A

Description:  
MANPOWER SHORTAGE: \*WITH 4 VEHICLES, 4 FIRING ROOM, 2 OPF BAYS, 2 PADS, EDWARDS RECOVERY RESPONSIBILITY, AND VLS INTEGRATION RESPONSIBILITY, SOME PERSONNEL WORK MULTIPLE JOBS AND OCCASIONLY VERY LONG HOURS. THE SHORTAGE OF PERSONNEL IN CERTAIN AREAS HAS OCCASIONALLY LED TO THE PRACTICE OF PLACING NEW OR LESS EXPERIENCED PERSONNEL IN POSITIONS OF RESPONSIBILITY. THE MANPOWER SHORTAGE ALSO LEADS TO THE STANDARD PRACTICE OF PERSONNEL ON CONSOLE SUPPORTING MULTIPLE FUNCTIONS(PRIMARY DURING SLACK TIME). THIS PRACTICE WAS CONSIDERED A CONTRIBUTING FACTOR IN THE 17" LH2 VALVE INCIDENT THAT OCCURRED DURING THIS COUNTDOWN . \* ----THE MANPOWER SHORTAGE CONTRIBUTES TO DECREASING QUALITY OF PAPERWORK AND EXPERIENCED PERSONNEL TAKING SHORTCUTS TO GET MORE DONE IN THE SAME TIME.

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ID: < 143.00> Issue(s): PAPERWORK : REQUIREMENTS  
Issue(s) cont.: QA :  
Issue Source: <PC REPORT > PAGE I-8, VOL.II  
Operation: <GENERIC > STS PROCESSING  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > STS  
Reference Data: N/A

Description:  
\*KSC DOCUMENTATION: AREAS OF UNCLEAR DOCUMENTATION WERE NOTED DURING THE DOCUMENT REVIEW. INSTRUCTIONS IN MAD'S ARE FREQUENTLY NOT CLEAR OR IMPRECISE. THE OMRSD SYSTEM IS VERY DIFFICULT TO PAPER TRACK WITH RESPECT TO AUDITING REQUIREMENTS. THE OMP AND PSP, WHICH ARE THE KSC SUPPORTING DOCUMENTS TO THE OMRSD SYSTEM, ARE OFTEN INCORRECT IN THAT DEVIATIONS(DEV'S) AND REVISIONS(REV'S) ARE INCORPORATED BETWEEN THE PUBLICATION OF ONE DOCUMENT AND ANOTHER. FINALLY, THE OMP IS NOT A CLOSED LOOP SYSTEM AND IS SUFFICIENTLY COMPLEX SUCH THAT THE COGNIZANT SYSTEMS ENGINEER IS THE ONLY PERSON WHO KNOWS THE FULL STATUS OF OMRSD REQUIREMENTS.\*

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ID: < 144.00>                    Issue(s): QA                    : PAPERWORK  
Issue(s) cont.: DISCIPLINE                    : TRAINING/CERTIF                    :  
Issue Source: <PC REPORT                    >                    PAGE I-8, VOL.II  
Operation: <GENERIC                    >                    STS PROCESSING  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<ORBITER                    >                    STS  
Reference Data:    N/A

Description:  
 "LACK OF DOCUMENTATION SYSTEM DISCIPLINE & EDUCATION: OF APPROX 5000 DOCUMENTS EVALUATED, A LARGE PERCENTAGE WERE FOUND TO BE INCORRECTLY EXECUTED. THE DISCREPANCIES ARE GENERALLY MINOR IN NATURE, SUCH AS INCORRECT SIGNATURES, MISSING SIGNATURES, LACK OF QC, INCOMPLETE RATIONALE FOR CLOSURE,ETC. HOWEVER, THESE DISCREPANCIES POINT TO A PROBLEM INVOLVING LACK OF DISCIPLINE AND EDUCATION REGARDING PROCEDURES AND REQUIREMENTS. AN ACROSS-THE-BOARD TRAINING PROGRAM IS REQUIRED TO EDUCATE PERSONNEL AT ALL LEVELS ON WAD PREPARATIONS, PROCESSING, VERIFICATION & CLOSURE. THE SPI, THE GUIDE FOR PREPARING & PERFORMING PAPERWORK , NEEDS TO BE REEVALUATED, UPGRADED IF NECESSARY, THEN ENFORCED. ATTENTION TO DETAIL MUST BE RE-EMPHASIZED."

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ID: < 145.00>                    Issue(s): MAINTAINABILITY                    : RELIABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT                    >                    PAGE I-8, VOL.II  
Operation: <COUNTDOWN                    >                    POST-LAUNCH  
Location: <PAD                    >                    PAD B  
Orb.No/Mission: <51-L                    >  
Hardware/Software:<GSE                    >                    ICE/SRB HD POSTS/6H2 VENT UMB ARM LATCH/  
Reference Data:    N/A

Description:  
 PAD B FACILITY REVIEW STUDY: "ALL LAUNCH DAMAGE AND LAUNCH MEASUREMENT DATA FOR LC-39B GROUND SYSTEMS ANOMALIES COVERED IN THE REPORT WERE CONSIDERED NORMAL WITH 5 RECEIVING SPECIAL ATTENTION. THE FIRST WAS THE FORMATION OF LARGE QUANTITIES OF ICE ON PAD FACILITIES BECAUSE OF THE FREEZING TEMPERATURES, WINDS, AND FLOWING WATER ASSOCIATED WITH THE FREEZE PLAN. A CONCERN WAS DEVELOPED FOR POTENTIAL EFFECT OF FREEZING TEMPS ON PAD SYSTEMS PERFORMANCE. THE 2ND ANOMALY WAS THE LOSS OF SPRINGS & PLUNGERS ON THE SRB HD POSTS BLAST SHIELDS. THE 3RD ITEM WAS THE FAILURE OF THE 6H2 VENT UMB ARM TO LATCH. THE 4TH & 5TH ANOMALIES (MINOR) WERE A CRACK IN THE MLP-2 BLAST DECK AND THE LOSS OF BRICKS FROM THE FLAME TRENCH."

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ID: < 146.00>                    Issue(s): QA                    : PLANNING  
Issue(s) cont.: DISCIPLINE                    :                    :  
Issue Source: <PC REPORT                    >                    PAGE I-10, VOL.II  
Operation: <INSPECTION                    >                    PAD B ACTIVATION  
Location: <PAD                    >                    PAD B  
Orb.No/Mission: <51-L                    >  
Hardware/Software:<GSE                    >                    LPS WIDEBAND LINES, HAZARDOUS GAS,FIRE &  
Reference Data:    N/A

Description:  
 PAD-B ACTIVATION: PAD B WAS NOT FULLY ACTIVATED WHEN IT WAS REQUIRED TO SUPPORT THE STS-51-L FLOW. SEVERAL SUPPORT SYSTEMS WERE NOT COMPLETELY VERIFIED; E.G., LPS WIDEBAND LINES, HAZARDOUS GAS, FIRE AND LEAK DETECTION SYSTEM, UPS-5B POWER SYSTEM. THESE AND OTHER PAD-B ISSUES CAUSED SCHEDULING PERTURBATIONS AND REQUIRED OCCASIONAL OPERATIONAL WORKAROUND."

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ID: < 147.00>            Issue(s): DISCIPLINE            : PAPERWORK  
Issue(s) cont.: TRAINING/CERTIF            :  
Issue Source: <PC REPORT            >            PAGE I-10, VOL.II  
Operation: <GENERIC            >  
Location: <KSC            >  
Orb.No/Mission: <S1-L            >  
Hardware/Software:<GSE            >            CRITICAL VEHICLE OR VEHICLE RELATED GSE  
Reference Data: N/A

Description:  
WORK AUTHORIZATION DOCUMENTATION AUDIT: THE REVIEW HAS FOUND THAT THE ABILITY OF THE WORK CONTROL DOCUMENTATION SYSTEM TO GUARANTEE PROPER REAL-TIME EXECUTION OF TASKS AND THEIR SUBSEQUENT TRACEABILITY IS INHIBITED BY FACTORS THAT MUST BE IDENTIFIED AND CORRECTED BY KSC MANAGEMENT. TRAINING MUST BE ADEQUATE TO ENSURE THAT ALL WORKERS ARE ABLE TO COMPLY WITH THE REGULATIONS WHICH GOVERN THE "PAPERWORK SYSTEM". ADDITIONALLY, IT APPEARS THAT A RE-EMPHASIS OF THE NECESSITY FOR PROPER DISCIPLINE IS IN ORDER. IT IS FURTHER RECOMMENDED THAT, IF POSSIBLE, THE SYSTEM BE MADE MORE "USER FRIENDLY" PROVIDING THAT THE PROPER LEVEL OF RIGOR CAN BE MAINTAINED."

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ID: < 148.00>            Issue(s): TRAINING/CERTIF            : SAFETY  
Issue(s) cont.: DISCIPLINE            :  
Issue Source: <PC REPORT            >            PAGE I-10, VOL.II  
Operation: <HAZARDOUS            >  
Location: <KSC            >  
Orb.No/Mission: <S1-L            >  
Hardware/Software:<GSE            >  
Reference Data: N/A

Description:  
HAZARDOUS OPERATIONS: "NINE ITEMS WERE IDENTIFIED WHICH DOCUMENT THE PERFORMANCE OF HAZARDOUS OPERATIONS WITHOUT PROPER SAFETY PROCEDURES. A RE-EMPHASIS OF PROPER TRAINING AND WORKER DISCIPLINE AS APPLICABLE TO THE PERFORMANCE OF HAZARDOUS OPERATIONS IS REQUIRED. THE EVENTS WHICH BECAME "FINDINGS" OF THE INTEGRATED GROUND PROCESSING TEAM RESULTED FROM FAILURES TO ADHERE TO STANDARD DEFINITIONS OF WHAT CONSTITUTES A HAZARDOUS OPERATION AND FROM FAILURE TO PROVIDE FOR ADEQUATE DOCUMENTATION AND SAFETY COVERAGE OF SUCH OPERATIONS. IT IS THE BELIEF OF THE TEAM THAT THE REGULATIONS IN EXISTENCE ARE SUFFICIENT TO PROVIDE FOR SAFE OPERATION, BUT NEED TO BE UNIFORMLY UNDERSTOOD, APPLIED, FOLLOWED AND ENFORCED."

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ID: < 149.00>            Issue(s): DISCIPLINE            : MANAGEMENT  
Issue(s) cont.:            :  
Issue Source: <PC REPORT            >            PAGE I-10, VOL.II  
Operation: <GENERIC            >  
Location: <KSC            >  
Orb.No/Mission: <S1-L            >  
Hardware/Software:<STS            >  
Reference Data: N/A

Description:  
WORKMANSHIP: "IN GENERAL, WORKMANSHIP WAS FOUND TO BE OF ACCEPTABLE QUALITY. HOWEVER, THERE WERE SOME INSTANCES OF UNDOCUMENTED PROBLEMS, UNREPORTED DAMAGE, AND POOR WORK PRACTICES INDICATING THAT PERSONAL RESPONSIBILITY AND DISCIPLINE ARE SOMETIMES INADEQUATE. MANAGEMENT MUST REINFORCE ITS STAND ON THE IMPORTANCE OF FLIGHT VEHICLE AND PERSONNEL SAFETY."

\*\*\*\*\*

ID: < 150.00>                    Issue(s): MANAGEMENT                    : DISCIPLINE  
Issue(s) cont.: EFFICIENCY                    :  
Issue Source: <PC REPORT                    >                    PAGE I-10, VOL.II  
Operation:                    <GENERIC                    >  
Location:                    <KSC                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <STS                    >  
Reference Data:                    N/A

Description:  
 WORKLOAD: AT TIMES, RESOURCES, BOTH HARDWARE AND PERSONNEL, WERE INADEQUATE TO COVER OPERATIONS AT PAD A AND PAD B SIMULTANEOUSLY. IN GENERAL, THE CONTINUATION OF STS 61-C ACTIVITIES WELL INTO THE STS 51-L TIMEFRAME DIVERTED PERSONNEL FROM THE STS 51-L OPERATIONS AND ALSO CAUSED MAJOR SCHEDULE PERTURBATIONS TO THE STS 51-L FLOW. AN EVALUATION OF THE EFFECT OF WORKLOAD SHOULD BE MADE TO DETERMINE IF THIS FACTOR IS A CONTRIBUTOR TO THE FINDINGS OF THIS REPORT. PROBLEMS FOUND WITH PAPER, WORKMANSHIP, LACK OF THOROUGH UNDERSTANDING OF REQUIREMENTS AND CONFIGURATION MAY WELL HAVE THEIR ROOTS IN THE OVERLOADING OF THE AVAILABLE WORKFORCE. EXTERNAL FACTORS SUCH AS LATE REQUIREMENTS ALSO AFFECT THE EFFICIENT UTILIZATION OF THE (CONTINUED ON ID:150.01)

\*\*\*\*\*  
ID: < 150.01>                    Issue(s): MANAGEMENT                    : DISCIPLINE  
Issue(s) cont.: EFFICIENCY                    :  
Issue Source: <PC REPORT                    >                    PAGE I-10, VOL.II  
Operation:                    <GENERIC                    >  
Location:                    <KSC                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <STS                    >  
Reference Data:                    N/A

Description:  
 WORKLOAD:                    (CONTINUED FROM ID:150.00)  
 ---AVAILABLE WORKFORCE, AS WELL AS INDUCING SCHEDULE PERTURBATIONS THAT TEND TO EXACERBATE THE PROBLEM OF IMPROPER DOCUMENTATION DISCIPLINE.

IN ADDITION, THE WORK WAS GENERALLY FOUND TO BE TECHNICALLY COMPLETE AND MET DEMANDING SCHEDULES BUT SOMETIMES AT THE EXPENSE OF COMPLETE DOCUMENTATION."

\*\*\*\*\*  
ID: < 151.00>                    Issue(s): MANAGEMENT                    : PAPERWORK  
Issue(s) cont.: AUTOMATION                    : CHANGE CONTROL                    : PLANNING  
Issue Source: <PC REPORT                    >                    PAGE I-11, VOL.II  
Operation:                    <GENERIC                    >                    ADVANCE PLANNING  
Location:                    <KSC                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <STS                    >                    UNIVERSAL DOCUMENTATION SYSTEM (UDS)  
Reference Data:                    N/A

Description:  
 RANGE SUPPORT REVIEW STUDY: "THE MOST SIGNIFICANT CONCERN UNCOVERED BY THE REVIEW TEAM IS THAT PROGRAM SUPPORT MANAGERS' LEVEL OF INVOLVEMENT AND DEGREE OF UNDERSTANDING OF THE DOCUMENTATION FLOW NEEDS TO BE IMPROVED. THE UNIVERSAL DOCUMENTATION SYSTEM (UDS) PROVIDES A COMMON LANGUAGE AND FORMAL FOR EFFECTIVE COMMUNICATION BETWEEN THE USER, LEAD RANGE, AND SUPPORT AGENCIES. USE OF THE UDS IS MANDATORY FOR NATIONAL RANGES. AN STS PECULIAR DOCUMENTATION SYSTEM HAS BEEN IMPLEMENTED AT THE ESMC THAT SIGNIFICANTLY MODIFIES THE UDS. THIS WAS REPORTEDLY DONE AT THE INSISTENCE OF NASA DUE TO THE DYNAMIC NATURE OF THE PROGRAM AND THE NEED TO AUTOMATE THE DOCUMENTATION SYSTEM. FOR STS 51-L, THE REVIEW CONCLUDED THAT ALL REQUIRED DOCUMENTATION FOR (CONT. ON ID:151.01)

ID: < 151.01>            Issue(s): MANAGEMENT            : PAPERWORK  
Issue(s) cont.: AUTOMATION            : CHANGE CONTROL            : PLANNING  
Issue Source: <PC REPORT            >    PAGE I-II, VOL.II  
Operation: <GENERIC                >    ADVANCE PLANNING  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<STS            >    UNIVERSAL DOCUMENTATION SYSTEM (UDS)  
Reference Data:    N/A

Description:  
 RANGE SUPPORT REVIEW STUDY: (CONTINUED FROM ID:151.00)

----SUPPORT OF THE MISSION WAS TIMELY AND COMPLETE. THE MOST SIGNIFICANT CONCERN UNCOVERED BY THE REVIEW WAS THAT THE PRESENT STS DOCUMENT CONCEPT, USING THE AUTOMATED SYSTEM, MAKES IT DIFFICULT IF NOT IMPOSSIBLE, TO DEVELOP AN AUDIT TRAIL OF CHANGING MISSION REQUIREMENTS, SUPPORT CAPABILITIES AND RANGE COMMITMENTS.

\*\*\*\*\*  
ID: < 152.00>            Issue(s): MANAGEMENT            : CONSTRAINTS  
Issue(s) cont.: WAIVERS                :                                :  
Issue Source: <PC REPORT            >    PAGE I-II, VOL.II  
Operation: <FLIGHT                 >    MISSION MANAGEMENT TEAM (MMT) IS FUNCT-  
Location: <KSC                    >    IONAL FOR EACH MISSION FROM T-48 HRS  
Orb.No/Mission: <GENERIC        >    THRU LANDING & ORBITER SAFING  
Hardware/Software:<STS            >  
Reference Data:    N/A

Description:  
 \*THE MMT PROVIDES THE STS PROGRAM MANAGER WITH THE TECHNICAL ADVISORY STRUCTURE NEEDED TO DEVELOP RECOMMENDATIONS ON STS ANOMALIES AND REQUIRED CHANGES TO PREVIOUSLY AGREED TO LAUNCH RULES, FLIGHT RULES, FLIGHT PLANS AND SYSTEM LIMITS OR REDLINES. THE STS 51-L FLIGHT READINESS REVIEW PROCESS WAS IMPLEMENTED CONSISTENT WITH NSTS FLIGHT CERTIFICATION POLICIES, PROCEDURES AND PRACTICES. THE TECHNICAL MANAGEMENT FROM EACH LEVEL OF THE PROGRAM WAS TYPICAL IN BOTH TIMING AND DEPTH OF DETAIL TO THAT USED IN PREVIOUS MISSION PROCESSES. HOWEVER, EVENTS ASSOCIATED WITH THE STS 51-L MISHAP IDENTIFIED SRM FLIGHT SAFETY ISSUES NOT ADDRESSED IN THE FRR PROCESS.

\*\*\*\*\*  
ID: < 153.00>            Issue(s): DESIGN                 :  
Issue(s) cont.:                        :                                :  
Issue Source: <PC REPORT            >    PAGE I-13, VOL.II  
Operation: <ASSEMBLY               >  
Location: <KSC                    >  
Orb.No/Mission: <51-L             >  
Hardware/Software:<SRB            >  
Reference Data:    N/A

Description:  
 PRE-LAUNCH ACTIVITIES TEAM -- FINDING

\*THE RIGHT HAND SRB AFT FIELD JOINT WAS PROPERLY ASSEMBLED USING ESTABLISHED, APPROVED PROCEDURES INCORPORATING THE DESIGN REQUIREMENTS, BUT THE DESIGN IS SUCH THAT THERE IS NO POSITIVE METHOD TO ASSURE THAT JOINT SEALING DEGRADATION HAS OCCURRED DUE TO ASSEMBLY DAMAGE TO THE O-RING, CONTAMINATION BEING GENERATED, OR WATER BEING TRAPPED IN THE JOINT.

\*\*\*\*\*

ID: < 154.00>                    Issue(s): PAPERWORK                    : DISCIPLINE  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE I-13, VOL.II  
Operation:   <GENERIC            >  
Location:    <KSC                >  
Orb.No/Mission: <51-L            >  
Hardware/Software:<STS            >  
Reference Data:    N/A  
Description:  
PRE-LAUNCH ACTIVITIES TEAM -- FINDING AND DISCUSSION

"THE WORK CONTROL DOCUMENTATION SYSTEM REQUIRES REVISION"  
"THE WORK CONTROL DOCUMENTATION SYSTEM, OR "PAPER SYSTEM" FOR PROCESSING, CONTROLLING, TRACKING, AND PROVIDING TRACEABILITY OF FLIGHT AND GROUND SYSTEM ELEMENTS AND THEIR ASSOCIATED HARDWARE/SOFTWARE, NEEDS REVIEW. THE INDIVIDUAL TEAM REVIEWS UNCOVERED A NUMBER OF WORK AUTHORIZATION DOCUMENTS WITH SOME SORT OF PROBLEM. THESE INCLUDED A LACK OF TIMELY CLOSURE; POOR ANNOTATION OF DEVIATION STEPS; LACK OF TRACEABILITY; AND MISSING SIGNATURES AND QUALITY CONTROL STAMPS."  
(CONTINUED ON ID:154.01)

\*\*\*\*\*  
ID: < 154.01>                    Issue(s): PAPERWORK                    : DISCIPLINE  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE I-13, VOL.II  
Operation:   <GENERIC            >  
Location:    <KSC                >  
Orb.No/Mission: <51-L            >  
Hardware/Software:<STS            >  
Reference Data:    N/A  
Description:  
PRE-LAUNCH ACTIVITIES TEAM -- FINDING AND DISCUSSION (CONT. FROM ID:154.00)

"IN SOME CASES WHERE THE DOCUMENTATION WAS INCOMPLETE THE RECONSTRUCTION ACTIVITY WAS TIME-CONSUMING, AND MIGHT HAVE BEEN IMPOSSIBLE IF MORE TIME HAD ELAPSED SINCE THE GROUND PROCESSING OF STS 51-L. THE PRIME CONCLUSION REACHED WAS THAT THE SYSTEM NEEDED TO BE REVIEWED AND REVISED, TO MAKE IT FULFILL ITS FUNDAMENTAL REQUIREMENTS IN A FASHION THAT WOULD ENCOURAGE COMPLIANCE BY THE USERS; I.E., MAKE THE SYSTEM "USER FRIENDLY" SECONDLY, EMPLOYEE TRAINING IN HOW TO USE THE REVISED SYSTEM SHOULD BE INSTITUTED, WITH AN EMPHASIS UPON THE IMPORTANCE OF THE SYSTEM AND THE NEED FOR THOROUGH AND COMPLETE DOCUMENTATION"

\*\*\*\*\*  
ID: < 155.00>                    Issue(s): MANAGEMENT                    : CONSTRAINTS  
Issue(s) cont.: COST/MANHOURS                    :                    :  
Issue Source: <PC REPORT        >        PAGE I-14, VOL.II  
Operation:   <SCHEDULING            >  
Location:    <KSC                >  
Orb.No/Mission: <51-L            >  
Hardware/Software:<STS            >  
Reference Data:    N/A  
Description:  
PRE-LAUNCH ACTIVITIES TEAM -- FINDING

"MANPOWER LIMITATIONS DUE TO HIGH WORKLOAD CREATED SCHEDULING DIFFICULTIES AND CONTRIBUTED TO OPERATIONAL PROBLEMS"

\*\*\*\*\*



ORIGINAL PAGE IS  
OF POOR QUALITY

ID: < 156.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <PC REPORT    >    PAGE I-14, VOL.II  
Operation:   <GENERIC       >     
Location:    <PAD           >    PAD B  
Orb.No/Mission: <GENERIC   >     
Hardware/Software:<GSE       >    PAD WATER/PAD HARDENING/PAD DIFFERENCES  
Reference Data:   N/A

Description:  
PRE-LAUNCH ACTIVITIES TEAM -- FINDING - "LC-39B REQUIRES ADDITIONAL MODS"  
"LC-39B DEMONSTRATED SATISFACTORY CAPABILITY DURING THE STS 51-L LAUNCH, WITH  
A FEW EXCEPTIONS. SINCE STS 51-L WAS THE INITIAL SHUTTLE LAUNCH FROM LC-39B, IT  
WAS ANTICIPATED THAT ADDITIONAL MODIFICATIONS WOULD BE IDENTIFIED DURING ITS  
FIRST USE. SUCH MODIFICATIONS NORMALLY INVOLVE CHANGES TO MAKE THE FACILITIES  
LESS SUSCEPTIBLE TO LAUNCH DAMAGE, AS WELL AS TO CORRECT MINOR OPERATIONAL  
PROBLEMS. THE MODIFICATIONS INDICATED ABOVE FOLLOW:  
1. PAD WATER SYSTEMS (SHOULD BE DONE ON BOTH PADS AND MLP'S)  
2. ADDITIONAL PAD "HARDENING" MODIFICATIONS (BOTH PADS AND MLP'S)  
3. PAD A AND PAD B SYSTEM DIFFERENCES "

\*\*\*\*\*  
ID: < 157.00>            Issue(s): PROCEDURE            : DISCIPLINE  
Issue(s) cont.: MANAGEMENT    :            :  
Issue Source: <PC REPORT    >    PAGE I-15, VOL.II  
Operation:   <TEST           >     
Location:    <KSC           >     
Orb.No/Mission: <51-L       >     
Hardware/Software:<GSE       >     
Reference Data:   N/A

Description:  
PRE-LAUNCH ACTIVITIES TEAM -- FINDING - "TEST TEAM ERRORS WERE FOUND THAT WERE  
CAUSED BY NOT FOLLOWING ESTABLISHED PROCEDURES"  
--DISCUSSION--"THE UNDERLYING FACTORS CONTRIBUTING TO THESE ERRORS WERE NOT DE-  
TERMINED DURING THE PROCESSING REVIEWS. HOWEVER, INDICATIONS ARE THAT A LACK OF  
APPRECIATION FOR THE SERIOUS RESULTS WHICH CAN RESULT FROM SUCH ERRORS IS A  
LEADING CONTRIBUTOR TO THE PROBLEM. A PROGRAM NEEDS TO BE INSTITUTED TO REIN-  
FORCE THE NEED TO ASSURE THAT PROBLEMS ENCOUNTERED DURING THE PROCESSING OF  
FLIGHT HARDWARE ARE REPORTED. IN ADDITION, WHERE CRITICAL HARDWARE IS INVOLVED,  
METHODS WITH THE POTENTIAL TO REDUCE INCIDENTS OF HUMAN ERROR SHOULD BE INVE-  
STIGATED."

\*\*\*\*\*  
ID: < 158.00>            Issue(s): LOGISTICS/SPARES    : COST/MANHOURS  
Issue(s) cont.: CANNIBALIZATION :            :  
Issue Source: <PC REPORT    >    PAGE I-16, VOL.II  
Operation:   <TEST           >    ASSEMBLY  
Location:    <KSC           >     
Orb.No/Mission: <51-L       >     
Hardware/Software:<ORBITER   >     
Reference Data:   N/A

Description:  
PRE-LAUNCH ACTIVITIES TEAM -- FINDING/DISCUSSION--"THE LOGISTICS SUPPORT FOR  
CHALLENGER IN TH 51-L GROUND PROCESSING WAS INADEQUATE, SINCE IT CREATED A NEED  
TO REMOVE PARTS FROM OTHER ORBITERS TO CONTINUE 51-L OPERATIONS. FOR 51-L, 45  
OUT OF APPROXIMATELY 300 REQUIRED PARTS WERE CANNIBALIZED. THESE PARTS RANGED  
FROM BOLTS TO AN OMS TVC ACTUATOR AND A FUEL CELL. THE SIGNIFICANCE TO OPERA-  
TIONS OF CANNIBALIZATION IS THAT IT CREATES (1) SIGNIFICANTLY INCREASED EFFORTS  
TO ACCOMPLISH THE SAME WORK DUE TO MULTIPLE INSTALLATION AND RETEST REQUIRE-  
MENTS, (2) SCHEDULE DISRUPTION DUE TO ADDED WORK & NORMALLY LATER PART AVAIL-  
ABILITY, & (3) ORBITER DAMAGE POTENTIAL DUE TO INCREASED PHYSICAL ACTIVITY IN  
THE VEHICLES. THESE EFFORTS MAKE CANNIBALIZATION OPERATIONALLY UNACCEPTABLE."

ID: < 159.00>                    Issue(s): CONSTRAINTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT                    >                    PAGE I-16, VOL.II  
Operation: <FLIGHT                    >                    LAUNCH  
Location: <PAD >  
Orb.No/Mission: <51-L                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A

Description:  
FINDING: "ADDITIONAL ANALYSIS WILL BE REQUIRED TO ASSESS THE ENVIRONMENTAL EFFECTS UPON LAUNCH CAPABILITY."----DISCUSSION--THE STS 51-L LAUNCH AND SUBSEQUENT EXAMINATION HAS INDICATED THAT ADDITIONAL ANALYSES NEED TO BE CONDUCTED TO ASSURE A FULL UNDERSTANDING OF ENVIRONMENTAL EFFECTS UPON LAUNCH CAPABILITY. POST-LAUNCH EXAMINATION OF LC-39B INDICATED SOME SYSTEMS HAD NOT OPERATED PROPERLY IN THE BELOW-FREEZING TEMPERATURES.---THE DIFFICULTY IN DEFINING THE OPERATING ENVIRONMENT ADEQUATELY WITH THE EXISTING INSTRUMENTATION AND ANALYTICAL MODELS WAS NOT FULLY APPRECIATED.----"

\*\*\*\*\*  
ID: < 160.00>                    Issue(s): CONSTRAINTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT                    >                    PAGE I-16, VOL.II  
Operation: <FLIGHT                    >                    LAUNCH  
Location: <PAD >                    FSS/RSS  
Orb.No/Mission: <51-L                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A

Description:  
FINDING/DISCUSSION: "ICE DEBRIS CREATED BY THE STS 51-L LAUNCH WAS GREATER THAN PREDICTED BY PRE-LAUNCH ANALYSIS. ----THE ACTUAL FSS/RSS ICE MOVEMENT, AS OBSERVED ON THE PHOTOGRAPHIC DOCUMENTATION, DID NOT CONFORM TO THE PREDICTIONS IN TWO IMPORTANT RESPECTS: (1)THE ICE GENERALLY DID NOT RELEASE UNTIL AFTER SSME IGNITION. (2)THE ICE TRANSLATED FURTHER TOWARD THE VEHICLE THAN PREDICTED . THE LATE ICE RELEASE COMPENSATED FOR THE ADDED TRANSLATION, BUT THE ORBITER MOVED OUT OF THE WAY BEFORE IT COULD BE HIT.---"

\*\*\*\*\*  
ID: < 161.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT                    >                    PAGE I-16, VOL.II  
Operation: <FRR                    >                    MMT  
Location: <KSC >  
Orb.No/Mission: <51-L                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A

Description:  
FINDING:  
"THE 51-L FLIGHT READINESS REVIEW(FRR) PROCESS, INCLUDING THE MISSION MANAGEMENT TEAM (MMT) ACTIVITIES IMMEDIATELY PRIOR TO LAUNCH , WAS CONDUCTED CONSISTENT WITH NSTS FLIGHT CERTIFICATION POLICIES, PROCEDURES, AND PRACTICES."

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ID: < 162.00>                    Issue(s): MANAGEMENT                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT                    >                    PAGE I-16, VOL.II  
Operation:    <FRR                    >                    FLIGHT READINESS REVIEW  
Location:     <KSC                    >  
Orb.No/Mission: <51-L                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A

Description:  
FINDING/DISCUSSION: "THE CHAIN OF EVENTS WHICH CULMINATED IN THE 51-L ACCIDENT INDICATES THAT THE MANAGEMENT PROCESS APPLIED TO CRITICAL FLIGHT SAFETY ISSUES WAS INADEQUATE.-----IF THE ORIGINAL ENGINEERING BASELINE IS LACKING, THE FRR "DELTA" APPROACH MAY NOT CAUSE THE PROBLEM TO SURFACE. ANOTHER PROBLEM WITH THE FRR "DELTA" APPROACH IS THAT REPEATED ANOMALIES TEND TO LOSE SIGNIFICANCE DURING SUBSEQUENT REPORTINGS. -----THE INADEQUATE EMPHASIS UPON THE SAFETY CRITICAL ITEMS DESENSITIZED THE PROGRAM PERSONNEL TO THE NEED TO FOCUS ON SAFETY."

\*\*\*\*\*  
ID: < 163.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT                    >                    PAGE I-17, VOL.II  
Operation:    <FLIGHT                    >                    PRE-LAUNCH ACTIVITY  
Location:     <KSC                    >  
Orb.No/Mission: <51-L                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A

Description:  
FINDING/DISCUSSION: "COMMUNICATION DURING THE LAUNCH DECISION PROCESS WAS INADEQUATE."

"DURING THE HOURS PRECEDING THE STS 51-L LAUNCH, THERE WERE A SERIES OF MEETINGS REGARDING THE VEHICLE'S ABILITY TO SUCCESSFULLY OPERATE UNDER THE ENVIRONMENTAL CONDITIONS EXPECTED AT LAUNCH TIME. IN THE DISCUSSION CONCERNING THE SRB JOINTS AND THE LAUNCH COMPLEX ICE CONDITIONS, KEY INDIVIDUAL'S OBJECTIONS TO LAUNCH WERE NOT REGISTERED TO TOP PROGRAM OFFICIALS."

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ID: < 164.00>                    Issue(s): SECURITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT                    >                    PAGE I-17, VOL.II  
Operation:    <FLIGHT                    >                    PRE-LAUNCH ACTIVITY  
Location:     <KSC                    >  
Orb.No/Mission: <51-L                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A

Description:  
FINDING/DISCUSSION: "NO FACTORS CONTRIBUTING TO THE 51-L MISHAP WERE FOUND BY THE SECURITY ASSESSMENT."

"----THIS REVIEW HAS DETERMINED THAT THE SECURITY PROCEDURES AND OPERATIONS SUPPORTING THE 51-L MISSION WERE ADEQUATE AND NO INFORMATION HAS BEEN DEVELOPED TO INDICATE ANY DELIBERATE MALICIOUS ACT CONTRIBUTED TO THE MISSION FAILURE."

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ID: < 167.01>            Issue(s): PLANNING            : PROCEDURE  
Issue(s) cont.: TRAINING/CERTIF            : SAFETY            : MAINTAINABILITY  
Issue Source: <PC REPORT            >            PAGE J-26, VOL.II  
Operation: <MANIFESTING            >            SCHEDULING  
Location: <JSC            >            KSC  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<STS            >  
Reference Data:    N/A

Description:  
MISSION PLANNING FINDINGS:    (CONTINUED FROM ID:167.00)  
"----STATEMENT THAT AUTHORIZES NASA TO AUDIT A PAYLOAD DEVELOPER TO ASSURE COM-  
PLIANCE WITH NSTS PAYLOAD SAFETY REQUIREMENTS. 7) THE NORMAL PAYLOAD SAFETY  
PROCESS FAILED TO IDENTIFY POTENTIALLY SERIOUS SINGLE POINT FAILURES IN THE  
CENTAUR UPPER STAGE. 8)THE OPERATIONAL MAINTENANCE INSPECTION PROGRAM IS IN-  
MATURE AND DOES NOT YET PROVIDE LEVEL II WITH ADEQUATE CLOSED LOOP OVERSIGHT.  
IT LACKS A COMPREHENSIVE SYSTEM TO TRACK AND AUDIT COMPLIANCE WITH ESTABLISHED  
REQUIREMENTS. CONCLUSION: AN INSPECTION AND MAINTENANCE PROGRAM SHOULD BE IN-  
PLEMENTED THAT WILL ENSURE FLAWLESS PERFORMANCE OF CRITICAL SPACE SHUTTLE HARD-  
WARE INTO THE 21ST CENTURY."

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ID: < 168.00>            Issue(s): PLANNING            : MAINTAINABILITY  
Issue(s) cont.: SAFETY            :            :  
Issue Source: <PC REPORT            >            PAGE J-51, VOL.II  
Operation: <MANIFESTING            >            SCHEDULING  
Location: <JSC            >            KSC  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<STS            >  
Reference Data:    N/A

Description:  
MISSION PLNG & OPS TEAM - MAJOR CONCLUSIONS: "1)THE NSTS PROGRAM SHOULD DE-  
VELOP A BOTTOMS-UP STRATEGY FOR EXPANDING THE FLIGHT RATE. AS A START, RIGID  
MANIFESTING CRITERIA NEED TO BE ESTABLISHED & ENFORCED. 2) AN INSPECTION AND  
MAINT. PROGRAM SHOULD BE IMPLEMENTED THAT WILL ENSURE FLAWLESS PERFORMANCE OF  
CRITICAL SHUTTLE HARDWARE INTO THE 21ST CENTURY. 3) THE NSTS PROGRAM SHOULD  
FOCUS ATTENTION ON DEFINING AND PROVIDING AN ADEQUATE MARGIN FOR END-OF-MISSION  
AND INTACT ABORT LANDINGS. THIS INCLUDES BOTH GROUND FACILITIES & FLT HARDWARE.  
4) THE NSTS PROGRAM SHOULD EVALUATE THE OPTIONS AND UTILITY OF PROVIDING CREW  
ESCAPE SYSTEMS AND AUGMENTING ORBITER ABORT MODES."

\*\*\*\*\*  
ID: < 169.00>            Issue(s): REQUIREMENTS            :  
Issue(s) cont.:            :            :  
Issue Source: <PC REPORT            >            PAGE K-30, VOL.II  
Operation: <TEST            >            ENVIRONMENTAL SPECIFICATIONS  
Location: <JSC            >            MSFC  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<SRB            >            SRM  
Reference Data:    N/A

Description:  
DEVELOPMENT & PRODUCTION: FINDING: "ALL ENVIRONMENTAL SPECIFICATIONS IMPOSED ON  
MORTON THIOKOL BY NASA WERE NOT ADEQUATELY VERIFIED BY TEST, ANALYSIS, OR SIM-  
ILARITY. CONCLUSION: JSC 07700, VOL.X, CLEARLY STATES THE NATURAL AND INDUCED  
ENVIRONMENTS TO WHICH THE SRM IS TO BE DESIGNED AND VERIFIED. THE FIELD JOINTS  
WHICH ARE SUSCEPTIBLE TO ENVIRONMENTAL CONDITIONS WERE NOT QUALIFICATION TEST-  
ED TO THE FULL RANGE OF THE CONTRACTUALLY REQUIRED ENVIRONMENTS. THIS LED TO A  
LACK OF COMPLETE UNDERSTANDING OF THE JOINT DESIGN LIMITS."

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ID: < 173.00>            Issue(s): REQUIREMENTS        : SAFETY  
Issue(s) cont.: RELIABILITY            : DESIGN                            :  
Issue Source: <PC REPORT            >    PAGE K-30, VOL.II  
Operation:    <ASSEMBLY            >    SPECIFICATIONS  
Location:    <VAB                    >  
Orb.No/Mission: <51-L                >  
Hardware/Software:<SRB               >    SRM  
Reference Data:    N/A

ORIGINAL PAGE IS  
OF POOR QUALITY

Description:  
 DEVELOPMENT & PRODUCTION: FINDING: "A CHANGE WAS MADE TO THE SRM STACK CONFIG. THAT CREATED THE MIDWEIGHT CONFIG., I.E., A COMBINATION OF STANDARD AND LIGHTWT. CASES. THIS CHANGE WAS QUALIFIED BY SIMILARITY. CONCLUSION: THE MIDWEIGHT CONFIG, WHICH WAS NOT FLOWN ON 51-L, DID NOT REPRESENT A SIGNIFICANT REDESIGN. ITS LOADS AND CASE REACTIONS WERE BETWEEN THE 2 EXTREMES DEMONSTRATED, WHICH WERE THE STD WT & LWT CONFIGS. EACH OF THESE CONFIGS WERE VERIFIED BY ANALYSIS & GND TESTING. THEREFORE, AT THE TIME, VERIFICATION BY SIMILARITY OF THE MIDWT CASE DESGN WAS ACCEPTABLE. THE EFFORT TO REQUALIFY THE SRM FOR FLT MUST INCLUDE SUFFICIENT ANALYSES AND GND TESTS TO ADEQUATELY PROVE THAT THE REDESIGN OF THE MOTOR AS AN ENTITY, & ITS COMPONENTS, WILL SATISFY ALL CEI SPEC REQ, & OP SAFELY -----"

\*\*\*\*\*

ID: < 174.00>            Issue(s): QA                            :  
Issue(s) cont.:                            :                                        :  
Issue Source: <PC REPORT            >    PAGE K-31, VOL.II  
Operation:    <N/A                        >    MANUFACTURING  
Location:    <N/A                        >  
Orb.No/Mission: <51-L                >  
Hardware/Software:<SRB               >    SRM O-RINGS  
Reference Data:    N/A

Description:  
 DEVELOPMENT & PRODUCTION: FINDING: "THE O-RING USED IN THE CASE JOINT IS CRITICAL TO THE SEALING INTEGRITY OF THE JOINT, YET IS NOT DESIGNATED AS A CRITICAL PROCESS. THE ADEQUACY OF O-RING PROCESS & QC IS QUESTIONABLE EVEN THOUGH A NO. OF O-RINGS IN BONDED STORES AT MTI WERE THOROUGHLY ANALYZED AND TESTED AS PART OF 51-L FAILURE ANALYSIS EFFORT & FOUND TO BE ACCEPTABLE. CONCLUSION: THE MANUFACTURING PROCESS INCLUDED DELIVERY OF THE FINAL O-RING RUBBER MATERIAL FROM PARKER TO HYDROAK WHERE THE MATERIAL IS CUT TO THE PROPER LENGTHS & A SCARF JOINT IS MADE. THE ARBITRARY ESTAB. OF A LIMIT OF 5 JOINTS PER O-RING & THE FACT THAT REPAIRS OF INCLUSIONS & VOIDS IN THE RUBBER DELIVERED FROM PARKER ARE ROUTINELY MADE BY HYDRAPAK TO A PROPR. PROCESS APPEARS TO BE POTENT. PROB AREA."

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ID: < 175.00>            Issue(s): QA                            :  
Issue(s) cont.:                            :                                        :  
Issue Source: <PC REPORT            >    PAGE K-31, VOL.II  
Operation:    <N/A                        >    MANUFACTURING  
Location:    <N/A                        >    MTI  
Orb.No/Mission: <51-L                >  
Hardware/Software:<SRB               >    SRM O-RINGS  
Reference Data:    N/A

Description:  
 DEVELOPMENT & PRODUCTION: FINDING: "FOR A PERIOD OF TIME, WHICH INCLUDED THE PROCESSING OF THE 51-L O-RINGS, THERE WAS AN ELIMINATION OF MANDATORY INSPECTION POINTS FROM THE O-RING ACCEPTANCE CRITERIA AT MTI. THE SECONDARY O-RING FOR THE SUSPECT 51-L FIELD JOINT WAS PROCESSED DURING THE TIME THAT THESE MANDATORY INSPECTION POINTS WERE NOT IN EFFECT. CONCLUSION: A REVIEW OF INSPECTION RECORDS FOR THE 51-L O-RING INDICATES THERE IS A HIGH PROBABILITY THAT THE 51-L O-RINGS WERE ACCEPTABLE. THE SYSTEM WHICH ALLOWED THE INSPECTION POINTS FOR THE O-RINGS TO BE ELIMINATED INADVERTENTLY HAS BEEN CORRECTED. THE POSSIBILITY EXISTS THAT OTHER AREAS SIMILAR IN CRITICALITY MAY BE SUSPECT IF A COMPLETE ACCESSMENT OF ALL MANDATORY INSPECTIONS IS NOT PERFORMED."

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ID: < 179.00>            Issue(s): REDUNDANCY            : REQUIREMENTS  
Issue(s) cont.: RELIABILITY            :  
Issue Source: <PC REPORT            >    PAGE K-31, VOL.II  
Operation:   <TEST                 >    DEVELOPMENT & CERTIFICATION  
Location:    <N/A                     >    MTI  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<SRB             >    NON-SRM COMPONENTS  
Reference Data:   N/A

Description:  
DEVELOPMENT & PRODUCTION: FINDING: "THE DEVELOPMENT AND CERTIFICATION OF THE NON-SRM PORTIONS OF THE SRB HAVE FOLLOWED THE NASA REQUIREMENTS AND APPROVED PLANS. THERE HAS BEEN NO LOSS OF REDUNDANCY OF ANY SRB SYSTEMS IN FLIGHT; THAT IS, THERE HAVE BEEN NO IN-FLIGHT ASCENT ANOMALIES."

CONCLUSION: THE SRB CONTAINS MATURE AND SOUND HARDWARE AND SYSTEMS. THE CONTINUED SUCCESS MUST FOCUS ON THE ATTENTION TO DETAIL IN THE REACCEPTANCE OF THE REUSED HARDWARE."

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ID: < 180.00>            Issue(s): REQUIREMENTS            :  
Issue(s) cont.:                        :                        :  
Issue Source: <PC REPORT            >    PAGE K-31, VOL.II  
Operation:   <TEST                 >  
Location:    <KSC                     >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<SRB             >    FLIGHT INSTRUMENTATION  
Reference Data:   N/A

Description:  
DEVELOPMENT & PRODUCTION: FINDING: "THE SRM DEVELOPMENT FLIGHT INSTRUMENTATION SYSTEM USED DURING THE DDT&E PHASE OF THE SPACE SHUTTLE PROGRAM PERFORMED SATISFACTORILY. THE ELECTRICAL AND INSTRUMENTATION SYSTEM CAN BE RECONFIGURED TO ACCOMMODATE ADDITIONAL INSTRUMENTATION DURING LAUNCH AND ASCENT.

CONCLUSION: ADDITIONAL FLIGHT INSTRUMENTATION WILL BE REQUIRED TO VERIFY ANY NEW SRM CONFIGURATION."

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ID: < 181.00>            Issue(s): REQUIREMENTS            : SAFETY  
Issue(s) cont.: DESIGN                        :                        :  
Issue Source: <PC REPORT            >    PAGE K-31, VOL.II  
Operation:   <FLIGHT                 >    LAUNCH  
Location:    <KSC                     >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<ET                     >    LO2/LH2 VENTS  
Reference Data:   N/A

Description:  
DEVELOPMENT & PRODUCTION: FINDING: "THE LO2 AND LH2 VENT AND RELIEF VALVE POSITION INDICATOR SWITCH TOLERANCE ALLOWS THE VALVE TO INDICATE "CLOSED" WHEN IT MAY BE OPEN UP TO 0.30 INCH. THIS CONDITION COULD ALLOW UNDETECTED ULLAGE GAS LEAKAGE PRIOR TO LAUNCH. HOT GASEOUS O2 MAY AUTOIGNITE THE ET TPS AFTER SSME IGNITION. GASEOUS H2 IN FLIGHT, CAN CAUSE FIRE AND LOSS OF TPS WHICH COULD RESULT IN A CATASTROPHIC SITUATION. CONCLUSION: ADDITIONAL ANALYSIS AND/OR TESTS MUST BE CONDUCTED TO COMPLETELY UNDERSTAND THE VALVE OPERATION AND EFFECTS SUCH THAT CORRECTIVE ACTIONS CAN BE IMPLEMENTED OR RATIONALE CAN BE ESTABLISHED THAT JUSTIFIES NO EXISTENCE OF A POTENTIAL HAZARD."

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ID: < 182.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :  
Issue Source: <PC REPORT        >        PAGE K-31, VOL.II  
Operation:       <FLIGHT            >        LAUNCH  
Location:        <KSC            >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<ET            >        WEIGHT  
Reference Data:    N/A

Description:  
DEVELOPMENT & PRODUCTION: FINDING: "THE LWT CONFIGURATION DESIGN USED A FACTOR OF SAFETY OF 1.25 IN CERTAIN COMPONENTS. CONCLUSION: THE 1.25 FACTOR OF SAFETY WAS USED ONLY FOR WELL-DEFINED LOADINGS; I.E., THRUST, INERTIA LOADS, AND THOSE RESULTING FROM CONTROLLED TANK ULLAGE PRESSURES. A PRORATION OF THE 1.25 FACTOR OF SAFETY AND A 1.4 FACTOR OF SAFETY WAS UTILIZED FOR UNCERTAINTIES. THE APPROACH INCORPORATED THE APPROPRIATE LEVEL OF CONSERVATISM AND YET ALLOWED A WEIGHT REDUCTION IN THE ET WHICH PROVIDED A GREATER PAYLOAD CAPABILITY FOR THE PROGRAM. "

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ID: < 183.00>                    Issue(s): SAFETY                    : REQUIREMENTS  
Issue(s) cont.:                    :  
Issue Source: <PC REPORT        >        PAGE K-31, VOL.II  
Operation:       <GENERIC            >  
Location:        <JSC            >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<ET            >  
Reference Data:    N/A

Description:  
DEVELOPMENT & PRODUCTION: FINDING: "SOME APPLICABLE LEVEL II REQUIREMENTS OF JSC 07700 VOLUME X ARE NOT IMPOSED DIRECTLY, OR VERBATIM, ON THE ET CONTRACT. THE CEI SPECIFICATION REQUIREMENT STATEMENTS ARE WRITTEN TO SATISFY THE INTENT OF THESE REQUIREMENTS. AN EXAMPLE IS THE DEBRIS PREVENTION REQUIREMENTS. STRICT COMPLIANCE OF THE LEVEL II REQUIREMENT AS WRITTEN IS NOT ALWAYS POSSIBLE." CONCLUSION: CONDUCT AN OVERALL PROGRAM ASSESSMENT TO ASSURE COMPATIBILITY OF THE LEVEL II AND LEVEL III REQUIREMENTS. SPECIAL ATTENTION SHOULD BE GIVEN TO THE CRITICALITY 1 AND 2 COMPONENTS AND IDENTIFIED HAZARDS."

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ID: < 184.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :  
Issue Source: <PC REPORT        >        PAGE K-32, VOL.II  
Operation:       <FLIGHT            >  
Location:        <KSC            >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<SSME        >  
Reference Data:    N/A

Description:  
DEVELOPMENT & PRODUCTION:  
FINDING: "THE SPACE SHUTTLE MAIN ENGINE IS A HIGH TECHNOLOGY, HIGH POWER DENSITY, STATE-OF-THE-ART ROCKET ENGINE.  
  
CONCLUSION: BECAUSE OF THE MANY HIGH ENERGY SOURCES, THE SSME IS A VERY COMPLEX AND HIGH RISK ELEMENT OF THE SPACE SHUTTLE SYSTEM."

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ID: < 188.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE K-32, VOL.II  
Operation:   <N/A                >        :  
Location:    <MSFC                >        ROCKETDYNE  
Orb.No/Mission: <GENERIC        >        :  
Hardware/Software:<SSME        >        :  
Reference Data:    N/A

Description:  
DEVELOPMENT & PRODUCTION: \*A NUMBER OF PROPOSED DESIGN CHANGES HAS BEEN IDENTIFIED TO INCREASE THE MARGIN OF SAFETY OF CRITICAL SSME COMPONENTS.

CONCLUSION: SOME OF THE COMPONENTS IDENTIFIED FOR CONSIDERATION OF REDESIGN APPEAR TO REDUCE THE HAZARDS ASSOCIATED WITH THE SSME OPERATION AND SHOULD BE CONSIDERED FOR INCORPORATION.\*

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ID: < 189.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE K-32, VOL.II  
Operation:   <N/A                >        :  
Location:    <MSFC                >        ROCKWELL  
Orb.No/Mission: <GENERIC        >        :  
Hardware/Software:<ORBITER     >        IMPROVEMENTS  
Reference Data:    N/A

Description:  
DEVELOPMENT & PRODUCTION: \*THE ORBITER DEVELOPMENT AND PRODUCTION HAS BEEN ACCOMPLISHED WITH APPROPRIATE REGOR AND FORMALITY. SEVERAL IMPROVEMENTS ARE NOW IN PROCESS AND OTHER IMPROVEMENTS HAVE BEEN PROPOSED TO REDUCE HAZARDS. CONCLUSION: THE PRESENTLY APPROVED ORBITER IMPROVEMENT PROGRAMS(E.G., BRAKES) SHOULD CONTINUE AS PRIORITY WORK. OTHER IMPROVEMENTS SHOULD BE PRIORITIZED AS A FUNCTION OF HAZARD REDUCTION WITH SPECIFIC ATTENTION TO THE CONSIDERATION OF AN ENGINEERING REDESIGN OF THE ORBITER/ET 17-INCH FLUID DISCONNECTS.\*

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ID: < 190.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.: REQUIREMENTS        : PLANNING                    : CHANGE CONTROL  
Issue Source: <PC REPORT        >        PAGE K-32, VOL.II  
Operation:   <N/A                >        :  
Location:    <JSC                    >        :  
Orb.No/Mission: <GENERIC        >        :  
Hardware/Software:<ORBITER     >        :  
Reference Data:    N/A

Description:  
DEVELOPMENT & PRODUCTION: \*EXTREMELY COMPLEX AND CRITICAL PAYLOADS ARE BEING MANIFESTED FOR NSTS MISSIONS WHICH OFTEN REQUIRE ORBITER MODIFICATIONS.

CONCLUSION: PAYLOADS AND/OR THEIR PROPULSIVE STAGES SUCH AS CENTAUR WHICH REQUIRE ORBITER CHANGES SHOULD RECEIVE SPECIAL SAFETY EMPHASIS REVIEWS IN ADDITION TO THE NORMAL CONFIGURATION CHANGE FORMALITY.\*

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ID: < 191.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        PAGE K-32, VOL.II  
Operation:     <GENERIC        >                    :  
Location:     <ALL            >                    :  
Orb.No/Mission:   <GENERIC     >                    :  
Hardware/Software: <STS         >        HAZARDS ANALYSIS  
Reference Data:     N/A

ORIGINAL PAGE IS  
OF POOR QUALITY

Description:  
DEVELOPMENT & PRODUCTION: FINDING: "THE OVERALL APPROACH USED BY THE SPACE SHUTTLE PROGRAM FOR THE CONDUCT OF THE FMEA/CIL AND HAZARDS ANALYSIS WAS DEEMED APPROPRIATE. CONCLUSION: A REASSESSMENT OF THE FMEA/CIL, IN CONJUNCTION WITH THE HAZARD ANALYSES, SHOULD BE CONDUCTED FOR EACH FLIGHT ELEMENT AND THE INTEGRATED SHUTTLE VEHICLE SYSTEM TO ASSURE THAT ALL CRITICALITY 1&2 ITEMS AND HAZARDS ARE IDENTIFIED SUCH THAT APPROPRIATE EFFORT CAN BE EFFECTED TO MINIMIZE THEIR CRITICALITY TO THE SHUTTLE SYSTEM."

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ID: < 192.00>                    Issue(s): INTERFACE                    : MANAGEMENT  
Issue(s) cont.: METHODS                    :                    :  
Issue Source: <PC REPORT        >        PAGE K-32, VOL.II  
Operation:     <GENERIC        >                    :  
Location:     <KSC            >                    :  
Orb.No/Mission:   <GENERIC     >                    :  
Hardware/Software: <ORBITER     >        AND ET  
Reference Data:     N/A

Description:  
DEVELOPMENT & PRODUCTION: FINDING: "THE ET & ORBITER CONTRACTORS NO LONGER HAVE DIRECT RESPONSIBILITIES FOR THE TOTAL PROCESSING ACTIVITIES AT THE LAUNCH SITES. THEIR ROLES ARE NOW ONLY SUPPORTIVE IN NATURE. CONCLUSION: THE SEPARATION OF RESPONSIBILITIES BETWEEN THE DESIGN ORGANIZATION AND THE PROCESSING ORGANIZATION HAS CREATED ADDITIONAL INTERFACES WHICH HAS MADE COORDINATION, COMMUNICATION, AND RESPONSIVENESS MORE COMPLEX. THE PROCESSING CONTRACTOR MAY NOT POSSESS THE NECESSARY TECH BACKGROUND GAINED DURING THE DESIGN & DEVELOPMENT PHASE TO ADEQUATELY DETERMINE SYSTEM DEGRADATION RESULTING FROM MULTIPLE MISSIONS. -----METHODS SHOULD BE DEVELOPED WHICH ASSURE MORE DIRECT DESIGN CONTRACTOR INVOLVEMENT IN THE PROCESSING AND TESTING EFFORT AT THE LAUNCH SITES."  
\*\*\*\*\*

ID: < 193.00>                    Issue(s): PLANNING                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <PC REPORT        >        VOL I, PP.4-6  
Operation:     <FLIGHT        >        LANDING  
Location:     <KSC            >        EAFB  
Orb.No/Mission:   <FLTS 1-25   >        COLUMBIA(102), CHALLENGER(099)  
Hardware/Software: <STS         >        DISCOVERY(103), ATLANTIS(104)  
Reference Data:     N/A                    LAUNCH DATES/RECOVERY DATES

Description:

FL MISS	DATE (L/L)	ORB	FL MISS	DATE (L/L)	ORB	FL MISS	DATE (L/L)	ORB
1	STS1 04/12-14/81	102	10 41-B	02/3-11/84	099	19 51-F	7/29-8/6/85	099
2	STS2 11/12-14/81	102	11 41-C	4/6-13/84	099	20 51-I	8/27-9/3/85	103
3	STS3 03/22-30/82	102	12 41-D	8/30-9/5/84	103	21 51-J	10/3-10/85	104
4	STS4 6/27-7/4/82	102	13 41-E	10/5-13/84	099	22 61-A	10/30-11/6/85	099
5	STS5 11/11-16/82	102	14 51-A	11/8-16/84	103	23 61-B	11/26-12/3/85	104
6	STS6 04/04-09/83	099	15 51-C	1/24-27/85	103	24 61-C	1/12-10/86	102
7	STS7 06/18-24/83	099	16 51-D	4/12-19/85	103	25 51-L	1/28/86	099
8	STS8 8/30-9/6/83	099	17 51-B	4/29-5/6/85	099			
9	STS9 11/28-12/8/83	102	18 51-G	6/17-24/85	103			

ID: < 200.00> Issue(s): LOGISTICS/SPARES : CANNIBALIZATION  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 036  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
"THERE ARE INSUFFICIENT SPARE PARTS TO MAINTAIN THE ORBITER FLEET IN AN OPERATIONAL CONFIGURATION. THEREFORE, THE PRACTICE OF PARTS CANNIBALIZATION HAS BEEN RESORTED TO IN ORDER TO MEET MANIFEST SCHEDULE DEMANDS. MANY LRU'S (LINE REPLACEABLE UNIT) WERE REMOVED AND REPLACED DURING THE STS-33 FLOW. LISTED BELOW ARE THOSE MAJOR VEHICLE COMPONENTS/LRU'S WHICH WERE CANNIBALIZED FROM ANOTHER VEHICLE AND THOSE THAT WERE DONATED BY OV-099: 1. ENGINE MOUNTED HEAT SHIELDS AND ATTACHING HARDWARE(TO 102). 2. FUEL CELL #1(FROM 103). 3. PLUNGER ON FLIPPER DOOR(TO 102). 4. R/H WING DUCT(FROM 104). 5. ENGINE MOUNTED HEAT SHIELDS AND ATTACHING HARDWARE(FROM 104). 6. THERMAL BARRIER(FRM 103). 7. NLG TIRES(FROM 103). (CONTINUED ON ID 200.01)

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ID: < 200.01> Issue(s): LOGISTICS/SPARES : CANNIBALIZATION  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 036  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
(CONTINUED FROM ID 200.0) 8. WSB LIQUID LEVEL SENSOR(FROM 103). 9. ET/ORB PURGE SYSTEM LINE(FROM 104). 10. PDI(FROM 103). 11. WCS(FROM 104). 12. ME #2 SSMEC(TO102). 13. MPS TEMP TRANSDUCERS(12) (FROM 102). 14. SPARE MDM(FROM 102). 15. CHAMP EXPERIMENT CAMERA(FROM 102). 16. GAS SAMPLE BOTTLE PYRO PLUGS (FROM 102). 17. EVA HATCH COVER(FROM 104).

CLOSURE ACTION, 9/15/86 - FORWARD TO LEVEL II

\*\*\*\*\*

ID: < 201.00> Issue(s): DISCIPLINE : QA  
Issue(s) cont.: PAPERWORK : PROCEDURE :  
Issue Source: <51-L FINDINGS > PAGE 037  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: OMI

Description:  
"OF 121 OMI'S REVIEWED BY LSOC/NASA QUALITY, 47% (OR 57 OMI'S) HAD PAPER ERRORS. MANY DISCREPANCIES OF A RELATIVELY MINOR NATURE WERE FOUND TO INCLUDE THE CATEGORIES LISTED BELOW. APPROXIMATELY 13% OF THE OMI'S HAD SOME DATA RECORDING POINTS MISSING OR INCORRECTLY DOCUMENTED (SUCH AS CALIBRATION DATES, VOLTAGE, TEMPERATURE, AND PRESSURE READINGS NOT RECORDED). AN ENGINEERING REVIEW OF OMI'S WAS PERFORMED TO VERIFY OMRSD COMPLIANCE. THIS REVIEW IS DOCUMENTED AS A SEPARATE REQUIREMENT TRACKING SYSTEM FINDING. THERE WERE NO FINDINGS FOR MISSING COMPONENT INSTALLATION, ERRONEOUS WORKING PROCEDURE, OR GROSS NEGLIGENCE."

CLOSURE ACTION, 9/15/86 - TRAINING FOR SPI-519(2)K."FLT ELEM OPS OMI IMPLNT"

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ID: < 202.00> Issue(s): DISCIPLINE : PAPERWORK  
Issue(s) cont.: QA : PROCEDURE :  
Issue Source: <51-L FINDINGS > PAGE 038  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: PRACA

Description:  
"FOR THE ENTIRE 51-L FLOW (DFRF THROUGH LAUNCH), A TOTAL OF 621 WORK AUTHORIZATION DOCUMENTS(WAD'S) IN THE IPR, PR, OR TPS CATEGORY WERE USED. OF THE 621 WAD'S, A TOTAL OF 479 WERE REVIEWED PERTAINING TO ORBITER PROCESSING IN THE OPF, HMF, AND LAUNCH COUNTDOWN. MAIN ENGINE RELATED WAD'S ARE DISCUSSED IN APPENDIX 1. OF THE 479 DOCUMENTS REVIEWED, NONE WERE INCIDENT RELATED, APPROXIMATELY 30% HAD NO ANOMALIES, AND 70% HAD ANOMALIES OR DOCUMENTATION PROBLEMS NOTED. OF THE 70% THAT HAD ANOMALIES, THE FOLLOWING CATEGORIES APPLY" -----.

CLOSURE ACTION, 9/15/86 - CREATE OMI'S FOR REPETITIVE TASKS(LRU R/R OMI'S)  
\*\*\*\*\*

ID: < 203.00> Issue(s): DISCIPLINE : PAPERWORK  
Issue(s) cont.: QA : MANAGEMENT :  
Issue Source: <51-L FINDINGS > PAGE 042  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<TPS >  
Reference Data: PRACA

Description:  
THERMAL PROTECTION SYSTEM(TPS) PAPERWORK HAD EXTENSIVE ERRORS RELATING TO ORBITER TILE, FIBROUS INSULATING BLANKETS, FLEXIBLE REUSABLE SURFACE INSULATION ,GAP FILLERS, THERMAL BARRIERS, CARRIER PANELS, AND OTHER TPS MATERIALS. (BASED ON REVIEW OF 37 TPS'S, 510 PR'S, 219 DR'S, AND 178 LOGS,ETC.)

CLOSURE ACTION, 9/15/86 - TRAINING FOR SPI QA-002. AUTO SYSEM I/W. AUDIT I/W  
\*\*\*\*\*

ID: < 204.00> Issue(s): DISCIPLINE : PAPERWORK  
Issue(s) cont.: QA : :  
Issue Source: <51-L FINDINGS > PAGE 042  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<TPS >  
Reference Data: PRACA

Description:  
THERMAL PROTECTION SYSTEM(TPS). "MANY NON-STANDARD DISPOSITIONS ARE INCOMPLETE AND LACK SUFFICIENT DETAIL TO PROVIDE A PERMANENT RECORD OF HOW THE WORK WAS ACTUALLY DONE, E.G.: --NUMBER OF STITCHES NOT SPECIFIED --RTV FORMULA NOT SPECIFIED --DISPOSITION ALLOWS OPTION FOR MATERIAL USE BUT DOES NOT PROVIDE FOR RECORDING WHAT KIND/HOW MANY WERE ACTUALLY USED"

CLOSURE ACTION, 9/15/86 - AUTO SYSTEM I/W  
\*\*\*\*\*

ID: < 205.00> Issue(s): DISCIPLINE : PAPERWORK  
Issue(s) cont.: QA :  
Issue Source: <51-L FINDINGS > PAGE 042  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<TPS >  
Reference Data: PRACA

Description:  
THERMAL PROTECTION SYSTEM(TPS). "STANDARD REPAIR PROCEDURES ARE APPLIED TO SITUATIONS FOR WHICH THEY WERE NOT INTENDED. --THERMAL BARRIER INSULATION AND REMORK --REMOVAL OF TILE OML(ORBITER MOLD LINE) CONTAMINATION BY SANDING THE OML --USE OF ALCOHOL TO BREAK DOWN WATERPROOFING OF TPS-207 REPAIR SO TPS-346 WILL STICK"

CLOSURE ACTION, 9/15/86 - REVISE SPI SP-614  
\*\*\*\*\*

ID: < 206.00> Issue(s): DISCIPLINE : PAPERWORK  
Issue(s) cont.: QA :  
Issue Source: <51-L FINDINGS > PAGE 042  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<TPS >  
Reference Data: PRACA

Description:  
THERMAL PROTECTION SYSTEM(TPS). "DR CRITERIA EXCEEDED. --(IML) INNER MOLD LINE FILLS EXCEED DR ALLOWABLE WHICH SHOULD HAVE BEEN THERMALLY ANALYZED --VAGUE DESCRIPTIONS OF WORK PERFORMED"

CLOSURE ACTION, 9/15/86 - TRAINING FOR SPI QA-002  
\*\*\*\*\*

ID: < 207.00> Issue(s): DISCIPLINE : PAPERWORK  
Issue(s) cont.: QA :  
Issue Source: <51-L FINDINGS > PAGE 042  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<TPS >  
Reference Data: PRACA

Description:  
THERMAL PROTECTION SYSTEM(TPS). "PROBLEM DESCRIPTIONS ARE OFTEN INCOMPLETE IN PROVIDING DAMAGE LOCATION AND DIMENSIONS ON GAP FILLERS, THERMAL BARRIERS, TILE THICKNESS, AND LOCATION."

CLOSURE ACTION, 9/15/86 - TRAINING FOR SPI QA-002  
\*\*\*\*\*



ID: < 208.00>                    Issue(s): QA                    : DISCIPLINE  
Issue(s) cont.: CHANGE CONTROL                    :  
Issue Source: <51-L FINDINGS >                    PAGE 043  
Operation: <REPAIR >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ORBITER >  
Reference Data: MCR  
Description:  
MCR 9163 -- WORK ACCOMPLISHED ON FLIGHT 10, MOD WAS FORMALLY APPROVED FOR FLIGHT 11.

CLOSURE ACTION, 9/15/86 - TRAINING FOR SPI-519 & QA-001. AUDIT I/W  
\*\*\*\*\*

ID: < 209.00>                    Issue(s): DISCIPLINE                    : QA  
Issue(s) cont.:                    :  
Issue Source: <51-L FINDINGS >                    PAGE 043  
Operation: <REPAIR >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<STRUCTURE >  
Reference Data: MCR                    MCR10727  
Description:  
"UNABLE TO VERIFY THAT NEWLY DRILLED HOLES ON WING UNDER TILES HAD BEEN PROPERLY CORROSION PROTECTED."

CLOSURE ACTION, 9/15/86 - REVISE SPI SP-504 & QA-003. AUDIT I/W  
\*\*\*\*\*

ID: < 210.00>                    Issue(s): DISCIPLINE                    : PAPERWORK  
Issue(s) cont.: QA                    : CHANGE CONTROL                    :  
Issue Source: <51-L FINDINGS >                    PAGE 043  
Operation: <REPAIR >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<STRUCTURE >  
Reference Data: MCR                    MCR 9881  
Description:  
ORBITER CENTAUR MOD: "A PAPER REVIEW DID NOT INDICATE THAT AFT HYDRAULIC LINE SUPPORT BRACKETS WERE REINSTALLED AFTER A FIT CHECK OF A NEW LINE TO SUPPORT THE CENTAUR FLIGHT IN THE OPF. HARDWARE WAS REINSTALLED AT THE PAD, BUT WITHOUT PROPER DOCUMENTATION."

CLOSURE ACTION, 9/15/86 - TRAINING FOR SPI'S QA-064, QA-001. QA-024. AUDIT I/W  
\*\*\*\*\*

ID: < 211.00> Issue(s): DISCIPLINE : PAPERWORK  
Issue(s) cont.: QA : SAFETY : PROCEDURE  
Issue Source: <51-L FINDINGS > PAGE 043  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: MCR

Description:  
MCR REVIEW. "AN INDEPENDENT SAFETY REVIEW WAS CONDUCTED ON ALL MCR'S AND ADDITIONAL PROBLEMS WERE DISCOVERED ON FIVE OF THE 22 MCR'S FOR AN ERROR RATE OF 23%. THE FOLLOWING CATEGORIES APPLY:  
1. CRITICAL SKILLS OR WRONG NUMBERS FOR SKILLS --1  
2. NO CERTIFICATION ANNOTATED --1  
3. PROCEDURE/FORMAT PROBLEMS --4  
4. MISSING SAFETY STAMP --1  
5. QUALITY DISPOSITION ON SAFETY AREA --2"

CLOSURE ACTION, 9/15/86 - REVISE SPI'S SP-504,-519,-509,-614,-514,QA-001.  
\*\*\*\*\*

ID: < 212.00> Issue(s): PAPERWORK : CHANGE CONTROL  
Issue(s) cont.: QA : PROCEDURE :  
Issue Source: <51-L FINDINGS > PAGE 043  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: WA MCR

Description:  
MCR REVIEW. "OF THE 51 WORK DOCUMENTS GENERATED BY THE MCR'S, 96% WERE FOUND TO HAVE ERRORS OF AN ADMINISTRATIVE OR FORMAT ERROR AS DEFINED BY THE SPI (STANDARD PRACTICE INSTRUCTIONS)."

CLOSURE ACTION, 9/15/86 - REVISE SPI'S QA-001 & SP-504. TRAINING FOR SAME.  
\*\*\*\*\*

ID: < 213.00> Issue(s): REQUIREMENTS : PAPERWORK  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: OMRSD

Description:  
OMRSD: "IN MANY AREAS, THE OMRSD IS OVERLY DETAILED; NOT ONLY LISTING REQUIREMENTS AND CONFIGURATIONS (WHICH IS APPROPRIATE), BUT ALSO SPECIFIC INSTRUCTIONS ON HOW TO OPERATE GSE TO OBTAIN THE DESIRED CONFIGURATION. IN OTHER AREAS, THE OMRSD LISTS ITEMS THAT ARE TOO BASIC; FOR EXAMPLE, THE REQUIREMENT TO CHECK THE WHEELS POST-LANDING IS LISTED FOR EACH ORBITER IN NINE SEPARATE OMI'S (EVERY PRIME AND CONTINGENCY LANDING SITE)."

CLOSURE ACTION, 9/15/86 - OMRSD REVIEW I/W  
\*\*\*\*\*

ID: < 214.00>            Issue(s): DISCIPLINE            : PAPERWORK  
Issue(s) cont.: REQUIREMENTS            :  
Issue Source: <51-L FINDINGS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51L >  
Hardware/Software:<N/A >  
Reference Data: OMRSD                    OMP

Description:  
OMP. KSC CREATES AN OMP AS A DATA BASE TO LIST ALL OMRSD REQUIREMENTS AND THE OMI'S AND TASK NUMBERS WHERE THE REQUIREMENTS WILL BE MET. OF THE 327 OMI'S LISTED FOR 51-L THE FOLLOWING OBSERVATIONS APPLY: 1. 34 OMI'S WERE NOT APPLICABLE FOR STS-33(10% ERROR). 2. 44 OMI'S WERE CONTINGENCY OMI'S(13%) 3. OMP NOT CLOSED LOOP, OMI REVISIONS FREQUENTLY NOT INCORPORATED. 4. THE OMP DOES NOT REFLECT THE CURRENT OMRS IMPLEMENTATION. 5. THE OMP DOES NOT CONTAIN A "CLOCK" SUCH THAT WHEN AN LRU IS REPLACED, THE INTERVAL REQUIREMENT CAN BE UPDATED TO INDICATE WHEN A REQUIREMENT IS REALLY EFFECTIVE.

CLOSURE ACTION, 9/15/86 - CLOSED LOOP OMP SYSTEM I/W  
\*\*\*\*\*

ID: < 215.00>            Issue(s): DISCIPLINE            : PAPERWORK  
Issue(s) cont.: REQUIREMENTS            :  
Issue Source: <51-L FINDINGS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: PSP                      OMRSD

Description:  
PSP. THE PROCESSING SUPPORT PLAN IS A KSC DOCUMENT THAT LISTS ALL WORK THAT MAY BE PERFORMED ON A SPECIFIC STS FLOW AND LISTS OMRSD REQUIREMENTS AND OMI'S THAT WILL BE RELEASED. THE PSP IS PUBLISHED ABOUT 50 DAYS PRIOR TO OPF ROLL-IN AND IS CONTINUALLY UPDATED BY SYSTEM ENGINEERS. THERE IS NO FEEDBACK INTO THE OMP.

CLOSURE ACTION, 9/15/86 - CLOSED LOOP OMP SYSTEM I/W  
\*\*\*\*\*

ID: < 216.00>            Issue(s): QA                      : PAPERWORK  
Issue(s) cont.: DISCIPLINE            :  
Issue Source: <51-L FINDINGS >        PAGE 045  
Operation: <INSPECTION >  
Location: <ORBITR>                      OPF  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET >  
Reference Data: OMRSD

Description:  
FORMAL POST-FLIGHT INSPECTION OF FORWARD ET ATTACH PLATE WAS NOT DOCUMENTED

REVISED FEB. '87  
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CLOSURE ACTION, 1/5/87 DISCIPLINE/SPI ENFORCEMENT  
\*\*\*\*\*

ID: < 217.00>                    Issue(s): PAPERWORK                    : QA  
Issue(s) cont.: DISCIPLINE                    : REQUIREMENTS                    :  
Issue Source: <51-L FINDINGS >                    PAGE 045  
Operation: <INSPECTION >  
Location: <ORBITR>                    VAB  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ORBITER >  
Reference Data: OMRSD  
Description:  
 FORWARD AVIONICS BAY CLOSEOUT PANEL NOT VERIFIED INSTALLED DURING ORBITER  
 ROLLOVER/STACKING OPERATIONS.

CLOSURE ACTION, 9/15/86 - AUDIT I/W

\*\*\*\*\*

ID: < 218.00>                    Issue(s): REQUIREMENTS                    : WAIVERS  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 045  
Operation: <COUNTDOWN >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<STRUCTURE >                    CREW HATCH MICROSWITCH  
Reference Data: PRACA                    PR                    OMRSD  
Description:  
 51-L WAS LAUNCHED WITH ONLY ONE OF TWO CREW HATCH MICROSWITCHS OPERATING. NO  
 WAIVER WAS OBTAINED.

CLOSURE ACTION, 9/15/86 - TRAINING FOR SPI QA-001.

\*\*\*\*\*

ID: < 219.00>                    Issue(s): QA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 045  
Operation: <INSPECTION >  
Location: <LDG >                    DFRF  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<APU >  
Reference Data: PRACA                    OMRSD  
Description:  
 POST-FLIGHT HYDRAULIC RESERVOIR SAMPLING NOT PERFORMED PRIOR TO GROUND  
 HYDRAULIC CONNECTION AT DFRF.

CLOSURE ACTION, 9/15/86 - OMRSD TRAINING. REVISE OMI V-9005.CLOSED LOOP SYS I/W

\*\*\*\*\*

ID: < 220.00>                    Issue(s): QA                    : WAIVERS  
Issue(s) cont.: REQUIREMENTS                    :  
Issue Source: <51-L FINDINGS >                    PAGE 045  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<APU >  
Reference Data: PRACA                    OMRSD

Description:  
DURING APU SERVICING, TANK #2 EVACUATION PRIOR TO TANK LOADING WAS NOT MAINTAINED AT PROPER LEVEL. NO WAIVER WAS SUBMITTED.

CLOSURE ACTION, 9/15/86 - OMRSD, QA-001 TRAINING  
\*\*\*\*\*

ID: < 221.00>                    Issue(s): REQUIREMENTS                    : QA  
Issue(s) cont.:                    :  
Issue Source: <51-L FINDINGS >                    PAGE 045  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<LANDING >  
Reference Data: PRACA                    OMRSD

Description:  
LANDING GEAR VOIDS WERE NOT REPLENISHED AND CREW MODULE METERS WERE NOT VERIFIED DURING FINAL CLOSEOUTS.

CLOSURE ACTION, 9/15/86 - SYSTEMS TRAINING. REVISE OMI'S S5009 & V9002  
\*\*\*\*\*

ID: < 222.00>                    Issue(s): QA                    : DISCIPLINE  
Issue(s) cont.: REQUIREMENTS                    :  
Issue Source: <51-L FINDINGS >                    PAGE 045  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET >                    LH2 AND LO2 ULLAGE PRESSURE CONTROL  
Reference Data: PRACA                    OMRSD

Description:  
ET LH2 AND LO2 ULLAGE PRESSURE CONTROL AND REDUNDANCY VERIFICATION USING SIMULATED TRANSDUCERS (V1009.02 SEQUENCE 8) HAS AN OMRSD EFFECTIVITY FOR THIS FLOW. HOWEVER, THE ENTIRE SEQUENCE WAS "NOT PERFORMED"

CLOSURE ACTION, 9/15/86 - OMRSD TRAINING. CLOSED LOOP OMP SYSTEM I/W  
\*\*\*\*\*

ID: < 223.00> Issue(s): PROCEDURE : DISCIPLINE  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 045, 094  
Operation: <TEST >  
Location: <OPF >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > PNEUMATIC ISOLATION VALVE  
Reference Data: PRACA OMRSD

Description:  
THE THREE OMRSD REQUIREMENTS (V41AA0.010, .030, .050), WHICH VERIFY THE SSME PNEUMATIC ISOLATION VALVE ACTUATION IN OMI V1009.036 SEQUENCE WERE NOT MET AS SPECIFICALLY CALLED OUT IN THE OMRSD. THE INTENT OF THE REQUIREMENT WAS NOT MET.

CLOSURE ACTION, 9/15/86 - OMI V1009.03 REVISED. OMRS REVIEW I/W

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ID: < 224.00> Issue(s): REQUIREMENTS :  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 046 095  
Operation: <TEST >  
Location: <OPF >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > PNEUMATIC ISOLATION VALVE  
Reference Data: PRACA OMRSD

Description:  
THE THREE OMRSD REQUIREMENTS (V41AA0.010, .030, .050), WHICH VERIFY THE SSME PNEUMATIC ISOLATION VALVE ACTUATION IN OMI V1009.03 SEQUENCE WERE NOT MET AS SPECIFICALLY CALLED OUT IN THE OMRSD. THE INTENT OF THE REQUIREMENT WAS NOT MET.

CLOSURE ACTION, 9/15/86 - OMI V1011.06 REVISED

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ID: < 225.00> Issue(s): DISCIPLINE : REQUIREMENTS  
Issue(s) cont.: QA : :  
Issue Source: <51-L FINDINGS > PAGE 046 095  
Operation: <TEST >  
Location: <OPF >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > PNEUMATIC REGULATOR  
Reference Data: PRACA OMRSD

Description:  
OMRSD V41B60.010 (SSME PNEUMATIC REGULATOR FUNCTIONAL TEST) WHICH CHECKS THE REDUNDANCY OF INDIVIDUAL REGULATORS WAS NOT VERIFIED UNDER FLOW CONDITIONS.

CLOSURE ACTION, 9/15/86 - OMRS REVIEW I/W. OMI V1011.06 REVISED

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ID: < 226.00>                    Issue(s): DISCIPLINE                    : QA  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 046 095  
Operation: <TEST >                    :  
Location: <OPF >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<SSME >                    HELIUM PNEUMATIC LOW PRESSURE SYSTEM  
Reference Data:    PRACA                    OMRSD

Description:  
THE HELIUM PNEUMATIC LOW PRESSURE SYSTEM DECAY CHECK (WITH CLOSING SOLENOIDS ENERGIZED) FAILED THE ALLOWABLE LIMIT. THE DECAY RATE WAS RECORDED AS 0.98 PSI/MIN; HOWEVER, A RE-CALCULATION OF THE DATA REVEALS THE DECAY RATE WAS ACTUALLY 1.4 PSI/MIN. THE CALCULATED ALLOWABLE DECAY RATE WAS 1.35 PSI/MIN. MAXIMUM.

CLOSURE ACTION, 9/15/86 - OPERATOR SUBTRACTION ERROR.  
\*\*\*\*\*

ID: < 227.00>                    Issue(s): REQUIREMENTS                    : QA  
Issue(s) cont.: DISCIPLINE                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 046 095  
Operation: <TEST >                    :  
Location: <OPF >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<SSME >                    :  
Reference Data:    PRACA                    OMRSD

Description:  
THE LEAK CHECK STEPS FOR TEST PORT #4, AFTER INSTALLATION OF THE PLUG, WERE INADVERTANTLY OMITTED FROM THE OMI V1009.04. THIS IS A VIOLATION OF OMRSD V41A20.070.

CLOSURE ACTION, 9/15/86 - OMI V1009.04 REVISED  
\*\*\*\*\*

ID: < 228.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 046 095  
Operation: <TEST >                    :  
Location: <OPF >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<SSME >                    PROTECTIVE COVERS  
Reference Data:    PRACA                    OMRSD

Description:  
SSME PROTECTIVE COVERS WERE NOT INSTALLED AT TIMES REQUIRED BY REQUIREMENT V41BWO.030. A REVISION TO THE REQUIREMENT IS NEEDED.

CLOSURE ACTION, 9/15/86 - OMRSD CHANGE SUBMITTED (RCN KV7262)  
\*\*\*\*\*





ID: < 232.00> Issue(s): REQUIREMENTS :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 046 095  
Operation: <INSPECTION >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > HUMIDITY INDICATOR  
Reference Data: OMRSD V4180.160

Description:  
THE HUMIDITY INDICATOR INSPECTION REQUIREMENT V4180.060 WAS NOT COMPLIED WITH BECAUSE THE ENGINES WERE NOT IN THE CONTROLLED ENVIRONMENT SINCE THERE IS A TRICKLE PURGE ON. THE REQUIREMENT NEEDS TO BE UPDATED.

CLOSURE ACTION, 9/15/86 - OMRSD CHANGE SUBMITTED (RCN KV7261)  
\*\*\*\*\*

ID: < 233.00> Issue(s): DISCIPLINE : TRAINING/CERTIF  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 047 093  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > LH2 ORB/ET DISCONNECT VALVE  
Reference Data: PRACA S0007

Description:  
DURING S0007, AN INCIDENT INVOLVING THE LH2 17" DISCONNECT OCCURRED. THE OMRSD REQUIREMENT OF 1 PSID IN THE MANIFOLD WAS VIOLATED IN THAT 6 PSID WAS PRESENT CAUSING THE VALVE TO SLAM.(SEE SSME FINDING #1 AND S0007 INCIDENTS)

CLOSURE ACTION, 9/15/86 - OMI G3251 & V1149 TO BE REVISED. S/W TO BE MODIFIED  
\*\*\*\*\*

ID: < 234.00> Issue(s): DISCIPLINE : QA  
Issue(s) cont.: PROCEDURE :  
Issue Source: <51-L FINDINGS > PAGE 047 094  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > LOX PREVALVE SOLENOID  
Reference Data: PRACA

Description:  
LOX PREVALVE SOLENOID LV82 ON SSME NO.2(2020) HAD A HELIUM LEAK RATE WHICH EXCEEDED THE ALLOWABLE (THIS WAS CAUSED BY A MATH ERROR.) SEE SSME FINDING #4.

CLOSURE ACTION, 9/15/86 - REVISE V1171  
\*\*\*\*\*

ID: < 235.00>            Issue(s): MANAGEMENT            : INTERFACE  
Issue(s) cont.: CONSTRAINTS            :  
Issue Source: <51-L FINDINGS >        PAGE 048  
Operation: <FLIGHT >                    :  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software: <ORBITER >  
Reference Data:        N/A

Description:  
"IN FLIGHT ANOMALIES--DURING A SHUTTLE MISSION, IFA(IN FLIGHT ANOMALIES) ARE GENERATED AND TRACKED BY THE SHUTTLE MISSION EVALUATION GROUP AT JSC. THIS IFA LIST DOES NOT INCLUDE THE EXTERNAL TANK OR SRB ANOMALIES AND MAY OR MAY NOT INCLUDE SSME ITEMS, BECAUSE MSFC IS NOT A PART OF THE FORMAL IFA TRACKING SYSTEM."

CLOSURE ACTION, 9/15/86 - SPI SP-507 REVISION REQ'D. MSFC AGREED TO IFA REPORT6  
\*\*\*\*\*

ID: < 236.00>            Issue(s): PAPERWORK            : CHANGE CONTROL  
Issue(s) cont.: PROCEDURE            : MANAGEMENT            :  
Issue Source: <51-L FINDINGS >        PAGE 048  
Operation: <GENERIC >                    :  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software: <N/A >  
Reference Data:        PRACA                    PROBLEM REPORT

Description:  
DURING THE PAPERWORK REVIEW OF PR'S, TPS'S, AND OMI'S BY CVAS, THE FOLLOWING MINOR HARDWARE CONFIGURATION ANOMALIES WERE NOTED: PR V070-9-10-0210(OMI STEPS INCORRECTLY MARKED); PR FRC-9-10-0022(PART CHANGED BY DEVIATION WITHOUT PROPER AUTHORITY); PR ECL-9-10-0500(CLAMP SUBSTITUTION WITHOUT PROPER ENGINEERING DOCUMENTATION); PR V070-199017-001(THERMAL BARRIER SUBSTITUTION WITHOUT PMRB APPROVAL).

CLOSURE ACTION, 9/15/86 - SPI SP-519 REVISION REQ'D. WAD SYSTEM TRAINING REQ'D  
CLOSURE ACTION, 9/15/86 - TRAINING FOR SP QA-019  
CLOSURE ACTION, 1/5/87 - DISCIPLINE/SPI SP-609 ENFORCEMENT & ON MRB ITEMS  
\*\*\*\*\*

ID: < 237.00>            Issue(s): REQUIREMENTS            : QA  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 050  
Operation: <INSPECTION >                    :  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software: <SRB >                    0-RINGS  
Reference Data:        N/A

Description:  
"THE FIELD JOINT O-RINGS ARE NOT INSPECTED AT KSC PRIOR TO INSTALLATION. THEY ARE SOURCE INSPECTED, LUBRICATED, AND DOUBLE BAGGED FOR SHIPMENT TO KSC."

REVISED FEB. '87

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CLOSURE ACTION, 9/15/86 - O-RINGS INSPECTED BY VENDOR. NO CORRECTIVE ACTION REQ  
\*\*\*\*\*



ID: < 241.00>                    Issue(s): METHODS                    : PROCEDURE  
Issue(s) cont.: QA                    : REQUIREMENTS                    :  
Issue Source: <51-L FINDINGS >                    PAGE 050  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >                    FIELD JOINTS  
Reference Data: N/A

Description:  
DURING MATING OF THE STS-33 RH SRB, THE OUT-OF-ROUNDNESS OF THE AFT CENTER TO AFT BOOSTER WAS 0.216 AT 0" AND -0.393 AT 120"

CLOSURE ACTION, 9/15/86 - SRB JOINT REDESIGN I/W

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ID: < 242.00>                    Issue(s): DESIGN                    : REQUIREMENTS  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 050  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >                    FIELD JOINTS  
Reference Data: N/A

Description:  
"WHILE THE AFT CENTER SEGMENT OF THE RH BOOSTER WAS LOCATED OUTSIDE THE VAB DOOR, ON 12-5-85, THERE WAS A HEAVY RAIN STORM. THE MOTOR SEGMENT WAS WET WITH WATER. WATER WAS REMOVED FROM ACCESSIBLE AREAS WITH A LINT FREE CLOTH."

CLOSURE ACTION, 9/15/86 - OMRS REVIEW I/W

\*\*\*\*\*

ID: < 243.00>                    Issue(s): RELIABILITY                    : QA  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 051  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >                    HOLDDOWN POST #2  
Reference Data: N/A

Description:  
"HOLDDOWN POST #2 STUD DID NOT MEET STRETCH REQUIREMENTS DURING STUD TENSIONING DUE TO NUT BINDING. THE STUD WAS REPLACED AFTER FULL STACK AND THE NEW STUD TENSIONED SATISFACTORILY."

CLOSURE ACTION, 9/15/86 - MAD TRAINING. PAPER AUDIT I/W

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ID: < 244.00>                    Issue(s): DISCIPLINE                    : PROCEDURE  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 051  
Operation: <ASSEMBLY >                    >  
Location: <KSC >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    LEFT FWD CENTER SEGMENT  
Reference Data: PRACA

Description:  
THE LEFT FORWARD CENTER SEGMENT WAS DAMAGED AT THE RPSF DURING END RING REMOVAL  
. BOTH THE LEFT FORWARD CENTER AND RIGHT AFT CENTER SEGMENTS WERE REPLACED  
PRIOR TO STACKING STS-33.

CLOSURE ACTION, 9/15/86 - SEE SRM HANDLING RING MISHAP INVESTIGATION  
\*\*\*\*\*

ID: < 245.00>                    Issue(s): QA                    : METHODS  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 051  
Operation: <REPAIR >                    >  
Location: <KSC >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data: N/A

Description:  
INSULATION DEBONDS ARE SEALED AT THE SURFACE WITH NO METHOD FOR VERIFYING THE  
DEPTH OF THE REPAIR.

CLOSURE ACTION, 9/15/86 - DEVELOP METHOD FOR VERIFYING ACCEPTABLE INSULATION  
\*\*\*\*\*

ID: < 246.00>                    Issue(s): TIME/CYCLE                    : QA  
Issue(s) cont.: PROCEDURE                    : QA                    :  
Issue Source: <51-L FINDINGS >                    PAGE 051  
Operation: <REPAIR >                    >  
Location: <KSC >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data: N/A

Description:  
"THE START AND STOP TIMES FOR A FEW PROCESSES REQUIRING TIME CONTROL WERE NOT  
INCLUDED IN THE APPROPRIATE OMI, I.E., POT LIFE OF MATERIALS, PRESSURE DECAY  
CHECKS, ETC."

CLOSURE ACTION, 9/15/86 - REVISION TO OMI 85303  
\*\*\*\*\*

ID: < 247.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 051  
Operation: <GENERIC >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<SRB >                    :  
Reference Data: N/A  
Description:  
"THERE IS NO REQUIREMENT FOR A CONTROLLING DOCUMENT TO SEQUENCE TASKS WITHIN THE OM'S."

CLOSURE ACTION, 9/15/86 - TASKS SEQUENCED BY FLOW CHARTS  
\*\*\*\*\*

ID: < 248.00>                    Issue(s): DISCIPLINE                    : PROCEDURE  
Issue(s) cont.: PAPERWORK                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 051  
Operation: <TEST >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<SRB >                    :  
Reference Data: N/A  
Description:  
"TASK DEVIATION LOG DOES NOT INDICATE EFFECTIVITY OF TEMPORARY DEVIATIONS. THEREFORE, THERE IS NO FOOL-PROOF WAY TO DETERMINE IF A TEMPORARY DEVIATION IS EFFECTIVE ON A GIVEN RUN."

CLOSURE ACTION, 9/15/86 - REVISE SPI SP-515. WAD TRAINING  
\*\*\*\*\*

ID: < 249.00>                    Issue(s): DISCIPLINE                    : PROCEDURE  
Issue(s) cont.: QA                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 051  
Operation: <GENERIC >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<SRB >                    :  
Reference Data: N/A  
Description:  
SEVERAL INSTANCES OF DEVIATIONS BEING LOGGED OR INCORPORATED IMPROPERLY.

CLOSURE ACTION, 9/15/86 - REVISE SPI SP-515. WAD TRAINING  
\*\*\*\*\*

ID: < 250.00>                    Issue(s): QA                    : PROCEDURE  
Issue(s) cont.: QA                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 051  
Operation: <GENERIC >                    >  
Location: <KSC >                            >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data: OMI                    85303C, 85307C  
Description:  
OMI 85305C. TASK 06 DEVIATION NUMBERING SYSTEM STARTED OVER AFTER A  
DEVIATION REPLACED ENTIRE TASK.

CLOSURE ACTION, 9/15/86 - REVISE SPI'S SP-515 & SP-519. OMI DEV TRAINING  
\*\*\*\*\*

ID: < 251.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 051  
Operation: <GENERIC >                    >  
Location: <KSC >                            >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data: OMI                    OM/85305,85307,85304,ETC.  
Description:  
REVIEW OF SEVERAL OM'S SHOWED OPPORTUNITIES FOR MINOR ENHANCEMENTS.

CLOSURE ACTION, 9/15/86 - REVISE OM'S 85305,85307,85304.OMI'S S5011,85003,S5010  
\*\*\*\*\*

ID: < 252.00>                    Issue(s): QA                    : DISCIPLINE  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 051  
Operation: <GENERIC >                    >  
Location: <KSC >                            >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data: OMI                    OM/85305C  
Description:  
IN OM 85305C, RESISTANCE READING WAS RECORDED IN ERROR. STEP WAS IMPROPERLY  
BOUGHT BY CONTRACTOR AND GOVERNMENT QUALITY CONTROL.

CLOSURE ACTION, 9/15/86 - MAD TRAINING. PAPER AUDIT I/W  
\*\*\*\*\*

ID: < 253.00>                    Issue(s): DISCIPLINE                    : REQUIREMENTS  
 Issue(s) cont.: QA                    :  
 Issue Source: <51-L FINDINGS >                    PAGE 051  
 Operation: <GENERIC >                    :  
 Location: <KSC >                    :  
 Orb.No/Mission: <099/51-L >                    :  
 Hardware/Software:<SRB >                    :  
 Reference Data: OMI                    OM 85307C  
 Description:  
 SEVERAL JOB CARD SUPPORT REQUIREMENTS SHEETS (E.G., FOR TASKS 1, 2, AND 7)  
 WERE NOT UPDATED PER OM 85307C.

CLOSURE ACTION, 9/15/86 - JC SUPPORT REQ'MTS LISTED ON MICR  
 \*\*\*\*\*

ID: < 254.00>                    Issue(s): REQUIREMENTS                    : TIME/CYCLE  
 Issue(s) cont.: PROCEDURE                    :  
 Issue Source: <51-L FINDINGS >                    PAGE 051  
 Operation: <GENERIC >                    :  
 Location: <KSC >                    :  
 Orb.No/Mission: <099/51-L >                    :  
 Hardware/Software:<SRB >                    :  
 Reference Data: OMI  
 Description:  
 AN OMRSD REQUIREMENT CONCERNING TIME THAT DWV VOLTAGE CAN BE APPLIED TO  
 CERTAIN PINS NOT REFLECTED IN OMI.

CLOSURE ACTION, 9/15/86 - REVISE OMI 85305  
 \*\*\*\*\*

ID: < 255.00>                    Issue(s): PROCEDURE                    :  
 Issue(s) cont.:                    :  
 Issue Source: <51-L FINDINGS >                    PAGE 052  
 Operation: <GENERIC >                    :  
 Location: <KSC >                    :  
 Orb.No/Mission: <099/51-L >                    :  
 Hardware/Software:<SRB >                    :  
 Reference Data: OMI  
 Description:  
 "O-RINGS ARE NOT IDENTIFIED BY FIND NUMBER IN THE OMI."

CLOSURE ACTION, 9/15/86 - REVISE OMI 85303  
 \*\*\*\*\*



ID: < 256.00> Issue(s): QA : RELIABILITY  
Issue(s) cont.: REQUIREMENTS :  
Issue Source: <51-L FINDINGS > PAGE 052  
Operation: <INSPECTION >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: PRACA

Description:  
"SEVEN OF TWENTY-TWO O-RINGS THAT WERE STOCKED AT KSC, WERE REINSPECTED TO TIGHTER CRITERIA AND WERE FOUND TO HAVE DR CONDITIONS."

CLOSURE ACTION, 9/15/86 - OMRS REVIEW I/W

\*\*\*\*\*

ID: < 257.00> Issue(s): QA : DISCIPLINE  
Issue(s) cont.: PROCEDURE : PAPERWORK :  
Issue Source: <51-L FINDINGS > PAGE 052  
Operation: <INSPECTION >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: PRACA

Description:  
"OF ALL THE PAPER REVIEWED, THIRTEEN ITEMS HAVE DISCREPANCIES AGAINST THE SRB OPERATIONS GROUP. THE BREAKDOWN IS AS FOLLOWS: (A) FOUR WERE DUE TO IMPROPER PROCEDURES. EXAMPLE-TECHNICIANS WORKED THREE SEQUENCES AND SIGNED THEM OFF THE CONSTRAINTS LIST THE FOLLOWING DAY. (B) FIVE DISCREPANCIES WERE LISTED TO HUMAN ERRORS - TECHNICIANS WERE NOT PROPERLY FILLING OUT THE REQUIRED DATA SHEETS AND JOB TASK CARDS. (C) FOUR ERRORS WERE FOUND IN WHICH STAMPS AND SIGNATURES WERE MISSING. WORK WAS ACCOMPLISHED, BUT NOT PROPERLY ACCEPTED BY TECHNICIANS OR DISCREPANCY REPORTS WERE DISPOSITIONED AND JOB WORKED WITHOUT A QUALITY ENGINEER'S SIGNATURE."

CLOSURE ACTION, 9/15/86 - WAD TRAINING. PAPER AUDIT I/W

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ID: < 258.00> Issue(s): QA : DISCIPLINE  
Issue(s) cont.: PAPERWORK : :  
Issue Source: <51-L FINDINGS > PAGE 052  
Operation: <INSPECTION >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: PRACA

Description:  
IN THE QUALITY DEPARTMENT, THE FOLLOWING MINOR RECORDKEEPING DISCREPANCIES WERE NOTED, AND REQUIRE CORRECTIVE ACTION: (A) THE AS-RUN DEVIATIONS FOR A TASK WERE NOT RECORDED AT THE END OF THE JOB CARD AS REQUIRED.--11 INSTANCES. (B) THE STANDARD TECHNICAL PROCESS DATA SHEETS AND/OR MICR'S WERE EITHER COMPLETED INCORRECTLY OR WERE MISSING DATA.--4. (C) SEQUENCES ON THE JOB CARD WERE NOT BOUGHT-OFF.--2. (D) STAMPS WERE ILLEGIBLE.--1. (E) CHANGE WAS MADE TO RECORDED DATA WITHOUT VERIFICATION OF WHO MADE THE CHANGE.--1. (F) BUY-POINTS, (DIPS )AND (MIPS), IN SOME TASKS REQUIRE CHANGES OR ADDITIONS.--3.

CLOSURE ACTION, 9/15/86 - REVISE SPI SP-515. WAD TRAINING. PAPER AUDIT I/W

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ID: < 259.00>                    Issue(s): PROCEDURE                    : QA  
Issue(s) cont.: STANDARDS                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 052  
Operation: <GENERIC >                    >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    GSE  
Reference Data: OMI

Description:  
 71 ENGINEERING ACTION ITEMS WERE NOTED DURING THE MECHANICAL ENGINEERING REVIEW. ALL GSE ACTION ITEMS WERE INCLUDED IN THIS TALLY. THESE ACTION ITEMS GENERALLY FELL INTO TWO AREAS OF ATTENTION: (A) CLARIFICATION OR ENHANCEMENT OF THE OMI. THERE ARE 34 ITEMS OF THIS TYPE. (B) ITEMS THAT NEED FURTHER INVESTIGATION. THERE ARE 37 ITEMS OF THIS TYPE. EXAMPLES ARE --NO VERIFICATION THAT QC SEALS ARE INTACT. --GM2 NOT TESTED FOR PARTICULATE AND MOISTURE PRIOR TO TEST.

CLOSURE ACTION, 9/15/86 - UPDATE OM'S 85303, 85304, 85306, 85308, 85309  
 \*\*\*\*\*

ID: < 260.00>                    Issue(s): PAPERWORK                    : PROCEDURE  
Issue(s) cont.: QA                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 053  
Operation: <GENERIC >                    >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data: OMI

Description:  
 OF THE ITEMS REVIEWED, PROCESS, PLANNING AND CONTROL (PP&C) HAD THIRTEEN ITEMS IN WHICH MISTAKES WERE FOUND. THE BREAKDOWN IS AS FOLLOWS: (A) FOUR WERE IMPROPER PROCEDURE. THIS INCLUDED DEVIATIONS NOT LOGGED ON TASK BUY-OFF CARDS. (B) NINE ITEMS WERE FOUND TO BE ERRORS CAUSED BY PP&C PLANNERS. ONE EXAMPLE IS WHEN THE JOB BUY-OFF CARD AND THE TASK OM DID NOT AGREE AND THE PLANNER DID NOT AGREE AND THE PLANNER DID NOT NOTICE THIS DISCREPANCY.

CLOSURE ACTION, 9/15/86 - WAD TRAINING. PAPER AUDIT I/W  
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ID: < 261.00>                    Issue(s): PAPERWORK                    : TRAINING/CERTIF  
Issue(s) cont.: CHANGE CONTROL                    : PROCEDURE                    : DISCIPLINE  
Issue Source: <51-L FINDINGS >                    PAGE 103-106 (060-063)  
Operation: <GENERIC >                    >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<N/A >                    >  
Reference Data: OMI                    PRACA

Description:  
 WORK AUTHORIZATION DOCUMENTS SUMMARY FINDINGS:

. VEHICLE PAPER REVIEWED(IPR/ORB/ET/SRB)	304 OF 304 (100%)
. CAT.A(SIGNIFICANT PROBLEMS OR CONCERNS)	24 OF 304 (8%)
. CAT.B(PROB/CONCERNS OF LESS SIGNIFICANCE REQUIRING FOLLOW-ON ACTION)	159 OF 304 (52%)
. CAT.C(NO SIGNIFICANT PROBLEM/CONCERN)	121 OF 304 (40%)
. GSE PAPER REVIEWED(INCLUDING GSE IPR'S)	773 OF 789 (98%)
. CAT.A	26 OF 773 (3%)
. CAT.B	451 OF 773 (58%)
. CAT.C	296 OF 773 (39%)

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ID: < 262.00>                    Issue(s): PAPERWORK                    : DISCIPLINE  
Issue(s) cont.: PROCEDURE                    : QA                    :  
Issue Source: <51-L FINDINGS >                    PAGE 064  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<MPS >                    GH2 FLOW CONTROL VALVES  
Reference Data: PRACA                    IPR33V-0088

Description:  
IPR 33V-0088 -- ALL THREE MPS GH2 FLOW CONTROL VALVES WERE FOUND ENERGIZED, SHOULD BE DE-ENERGIZED. ENERGIZED INADVERTANTLY DURING CALIBRATION OF ET PRESSURE TRANSDUCERS. MPS PERSONNEL NOT INFORMED OF OPERATION.

CLOSURE ACTION, 9/15/86 - MAD TRAINING. PAPER AUDIT I/W

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ID: < 263.00>                    Issue(s): DISCIPLINE                    : QA  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 064  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >                    PAYLOAD TESTING  
Reference Data: PRACA                    IPR33V-0142

Description:  
IPR 33V-0142 -- PAYLOAD GSE CIRCUITRY BREAKERS WERE OPEN, SHOULD BE CLOSED.

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ID: < 264.00>            Issue(s): DISCIPLINE            : DESIGN  
Issue(s) cont.: SAFETY            : QA            :  
Issue Source: <51-L FINDINGS >    PAGE 064  
Operation: <PROPELLANT >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >        HPU  
Reference Data:    PRACA            IPR33V-0187  
Description:  
IPR 33V-0187 -- FLIGHT HALF POPPET MISSING FROM LH SRB TILT FILL QD. DURING  
REPAIR HYDRAZINE LOAD SPILLED TO ATMOSPHERE.

\*\*\*\*\*  
ID: < 265.00>            Issue(s): QA            : DISCIPLINE  
Issue(s) cont.: PROCEDURE            : SAFETY            :  
Issue Source: <51-L FINDINGS >    PAGE 065  
Operation: <TEST >  
Location: <PAD >            PAD B MLP  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >        GROUND PIC RACK CIRCUIT BRKS  
Reference Data:    PRACA            IPR33V-0223  
Description:  
IPR 33V-0223-- DURING THE PERFORMANCE OF ORDNANCE PIC CHECKS, IT WAS DETERMINED  
THAT THE PIC CIRCUIT BREAKERS IN THE MLP HAD NOT BEEN CLOSED AS WAS CALLED  
OUT PER PROCEDURE. SINCE THE PAD HAD BEEN CLOSED FOR THESE CHECKS, IT WAS  
NECESSARY TO SEND PERSONNEL BACK INTO THE PAD TO CLOSE THE BREAKERS. NO HARD-  
WARE DAMAGE RESULTED FROM THIS PROBLEM.

\*\*\*\*\*  
ID: < 266.00>            Issue(s): REQUIREMENTS            : WAIVERS  
Issue(s) cont.:            :            :  
Issue Source: <51-L FINDINGS >    PAGE 065  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<POWER >        PRSD  
Reference Data:    PRACA            IPR33V-0227, PR 570-0017-2-0149  
Description:  
IPR 33V-0227-- PRSD LD2 DEMAR VACUUM LOSS. DURING MONITORING OF THE DEMAR  
VACUUM, IT WAS NOTED THAT THE VACUUM HAD GONE FROM BELOW 25 MICRONS, THE OMRSD  
REQUIREMENT, TO ABOVE 120 MICRONS. THE SYSTEM WAS USED IN THAT CONFIGURATION  
FOR STS-33 PRSD LOADING. NO WAIVER WAS REQUESTED.



ID: < 270.00> Issue(s): DESIGN : METHODS  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 066  
Operation: <TEST >  
Location: <ORBITR> OPF, PAD  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<MPS > LH2 PURGE BARRIER  
Reference Data: OMI VI149 TASK 8

Description:  
INVESTIGATION OF WATER IN THE AFT RESULTED IN DETERMINING THAT THE INTENTIONAL "SLITTING" OF THE LH2 PURGE BARRIER TO COMPLETE OMI VI149 TASK 8 (MPS LEAK CHECKS) WAS THE CAUSE. TASK 8 IS NORMALLY COMPLETED IN THE VAB, AND NO DESIGN PROVISIONS ARE MADE FOR WEATHER PROTECTING THE LH2 PURGE BARRIER AREA SHOULD THIS TASK BE DEFERRED TO THE PAD; A FREQUENT OCCURENCE.

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ID: < 271.00> Issue(s): PAPERWORK : PROCEDURE  
Issue(s) cont.: SAFETY : DISCIPLINE :  
Issue Source: <51-L FINDINGS > PAGE 066  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET > TUMBLE SYSTEM  
Reference Data: OMI ET-26-T1251F

Description:  
ET-26-T1251F - ET TUMBLE SYSTEM CHECKS . THE REVIEW OF THIS OMI REVEALED SIGNIFICANT PAPERWORK PROBLEMS ON A CRITICAL SYSTEM. DEVIATIONS DID NOT HAVE SAFETY SIGNATURES AND OTHER SIGNATURES WERE INCONSISTENT. SEVERAL OF THE DEVIATIONS WERE VERY OLD INDICATING THAT THE OMI WAS IN NEED OF UPDATING.

\*\*\*\*\*  
ID: < 272.00> Issue(s): DISCIPLINE : METHODS  
Issue(s) cont.: PROCEDURE : :  
Issue Source: <51-L FINDINGS > PAGE 066  
Operation: <REPAIR >  
Location: <VAB >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET > ORBITER  
Reference Data: PRACA PR'S ET-26-TS-0068,0069,0070,0071

Description:  
PR'S ET-26-TS-0068,0069,0070,0071 - ET THERMAL PROTECTION DAMAGE. THESE PR'S DOCUMENT AND REPAIR ET TPS DAMAGE WHICH OCCURRED DURING ORBITER/ET MATE. HEAVY TOOLS ARE USED IN THIS CONFINED AREA BETWEEN THE ORBITER AND THE ET DURING MATING AND DAMAGE OFTEN OCCURS DURING THIS OPERATION.

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ID: < 273.00> Issue(s): PROCEDURE : METHODS  
Issue(s) cont.: MAINTAINABILITY : PAPERWORK :  
Issue Source: <51-L FINDINGS > PAGE 066  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB > AFT IEA  
Reference Data: OMI OMI SB-BI-026-B5100

Description:  
SRB-OMI SB-BI-026-B5100 - SRB AFT IEA REPLACEMENT. THIS OMI IS USED WHENEVER REPLACEMENT OF THE IEA IS REQUIRED. A REVIEW OF THE OMI REVEALED THAT THERE ARE 26 OUTSTANDING DEVIATIONS AMOUNTING TO 46 PAGES. THIS INDICATED THAT THE OMI IS BADLY IN NEED OF UPDATING.

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ID: < 274.00> Issue(s): MAINTAINABILITY : ACCESSABILITY  
Issue(s) cont.: QA :  
Issue Source: <51-L FINDINGS > PAGE 066  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB > LH IEA  
Reference Data: PRACA SRB DR SB-BI-026L-0002

Description:  
SRB-DR SB-BI-026L-0002 - MISSING K5NA ON LH IEA. THIS DR WAS TAKEN AFTER REPLACEMENT OF THE LH IEA WHEN IT WAS DISCOVERED THAT K5NA HAD NOT BEEN APPLIED AT ONE MATING AREA OF THE IEA TO THE SRB. THE APPLICATION OF K5NA SHOULD HAVE OCCURRED FOLLOWING IEA REPLACEMENT BUT WAS MISSED IN THIS AREA DUE TO ACCESS PLATFORM OBSTRUCTIONS. THE MISSING K5NA WAS NOTED ON THIS DR AND WAS INSTALLED.

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ID: < 275.00> Issue(s): QA : DISCIPLINE  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 067  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB > CONFINED DETONATING FUSE(CDF)  
Reference Data: PRACA SRB PR SB-BI-026L-0004

Description:  
SRB-PR SB-BI-026L-0004 - CDF CONNECTION INCORRECT. THIS PR WAS TAKEN WHEN IT WAS DISCOVERED DURING TUNNEL COVER INSTALLATION (B5304 TASK 11) THAT THE CDF WAS SAFETY WIRED BACKWARDS AS PART OF FINAL ORDNANCE CONNECTIONS. THE PROBLEM WAS CORRECTED ON THIS PR.

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ID: < 276.00>                    Issue(s): WAIVERS                    : QA  
Issue(s) cont.: PAPERWORK                    : DISCIPLINE                    :  
Issue Source: <51-L FINDINGS >                    PAGE 067  
Operation: <INSPECTION >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >                    IGNITOR S&A  
Reference Data:    PRACA                    SRB PR SB-BI-026L-0006/026R-0008  
Description:  
SRB-PR SB-BI-026L-0006/026R-0008 --SRB IGNITOR S&A CERTIFICATION NOT AVAILABLE.  
THESE PR'S WERE TAKEN WHEN IT WAS NOTED THAT PROPER SIGNATURES WERE NOT AVAIL-  
ABLE ON THE PYROTECHNIC LOT CERTIFICATION COVER SHEETS. THIS IS A RECURRING  
PROBLEM ON S&A'S DELIVERED TO KSC. A WAIVER WAS PROCESSED, AND PROPER  
SIGNATURES WERE FINALLY OBTAINED.

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ID: < 277.00>                    Issue(s): DISCIPLINE                    : PAPERWORK  
Issue(s) cont.: QA                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 067  
Operation: <ASSEMBLY >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<TPS >  
Reference Data:    PRACA  
Description:  
\*PAD TPS H70-0534-2-0100 -- TDRS FILLER PLATE INSTALLATION. THIS TPS INSTALLED  
THE FILLER PLATES ADJACENT TO THE FLIGHT PAYLOAD WITHOUT REQUIRED NASA  
SIGNATURES ON THE TPS, AN INDICATION OF IMPROPER PAPERWORK FOR WORK PERFORMED  
ON A CRITICAL SYSTEM."

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ID: < 278.00>                    Issue(s): REQUIREMENTS                    : PROCEDURE  
Issue(s) cont.: INTERFACE                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 067  
Operation: <ASSEMBLY >  
Location: <VAB >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ORBITER >                    ET MATE  
Reference Data:    OMI                    OMI 50004  
Description:  
\*OMI 50004 - ORBITER/ET MATE. ENGINEERING DIRECTIONS ARE NOT PROPERLY WRITTEN  
FOR THIS VERY CRITICAL OPERATION. VERY FEW INSTRUCTIONS ARE GIVEN FOR MATING  
INTERFACES SUCH AS THE LO2/LH2 MONOBALLS. OMRSD REQUIREMENTS ARE NOT CLEAR OR  
ARE HARD TO UNDERSTAND."

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ID: < 279.00> Issue(s): PROCEDURE : QA  
Issue(s) cont.: DISCIPLINE :  
Issue Source: <51-L FINDINGS > PAGE 067  
Operation: <PROPELLANT >  
Location: <PAD > PAD 8  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE > PROPELLANT LOADING  
Reference Data: OMI OMI S0024

Description:  
"OMI S0024 - PRELAUNCH PROPELLANT LOAD. THERE ARE MANY PAGES OF DEVIATIONS MAINLY CONCERNED WITH CORRECTING THE OMI FOR PAD 8. SEVERAL QC "BUY" STEPS WERE BOUGHT BY ANOTHER ORGANIZATION. THIS INDICATES IMPROPER PAPERWORK CLOSURE FOR A CRITICAL OPERATION."

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ID: < 280.00> Issue(s): DISCIPLINE : PAPERWORK  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 067  
Operation: <ASSEMBLY >  
Location: <VAB >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<STRUCTURE > PAYLOAD BAY  
Reference Data: N/A LOGBOOK ENTRY

Description:  
"LOG BOOK ENTRY - SLIDING OR ROLLING NOISE HEARD IN ORBITER DURING ORBITER LIFT TO VERTICAL. DURING THE RAISING OF THE ORBITER TO VERTICAL FOR MATE WITH THE ET, A "SLIDING" NOISE WAS HEARD BY ONE OF THE CRANE CREW MEMBERS WHICH SEEMED TO COME FROM THE PAYLOAD BAY. NO WRITTEN DOCUMENTATION WAS MADE ON THIS POTENTIAL PROBLEM. THE PLB WAS INSPECTED AT THE PAD AFTER THE PLBD'S WERE OPENED WITH NO ANOMALIES FOUND."

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ID: < 281.00> Issue(s): QA : DESIGN  
Issue(s) cont.: CONSTRAINTS :  
Issue Source: <51-L FINDINGS > PAGE 066  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB > SRB RECOVERY SYSTEM BATTERY  
Reference Data: PRACA IPR 33V-0087

Description:  
"IPR 33V-0087 -- LH & RH SRB RECOVERY SYSTEM BATTERY TEMPERATURES CANNOT BE MEASURED. DURING S0008 SHUTTLE INTEGRATED TEST IT WAS NOTED THAT THE SRB BATTERY TEMPERATURES COULD NOT BE READ. INVESTIGATION REVEALED THAT THE FORWARD ASSEMBLIES WERE DELIVERED FROM THE BPC WITH MISSING CONDUCTORS IN THE CABLES. THE BPC HAD WORKED A MSFC MODIFICATION WHICH HAD INADVERTANTLY DELETED THE CONDUCTORS. CONDUCTORS WERE ADDED PER FEC TO CORRECT THE PROBLEM."

061

CLOSURE ACTION, 9/15/86 - SPI TRAINING. WAD TRAINING

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ID: < 282.00>            Issue(s): DESIGN            : QA  
Issue(s) cont.: DISCIPLINE            :  
Issue Source: <51-L FINDINGS >        PAGE 068  
Operation: <TEST >                    :  
Location: <PAD >                        PAD B  
Orb.No/Mission: <099/51-L >            :  
Hardware/Software:<GSE >            ELECTRICAL POWER SUPPLY  
Reference Data: PRACA                IPR 33V-0097

Description:  
"IPR 33V-0097 -- MAIN C MOTOR SWITCH (HARDWARE) INDICATES ON, SHOULD BE OFF. DURING ORBITER INITIAL POWER UP ATTEMPTS AT PAD B, ONE GSE POWER SUPPLY WOULD NOT TURN ON. INVESTIGATION REVEALED A SHORT IN ONE PART OF THE GSE AND ELECTRICAL PATCHING PROBLEMS IN ANOTHER AREA. THE IPR WAS UPGRADED TO PR SS23B-0044 AND JUMPERS WERE ADDED TO THE SYSTEM TO CORRECT THE PROBLEM ALONG WITH A REPAIR OF THE SHORTED WIRING. DOCUMENTATION OF THE JUMPERS WAS NOT ACCOMPLISHED THROUGH DESIGN ENGINEERING. THE SYSTEM PERFORMED NOMINALLY THROUGH THE REMAINDER OF THE FLOW."

\*\*\*\*\*  
ID: < 283.00>            Issue(s): DESIGN            : INTERFACE  
Issue(s) cont.:                        :  
Issue Source: <51-L FINDINGS >        PAGE 068  
Operation: <FAULT ISOLATION >        :  
Location: <KSC >                        :  
Orb.No/Mission: <099/51-L >            :  
Hardware/Software:<GSE >            LH2 SKID INLET  
Reference Data: PRACA                IPR 33V-0107

Description:  
"IPR 33V-0107 -- LH2 SKID INLET INDICATING IMPROPER READING. TROUBLESHOOTING OF THIS PROBLEM REVEALED AN INCOMPATIBILITY BETWEEN THE GSE TRANSDUCER AND THE CABLING TO THE TRANSDUCER. THE IPR WAS UPGRADED TO PR S72-0012-2-0059 AND A SPARE CABLE WAS LOCATED IN THE GSE WHICH WAS COMPATIBLE WITH THE TRANSDUCER. THE NEW CABLE/TRANSDUCER CONFIGURATION REQUIRED ELECTRICAL JUMPERS TO PROPERLY ROUTE THE SIGNAL AND THESE JUMPERS WERE INSTALLED. THE SYSTEM THEN DID PERFORM PROPERLY. HOWEVER, NO DESIGN ENGINEERING CONCURRENCE WAS OBTAINED ON THIS CONFIGURATION CHANGE."

\*\*\*\*\*  
ID: < 284.00>            Issue(s): QA                :  
Issue(s) cont.:                        :  
Issue Source: <51-L FINDINGS >        PAGE 068  
Operation: <TEST >                        :  
Location: <KSC >                        :  
Orb.No/Mission: <099/51-L >            :  
Hardware/Software:<GSE >            HYPERGOLIC GSE  
Reference Data: PRACA                IPR 33V-0116/0168

Description:  
"IPR 33V-0116/0168 - HYPERGOLIC GSE LEAKS. THESE IPR'S WERE TAKEN ON LEAKS IN THE HYPER GSE. INVESTIGATION REVEALED THAT BUTYL RUBBER O-RINGS HAD BEEN INSTALLED IN THE SYSTEM BY THE INSTALLATION CONTRACTOR RATHER THAN TEFLON O-RINGS. THE O-RINGS WERE REPLACED WHICH CORRECTED THE PROBLEMS. IT WAS DECIDED NOT TO COMPLETELY TEAR DOWN THE LOADING SYSTEM TO LOOK FOR THESE TYPE O-RINGS, RATHER TO DEAL WITH THEM ON A ONE-FOR-ONE BASIS."

\*\*\*\*\*

ID: < 285.00>                    Issue(s): QA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >    PAGE 068  
Operation: <TEST >                    :  
Location: <PAD >                    PAD B  
Orb.No/Mission: <099/51-L >       :  
Hardware/Software:<GSE >        HYPER GSE HELIUM QD VENT LINE  
Reference Data: PRACA                IPR 33V-0153

Description:  
 "IPR 33V-0153 -- BLOWING LEAK ON HYPER GSE HELIUM QD VENT LINE. INVESTIGATION OF THIS PROBLEM REVEALED THAT A PNEUMATIC JUMPER HAD BEEN INSTALLED BY THE INSTALLATION CONTRACTOR AND CAUSED THE LEAK PROBLEM. THE JUMPER WAS REMOVED AND THE SYSTEM OPERATED NOMINALLY. THE HYPER HOT FLOWS WHICH HAD BEEN PERFORMED EARLIER DID NOT USE THIS PORTION OF THE SYSTEM AND THEREFORE THE JUMPER WAS NOT DETECTED UNTIL ORBITER LOADING OPERATIONS WERE STARTED."

\*\*\*\*\*  
ID: < 286.00>                    Issue(s): QA                    : DISCIPLINE  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >    PAGE 068  
Operation: <TEST >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <099/51-L >       :  
Hardware/Software:<GSE >        HYPER GSE OXIDIZER TANK REGULATOR  
Reference Data: PRACA                IPR 33V-0167

Description:  
 "IPR 33V-0167 -- HYPER GSE OXIDIZER TANK DID NOT PRESSURIZE PROPERLY. INVESTIGATION REVEALED THAT A GSE REGULATOR WAS NOT SET PROPERLY CAUSING THE TANK PRESSURE TO BE TOO LOW. THE REGULATOR WAS RESET TO THE PROPER PRESSURE AND THE SYSTEM PERFORMED NOMINALLY. THE REGULATOR HAD BEEN PROPERLY SET DURING THE PREPARATIONS FOR THE TEST BUT HAD SOMEHOW BEEN BACKED OFF PRIOR TO TEST START"

\*\*\*\*\*  
ID: < 287.00>                    Issue(s): CHANGE CONTROL        : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >    PAGE 069  
Operation: <TEST >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <099/51-L >       :  
Hardware/Software:<SOFTWARE >    SSME CONTROLLER MEMORY  
Reference Data: PRACA                IPR 33V-0207

Description:  
 "IPR 33V-0207 -- UNSCHEDULED VENTING DURING SSME POWER DOWN. DURING POWER DOWN OF SSME'S 2 & 3, PNEUMATIC VENTING OCCURRED FROM THE ENGINES. INVESTIGATION REVEALED THAT THE CONFIGURATION OF THE CHECKOUT OVERLAY RESIDING IN THE SSME CONTROLLER MEMORY CAUSED THE PROBLEM. THE CONFIGURATION WAS NOT POSSIBLE DURING THE COUNTDOWN SINCE THIS SOFTWARE IS OVERWRITTEN BY THE FLIGHT SOFTWARE. THIS COULD ALSO BE CONSIDERED A SAFETY PROBLEM SINCE VENTING CANNOT BE PREDICTED AND THE AREA WOULD NOT BE CLEARED FOR THE VENTING OPERATION (POTENTIAL O2 DEFICIENCY)."

\*\*\*\*\*

ID: < 288.00>                    Issue(s): PROCEDURE                    : REQUIREMENTS  
 Issue(s) cont.:                    :                    :  
 Issue Source: <51-L FINDINGS >    PAGE 069  
 Operation: <ASSEMBLY >                    :  
 Location: <KSC >                    :  
 Orb.No/Mission: <099/51-L >                    :  
 Hardware/Software:<SRB >                    SRB FORWARD IEA CODE PLUGS  
 Reference Data:    PRACA                    SRB PR SB-BI-026-0004

Description:  
 \*PR SB-BI-026-0004 -- SRB FORWARD IEA CODE PLUGS NOT SAFETY WIRED. THE PR WAS GENERATED SINCE THE CONFIGURATION CALLED OUT DID NOT REQUIRE SAFETY WIRE EVEN THOUGH THOSE TYPE CONNECTORS SHOULD BE SAFETY WIRED. THIS CONDITION WAS CONSIDERED ACCEPTABLE FOR FLIGHT. HOWEVER, CLOSEOUT PHOTOS REVEALED THAT THE CONNECTORS WERE SAFETY WIRED EVEN THOUGH THE CALLOUT WAS NOT THERE.\*

\*\*\*\*\*

ID: < 289.00>                    Issue(s): DESIGN                    : CHANGE CONTROL  
 Issue(s) cont.:                    :                    :  
 Issue Source: <51-L FINDINGS >    PAGE 069  
 Operation: <COUNTDOWN >                    :  
 Location: <PAD >                    :  
 Orb.No/Mission: <099/51-L >                    :  
 Hardware/Software:<SRB >                    SRB HDP  
 Reference Data:    OMI                    SRB OMI 85306, TASK 27

Description:  
 \*SRB OMI 85306, TASK 27 -- SRB HDP CLOSEOUT FOR LAUNCH. THIS OMI WAS DEVIATED TO CHANGE THE CONFIGURATION OF THE HOLD DOWN POST BLAST SHIELDS FOR LAUNCH. THE NEW CONFIGURATION WAS DISCUSSED AT THE STE-33 LAUNCH READINESS REVIEW BUT FORMAL ENGINEERING WAS NOT AVAILABLE FOR THE OPERATIONS. VERBAL AGREEMENTS WERE REACHED AND FOUR OF THE BLAST SHIELDS WERE MODIFIED. POST LAUNCH INSPECTION REVEALED THAT THE ITEMS INCORPORATED FOR THE MOD WERE BLOWN AWAY AT LAUNCH.\*

\*\*\*\*\*

ID: < 290.00>                    Issue(s): QA                    : STANDARDS  
 Issue(s) cont.: DISCIPLINE                    : REQUIREMENTS                    :  
 Issue Source: <51-L FINDINGS >    PAGE 069  
 Operation: <COUNTDOWN >                    :  
 Location: <PAD >                    :  
 Orb.No/Mission: <099/51-L >                    :  
 Hardware/Software:<ET >                    L02 PAD VACUUM JACKETED SECTION  
 Reference Data:    OMI                    ET OMI 572-0813-2-66102

Description:  
 \*ET OMI 572--0813-2-66102 -- L02 PAD VACUUM JACKETED SECTION CHECKS. THIS OMI MONITORS AND RECORDS THE VACUUM READINGS ON VARIOUS VACUUM JACKETED LINES IN THE L02 LOADING SYSTEM. RECORDINGS OF THE VACUUM INDICATE THAT SOME LINE SECTIONS WERE OUT OF SPECIFICATION.; NO PR'S WERE TAKEN ON THESE CONDITIONS AND NO RATIONALE WAS PROVIDED AS TO WHY THESE CONDITIONS WERE ACCEPTABLE. ET LOADING DURING COUNTDOWN WAS NOMINAL.\*

\*\*\*\*\*



ID: < 294.00>                    Issue(s): CHANGE CONTROL                    : QA  
Issue(s) cont.: DISCIPLINE                    :  
Issue Source: <51-L FINDINGS >                    PAGE 070  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >                    CABLING  
Reference Data:    N/A                    ET TPS S72-0694-1-2-0018

Description:  
"ET TPS S72-0694-1-2-0018 -- ET INTERTANK HEATER AC POWER CONNECTION DURING INSTALLATION OF THE GSE CABLING TO THE ET I/T HEATERS, THE CABLING COULD NOT BE INSTALLED PER PRINT SINCE A TOO SMALL BEND RADIUS FOR THE CABLE WAS CALLED OUT. THE PROBLEM WAS SOLVED BY INSTALLING AN ELBOW AT LOCATION. THIS CONDITION DID NOT HAVE DESIGN ENGINEERING CONCURRENCE."

\*\*\*\*\*

ID: < 295.00>                    Issue(s): QA                    : DESIGN CRITERIA  
Issue(s) cont.:                    :  
Issue Source: <51-L FINDINGS >                    PAGE 070  
Operation: <ASSEMBLY >  
Location: <PAD >                    PAD B  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >                    HYPER LINES  
Reference Data:    PRACA                    PAD PR S70-0700-7-2-0032

Description:  
"PAD PR S70-0700-7-2-0032/PR S70-0700-8-2-0037/DR S70-0700-3-2-0006 MISSING BONDING STRAPS  
--BONDING STRAPS ARE NOT INSTALLED ACROSS THE PIPING FLANGES OF THE HYPER LINES AT THE PAD. THESE ITEMS ARE STILL OPEN EVEN THOUGH CALLED OUT BY THE SYSTEM DRAWINGS. THE STAINLESS STEEL FLANGE BOLTS ARE ASSUMED TO PROVIDE THE GROUNDING PATH.

\*\*\*\*\*

ID: < 296.00>                    Issue(s): DISCIPLINE                    : PAPERWORK  
Issue(s) cont.: PROCEDURE                    :  
Issue Source: <51-L FINDINGS >                    PAGE 070  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >                    AFT SKIRT WEBS  
Reference Data:    PRACA                    SRB DR SB-8I-026-0002

Description:  
"SRB DR SB-8I-026-0002 -- DAMAGED CORK ON SRB AFT SKIRT WEBS

THE DAMAGED CORK WAS SATISFACTORILY REPAIRED. HOWEVER, THERE WAS NO EXPLANATION AS TO HOW THE CORK WAS DAMAGED."

ID: < 297.00> Issue(s): DISCIPLINE : QA  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 070  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A > INSTRUMENTATION  
Reference Data: PRACA PR S78-5005-2-0002  
Description:

ORIGINAL PAGE IS  
OF POOR QUALITY

"PR S78-5005-2-0002 -- IMPROPER METER READING DURING SYSTEM CALIBRATION.

TROUBLESHOOTING OF THE SYSTEM INDICATED THAT TWO SIGNAL CONDITIONERS WERE FAILED. ONE SIGNAL CONDITIONER WAS REPLACED AND THE SYSTEM APPEARED TO FUNCTION NORMALLY. NO RESOLUTION WAS MADE ON THE SECOND UNIT."

\*\*\*\*\*

ID: < 298.00> Issue(s): QA : SAFETY  
Issue(s) cont.: DISCIPLINE : PROCEDURE :  
Issue Source: <51-L FINDINGS > PAGE 071  
Operation: <TEST >  
Location: <PAD > RSS  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE > HYPER FUEL SYSTEM  
Reference Data: PRACA IPR 33V-0152  
Description:  
"IPR 33V-0152 -- HYPER FUEL SYSTEM LEAK ON THE ROTATING SERVICE STRUCTURE (RSS)

THERE IS NO EVIDENCE ON THE IPR THAT SAFETY CONCURRENCE WAS OBTAINED PRIOR TO THE START OF TROUBLESHOOTING. IT IS BELIEVED THAT A "GO" WAS RECEIVED OVER THE OIS BUT THE IPR IS NOT STAMPED."

CLOSURE ACTION, 9/15/86 - WAD TRAINING

\*\*\*\*\*

ID: < 299.00> Issue(s): QA : DISCIPLINE  
Issue(s) cont.: SAFETY :  
Issue Source: <51-L FINDINGS > PAGE 071  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE > RH SRB HYPER QD  
Reference Data: PRACA IPR 33V-0192  
Description:  
"IPR 33V-0192 - RH SRB HYPER QD LEAKING

THERE WAS NO EVIDENCE OF A SAFETY SIGNATURE ON THIS HAZARDOUS PR."

\*\*\*\*\*

ID: < 300.00> Issue(s): SAFETY : QA  
Issue(s) cont.: DISCIPLINE :  
Issue Source: <51-L FINDINGS > PAGE 071  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE > HYPER VALVE  
Reference Data: PRACA IPR 33V-0198  
Description:  
\*IPR 33V-0198 - HYPER VALVE LEAKING

HAZARDOUS OPERATIONS WERE PERFORMED PER THIS IPR WITH NO EVIDENCE OF SAFETY SIGNATURE OR CONCURRENCE."

\*\*\*\*\*  
ID: < 301.00> Issue(s): DISCIPLINE : QA  
Issue(s) cont.: SAFETY :  
Issue Source: <51-L FINDINGS > PAGE 071  
Operation: <REPAIR >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > INSULATION ON NOZZLE  
Reference Data: PRACA PR ME2023-9-10-0068  
Description:  
\*PR ME2023-9-10-0068 -- TORN INSULATION ON SSME NOZZLE

REPAIR OF THIS INSULATION REQUIRES SPOT WELDING WHICH IS CONSIDERED HAZARDOUS. THERE IS NO EVIDENCE OF A SAFETY SIGNATURE ON THIS PR."

\*\*\*\*\*  
ID: < 302.00> Issue(s): SAFETY : QA  
Issue(s) cont.: DISCIPLINE :  
Issue Source: <51-L FINDINGS > PAGE 071  
Operation: <REPAIR >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > SSME SUPPORT STRAP  
Reference Data: PRACA PR ME2021-9-10-0094  
Description:  
\*PR ME2021-9-10-0094 -- SSME SUPPORT STRAP TORN LOOSE

THERE WAS NO EVIDENCE OF A SAFETY SIGNATURE ON THIS HAZARDOUS PR WHICH IS CONSIDERED HAZARDOUS SINCE BRAZING IS REQUIRED TO EFFECT THE REPAIR."

\*\*\*\*\*



ID: < 303.00>            Issue(s): DISCIPLINE            : BA  
Issue(s) cont.: SAFETY            :            :  
Issue Source: <51-L FINDINGS >    PAGE 071  
Operation: <REPAIR            >  
Location: <KSC            >  
Orb.No/Mission: <099/51-L    >  
Hardware/Software:<SRB            >    LH FORWARD SEGMENT CORK BAND  
Reference Data:    PRACA            SRB SB-B1-026L-0005  
Description:  
\*SRB SB-B1-026L-0005 -- LH FORWARD SEGMENT CORK BAND DAMAGED

THERE WAS NO EVIDENCE OF SAFETY APPROVAL ON THIS HAZARDOUS PR."

\*\*\*\*\*  
ID: < 304.00>            Issue(s): SAFETY            : QA  
Issue(s) cont.: DISCIPLINE            :            :  
Issue Source: <51-L FINDINGS >    PAGE 071  
Operation: <TEST            >  
Location: <PAD            >            TSM, MLP  
Orb.No/Mission: <099/51-L    >  
Hardware/Software:<GSE            >    VACUUM JACKETED LINE  
Reference Data:    PRACA            MLP PR S72-0814-2-0119/120  
Description:  
\*MLP PR S72-0814-2-0119/120 -- VACUUM JACKETED LINE LEAKAGE

THESE TWO PR'S REQUIRE ACCESS TO THE TSM'S FOR PERFORMANCE OF THE TASKS.  
THERE WAS NO VERIFICATION FROM SAFETY THAT THE O2 MONITORS WERE INSTALLED  
IN THE TSM'S PRIOR TO ENTRY FOR THESE OPERATIONS."

\*\*\*\*\*  
ID: < 305.00>            Issue(s): SAFETY            : QA  
Issue(s) cont.: DISCIPLINE            :            :  
Issue Source: <51-L FINDINGS >    PAGE 071  
Operation: <MAINTENANCE       >  
Location: <PAD            >            TSM, MLP  
Orb.No/Mission: <099/51-L    >  
Hardware/Software:<GSE            >    PNEUMATIC LINES  
Reference Data:    PRACA            PAD DR'S S523B-0034/0035  
Description:  
\*PAD DR'S S523B-0034/0035 -- CONTAMINATION IN PNEUMATIC LINES

THESE DR'S REQUIRED THAT CERTAIN LINE SECTIONS BE REMOVED FOR CLEANING. THERE  
WAS NO VERIFICATION ON THE DR'S THAT THE SYSTEMS HAD BEEN DEPRESSURIZED PRIOR  
TO LINE REMOVAL. THESE DR'S WERE ACCOMPLISHED IN CONJUNCTION WITH AN OMI  
WHICH DID DEPRESSURIZE THE SYSTEMS BUT NO STATEMENT WAS MADE ON THE DR'S TO  
PREVENT PERFORMANCE OF THE WORK WITHOUT EXECUTION OF THE OMI."

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ID: < 309.00>          Issue(s): SAFETY      :
Issue(s) cont.:       :                    :
Issue Source: <51-L FINDINGS >    PAGE 072
Operation: <HAZARDOUS >
Location: <PAD >          PAD B
Orb.No/Mission: <099/51-L >
Hardware/Software:<SRB >        LH2 OD POPPET
Reference Data:  REPORT          INCIDENT REPORT
Description:
STS-33 PAD B INCIDENT REPORT

```

"FAILURE OF THE LH SRB OD POPPET (DISCUSSED EARLIER UNDER IPR 33V-0187) CAUSED AN EMPLOYEE TO HYPER-VENTILATE IN HIS SCAPE SUIT. PERSONNEL WHO WENT TO HIS AID WERE NOT PROPERLY ATTIRED TO BE IN THE VICINITY OF HYPER FUMES."

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*****
ID: < 310.00>          Issue(s): SAFETY      :
Issue(s) cont.:       :                    :
Issue Source: <51-L FINDINGS >    PAGE 072
Operation: <HAZARDOUS >
Location: <PAD >          PAD B
Orb.No/Mission: <099/51-L >
Hardware/Software:<GSE >        PGHM PLATFORM
Reference Data:  REPORT          INCIDENT REPORT
Description:
STS-33 PAD B INCIDENT REPORT

```

"A PGHM PLATFORM FELL FROM ITS STOWED POSITION SINCE THE PIP PINS WHICH HELD PLATFORM IN PLACE WERE TOO SMALL FOR THE HOLES IN WHICH THEY WERE INSERTED. NO HARDWARE DAMAGE OR PERSONNEL INJURY OCCURRED."

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*****
ID: < 311.00>          Issue(s): SAFETY      :
Issue(s) cont.:       :                    :
Issue Source: <51-L FINDINGS >    PAGE 072
Operation: <HAZARDOUS >
Location: <PAD >          PAD B
Orb.No/Mission: <099/51-L >
Hardware/Software:<SSME >       NOZZLES
Reference Data:  REPORT          INCIDENT REPORT
Description:
STS-33 PAD B INCIDENT REPORT

```

"THE SSME'S WERE INADVERTENTLY VENTED THROUGH THE NOZZLES. SINCE THE VENTING WAS INADVERTANT, THERE WAS NO SAFETY NOTIFICATION OR SAFETY CLEARING OF THE ADJACENT AREA."

\*\*\*\*\*

ID: < 312.00>                    Issue(s): PAPERWORK                    : MANAGEMENT  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 073  
Operation: <TEST >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
"SIGNATURE REQUIREMENTS ON 'REAL TIME' WORK PAPER (DEVIATIONS, TPS' IPR'S, ETC.) ARE LENGTHY AND REQUIRED PERSONNEL ARE GEOGRAPHICALLY SCATTERED (USUALLY MILES, NOT FEET). RAPID RESPONSE TO PROBLEMS OR CHANGING WORK SCHEDULES IS PRECLUDED; ENCOURAGING 'SHORT CUTS'."

CLOSURE ACTION, 9/15/86 - MAD TRAINING

\*\*\*\*\*

ID: < 313.00>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 073  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A                    PAPER SYSTEM

Description:  
"THE SIGNATURE 'LOOP' IS MANPOWER INTENSIVE, REQUIRING MANY 'PROCESSORS' AS WELL AS FULL TIME AVAILABILITY OF SYSTEM ENGINEERS."

\*\*\*\*\*

ID: < 314.00>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 073  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A                    PAPER SYSTEM

Description:  
"THE AMOUNT OF TIME REQUIRED TO COMPLETE ANY CATEGORY OF DOCUMENTATION FROM OPEN TO CLOSE IS UNACCEPTABLY HIGH WHEN COMPARED TO THE ACTUAL TIME TO DO THE WORK."

\*\*\*\*\*





ID: < 321.00> Issue(s): PLANNING : MANAGEMENT  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 074  
Operation: <SCHEDULING >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
"THERE ARE REFERENCES IN THE OTC LOG CITED BY REVIEWERS WHERE RESOURCES (BOTH  
HARDWARE AND PERSONNEL) WERE INADEQUATE TO COVER PAD A AND PAD B OPERATIONS  
SIMULTANEOUSLY. SPECIFIC REFERENCE IS MADE TO LACK OF TECHS, QUALITY, NASA  
QUALITY, ENGINEERING, AND LACK OF SUPPORT EQUIPMENT SUCH AS THE SIDE HATCH  
ADAPTER AND HATCH PROTECTIVE COVER AND OTHER ONE-OF-A-KIND ITEMS. FREQUENT  
RESCHEDULING/REPLANNING DUE TO THESE SHORTAGES INCREASES THE POTENTIAL FOR  
ERROR."

CLOSURE ACTION, 9/15/86 - CONTINUED RESOURCE EVALUATION

\*\*\*\*\*

ID: < 322.00> Issue(s): PROCEDURE :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 074  
Operation: <SCHEDULING >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
"MANY REVIEWERS HAVE FOUND IN THEIR AUDIT OF THE PROCEDURES THAT BOOKS ARE  
CONTINUING TO CARRY A MULTITUDE OF DEVIATIONS, SOME QUITE OLD. IN ONE CASE, THE  
TEAM FOUND A PROCEDURE CONTAINING MORE DEVIATIONS THAN STEPS. OTHER BOOKS  
CARRY CALL-SIGNS THAT ARE OUT OF DATE, INDICATING POOR DISCIPLINE IN  
REVIEW/UPDATE PROCESS. THIS PROBLEM SEEMS TO BE MORE PREVALENT IN THE ET/SRB  
AREA, BUT MANY EXAMPLES EXIST IN ORBITER PROCEDURES AS WELL."

CLOSURE ACTION, 9/15/86 - REVISE SPI'S SP-514 & SP-519. WAD TRAINING

\*\*\*\*\*

ID: < 323.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 074  
Operation: <SCHEDULING >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
"RANGE SAFETY CONFIGURATIONS ALLOW SUPPORT OF TESTING AT ONLY ONE PAD AT A  
TIME. RAPID RECONFIGURATION IS DESIGN PRECLUDED, CAUSING SCHEDULE IMPACT.  
RANGE SAFETY TESTING FOR 51-L WAS IMPACTED BY LAUNCH COUNTDOWN AT PAD-A  
FOR 61-C."

075

CLOSURE ACTION, 9/15/86 - SYSTEM TRAINING. PAD PCR & WATER SYS. MODS

\*\*\*\*\*

ID: < 324.00> Issue(s): TIME/ON-LINE :  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 074  
Operation: <ASSEMBLY >  
Location: <RSS >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
\*BECAUSE OF THE RELATIVELY POOR FIT OF THE ROTATING SERVICE STRUCTURE TO THE VEHICLE AT PAD B, WATER IS ABLE TO GET INTO THE PCR DURING HEAVY RAINSTORMS. A TEMPORARY FIX WAS IMPLEMENTED FOR 51-L.\*

\*\*\*\*\*  
ID: < 325.00> Issue(s): DISCIPLINE :  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 074  
Operation: <TEST >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
\*THE TEAM DOCUMENTED NUMEROUS EXAMPLES OF TASKS BEING DONE BY A TECHNICIAN OR ENGINEER WHO WAS UNAWARE OF THE CONFIGURATION AT THE TIME OF THE TEST. IN SOME CASES THE CONFIGURATION WAS PER SPECIFICATION; IN OTHER CASES IT WAS NOT.\*

\*\*\*\*\*  
ID: < 326.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 074  
Operation: <TEST >  
Location: <PAD > PAD B  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
\*THE PAD WATER SYSTEM IS NOT FREEZE-PROTECTED, AND REQUIRES SPECIAL ACTION WHEN FREEZING WEATHER IS PREDICTED. THE FREEZE PLAN CAN BE INITIATED IN TWO WAYS; ONE WHICH DRAINS THE ENTIRE SYSTEM BUT CAN ONLY BE USED WHEN THE PAD IS PLACED IN A 'STAND-DOWN' MODE, DUE TO LOSS OF SAFETY PROVISIONS: FIREX, SAFETY SHOWER, ETC.; THE SECOND, WHICH ALLOWS WATER TRICKLE TO PREVENT FREEZING AND CAN BE USED WHEN SYSTEM OPERATIONS NEED TO CONTINUE. THE SECOND METHOD, HOWEVER, DOES ALLOW ICE BUILD-UP ON THE STRUCTURES WHICH CAUSES SLIPPERY CONDITIONS AND THE POSSIBILITY OF ICE PROJECTILES DURING LAUNCH.\*

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ID: < 327.00>                    Issue(s): COST/MANHOURS                    : FAULT DETECTION  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 075  
Operation: <TEST >                    :  
Location: <RSS >                    PAD B  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<GSE >                    MANPOWER SIPHONED FROM STS-33 CHECKOUT  
Reference Data:    N/A

Description:  
"THE PGHM MOVEMENT DURING CHECKOUT WAS ERRATIC AND WAS TROUBLESHOT UP UNTIL THE TRANSFER OF THE PAYLOAD FROM THE CANISTER TO THE PGHM. THE ERRATIC MOTION WAS DAMPENED BUT WAS NEVER FULLY ELIMINATED."

CLOSURE ACTION, 9/15/86 - FACTORS ARE NOT CONTROLLABLE

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ID: < 328.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 075  
Operation: <TEST >                    :  
Location: <PAD >                    PAD B  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<GSE >                    MANPOWER SYPHONED FROM STS-33 C/O....  
Reference Data:    N/A

Description:  
"IT WAS NECESSARY TO PERFORM ANOTHER HYPER OXIDIZER HOT FLOW AFTER THE SSV WAS AT THE PAD TO ELIMINATE IRON NITRATE FROM THE SYSTEM."

\*\*\*\*\*

ID: < 329.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 075  
Operation: <TEST >                    :  
Location: <PAD >                    PAD B  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<GSE >                    MANPOWER SYPHONED FROM STS-33 C/O....  
Reference Data:    N/A

Description:  
"THE LPS WIDEBAND LINES HAD NOT BEEN COMPLETELY VERIFIED. SSV POWER UP AT THE PAD WAS DELAYED UNTIL THE SYSTEM COULD BE PROPERLY ADJUSTED."

\*\*\*\*\*

ID: < 330.00> Issue(s): COST/MANHOURS :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 075  
Operation: <TEST >  
Location: <PAD > PAD B  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<APU > MANPOWER SYPHONED FROM STS-33 C/D....  
Reference Data: N/A

Description:  
"THE APU CARTS FOR PAD B WERE NOT AVAILABLE SINCE DUAL PAD A/PAD B OPERATIONS HAD NOT BEEN SCHEDULED UNTIL LATER IN THE YEAR. THE SLIP OF STS-32 REQUIRED THAT THE CARTS FROM PAD A BE REMOVED PRIOR TO THE STS-32 LAUNCH, BUT AFTER STS-33 HAD ARRIVED AT PAD B, COMPOUNDING OPERATIONS DUE TO SAFETY RESTRICTIONS IMPOSED DURING THIS TRANSFER/INSTALL."

\*\*\*\*\*  
ID: < 331.00> Issue(s): COST/MANHOURS : SAFETY  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 075  
Operation: <TEST >  
Location: <PAD > PAD B  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE > MANPOWER SYPHONED FROM STS-33 C/D....  
Reference Data: N/A

Description:  
"THE UPS-40 POWER SYSTEM WAS NOT READY TO SUPPORT HAZARDOUS ACTIVITIES REQUIRING SSV POWER AND HAD TO BE BYPASSED WITH GENERATORS FOR S0024."

\*\*\*\*\*  
ID: < 332.00> Issue(s): COST/MANHOURS : SAFETY  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 075  
Operation: <TEST >  
Location: <PAD > PAD B  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE > MANPOWER SYPHONED FROM STS-33 C/D....  
Reference Data: N/A

Description:  
"THE HGDS/H2 FIRE AND LEAK DETECTION SYSTEM WAS NOT COMPLETELY VERIFIED PRIOR TO SSV ROLL-OUT AND WAS READIED FOR VARIOUS HAZARDOUS TESTS ALMOST SIMULTANEOUSLY WITH THE REQUIREMENT TO SUPPORT."

\*\*\*\*\*

c-2



ID: < 336.00> Issue(s): COST/MANHOURS :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 075  
Operation: <TEST >  
Location: <PAD > PAD B  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE > MANPOWER SIPHONED FROM STS-33 C/O....  
Reference Data: N/A

Description:  
"THE INCLEMENT WEATHER (VERY COLD, HIGH WINDS, HEAVY RAINS AT VARIOUS TIMES) CAUSED ADDITIONAL WORK TO SECURE SYSTEMS FOR THE WEATHER AND ALSO CAUSED RESCHEDULING OF VARIOUS PAD/SSV OPERATIONS."

\*\*\*\*\*

ID: < 337.00> Issue(s): PROCEDURE : PAPERWORK  
Issue(s) cont.: QA : CONSTRAINTS : EFFICIENCY  
Issue Source: <51-L FINDINGS > PAGE 076  
Operation: <TEST >  
Location: <PAD > PAD B  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >  
Reference Data: OMI

Description:  
"DURING THE PERFORMANCE OF CERTAIN PROCEDURES, MOST NOTABLY S0024 PRELAUNCH PROPELLANT LOAD, IPR'S WERE TAKEN, ASSESSED, TROUBLESHOT, IF REQUIRED, THEN DISPOSITIONED 'NO CONSTRAINT' AND THE OPERATION PROCEEDS WITH NO FURTHER ACTION . SINCE S0024 IS PERFORMED WITH ONE SYSTEM SPECIALIST, FOUR CONTRACTOR ENGINEERS, ONE NASA ENGINEER, AND ONE LSS ENGINEER ON STATION FOR EACH SHIFT, THIS POLICY APPEARS SAFE AND IS EFFICIENT FROM A SCHEDULE STANDPOINT. THERE IS A PROBLEM WITH SUBSEQUENT TRACEABILITY SINCE NO RATIONALE IS WRITTEN ON THESE IPR'S AS TO WHY IT WAS ACCEPTABLE TO PROCEED."

CLOSURE ACTION, 9/15/86 - REVISE SPI QA-001

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ID: < 338.00> Issue(s): PAPERWORK : CONSTRAINTS  
Issue(s) cont.: WAIVERS : :  
Issue Source: <51-L FINDINGS > PAGE 076  
Operation: <TEST >  
Location: <PAD > PAD B  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >  
Reference Data: N/A

Description:  
"DURING THE REVIEW OF PAPER FOR 51-L, TEAM MEMBERS IDENTIFIED SEVERAL PROBLEMS WITH THE CONSTRAINT SYSTEM WHICH HAMPERED EFFECTIVE TRACEABILITY OF OPEN WORK ITEMS. PAPER WAS REVIEWED THAT HAD NO PROPER CONSTRAINT IDENTIFIED OR WHERE NO ATTEMPT WAS MADE TO REIDENTIFY A NEW CONSTRAINT AFTER AN ITEM HAD BEEN WAIVED OR A SPECIFIC TEST WAS COMPLETE. IN ADDITION, GSE ITEMS ARE BEING HANDLED DIFFERENTLY THAN VEHICLE ITEMS IN THE CONSTRAINT SYSTEM; AND FURTHER, LIMITED VISIBILITY OF THE CONSTRAINTS STATUS MAKE IT DIFFICULT TO IDENTIFY AND SCHEDULE WORK ITEMS TO SUPPORT THE TEST FLOW."

CLOSURE ACTION, 9/15/86 - REVISE SPI SP-507

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ID: < 342.00> Issue(s): PAPERWORK : MANAGEMENT  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 077  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >  
Reference Data: N/A

Description:  
"THERE WAS DIFFICULTY IN LOCATING ALL OF THE REQUIRED PAPERWORK, PARTICULARLY IN THE GSE AREA. MOBILE GSE TAIR BOOKS PRESENTED THE MOST PROBLEMS SINCE THE TAIR BOOKS TRAVEL WITH THE GSE."

CLOSURE ACTION, 1/5/87 - NEW TAIR BOOK PROCEDURES INITIATED

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ID: < 343.00> Issue(s): PAPERWORK :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 077  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >  
Reference Data: N/A

Description:  
"AN ADDITIONAL IMPEDIMENT IS THE LACK OF COMMON GROUND RULES IN THE WORK PAPER TRACKING SYSTEM BETWEEN THE VARIOUS PROCESSING ELEMENTS."

\*\*\*\*\*

ID: < 344.00> Issue(s): PAPERWORK :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 077  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >  
Reference Data: N/A

Description:  
"IT WAS DETERMINED THAT THERE IS NO MASTER LIST OF ACTIVE TAIR BOOKS GIVING THE LOCATION OF THE BOOKS. LOCATING THE BOOKS REQUIRES MANY TELEPHONE CALLS TO LOCATE THE BOOKS. ALL BOOKS HAVE NOT BEEN LOCATED."

REVISED FEB. '87

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ID: < 345.00>            Issue(s): PAPERWORK            : MANAGEMENT  
Issue(s) cont.: PROCEDURE            :  
Issue Source: <51-L FINDINGS >        PAGE 077  
Operation: <TEST            >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:

"GSE WITH DIRECT INTERFACE WITH FLIGHT HARDWARE IS NOT ALWAYS TREATED THE SAME AS FLIGHT HARDWARE FOR WAD/IPR SIGNATURE/DISPOSITION DECISION AUTHORITY."

CLOSURE ACTION, 9/15/86 - REVISE SPI SP-519. WAD TRAINING

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ID: < 346.00>            Issue(s): PAPERWORK            : REQUIREMENTS  
Issue(s) cont.: DISCIPLINE            : PROCEDURE            :  
Issue Source: <51-L FINDINGS >        PAGE 078  
Operation: <TEST            >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >  
Reference Data: OMRSD  
Description:

"THE GSE OMRSD IS NOT MAINTAINED WITH THE SAME REGULARITY AS THE FLIGHT VEHICLE OMRSD. MANY ITEMS WERE FOUND WHICH WERE THREE YEARS OUT OF DATE. IN ADDITION, THE GSE VERIFICATION PROCEDURES DO NOT REFLECT THE OMRSD REQUIREMENT NUMBERS WHICH MAKES IT VERY DIFFICULT TO TRACK THE COMPLIANCE WITH THE OMRSD."

CLOSURE ACTION, 9/15/86 - OMRS FILE VI REVIEW I/W

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ID: < 347.00>            Issue(s): PAPERWORK            : REQUIREMENTS  
Issue(s) cont.:            :            :  
Issue Source: <51-L FINDINGS >        PAGE 078  
Operation: <TEST            >  
Location: <PAD >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<GSE >  
Reference Data: OMRSD  
Description:

"THE GSE BASELINE DOCUMENT 79K05979 USED FOR DEFINING THE GSE REQUIRED AT KSC IS OUT OF DATE, THIS DOCUMENT IS USED TO TRACK THE EQUIPMENT TITLE, O&M RESPONSIBLE CONTRACTOR, SYSTEM RESPONSIBILITY, AND THE NUMBER OF MODEL NUMBERS/SERIAL NUMBERS AVAILABLE."

CLOSURE ACTION, 9/15/86 - OMRS FILE VI REVIEW I/W

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ID: < 348.00>            Issue(s): PAPERWORK            : DISCIPLINE  
Issue(s) cont.: PROCEDURE            :            :  
Issue Source: <51-L FINDINGS >        PAGE 078  
Operation:   <TEST            >  
Location:    <PAD            >  
Orb.No/Mission: <099/51-L        >  
Hardware/Software:<GSE            >  
Reference Data:    OMRSD

Description:  
"THE SERIAL NUMBERS OF PORTABLE/TEST EQUIPMENT ARE NOT ENTERED, OR REPAIRED, ON THE WORK PAPER MAKING IT DIFFICULT TO TRACE WHICH PIECE OF GEAR WAS USED TO PERFORM A PARTICULAR OPERATIONS IN THE EVENT OF A PROBLEM."

CLOSURE ACTION, 9/15/86 - WAD TRAINING. WAD STYLE GUIDE I/W  
\*\*\*\*\*

ID: < 349.00>            Issue(s): PAPERWORK            : TRAINING/CERTIF  
Issue(s) cont.: DISCIPLINE            :            :  
Issue Source: <51-L FINDINGS >        PAGE 079        RECOMMENDATIONS.....  
Operation:   <TEST            >  
Location:    <PAD            >  
Orb.No/Mission: <099/51-L        >  
Hardware/Software:<GSE            >  
Reference Data:    N/A

Description:  
"THE INTEGRATED GROUND PROCESSING REVIEW HAS FOUND THAT THE ABILITY OF THE WORK CONTROL DOCUMENTATION SYSTEM TO GUARANTEE PROPER REAL-TIME EXECUTION OF TASKS AND THEIR SUBSEQUENT TRACEABILITY IS INHIBITED BY FACTORS THAT MUST BE IDENTIFIED AND CORRECTED BY KSC MANAGEMENT. TRAINING MUST BE ADEQUATE TO ENSURE THAT ALL WORKERS ARE ABLE TO COMPLY WITH THE REGULATIONS WHICH GOVERN THE 'PAPERWORK SYSTEM.' ADDITIONALLY, IT WOULD APPEAR THAT A RE-EMPHASIS OF THE NECESSITY FOR PROPER DISCIPLINE IS IN ORDER. IT IS FURTHER RECOMMENDED THAT , IF POSSIBLE, THE SYSTEM BE MADE MORE 'USER FRIENDLY' PROVIDING THAT THE PROPER LEVEL OF RIGOR CAN BE MAINTAINED."

\*\*\*\*\*

ID: < 350.00>            Issue(s): DISCIPLINE            : TRAINING/CERTIF  
Issue(s) cont.: SAFETY                :            :  
Issue Source: <51-L FINDINGS >        PAGE 079        RECOMMENDATIONS.....  
Operation:   <HAZARDOUS            >  
Location:    <PAD            >  
Orb.No/Mission: <099/51-L        >  
Hardware/Software:<GSE            >  
Reference Data:    N/A

Description:  
"A RE-EMPHASIS OF PROPER TRAINING AND WORKER DISCIPLINE AS APPLICABLE TO THE PERFORMANCE OF HAZARDOUS OPERATIONS IS ALSO REQUIRED. THE EVENTS WHICH BECAME 'FINDINGS' IN THIS REPORT RESULTED FROM FAILURES TO ADHERE TO STANDARD DEFINITIONS OF WHAT CONSTITUTES A HAZARDOUS OPERATION AND FROM FAILURE TO PROVIDE FOR ADEQUATE DOCUMENTATION AND SAFETY COVERAGE OF SUCH OPERATIONS. IT IS THE BELIEF OF THE TEAM THAT THE REGULATIONS IN EXISTENCE ARE SUFFICIENT TO PROVIDE FOR SAFE OPERATION, BUT NEED TO BE UNIFORMLY UNDERSTOOD, APPLIED, FOLLOWED, AND ENFORCED."

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ID: < 354.00>                    Issue(s): COST/MANHOURS                    : MANAGEMENT  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 079                    RECOMMENDATIONS.....  
Operation: <TEST >                    :  
Location: <ALL >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<GSE >                    WORK LOAD  
Reference Data:    N/A

Description:  
"AN EVALUATION OF THE EFFECT OF WORK LOAD SHOULD BE MADE TO DETERMINE IF THIS FACTOR IS A CONTRIBUTOR TO THE FINDINGS OF THIS REPORT. POOR PAPER, POOR WORKMANSHIP, LACK OF THOROUGH UNDERSTANDING OF REQUIREMENTS AND CONFIGURATION MAY WELL HAVE THEIR ROOTS IN THE OVERLOADING OF THE AVAILABLE WORK FORCE."

\*\*\*\*\*  
ID: < 355.00>                    Issue(s): REQUIREMENTS                    : DISCIPLINE  
Issue(s) cont.: EFFICIENCY                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 080                    RECOMMENDATIONS.....  
Operation: <TEST >                    :  
Location: <ALL >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<GSE >                    WORK LOAD  
Reference Data:    N/A

Description:  
"EXTERNAL FACTORS, SUCH AS LATE REQUIREMENTS, ALSO AFFECT THE EFFICIENT UTILIZATION OF THE AVAILABLE WORK FORCE AS WELL AS INDUCING SCHEDULE PERTURBATIONS THAT TEND TO EXACERBATE THE PROBLEM OF IMPROPER DOCUMENTATION DISCIPLINE."

\*\*\*\*\*  
ID: < 356.00>                    Issue(s): DISCIPLINE                    : PAPERWORK  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 080                    RECOMMENDATIONS.....  
Operation: <TEST >                    :  
Location: <ALL >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<GSE >                    WORK LOAD  
Reference Data:    N/A

Description:  
"IN ADDITION, THE DESIRE TO ASSURE TECHNICALLY COMPLETE WORK WITHIN SCHEDULE CONSTRAINTS SOMETIMES IS AT THE EXPENSE OF PROPER DOCUMENTATION."

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ID: < 357.00> Issue(s): TRAINING/CERTIF : PAPERWORK  
Issue(s) cont.: MANAGEMENT :  
Issue Source: <51-L FINDINGS > PAGE 109 028  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:

ORIGINAL PAGE IS  
OF POOR QUALITY

"CERTIFICATION RECORDS FOR TECHNICIANS AND QUALITY ARE NOT MAINTAINED IN A SUITABLE FORM TO PERMIT EASY VERIFICATION THAT PERSONNEL WORKING ON FLIGHT HARDWARE ARE PROPERLY CERTIFIED."

CLOSURE ACTION, 9/15/86 - REVISE SPI'S SP-504,SP-519,SP-614,SP-514,QA-001.TRAIN  
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ID: < 358.00> Issue(s): PAPERWORK : DISCIPLINE  
Issue(s) cont.: TRAINING/CERTIF :  
Issue Source: <51-L FINDINGS > PAGE 109 028  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET > FLIGHT HARDWARE  
Reference Data: N/A  
Description:  
CERTIFIED SKILLS.

"IN ADDITION TO A PERSONNEL CERTIFICATION CONCERN, THERE WAS SOME QUESTION THAT THE WORK AUTHORIZATION DOCUMENT PROPERLY SPECIFIED THE SKILLS REQUIRED TO PERFORM THE WORK. AN AUDIT IN THIS AREA ALSO INDICATED THAT ALL FLIGHT HARDWARE TASKS WERE PERFORMED BY CERTIFIED PERSONNEL BUT THAT THE IDENTIFIED SKILLS WERE NOT ALWAYS IDENTIFIED IN THE APPROPRIATE BLOCK OF THE WORK AUTHORIZATION DOCUMENT."

CLOSURE ACTION, 9/15/86 - REVISE SPI'S SP-504,SP-519,SP-614,SP-514,QA-001.TRAIN  
\*\*\*\*\*

ID: < 359.00> Issue(s): SECURITY : QA  
Issue(s) cont.: DISCIPLINE :  
Issue Source: <51-L FINDINGS > PAGE 109 028  
Operation: <INSPECTION >  
Location: <VAB >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET > RESTRAINTS  
Reference Data: PRACA PR ST-0006  
Description:

PR ST-0006 -- ET AFT RESTRAINT INTEGRITY SEALS MISSING  
THE ET IS PLACED IN THE VERTICAL POSITION IN THE VAB CHECKOUT AND STORAGE CELLS DURING STAND-ALONE PROCESSING. ET IS POSITIONED IN THE CELL, AFT RESTRAINTS ATTACHED AND ADJUSTED, AND THE INTEGRITY SEALS INSTALLED. THE PR WAS WRITTEN TO DOCUMENT THAT THE INTEGRITY SEALS WERE MISSING. SUBSEQUENT DATA DIFFERED FROM THE ORIGINAL SETTINGS. ANALYSIS CONFIRMED, HOWEVER, THAT THE ET STRUCTURAL INTEGRITY COULD NOT HAVE BEEN COMPROMISED.

REVISED FEB. '87  
087

CLOSURE ACTION, 1/5/87 - DISCIPLINE IN WORKING PROPER HARDWARE  
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ID: < 360.00> Issue(s): PAPERWORK : REQUIREMENTS  
Issue(s) cont.: PROCEDURE : CHANGE CONTROL :  
Issue Source: <51-L FINDINGS > PAGE 110 029  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET >  
Reference Data: OMRSD OMI

Description:

OMI REVIEW OF OMRSD REQUIREMENTS  
"TWENTY-THREE OMI'S WERE REVIEWED, 16 OF WHICH WERE PROCESSED DURING THE ET-26  
STAND-ALONE TIME FRAME AND SEVEN WERE PROCESSED DURING THE INTEGRATED TIME  
FRAME. ALL THE REQUIRED OMRSD'S WERE SATISFACTORILY ACCOMPLISHED WITH NO  
MAJOR PROBLEMS. HOWEVER, THE REVIEW CONSISTENTLY UNCOVERED PROBLEMS WITH  
REVISION LEVELS CALLED OUT IN THE OMP NOT MATCHING THE AS-RUN OMI REVISION  
LEVELS. BUT THESE DIFFERENCES WERE VERIFIED AS HAVING NO EFFECT ON SATISFYING  
OMRSD REQUIREMENTS."

CLOSURE ACTION, 9/15/86 - CLOSED LOOP OMP SYSTEM, I/W

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ID: < 361.00> Issue(s): PAPERWORK : DISCIPLINE  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 111 030  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET >  
Reference Data: WA

Description:

WAD - PAPER NOT FILLED OUT PROPERLY/MISSING/INCOMPLETE DATA  
"DURING WAD REVIEWS MANY OF THE WAD'S HAVE ONE OR MORE INSTANCES WHERE THE  
PAPER WAS NOT COMPLETED. THE RANGE OF THIS FINDING WAS FROM CHECKING BLOCKS  
FOR NON-CRITICAL ITEMS, SUCH AS RECURRENCE CONTROL, TO THE LACK OF DATA  
BEING SUPPLIED AT THE APPROPRIATE STEP IN THE WAD. SEVERAL EXAMPLES OF  
MISSING DATA ARE ANNOTATING "Z" NUMBERS AND CALIBRATION DUE DATES, LACK OF  
TEMPERATURE DATA, AND MISSING HYGROTHERMOGRAPH CHARTS."

CLOSURE ACTION, 9/15/86 - TRAINING FOR WAD STYLE GUIDE. WAD STYLE GUIDE I/W

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ID: < 362.00> Issue(s): DISCIPLINE : TRAINING/CERTIF  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 111 030  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET >  
Reference Data: N/A

Description:

NO CRITICAL SKILL SPECIFIED/RECORDS SHOW THAT PERSONNEL ARE NOT CERTIFIED--  
"THIS CATEGORY INCLUDED CASES WHERE ENGINEERING DID NOT SPECIFY SOME OR ALL  
OF THE CRITICAL SKILLS NECESSARY TO PERFORM THE REQUIRED WORK. ALSO INCLUDED  
WERE INSTANCES WHERE TECHNICIAN AND INSPECTOR CERTIFICATIONS COULD NOT BE  
VERIFIED BY USING TRAINING CERTIFICATION RECORD STRIPOUTS. A PERSONNEL  
CERTIFICATION AUDIT WAS PERFORMED BY THIOKOL, ON A PERSON-BY-PERSON BASIS,  
AND ESTABLISHED THAT ALL PERSONNEL WERE QUALIFIED."

CLOSURE ACTION, 9/15/86 - REVISE SPI'S SP-504,-519,-509,-614,-514,QA-001. TRAIN

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ID: < 363.00>                    Issue(s): DISCIPLINE                    : PAPERWORK  
Issue(s) cont.: QA                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 111                    030  
Operation: <GENERIC >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<ET >                    :  
Reference Data: WA                    :  
Description:

ORIGINAL PAGE IS  
OF POOR QUALITY

ILLEGIBLE STAMPS/INCORRECT/UNDATED STAMPS.

"A LARGE NUMBER OF WAD'S HAD ILLEGIBLE STAMPS AND SEVERAL WAD'S CONTAINED INCORRECT OR UNDATED STAMPS. INK-SMUDGED STAMPS PREVENT TRACEABILITY. IN NUMEROUS CASES, THERE WERE UNDATED OR IMPROPERLY DATED STAMPS."

CLOSURE ACTION, 9/15/86 - TRAINING FOR SPI QA-004

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ID: < 364.00>                    Issue(s): PAPERWORK                    : DISCIPLINE  
Issue(s) cont.: MANAGEMENT                    : QA                    :  
Issue Source: <51-L FINDINGS >                    PAGE 112                    031  
Operation: <GENERIC >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<ET >                    :  
Reference Data: OMI                    TPS, PR, DR, IPR  
Description:

MISSING/IMPROPER SIGNATURES.  
"DURING THE REVIEW OF OMI'S, TPS'S, AND PR'S/DR'S/IPR'S, THERE WERE NUMEROUS INSTANCES OF MISSING AND/OR IMPROPER SIGNATURES. THE MAJOR CONCERN ON MISSING SIGNATURES WAS THE FACT THAT A COVER SHEET OF A WAD OR ATTACHMENT WOULD BE SIGNED, BUT NO SIGNATURE WAS ON THE OTHER PAGES OF THE PR. THIS ALLOWS THE POTENTIAL FOR OTHER PAGES TO BE CHANGED WITHOUT SIGNATURE CONTROL. IN SOME CASES, IMPROPER SIGNATURES WERE IDENTIFIED. SIGNATURES WERE AT A LOWER LEVEL THAN REQUIRED BY THE SPI, I.E., LEADMAN INSTEAD OF SUPERVISOR ON DR'S."

CLOSURE ACTION, 9/15/86 - WAD TRAINING

\*\*\*\*\*  
ID: < 365.00>                    Issue(s): DISCIPLINE                    : PAPERWORK  
Issue(s) cont.: QA                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 112                    031  
Operation: <GENERIC >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <099/51-L >                    :  
Hardware/Software:<ET >                    :  
Reference Data: OMI                    TPS, PR, DR, IPR  
Description:

MISSING/IMPROPER STAMPS.  
"NUMEROUS CASES WERE FOUND WHERE THERE WAS NO QUESTION THAT THE WORK WAS PERFORMED, BUT SOME OR ALL OF THE TECH/QUALITY/NASA VERIFICATIONS WERE NOT AFFIXED. THESE INCLUDED ITEMS WHERE EITHER ONE OR THE OTHER STAMPS WERE MISSING AT EITHER THE WORKSTEP, THE BOTTOM OF THE PAGE, OR ON A NOT-PERFORMED STEP. IN SOME CASES, A NOT PERFORMED STEP WAS STAMPED AND IT WAS OBVIOUS THAT THE WORK WAS PERFORMED, AND VICE VERSA.

CLOSURE ACTION, 9/15/86 - TRAINING FOR WAD STYLE GUIDE. WAD STYLE GUIDE I/W

\*\*\*\*\*



ID: < 369.00> Issue(s): DISCIPLINE : QA  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 115 034  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<ET >  
Reference Data: PRACA ONI

ORIGINAL PAGE IS  
OF POOR QUALITY

Description:

ET STAND-ALONE PROCESSING REVIEW TEAM -- RECOMMENDATIONS/CONCLUSIONS-----  
RECOMMENDATIONS--1. IMPLEMENT, ENFORCE, AND MONITOR THE KSC SPI SYSTEM. \*SET  
UP AN SPI SYSTEM TRAINING COURSE AND MAKE IT MANDATORY FOR ALL KSC PROCESSING  
PERSONNEL TO ATTEND. \*PERFORM AN AUDIT OF ALL PAPER AT EACH MAJOR ET PROCESSING  
MILESTONE. \*RE-ESTABLISH NASA QA AS THE ENFORCER OF THE SPI SYSTEM.  
2. IMPLEMENT A UNIFORM SYSTEM FOR CONDUCTING TRAINING AND CERTIFICATION ACTI-  
VITIES(RETRAINING) WHICH INCLUDES A CURRENT RECORDS SYSTEM THAT IS MAINTAINED  
FOR ALL CRITICAL SKILLS. 3. REPLACE AFT RESTRAINT PAPER INTEGRITY SEALS WITH  
LEAD WIRE SEALS. ---CONCLUSION--- ET-26 WAS PROPERLY PROCESSED FOR STS 51-L  
DURING STAND-ALONE OPERATIONS AND MET ALL OMRSD REQUIREMENTS.

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ID: < 370.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: N/A

Description:

SRB OBSERVATIONS/RECOMMENDATIONS:  
A THOROUGH REVIEW OF KSC PROCESSING RECORDS OF THE SRB REVEALED NO SIGNIFICANT  
DISCREPANCIES. THE TEST REQUIREMENTS AS SPECIFIED IN THE OPERATIONS, MAINTEN-  
ANCE, REQUIREMENTS, AND SPECIFICATIONS DOCUMENT (OMRSD) WERE ALL MET. HOWEVER,  
THERE WERE CONCERNS OF THE REVIEW TEAM THAT FOCUS ON PROBLEM AREAS THAT WERE  
IDENTIFIED ON THE INCIDENT REVIEW SHEETS. THESE ARE SUMMARIZED INTO CATEGORIES  
AND GROUPED BY DEPARTMENT: ENGINEERING, QUALITY, PROCESS, PLANNING & CONTROL,  
AND OPERATIONS. RESPONSIBILITY FOR CORRECTIVE ACTION RESIDES IN THE APPROPRIATE  
DEPARTMENT. IT IS OUR RECOMMENDATION THAT REMEDIAL ACTION BE IMPLEMENTED BY  
COGNIZANT DEPARTMENTS FOR RESOLUTION OF (CONTINUED ON ID:370.01)

\*\*\*\*\*  
ID: < 370.01> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: N/A

Description:

SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.00)  
--PROBLEM AREAS AND EACH ITEM TRACKED FOR FINAL CLOSURE. THIS EFFORT SHOULD  
BE ACCOMPLISHED PRIOR TO PERFORMING ANY OPERATION WHICH PREPARES BOOSTER HARD-  
WARE FOR FLIGHT. APPROXIMATELY 121 ITEMS WILL REQUIRE CLOSURE BY ALL DEPART-  
MENTS. DURING TEAM DISCUSSIONS SOME QUESTIONS WERE RAISED CONCERNING SRB  
PROCESSING AT KSC. FOR EXAMPLE, AN ANALYSIS OF THE DESIGN REQUIREMENT OF A  
MINIMUM SQUEEZE OF .020" ON THE O-RINGS AND THE ASSEMBLY REQUIREMENTS OF THE  
SHUTTLE SYSTEM AT KSC RAISE A QUESTION WHETHER THE MINIMUM SQUEEZE CAN BE  
GUARANTEED AT THE TIME OF LAUNCH. THERE HAS BEEN NO OMRSD REQUIREMENT TO  
MEASURE THE EFFECTS OF CLEVIS GAP OF MATING (CONT. ON ID:370.02)

ID: < 370.02> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.01)  
---SEGMENTS THAT ARE OUT-OF-ROUND AND THAT HAVE ALLOWABLE DIAMETER MISMATCH. MATING THE ORBITER TO THE EXTERNAL TANK AND THE BENDING LOADS IMPOSED ON THE SRB HAS AN EFFECT ON CLEVIS GAP THAT HAS NOT BEEN MEASURED. SINCE THESE EFFECTS HAVE NOT BEEN MEASURED, IT IS POSSIBLE THAT THE ASSEMBLED FIELD JOINTS DO NOT MAINTAIN A MINIMUM O-RING SQUEEZE OF .020. THE DESIGN AGENCY SHOULD CONSIDER WHETHER O-RING SQUEEZE MARGINS SHOULD INCLUDE ALLOWANCES TO ACCOUNT FOR ASSEMBLY VARIABLES. IT SHOULD BE NOTED THAT THE JOINT DESIGN DOES NOT ALLOW ADJUSTMENT TO INCREASE O-RING SQUEEZE. THE SQUEEZE IS DETERMINED BY THE MANUFACTURING TOLERANCES OF THE COMPONENTS (CONT. ON ID:370.03)

\*\*\*\*\*  
ID: < 370.03> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.02)  
---MAKING UP THE ASSEMBLY. A REDESIGN FEATURE MIGHT BE CONSIDERED FOR THE FIELD JOINT THAT WILL MAINTAIN THE PROPER O-RING SQUEEZE THROUGHOUT KSC OPERATIONS AND FLIGHT. THIS FEATURE MIGHT INCLUDE A THREADED FASTENER TO MAINTAIN CLEVIS GAP DIMENSION, LARGER DIAMETER O-RINGS, THICKER PIN RETAINERS, OR A COMBINATION OF THESE FEATURES. THE MATED JOINTS ARE PRESSURE DECAY CHECKED AT 50 PSIG FOR A PERIOD OF TEN MINUTES, AFTER SEATING THE O-RINGS AT 200 PSI, IN ORDER TO VERIFY THE INTEGRITY OF THE JOINTS. HOWEVER, THE PRELAUNCH LOADS ON THE JOINTS ARE DIFFERENT FROM THOSE AT THE TIME OF THE LEAK CHECK. ALSO, THE PRIMARY O-RING IS LEAK CHECKED IN THE (CONT. ON ID:370.04)

\*\*\*\*\*  
ID: < 370.04> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.03)  
---"UP" POSITION RATHER THAN ITS FLIGHT POSITION WHICH IS "DOWN" BECAUSE OF THE SYSTEM DESIGN. IN ADDITION, IF DESIRABLE, FIELD JOINTS MIGHT BE PRESSURE TESTED AFTER ORBITER MATE IN THE VAB AND A TECHNIQUE MIGHT BE DEvised FOR CHECKING THE PRIMARY AND SECONDARY O-RINGS IN THEIR FLIGHT POSITIONS AT A PRESSURE GREATER THAN OPERATING PRESSURE. THIS MIGHT BE ACCOMPLISHED BY ADDING A THIRD O-RING TO THE FIELD JOINT OR USING A NOZZLE THROAT PLUG TO PRESSURIZE THE ENTIRE SRB TO THE HIGHEST ACCEPTABLE PRESSURE WHILE MONITORING THE O-RING CAVITY PRESSURE. ANOTHER POSSIBILITY WOULD BE TO MAINTAIN A PRESSURE GREATER THAN OPERATING PRESSURE BETWEEN THE O-RINGS THROUGHOUT (CONT. ON ID:370.05)



ID: < 370.04>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >                    >  
Location: <KSC >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data:    N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.03)  
---"UP" POSITION RATHER THAN ITS FLIGHT POSITION WHICH IS "DOWN" BECAUSE OF  
THE SYSTEM DESIGN.        IN ADDITION, IF DESIRABLE, FIELD JOINTS MIGHT BE  
PRESSURE TESTED AFTER ORBITER MATE IN THE VAB AND A TECHNIQUE MIGHT BE DEvised  
FOR CHECKING THE PRIMARY AND SECONDARY O-RINGS IN THEIR FLIGHT POSITIONS AT A  
PRESSURE GREATER THAN OPERATING PRESSURE. THIS MIGHT BE ACCOMPLISHED BY ADDING  
A THIRD O-RING TO THE FIELD JOINT OR USING A NOZZLE THROAT PLUG TO PRESSURIZE  
THE ENTIRE SRB TO THE HIGHEST ACCEPTABLE PRESSURE WHILE MONITORING THE O-RING  
CAVITY PRESSURE. ANOTHER POSSIBILITY WOULD BE TO MAINTAIN A PRESSURE GREATER  
THAN OPERATING PRESSURE BETWEEN THE O-RINGS THROUGHOUT (CONT. ON ID:370.05)

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ID: < 370.05>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >                    >  
Location: <KSC >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data:    N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.04)  
---FLIGHT. THIS TECHNIQUE WOULD KEEP THE PRIMARY O-RING IN THE "UP" POSITION  
THROUGHOUT FLIGHT. CONSIDERATION SHOULD BE GIVEN TO PROVIDING INSTRUMENTATION  
TO MONITOR POSSIBLE EFFECTS OF ORBITER MATE, LAUNCH PAD ENVIRONMENTS, MAIN  
ENGINE OPERATION, AND SRB OPERATION ON JOINT LEAKAGE.        AN INSPECTION AT  
KSC OF 22 O-RINGS THAT HAD BEEN PREVIOUSLY SOURCE INSPECTED BY MORTON-THIOKOL  
AT WASATCH, UTAH REVEALED THAT 7 WERE FOUND TO HAVE DISCREPANT CONDITIONS.  
SINCE FEBRUARY OF 1984, O-RINGS HAVE NOT BEEN REINSPECTED AT KSC PRIOR TO  
INSTALLATION IN THE SRB FIELD JOINTS. AN ANALYSIS OF THE 7 DISCREPANT O-RINGS  
SHOULD BE PERFORMED TO DETERMINE IF SIMILAR DISCREPANCIES (CONT. ON ID:370.06)

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ID: < 370.06>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >                    >  
Location: <KSC >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<SRB >                    >  
Reference Data:    N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.05)  
---COULD HAVE CONTRIBUTED TO FIELD JOINT LEAKAGE.        O-RINGS ARE MANUFACT-  
URED WITH AS MANY AS 5 SCARF JOINTS. WHILE THERE IS NO EVIDENCE FROM DISASSEM-  
BLY THAT SCARF JOINTS HAVE FAILED, CONSIDERATION SHOULD BE GIVEN TO REDUCING  
OR ELIMINATING THE JOINTS.        CONSIDERATION SHOULD BE GIVEN TO ADDING ADDIT-  
IONAL SUPPORT FOR EACH SRB ON THE MLP'S THAT WOULD KEEP THE AFT SEGMENTS ROUND.  
THE EXISTING DESIGN CAUSES LENGTHY DELAYS IN ASSEMBLING THE AFT CENTER SEGMENT  
TO THE AFT BOOSTER SEGMENT AND MAY AFFECT THE O-RING SQUEEZE OF THE ASSEMBLED  
JOINT. AN ANALYSIS SHOULD BE PERFORMED TO DETERMINE WHETHER OUT-OF-ROUNDNESS  
AND CONGRUENCY OF TANG AND CLEVISSES AFFECTS O-RING SQUEEZE (CONT. ON ID:370.07)

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ID: < 370.07>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >                    )  
Location: <KSC >                    )  
Orb.No/Mission: <099/51-L >                    )  
Hardware/Software:<SRB >                    )  
Reference Data: N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.06)  
---AND JOINT PERFORMANCE. IN ADDITION, THE FEASIBILITY OF REFURBISHING, SHIPPING AND HANDLING HORIZONTAL SRM SEGMENTS WITH THE 0 DEGREE OR 180 DEGREE POSITION UP SHOULD BE INVESTIGATED. THIS WOULD RESULT IN THE SEGMENTS HAVING THEIR MAXIMUM DIAMETER ALONG THE 90 DEGREE TO 270 DEGREE LINE WHICH WOULD CORRESPOND TO THE AFT BOOSTER SEGMENT SHAPE WHEN STACKED ON THE HOLDDOWN POSTS AND EASE MATING OPERATIONS. SRB SEGMENT CASE DIAMETERS ARE NOT MEASURED DURING REFURBISHMENT. THE INITIAL MEASUREMENTS TAKEN AT THE FACTORY ARE USED THROUGHOUT THE LIFE OF THE SEGMENT. THE SEGMENT CASE DIAMETERS MAY GROW AS A RESULT OF FLIGHT PRESSURIZATION AND HYDROSTATING OF THE SEGMENTS (CONT. ON ID:370.08)

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ID: < 370.08>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >                    )  
Location: <KSC >                    )  
Orb.No/Mission: <099/51-L >                    )  
Hardware/Software:<SRB >                    )  
Reference Data: N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.07)  
---WHEN THEY ARE REQUALIFIED. ANY CHANGE IN SEGMENT CASE DIAMETER WILL HAVE AN EFFECT ON O-RING SQUEEZE. STANDARD WEIGHT SEGMENTS HAVE A WALL THICKNESS OF 0.506+/-0.020, WHILE LIGHTWEIGHT SEGMENTS HAVE A WALL THICKNESS OF 0.479 +/-0.020. ANY GROWTH IN A LIGHTWEIGHT SEGMENT CAN BE EXPECTED TO BE DIFFERENT FROM THE GROWTH IN A STANDARD SEGMENT. 4 OF 9 FIELD JOINTS THAT EXPERIENCED O-RING DAMAGE WERE MADE UP OF STANDARD TO LIGHTWEIGHT CASES. A SIMILAR PROBLEM MAY BE EXPERIENCED IN ASSEMBLING JOINTS WITH ONE USED SEGMENT AND ONE NEW SEGMENT. WHILE THE AFT CENTER SEGMENT OF THE RH BOOSTER WAS LOCATED OUTSIDE THE VAB DOOR ON 12/5/85, THERE WAS A HEAVY RAINSTORM (CONT. ON ID:370.09)

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ID: < 370.08>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >        PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >                    )  
Location: <KSC >                    )  
Orb.No/Mission: <099/51-L >                    )  
Hardware/Software:<SRB >                    )  
Reference Data: N/A

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.07)  
---WHEN THEY ARE REQUALIFIED. ANY CHANGE IN SEGMENT CASE DIAMETER WILL HAVE AN EFFECT ON O-RING SQUEEZE. STANDARD WEIGHT SEGMENTS HAVE A WALL THICKNESS OF 0.506+/-0.020, WHILE LIGHTWEIGHT SEGMENTS HAVE A WALL THICKNESS OF 0.479 +/-0.020. ANY GROWTH IN A LIGHTWEIGHT SEGMENT CAN BE EXPECTED TO BE DIFFERENT FROM THE GROWTH IN A STANDARD SEGMENT. 4 OF 9 FIELD JOINTS THAT EXPERIENCED O-RING DAMAGE WERE MADE UP OF STANDARD TO LIGHTWEIGHT CASES. A SIMILAR PROBLEM MAY BE EXPERIENCED IN ASSEMBLING JOINTS WITH ONE USED SEGMENT AND ONE NEW SEGMENT. WHILE THE AFT CENTER SEGMENT OF THE RH BOOSTER WAS LOCATED OUTSIDE THE VAB DOOR ON 12/5/85, THERE WAS A HEAVY RAINSTORM (CONT. ON ID:370.09)

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ID: < 370.09> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 7-1 THRU 7-3 (055-057)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SRB >  
Reference Data: N/A

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OF POOR QUALITY

Description:  
SRB OBSERVATIONS/RECOMMENDATIONS: (CONTINUED FROM ID:370.08)  
---THE MOTOR SEGMENT WAS WET WITH WATER. WATER WAS REMOVED FROM ACCESSIBLE  
AREAS WITH A LINT-FREE CLOTH. IN ADDITION, CONDENSATION AND EVIDENCE OF  
EVAPORATED CONDENSATE HAS BEEN OBSERVED DURING RECEIVING INSPECTION OF SRB  
SEGMENTS. IT IS POSSIBLE THAT LIQUID CONDENSATE COULD COLLECT INSIDE THE AFT  
SEGMENTS IN THE FLEX BEARING AREA AND MAY HAVE A DETRIMENTAL EFFECT. THE DESIGN  
AGENCY SHOULD DETERMINE ANY ADVERSE EFFECT WATER HAD ON THIS SEGMENT AND  
POTENTIAL ADVERSE EFFECTS ON OTHER SEGMENTS SUCH AS THE AFT SEGMENT. (END)

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ID: < 371.00> Issue(s): QA : PAPERWORK  
Issue(s) cont.: DISCIPLINE : PROCEDURE :  
Issue Source: <51-L FINDINGS > PAGE 041  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: PRACA

Description:  
"IPR/PR/TPS REVIEW THE FOLLOWING GENERAL FINDINGS APPLY:  
. 1. THERE IS AN INADEQUATE REVIEW OF PAPER PRIOR TO CLOSURE FOR PROCEDURAL  
. DETAIL.  
. .  
. 2. DOCUMENTS PERFORM THE WORK REQUIRED TO SUPPORT THE FLOW; HOWEVER, SYSTEM  
. TRACEABILITY REQUIRES MORE ATTENTION.  
. .  
. 3. REPETITIVE TASKS ARE OFTEN PERFORMED ON TPS'S. REPETITIVE WORK SHOULD  
. BE PERFORMED ON RELEASED OMI'S.

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ID: < 400.00> Issue(s): DISCIPLINE :  
 Issue(s) cont.: : :  
 Issue Source: <51-L FINDINGS > PAGE 336 082  
 Operation: <TEST >  
 Location: <LCC >  
 Orb.No/Mission: <099/51-L >  
 Hardware/Software:<N/A >  
 Reference Data: N/A

Description:  
 "SEVERAL IMPORTANT CONSOLES HAVE THE RESPONSIBILITY OF SUPPORTING THE ENTIRE LC39 AREA INCLUDING OPF, VAB, & PAD. SPECIFICALLY SAFETY, STM AND LTD ARE OBLIGATED BY POLICY AND THEIR POSITION TO SUPPORT OTHER NON-RELATED TASKS DURING LAUNCH COUNTDOWNS. ALTHOUGH THIS HAS NOT CAUSED A PROBLEM DURING ANY LAUNCH, THERE ARE TIMES WHEN OUTSIDE DISTRACTIONS CANNOT BE TOLERATED. ALSO, OTHER WORK STATIONS DURING NON-CRITICAL TIME PERIODS OF COUNT MAY NOT BE DEDICATED TO THE LAUNCH COUNT OR MAY WORK MULTIPLE CONSOLES."

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ID: < 401.00> Issue(s): PROCEDURE :  
 Issue(s) cont.: : :  
 Issue Source: <51-L FINDINGS > PAGE 336 082  
 Operation: <TEST >  
 Location: <RSS >  
 Orb.No/Mission: <099/51-L >  
 Hardware/Software:<ORBITER >  
 Reference Data: PRACA IPR-33V-238

Description:  
 "DURING PREPS FOR RSS ROLLBACK, WHILE SECURING THE RSS BIFOLD DOORS TO THE STOWED POSITION, A KICK PLATE BOLT ON THE EAST RSS ADJUSTABLE PLATFORM GOUGED THE FOAM ON THE +Z FACE OF THE +Y FORWARD BIPOD RAMP. THERE WERE NO OBSERVERS REQUESTED TO WATCH THIS AREA. IPR 33V-238 WAS GENERATED AND THIS DISCREPANCY WAS INSPECTED BY NASA/SE, LSOC/SE, MSFC/SE, MMC/LSS AND MMC/MAF. THERE WAS NO DAMAGE TO ANY OTHER FLIGHT HARDWARE. AN MRB WAS CONVENED AND ALL APPROPRIATE DISCIPLINES ASSESSED THE ANOMALY. IT WAS CONCLUDED THAT THIS ANOMALY WAS REPAIRABLE AND SUBSEQUENTLY FLIGHT WORTHY."

CLOSURE ACTION, 9/15/86 - RSS MOD WORKED PER ED 1034-79K24048

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ID: < 402.00> Issue(s): REQUIREMENTS : DISCIPLINE  
 Issue(s) cont.: QA : TRAINING/CERTIF : WAIVERS  
 Issue Source: <51-L FINDINGS > PAGE 336 082  
 Operation: <PROPELLANT >  
 Location: <PAD > PAD 8  
 Orb.No/Mission: <099/51-L >  
 Hardware/Software:<MPS >  
 Reference Data: OMRSD

Description:  
 "DURING PROPELLANT LOADING PREPS FOR STS-33, THE LH2 17 INCH DISCONNECT VALVE WAS OPENED PRIOR TO VENTING DOWN THE LH2 MANIFOLD. THE OMRSD REQUIREMENT IS THAT THE PRESSURE DIFFERENTIAL BETWEEN THE LH2 MANIFOLD AND ET LH2 TANK BE NO GREATER THAN 1 PSIA. THE VALVE WAS OPENED WITH 6 PSIA DIFFERENTIAL. THE OMRSD REQUIREMENT WAS NOT WAIVED. FINDINGS INCLUDE: \*A. THE INDIVIDUAL WAS SUPPORTING TWO CONSOLES SIMULTANEOUSLY - BOTH LOX (CH 156) AND CLHY (166) DURING THE T-11 HOUR HOLD AS WELL AS COORDINATING WORK IN THE OPF. \*B. PUBLISHED PROCEDURES WERE NOT FOLLOWED. \*C. THE CAUSE WAS HUMAN ERROR. \*D. AN IPR WAS NOT TAKEN."

CLOSURE ACTION, 9/15/86 - SYSTEMS TRAINING/FR CERTIFICATION

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ID: < 403.00>                    Issue(s): QA                    : DISCIPLINE  
Issue(s) cont.:                    :  
Issue Source: <51-L FINDINGS >    PAGE 337    083  
Operation: <TEST >                    >  
Location: <LCC >                    PAD B  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software: <POWER >                    >  
Reference Data: OMI                    SWITCH LIST

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OF POOR QUALITY

Description:  
"DURING THIS LAUNCH FLOW, TWO SWITCH LISTS WERE PERFORMED. AN APPARENT ABNORMALLY HIGH NUMBER OF SWITCHES AND CIRCUIT BREAKERS REQUIRED REPOSITIONING. PRIMARILY DUE TO THE FACT THAT THERE IS A LACK OF COMMUNITY AGREEMENT AS TO THE JUNCTION OR PHILOSOPHY FOR PERFORMING A SWITCH LIST; E.G., IS IT A FINAL SWITCH VERIFICATION OR IS IT FINAL SYSTEM CONFIGURATION? STANDARD VERBAGE BETWEEN OTC AND ASTRONAUTS PERFORMING THE SWITCH LIST WAS NOT USED, E.G., A COMMAND AND RESPONSE SUCH AS OTC GPC 1 IN RUN, ASP: AS "VERIFIED" OK "GPC 1 IN STANDBY, GOING TO RUN NOW."

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ID: < 404.00>                    Issue(s): DISCIPLINE                    : SAFETY  
Issue(s) cont.: MANAGEMENT                    :  
Issue Source: <51-L FINDINGS >    PAGE 337    083  
Operation: <COUNTDOWN >                    >  
Location: <PAD >                    PAD B  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software: <ORBITER >                    >  
Reference Data: OMI                    ICE INSPECTION TEAM REPORT

Description:  
"THE ICE TEAM FOUND ICE ON THE APPROACH PATH TO THE SLIDEWIRE BASKETS. NEITHER THIS FINDING, NOR THE REST OF THE REPORT, WAS GIVEN TO THE TEST TEAM OVER COMMAND CHANNEL 232 AS IS REQUIRED."

CLOSURE ACTION, 9/15/86 - S0007 TO INCLUDE ICE INSPECTION SEQUENCE  
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ID: < 405.00>                    Issue(s): SAFETY                    : DISCIPLINE  
Issue(s) cont.:                    :  
Issue Source: <51-L FINDINGS >    PAGE 337    083  
Operation: <COUNTDOWN >                    >  
Location: <PAD >                    PAD B  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software: <ORBITER >                    >  
Reference Data: OMI                    RED CREW ENTRY

Description:  
"THESE WERE SIX RED CREW ENTRIES DURING COUNTDOWN. TWO OCCURRED ON THE JAN. 27, 1986 ATTEMPT; ONE CREW ENTERED TO REPAIR A LEAKING LH2 VAPORIZER VALVE AND LATER A SERIES OF ENTRIES WERE MADE TO ATTEMPT TO REMOVE THE CREW MODULE HATCH GSE HANDLE. THIS LATER ENTRY ALSO INVOLVED MANAGEMENT PERSONNEL ENTERING AS A RED CREW WITHOUT FULL FIRING ROOM COORDINATION OR REQUIRED TRAINING. NUMEROUS PROBLEMS WERE ENCOUNTERED WITH RED CREW ENTRIES IN THAT MANY SUBSTITUTIONS TO A PREVIOUSLY SUBMITTED RED CREW LIST WERE MADE. THERE WAS DIFFICULTY IN CERTIFYING PROPER CLEARANCE AND TRAINING FOR SUBSTITUTED PERSONNEL IN THAT TRAINING FILES WERE INITIALLY DOCUMENTED ONLY FOR PERSONNEL ON THE ORIGINAL LIST."

\*\*\*\*\*

ID: < 406.00>                    Issue(s): DISCIPLINE                    : REQUIREMENTS  
Issue(s) cont.:                    :    :  
Issue Source: <51-L FINDINGS >        PAGE 337    083  
Operation:    <COUNTDOWN        >  
Location:     <LCC                >        PAD 8  
Orb.No/Mission: <099/51-L        >                                    CLOSURE ACTION, 9/15/86 -  
Hardware/Software:<GOAL         >                                    GLS MOD FOR OAA POSITION  
Reference Data:    N/A                    GLS

Description:  
"DURING THE GLS DATA AND COMPUTER PROGRAM CODE REVIEW, ONE FINDING SURFACED. THE OAA POSITION INDICATION HAD A ONE-VOTING LOGIC (DATA ONLY) FAILURE AT 1636:41Z TIME. THE OAA POSITION INDICATION IS A REDUNDANT FEEDBACK (TWO FUNCTION DESIGNATORS) THROUGH TWO HIM'S FROM A SINGLE POSITION TRANSDUCER. THE INTERRUPT RECEIVED BY THE GLS WAS VOTING LOGIC COMPARED WITH THE REDUNDANT POSITION INDICATION AND THE OAA RETRACTED DISCRETES WHICH ARE SIMILIAR IN FEEDBACK DESIGN (I.E., SINGLE TRANSDUCER DUAL DATA PATH). SINCE A ONE OF FOUR VOTING LOGIC CHECK WAS SUCCESSFUL, NO GLS HOLD WAS ANNUNCIATED. THIS WAS A REDUNDANT PATH MEASUREMENT AND WAS DOCUMENTED BY PR-SS23-0002 TO REVIEW THE DESIGN OF THE OAA POSITION FEEDBACK SYSTEM REDUNDANCY FOR LATCHBACK INDICATIONS  
\*\*\*\*\*

ID: < 407.00>                    Issue(s): DISCIPLINE                    : SAFETY  
Issue(s) cont.: TRAINING/CERTIF        : MANAGEMENT                    :  
Issue Source: <51-L FINDINGS >        PAGE 339    085  
Operation:    <COUNTDOWN        >  
Location:     <LCC                >        PAD 8  
Orb.No/Mission: <099/51-L        >  
Hardware/Software:<N/A            >  
Reference Data:    OMI                    S0007    RECOMMENDATIONS

Description:  
"NASA SHOULD REVIEW THE POLICY OF NOT HAVING 100% DEDICATED PERSONNEL IN THE FIRING ROOM FOR LAUNCH COUNTDOWN; ESPECIALLY AT CRITICAL TIMES. THIS APPLIES TO GENERAL ENGINEERING AT CONSOLES AND THE LTD, SAFETY AND STM CONSOLES."

CLOSURE ACTION, 9/15/86 - FR CERTIFICATION/DISCIPLINE  
\*\*\*\*\*

ID: < 408.00>                    Issue(s): DISCIPLINE                    :  
Issue(s) cont.:                    :    :  
Issue Source: <51-L FINDINGS >        PAGE 339    085  
Operation:    <COUNTDOWN        >  
Location:     <RSS                 >        PAD 8  
Orb.No/Mission: <099/51-L        >  
Hardware/Software:<N/A            >  
Reference Data:    OMI                    S0007    RECOMMENDATIONS

Description:  
"RSS ROLLBACK PROCEDURES  
\*1. AN OBSERVER SHOULD BE STATIONED ON THE 207' LEVEL DURING ET PLATFORM OPERATIONS.  
\*2. ADDITIONAL CLEARANCE SHOULD BE PROVIDED BETWEEN PLATFORM AND VEHICLE TO ACCOMMODATE MISALIGNMENT AND PAYLOAD WEIGHT VARIATIONS."

\*\*\*\*\*

ID: < 409.00> Issue(s): DISCIPLINE : SAFETY  
Issue(s) cont.: TRAINING/CERTIF : MANAGEMENT :  
Issue Source: <51-L FINDINGS > PAGE 339 085  
Operation: <COUNTDOWN >  
Location: <PAD > PAD 8  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: OMI S0007 RECOMMENDATIONS

Description:  
"RED CREW ENTRY  
\*1. RED CREW TRAINING VERIFICATION CAN BE IMPROVED BY IDENTIFYING ALL  
. QUALIFIED PERSONNEL FROM TRAINING RECORDS.  
\*2. THE RED CREW FORM LACKS ESSENTIAL INFORMATION (WAD, TIMES, RESULTS)  
. AND SHOULD BE IMPROVED.  
\*3. CONTROL OF RED CREW ENTRIES SHOULD BE THROUGH THE TEST TEAM CHAIN OF  
. COMMAND.  
\*4. REQUIREMENTS FOR RED CREW ENTRY PROCEEDING NEED TO BE BROADENED (I.E.,  
. AFTER BDA CLEARED)."

\*\*\*\*\*

ID: < 410.00> Issue(s): DISCIPLINE : PROCEDURE  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 339 085  
Operation: <COUNTDOWN >  
Location: <LCC > PAD 8  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: OMI S0007 RECOMMENDATIONS

Description:  
"SWITCHLISTS  
THE LAUNCH COUNTDOWN SWITCHLIST SHOULD BE A SWITCH POSITION VERIFICATION  
PROCEDURE. ALL VEHICLE SYSTEMS SHOULD BE CONFIGURED CORRECTLY BY COGNIZANT  
SYSTEM ENGINEERS PRIOR TO SWITCHLIST EXECUTION."

CLOSURE ACTION, 9/15/86 - S0007 SWITCHLIST REVISION  
\*\*\*\*\*

ID: < 411.00> Issue(s): DISCIPLINE :  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 339 085  
Operation: <COUNTDOWN >  
Location: <LCC > PAD 8  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: OMI S0007 RECOMMENDATIONS

Description:  
"OFF-LINE MANAGEMENT MEETINGS  
ALL OFFLINE MANAGEMENT MEETING SHOULD BE RECORDED AN/OR DOCUMENTED ONCE  
LAUNCH COUNTDOWN HAS BEGUN. THIS INCLUDES ALL TELECONS WITH VENDORS AND  
SUPPORT CONTRACTORS."

\*\*\*\*\*

ID: < 412.00> Issue(s): LOGISTICS/SPARES : CANNIBALIZATION  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 192 007  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A RECOMMENDATIONS  
Description:  
"SPARE PARTS

FUNDING FOR SPARE PARTS SHOULD NOT BE CUT BUT INCREASED.

CANNIBALIZATION SHOULD BE DISCOURAGED AND USED ONLY AS AS ABSOLUTE  
"LAST RESORT"

LEVEL II SHOULD BE MADE AWARE OF ALL CANNIBALIZATIONS."

\*\*\*\*\*  
ID: < 413.00> Issue(s): PAPERWORK :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 192 007  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: N/A RECOMMENDATIONS -PAPER ACCOUNTING SYSTEM  
Description:  
"REVISE EXISTING INSTRUCTIONS FOR DISPOSITION OF NON-CONFORMING MATERIAL,  
INCLUDING: MRE (MATERIAL REVIEW BOARD), PMS (PRIMARY MATERIAL REVIEW BOARD),  
AND EOP (ENGINEERING ORDER TO FOLLOW) APPLICABILITY AND METHODS. INCLUDE  
DEFINITIONS OF MEMBER AUTHORITY, LIMITATION, AND QUALIFICATIONS AND FOLLOW UP  
WITH TRAINING SESSIONS TO ALL APPLICABLE PERSONNEL."

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ID: < 414.00> Issue(s): PAPERWORK :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 192 007  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data: OMI RECOMMENDATIONS -PAPER ACCOUNTING SYSTEM  
Description:  
"REVISE PROCEDURES FOR OMI DEVIATION PREPARATION TO CLEARLY STATE CONDITIONS  
WHERE DEVIATIONS ARE PERMITTED AND TO ESTABLISH METHODS WHICH WILL PREVENT  
DEVIATION OF CONTRACT AND SPECIFICATION REQUIREMENTS AND AUTHORIZED PARTS  
WITHOUT FORMAL AUTHORITY TO DO SO. REVIEW ALL PERMANENT DEVIATIONS TO OMI'S AND  
CHANGES TO JOB CARDS IN THE PAST TWO YEARS TO INSURE THAT SN'S (SERIAL NUMBERS)  
AND OCN'S (ORDER CONTROL NUMBERS) HAVE NOT BEEN IMPROPERLY DELETED, AND THAT  
PART NUMBERS HAVE NOT BEEN IMPROPERLY CHANGED OR DELETED."

\*\*\*\*\*



ORIGINAL PAGE IS  
OF POOR QUALITY

ID: < 415.00>                    Issue(s): PAPERWORK                    : WAIVERS  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 192    087  
Operation: <GENERIC >                    >  
Location: <ALL >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<ORBITER >                    RECOMMENDATIONS -PAPER ACCOUNTING SYSTEM  
Reference Data:    N/A

Description:  
"ADD PROCEDURES AND SPECIFIC INSTRUCTIONS ON ORBITER AND KIT TRACEABILITY, TRACKABILITY, AND ASSOCIATED REQUIREMENTS FOR WAIVER. INCLUDE OCN RECORDING, SN RECORDING, DEVIATIONS, AND LEVEL I AND LEVEL II WAIVERS. ALSO REVIEW PRESENT REQUIREMENTS FOR THE TRACING/TRACKING OF EACH PART, AND REAFFIRM OR REVISE THE REQUIREMENTS SPECIFIED FOR EACH PART."

\*\*\*\*\*  
ID: < 416.00>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 192    087  
Operation: <GENERIC >                    >  
Location: <ALL >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<N/A >                    RECOMMENDATIONS -PAPER ACCOUNTING SYSTEM  
Reference Data:    OMI

Description:  
"REVISE PROCEDURES AND INSTRUCT PERSONNEL ON PREPARATION, RELEASE, MODIFICATION , AND EXECUTION OF WORK AUTHORIZING DOCUMENTS. INCLUDE: USE OF "N/A" (NOT APPLICABLE) RESPONSE; LIMITATIONS ON AND METHODS FOR REAL-TIME CORRECTIONS; COMPLETE CALLOUT OF PART NUMBERS; INCORPORATION OF PROCESS CONTROL STEPS INTO TILE WADS; QUALITY PRACTICES FOR EXECUTION OF TILE PROCESS CONTROL STEPS; USE OF OMI APPENDIX X, INCLUDING SECIB OF APPENDIX X ITEMS; PROPER CALLOUT OF MATERIALS BY SPECIFICATION IN WADS; SECIB OF CHANGES INCORPORATED BY OMI; AND RE-SECIB OF CHANGES MOVED TO EARLIER EFFECTIVITY."

\*\*\*\*\*  
ID: < 417.00>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 192    087  
Operation: <GENERIC >                    >  
Location: <ALL >                    >  
Orb.No/Mission: <099/51-L >                    >  
Hardware/Software:<N/A >                    RECOMMENDATIONS -PAPER ACCOUNTING SYSTEM  
Reference Data:    N/A

Description:  
"ADD PROCEDURES AND SPECIFIC INSTRUCTIONS FOR RETAGGING, OR OTHERWISE INFORMING TECHNICIANS AND INSPECTORS, OF THE PART NUMBERS, SERIAL NUMBERS, AND ORDER CONTROL NUMBERS OF PARTS ON WHICH THIS INFORMATION CANNOT BE MARKED OR RETAINED."

\*\*\*\*\*

ID: < 418.00>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >    PAGE 193    088  
Operation:                    <GENERIC >  
Location:                    <ORBITR>  
Orb.No/Mission:                    <099/51-L >  
Hardware/Software:<N/A >        RECOMMENDATIONS -PAPER ACCOUNTING SYSTEM  
Reference Data:                    N/A  
Description:  
 \*REVISE PROCEDURES AND INSTRUCT PERSONNEL ON CONTROL METHODS FOR MATERIALS WHICH MAY BE USED IN AND AROUND THE ORBITER, AND FOR CALLOUT ON WADS OF MATERIAL USED FOR REPAIR.\*

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ID: < 419.00>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >    PAGE 193    088  
Operation:                    <GENERIC >  
Location:                    <ALL >  
Orb.No/Mission:                    <099/51-L >  
Hardware/Software:<N/A >        RECOMMENDATIONS -PAPER ACCOUNTING SYSTEM  
Reference Data:                    N/A  
Description:  
 \*ENFORCE PROCEDURES AT MANUFACTURING FACILITIES FOR MARKING OF MATERIAL REVIEW DOCUMENT NUMBER ON PARTS WHEREVER POSSIBLE.\*

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ID: < 420.00>                    Issue(s): QA                    : PROCEDURE  
Issue(s) cont.: PAPERWORK                    : TRAINING/CERTIF                    :  
Issue Source: <51-L FINDINGS >    PAGE 193    088  
Operation:                    <INSPECTION >  
Location:                    <ALL >  
Orb.No/Mission:                    <099/51-L >  
Hardware/Software:<N/A >        RECOMMENDATIONS  
Reference Data:                    N/A  
Description:  
 \*QUALITY AUDIT SYSTEM

IMPLEMENT IMMEDIATELY THE QUALITY AUDIT SYSTEM PROPOSED BY LSOC. REVISE THE STANDARD PRACTICE INSTRUCTION (SPI) TO INSURE CLARITY. EDUCATE ALL APPROPRIATE PERSONNEL ON PROPER IMPLEMENTATION OF THE SPI.\*

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ID: < 424.01>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 193    088  
Operation:                    <GENERIC                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <099/51-L                    >  
Hardware/Software:<N/A                    >                    RECOMMENDATIONS  
Reference Data:                    N/A

Description:

"IN ORDER TO MAKE THE BUILDING 45 SYSTEM MORE TRACKABLE, THE FOLLOWING ARE SUGGESTED:

2. WHENEVER AN OMS POD IS REFERENCED, ONLY REFER TO IT BY ITS S/N OR E/I. MUCH CONFUSION ARISES WHEN ONE STATES "OV-099 OMS POD." ALSO, THE METHOD THAT BUILDING 45'S ARE CATEGORIZED, THE VEHICLE (I.E., OV-099) POD IS TRACKED AND NOT NECESSARILY THE POD S/N WHICH IS ACTUALLY LOCATED ON THE VEHICLE. RCN SHOULD BE IMPLEMENTED FOR SUBSEQUENT MISSIONS."

3. A MORE TIMELY RESPONSE SHOULD BE SUBMITTED SO THAT THE BUILDING 45 REQUEST CAN BE CLOSED SOONER."

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ID: < 425.00>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 193    088  
Operation:                    <GENERIC                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <099/51-L                    >  
Hardware/Software:<TPS                    >                    RECOMMENDATIONS  
Reference Data:                    N/A

Description:

\*THERMAL PROTECTION SYSTEM

A GENERAL REVIEW AND OVERHAUL OF THE ON-VEHICLE PAPER SYSTEM IS RECOMMENDED. STEPS SHOULD BE TAKE TO IMPROVE THE QUALITY AND CONSISTENCY OF WORKMANSHIP OF ALL PERSONS INVOLVED IN THE SYSTEM TO OVERCOME THE OBVIOUS DISCREPANCIES CAUSED BY LACK OF ATTENTION TO DETAIL. PERSONNEL AT ALL LEVELS SHOULD BE ENCOURAGED TO STRIVE FOR QUALITY IN PROCESSING AND DOCUMENTATION. A FEW GENERAL RECOMMENDATIONS ARE:

(CONTINUED ON 425.01)

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ID: < 425.01>                    Issue(s): PAPERWORK                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <51-L FINDINGS >                    PAGE 193    088  
Operation:                    <GENERIC                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <099/51-L                    >  
Hardware/Software:<TPS                    >                    RECOMMENDATIONS  
Reference Data:                    N/A

Description:

1. THE PCR'S SHOULD BE REVIEWED FOR DRASTIC REDESIGN TO CORRECT THE NUMEROUS PROBLEMS REPORTED.
2. ESTABLISH A PROCEDURE TO HANDLE MULTI-FLOW WADS TO PROVIDE ADEQUATE TRACEABILITY AND ELIMINATE UNNEEDED CARRYOVER.
3. PROVIDE ADDITIONAL TRAINING AND DISCIPLINE OF THE PERSON(S) PERFORMING MIX CRIB OPERATIONS.
4. CLEARLY DEFINE AND DISTRIBUTE THE LEVEL OF VISIBILITY REQUIRED FOR ALL DISPOSITIONS.
5. IMPROVE DOCUMENTATION TRACEABILITY AND INTEGRITY BY ASSIGNING CONTROL TO R&QA."

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ID: < 429.00> Issue(s): PAPERWORK : DISCIPLINE  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 197 092  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A > CONCLUSIONS - KSC DOCUMENTATION  
Reference Data: N/A

Description:  
"DURING THE DOCUMENT REVIEW, MANY AREAS OF UNCLEAR OR INCONCISE DOCUMENTATION WERE NOTED. INSTRUCTIONS IN MAD'S ARE FREQUENTLY NOT CLEAR OR PRECISE. THE OMRSD SYSTEM IS VERY DIFFICULT TO PAPER TRACK WITH RESPECT TO AUDITING REQUIREMENTS. THE OMP AND PSP, WHICH ARE THE KSC SUPPORTING DOCUMENTS TO THE OMRSD SYSTEM ARE USUALLY INCORRECT IN THAT DEV'S AND REV'S ARE INVARIABLY INCORPORATED BETWEEN THE PUBLICATION OF ONE DOCUMENT OR THE OTHER. FINALLY, THE OMP IS NOT A CLOSED LOOP SYSTEM AND IS SUFFICIENTLY COMPLEX THAT THE COGNIZANT SYSTEMS ENGINEER IS THE ONLY PERSON WHO KNOWS THE FULL STATUS OF THE OMRSD REQUIREMENTS. OUR PAPERWORK SYSTEM NEED REVIEWING."

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ID: < 430.00> Issue(s): TRAINING/CERTIF : DISCIPLINE  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 197 092  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A > CONCLUSIONS-LACK OF DISCIPLINE/EDUCATION  
Reference Data: N/A

Description:  
"OF APPROXIMATELY FIVE THOUSAND DOCUMENTS EVALUATED, A VERY LARGE PERCENTAGE WERE FOUND TO BE CORRECTLY EXECUTED. THE DISCREPANCIES ARE GENERALLY MINOR IN NATURE SUCH AS INCORRECT SIGNATURES, MISSING SIGNATURES, LACK OF QC, INCOMPLETE FOR CLOSURE, ETC. HOWEVER, THESE DISCREPANCIES POINT TO A PROBLEM INVOLVING LACK OF DISCIPLINE AND EDUCATION ON PROCEDURES AND REQUIREMENTS. WE NEED TO INITIATE AN ACROSS-THE-BOARD TRAINING PROGRAM TO EDUCATE PERSONNEL AT ALL LEVELS ON MAD PREPARATIONS, PROCESSING, VERIFICATION, AND CLOSURE. THE SPI (STANDARD PRACTICE INSTRUCTIONS), THE GUIDE FOR PREPARING AND PERFORMING PAPERWORK, NEEDS TO BE REEVALUATED, UPGRADED IF NECESSARY, THEN ENFORCED. ATTENTION TO DETAIL MUST BE REEMPHASIZED."

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ID: < 431.00> Issue(s): PROCEDURE : PAPERWORK  
Issue(s) cont.: QA : :  
Issue Source: <51-L FINDINGS > PAGE 213 093  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > FINDINGS  
Reference Data: N/A

Description:  
"FINDING NO.2 - TPS NOT ISSUED CORRECTLY AND LEAKS REPAIRED ON TPS. (REF. TPS ME2023-9-10-038 "HOT GAS MANIFOLD LEAK CHECKS." THIS TPS PERFORMED THE GSE SETUP/TEARDOWN AND THE LEAK CHECKS OF ENGINES 2023, 2020, AND 2021 VIOLATED HOT GAS JOINTS. THE TPS WAS ASSIGNED TO ONE ENGINE, HOWEVER IT PERFORMED WORK ON ALL THREE ENGINES, IT SHOULD HAVE BEEN ISSUED AS A MULTIPLE TPS TO WORK ENGINES 2020 AND 2021, AS WELL AS 2023. DURING THE LEAK CHECKS, A FUZZ LEAK WAS DISCOVERED AT JOINT 65.2 ON ENGINE 2 (2020). THE LEAK WAS REPAIRED PER ATTACHMENT TO THE TPS. A PROBLEM REPORT (PR) SHOULD HAVE BEEN GENERATED TO REPAIR THE LEAK."

CLOSURE ACTION, 9/15/86 - REVISE SPI SP-504. TRAINING FOR SPI'S SP-504 & QA-001  
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ID: < 432.00> Issue(s): QA : PAPERWORK  
Issue(s) cont.: DISCIPLINE : PROCEDURE :  
Issue Source: <51-L FINDINGS > PAGE 214 094  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > FINDINGS  
Reference Data: N/A

ORIGINAL PAGE IS  
OF POOR QUALITY

Description:

"FINDING NO.3 - CONNECTOR RETEST NOT DISPOSITIONED PROPERLY (REF. TPS-MPS-9-10-117 "OV99 CONNECTOR INTEGRITY GROUP RETEST" THE TPS PERFORMED A CIG RETEST OF CONNECTORS DEMATED AFTER OMI V1161 "BUS REDUNDANCY TEST". NINETY THREE ITEMS WERE NOT DISPOSITIONED PROPERLY IN THE CIG LISTS. AS A PART OF THE INVESTIGATION, ALL THE FUNCTIONS WERE VERIFIED TO HAVE BEEN RETESTED PRIOR TO FLIGHT DURING EITHER THE BUS REDUNDANCY TEST, THIS TPS, OR NORMAL TESTING/ PROCESSING."

CLOSURE ACTION, 9/15/86 - CIG TRAINING

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ID: < 433.00> Issue(s): DISCIPLINE : QA  
Issue(s) cont.: PROCEDURE : :  
Issue Source: <51-L FINDINGS > PAGE 214 094  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > FINDINGS  
Reference Data: N/A

Description:

"FINDING NO.5 - POOR TRACEABILITY OF SSME JOINT LEAK CHECKS (REF. PR ME2020-9-A0003 "RE-EVALUATION OF RADIOGRAPHS TAKEN OF WELD 3 ON NOZZLE FORWARD MANIFOLD REVEALED LACK OF FUSION" THE RADIOGRAPHIC INSPECTION REQUIRED THE NOZZLE TO BE REMOVED FROM THE ENGINE FOR ACCESS. THE RETEST LEAK CHECKS WERE PERFORMED ON THIS PR. FOLLOWING THE ENGINE REASSEMBLY, ATTACHMENT F IDENTIFIED JOINTS D35.2, D25, D34, AND D26 WOULD BE LEAK CHECKED PER ATTACHMENT G. THESE JOINTS WERE NOT LISTED IN ATTACHMENT G AND, CONSEQUENTLY, WERE NOT LEAK CHECKED . ADDITIONALLY, ATTACHMENT G HAD A PAGE 12A ADDED TO PERFORM A LEAK CHECK OF A NUMBER OF JOINTS WHICH WERE NOT DISTURBED PER THIS PR. "

CLOSURE ACTION, 9/15/86 - CLOSED LOOP OMP SYSTEM I/W

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ID: < 434.00> Issue(s): TRAINING/CERTIF : QA  
Issue(s) cont.: : :  
Issue Source: <51-L FINDINGS > PAGE 214 094  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > FINDINGS  
Reference Data: OMRSO

Description:

"FINDING NO. 6- MASS SPECTROMETER USAGE FROM THE WAD REVIEW, THERE IS NO CONSISTENCY AND A LACK OF UNDERSTANDING OF THE CALCULATIONS INVOLVED IN THE USE OF A MASS SPECTROMETER FOR DETERMINING LEAK RATES USING METHOD A, B. OR ALT. METHOD B. THE MAXIMUM ALLOWABLE HELIUM BACKGROUND READING IS NOT UNDERSTOOD. IN SEVERAL INSTANCES, BACKGROUNDS HIGHER THAT THE ALLOWABLE LEAK RATE WAS USED IN VIOLATION OF SPEC. MF0001-003. THE METHODS OF RECORDING THE APPLICABLE DATA VARIES FROM WAD TO WAD, MAKING IT IMPOSSIBLE TO TELL WHAT WAS INTENDED BY THE RECORDER."

CLOSURE ACTION, 9/15/86 - MASS SPEC TRAINING

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ID: < 435.00> Issue(s): DISCIPLINE :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 217 097  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > CONCLUSIONS MAIN PROPULSION REVIEW TEAM  
Reference Data: OMRSD

Description:  
"THE MAIN PROPULSION REVIEW TEAM ENDORSES THE CONCLUSIONS CITED BY THE ORBITER REVIEW TEAM. THE REVIEW OF THE DATA, OMI'S, AND OTHER PAPER HAS POINTED OUT A NUMBER OF DEFICIENCIES WHICH NEED TO BE CORRECTED. THE SIGNIFICANCE OF THE FINDINGS SHOULD NOT BE OVEREMPHASIZED. THE OUT-OF-SPECIFICATION CONDITIONS WHICH WERE FOUND WERE ONLY marginally OUT-OF-SPECIFICATION. THE OMRSD REQUIREMENTS, WHICH WERE NOT SATISFIED, IN MOST CASES EITHER REQUIRE A REVISION , THE INTENT WAS SATISFIED, OR ARE REQUIRED AT PERIODIC INTERVALS. NONE OF THE FINDINGS OR ANY RESULTS OF THIS REVIEW HAS UNCOVERED ANY FACTOR WHICH MAY HAVE CAUSED THE STS-51L ACCIDENT."

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ID: < 436.00> Issue(s): QA :  
Issue(s) cont.: :  
Issue Source: <51-L FINDINGS > PAGE 216 096  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > FINDINGS  
Reference Data: N/A

Description:  
"FINDING NO. 8 - LH2 17-INCH SEAL INTEGRITY THE POST INSTALLATION STEPS TO VERIFY THE LH2 17-INCH DISCONNECT PRIMARY SEAL INTEGRITY WERE NOT COMPLETED BY LSOC OR NASA QUALITY PERSONNEL ON THE JOB CARD. IF PROBLEMS WITH THE SEAL WERE NOT IDENTIFIED UNTIL POST MATING PROCEDURES WERE COMPLETED, A DEMATE WOULD BE REQUIRED TO CORRECT THE PROBLEMS. THE SEAL DID NOT PASS LEAK CHECKS IN THE VAB."

CLOSURE ACTION, 9/15/86 - WAD TRAINING. PAPER AUDIT I/W

\*\*\*\*\*

ID: < 437.00> Issue(s): PAPERWORK : DISCIPLINE  
Issue(s) cont.: PROCEDURE :  
Issue Source: <51-L FINDINGS > PAGE 216 096  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<SSME > FINDINGS  
Reference Data: N/A

Description:  
"FINDING NO. 9 - REPETITIVE OMI NOT UTILIZED CORRECTLY THE "MPS/SSME PRESSURIZATION OPERATIONS" OMI V1171 IS NOT UTILIZED IN A MANNER CONSISTENT WITH THE CONCEPT THAT WORK IS PREPLANNED AND APPROVED BY THE APPROPRIATE SIGNATURE LEVELS. WHEN A WAD CALLS OUT A TASK IN V1171, THE ENGINEER DECIDES REAL TIME WHAT SEQUENCES ARE REQUIRED TO SATISFY THE INTENT OF THE WAD. THE AUTHORIZING WAD SHOULD BE SPECIFIC AS TO WHAT SEQUENCE (BY EXACT TITLE) SHOULD BE USED. ADDITIONALLY, OMI V1171 IS OFTEN UTILIZED WITH NO AUTHORIZING WAD USING "DAILY SCHEDULE" AS AUTHORIZATION."

REVISED FEB. '87

108

CLOSURE ACTION, 1/5/87 - OMI V1171 TO BE REVISED

\*\*\*\*\*





ID: < 500.00> Issue(s): COMMONALITY : INTERFACE  
Issue(s) cont.: :  
Issue Source: <ASAP > JAN. '85 ANNUAL REPORT, P.38  
Operation: <MANIFESTING >  
Location: <OPF >  
Orb.No/Mission: <6 >  
Hardware/Software:<SCAR >  
Reference Data: N/A

Description:  
REPORT RECOMMENDS THAT WHEREVER POSSIBLE THERE SHOULD BE AN INCREASING EFFORT TO PREPARE AND CARRY PAYLOADS IN A STANDARDIZED FASHION.

\*\*\*\*\*

ID: < 501.00> Issue(s): TIME/ON-LINE : CHANGE CONTROL  
Issue(s) cont.: :  
Issue Source: <ASAP > JAN. '85 ANNUAL REPORT, P.73  
Operation: <MAINTENANCE >  
Location: <OPF >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
"UNPLANNED MODIFICATIONS NOW REQUIRE 5% TO 8% OF THE PROCESSING TIME, A CONSIDERABLE IMPROVEMENT; HOWEVER, ABOUT 35% OF THE TIME IS STILL DEVOTED TO RESPONDING TO UNPLANNED TESTS OR CHANGE-OUTS RESULTING FROM FLIGHT CONCERNS AND ANOMALIES."

\*\*\*\*\*

ID: < 503.00> Issue(s): LOGISTICS/SPARES : TIME/ON-LINE  
Issue(s) cont.: EFFICIENCY :  
Issue Source: <ASAP > JAN. '85 ANNUAL REPORT, P.37  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
"FACILITIES SHOULD BE PROVIDED TO MINIMIZE TURNAROUND TIMES OF THE SHUTTLE AND LINE REPLACEABLE UNITS (LRUS).  
\* ORBITER MAINTENANCE AND REFURBISHMENT FACILITY (OMRF) BUILDING SHOULD BE AUTHORIZED.  
\* LRU REPAIR FACILITIES SHOULD BE PROVIDED AT KSC FOR ALL UNITS WHICH CAN PROPERLY AND EFFICIENTLY HANDLED THERE."

\*\*\*\*\*

ID: < 504.00>                    Issue(s): PLANNING                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <ASAP                    >                    JAN. '85 ANNUAL REPORT, P.37  
Operation: <SCHEDULING                    >                    :  
Location: <OPF                    >                    :  
Orb.No/Mission: <6                    >                    :  
Hardware/Software: <SCAR                    >                    :  
Reference Data: N/A

Description:  
"NASA SHOULD EXPLORE WHETHER BETTER COORDINATION COULD BE ACHIEVED BETWEEN THOSE PERSONS DETERMINING MANIFESTS FOR SPECIFIC FLIGHTS AND THOSE PERSONS CHARGED WITH LAUNCH PROCESSING. IN SOME INSTANCES, THE COMBINATION OF PAYLOADS HAS EXACERBATED THE LAUNCH PROCESSING SEQUENCE."

\*\*\*\*\*

ID: < 505.00>                    Issue(s): CHANGE CONTROL                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <ASAP                    >                    JAN. '85 ANNUAL REPORT, P.36  
Operation: <GENERIC                    >                    :  
Location: <OPF                    >                    :  
Orb.No/Mission: <6                    >                    :  
Hardware/Software: <N/A                    >                    :  
Reference Data: N/A

Description:  
"NASA SHOULD EXAMINE THE FEASIBILITY OF DEVELOPING DATA SYSTEMS UNDER MANAGEMENT OF THE SPC, SUCH AS CONFIGURATION MANAGEMENT, THAT WILL CENTRALIZE AND AUGMENT KSC'S OPERATIONAL LAUNCH CAPABILITY."

\*\*\*\*\*

ID: < 506.00>                    Issue(s): LOGISTICS/SPARES                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <ASAP                    >                    JAN. '85 ANNUAL REPORT, P.37  
Operation: <MAINTENANCE                    >                    :  
Location: <OPF                    >                    :  
Orb.No/Mission: <6                    >                    :  
Hardware/Software: <SSME                    >                    SPARE PARTS  
Reference Data: N/A

Description:  
CONCERN EXPRESSED FOR LACK OF SPARES  
"NASA SHOULD CONTINUE TO GIVE HIGH PRIORITY TO ACQUISITION OF SPARE PARTS AND TO UPGRADE THE RELIABILITY (PLANNED LIFE) OF HARDWARE, ESPECIALLY ITEMS ASSOCIATED WITH SPACE SHUTTLE MAIN ENGINE."

\*\*\*\*\*

ID: < 507.00>                    Issue(s): RELIABILITY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <ASAP                    >                    JAN. '85 ANNUAL REPORT, P.09  
Operation:   <LANDING                    >                    :  
Location:   <LDG                    >                    :  
Orb.No/Mission:   <G                    >                    :  
Hardware/Software: <LANDING                    >                    BRAKES  
Reference Data:   N/A

Description:  
BRAKE PROBLEMS ON FIRST 21 FLIGHTS  
CARBON BRAKE DESIGN IN WORK  
NOSE WHEEL STEERING REDUCES BRAKE DAMAGE

\*\*\*\*\*



ID: < 603.00>                    Issue(s): TIME/ON-LINE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC            >                    GROUND SUPPORT EQUIPMENT PAPER, P.1  
Operation: <PROPELLANT        >                    :  
Location: <PAD                >                    :  
Orb.No/Mission: <102, STS-2 >                    :  
Hardware/Software:<MPS        >                    OMS/RCS  
Reference Data:                    N/A  
Description:  
 "DURING OMS/RCS HYPERGOL LOADING OF OV-102 FOR STS-2, A FAILURE OF A QUICK DISCONNECT (QD) RESULTED IN A HYPERGOL SPILL WHICH DEBONDED AND REQUIRED REPLACEMENT OF APPROXIMATELY 378 THERMAL PROTECTION TILES AND FOUR WEEKS SLIPPAGE TO LAUNCH SCHEDULE."

\*\*\*\*\*  
ID: < 604.00>                    Issue(s): DISCIPLINE                    : TIME/ON-LINE  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC            >                    GROUND SUPPORT EQUIPMENT PAPER, P.1  
Operation: <MAINTENANCE        >                    :  
Location: <OPF                >                    :  
Orb.No/Mission: <103, STS-23 >                    :  
Hardware/Software:<GSE        >                    PLB ACCESS BRIDGE  
Reference Data:                    N/A  
Description:  
 "DURING PREPARATION FOR OPF ROLLOUT OF OV-103 FOR STS 23/51D UPON MOVEMENT OF THE PLB ACCESS BRIDGE, THE PERSONNEL CARRIER BUCKET FELL DUE TO FAILURE OF MASTER LINKS IN THE HOISTING MECHANISM, DAMAGING THE PAYLOAD BAY DOOR. THIS CAUSED A SLIP IN LAUNCH SCHEDULE OF APPROXIMATELY FOUR WEEKS."

\*\*\*\*\*  
ID: < 605.00>                    Issue(s): TIME/OFF-LINE                    : PAPERWORK  
Issue(s) cont.: QA                    :                    :  
Issue Source: <AFOTEC            >                    GROUND SUPPORT EQUIPMENT PAPER, P.2B  
Operation: <MAINTENANCE        >                    :  
Location: <KSC                >                    :  
Orb.No/Mission: <6                >                    :  
Hardware/Software:<GSE        >                    TOP 9 GSE PROBLEMS FROM 600+ GSE SYSTEMS  
Reference Data:                    N/A                    (STS-17 THRU STS-27 -- 8 FLOWS)  
Description:  

SYS ID	SYSTEM NAME	# PR'S	PMOMI	DAYS-OPEN/CLOSE(AV)
570-0700	PAD HYPER SER SYS	283	V6A96	65.4
570-0865	HYPER DESERV & C/O	218	V6B01	49.3
572-0841	HYD HI-PRESS PUMP	174	V6A38	54.0
572-0869	PAD ECS SYSTEM	144	V6C68	73.9
570-0508	GRND COOLING UNIT	136	V6D35	46.6
570-0863	BRIDGE ACC. PLATFM	136	V6E49	32.1
572-0111	LH2 STORAGE LOADING	122	-----	35.3
A70-0666	APS HYPER DIST SYS	115	V6J05	59.5
C70-0727	COMM/TRACKING C/O	103	V6E25	63.0

 \*\*\*\*\*

ID: < 606.00>                    Issue(s): MANAGEMENT                    : PAPERWORK  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC            >                    GROUND SUPPORT EQUIPMENT PAPER, P.3  
Operation: <GENERIC            >                    :  
Location: <KSC                >                    :  
Orb.No/Mission: <6                >                    :  
Hardware/Software:<GSE            >                    PRACA REPORTING SYSTEM  
Reference Data: N/A

ORIGINAL PAGE IS  
OF POOR QUALITY

Description:  
 \*DATA COLLECTION SYSTEMS GENERALLY ARE UTILIZED BY MANAGEMENT TO IDENTIFY:  
 (1) PROBLEM AREAS; (2) NEED FOR MODIFICATIONS/UPDATES TO EQUIPMENT;  
 (3) INCREASED MANPOWER OR DIFFERENT SKILL LEVELS; (4) EFFECTIVENESS OF, OR LACK  
 OF, ADEQUATE SUPPLY SUPPORT. NONE OF THIS CAN BE ACCOMPLISHED USING AVAILABLE  
 PRACA DATA AS A MANAGEMENT TOOL, THERE NEEDS TO BE AN EDUCATION PROGRAM STARTED  
 TO ASSURE PROPER DATA IS PREPARED AND PRESENTED BY ALL FACETS OF SHUTTLE FLOW  
 AND MAINTENANCE.\*

\*\*\*\*\*  
 ID: < 607.00>                    Issue(s): LOGISTICS/SPARES                    : EFFICIENCY  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC            >                    STS LAUNCH RATE CAPABILITY, P. VI  
Operation: <MAINTENANCE        >                    :  
Location: <KSC                >                    :  
Orb.No/Mission: <6                >                    :  
Hardware/Software:<N/A            >                    LOGISTICS SYSTEM  
Reference Data: N/A

Description:  
 \*THE SLOW DEVELOPMENT OF AN EFFICIENT AND EFFECTIVE LOGISTICS SUPPORT SYSTEM IS  
 CONTRIBUTING TO THE OVERALL PROGRESS IN ACHIEVING FULL LAUNCH RATE CAPABILITY.  
 LACK OF SUFFICIENT OFF-LINE MAINTENANCE AND REPAIR CAPABILITY AND INSUFFICIENT  
 TRACKING OF REPAIR TIMES CONTRIBUTE TO EXCESSIVE COMPONENT REPAIR TIMES. THIS  
 CREATES THE NEED FOR A LARGER SPARES INVENTORY TO INSURE SERVICEABLE ITEMS ARE  
 AVAILABLE TO PRECLUDE LAUNCH DELAYS.\*

\*\*\*\*\*  
 ID: < 608.00>                    Issue(s): LOGISTICS/SPARES                    : CANNIBALIZATION  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC            >                    STS LAUNCH RATE CAPABILITY, P. VI  
Operation: <REPAIR                >                    :  
Location: <KSC                >                    :  
Orb.No/Mission: <6                >                    :  
Hardware/Software:<GSE            >                    :  
Reference Data: N/A

Description:  
 \*INADEQUATE SPARES INVENTORY AND EXCESSIVE REPAIR TIMES LEAD TO A RELIANCE  
 ON CANNIBALIZATION. CANNIBALIZATION HAS BEEN USED EXTENSIVELY TO MEET  
 PROCESSING SCHEDULES. THIS CREATES DOUBLE WORK ACTIVITIES WHICH COULD  
 POTENTIALLY CONSTRAIN THE LAUNCH RATE.\*

\*\*\*\*\*

ID: < 609.00>                    Issue(s): TIME/ON-LINE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC            >                    STS LAUNCH RATE CAPABILITY, P. 11  
Operation: <MAINTENANCE       >                    :  
Location: <OPF                   >                    :  
Orb.No/Mission: <6               >                    :  
Hardware/Software:<TPS           >                    :  
Reference Data:    N/A  
Description:  
 \*REPAIRS TO THE THERMAL PROTECTION SYSTEM, ESPECIALLY TILE, HAVE CAUSED LAUNCH DELAYS. DATA COLLECTED DURING ORBITER PROCESSING SHOWS THAT TIME TO REPAIR OR REMOVE AND REPLACE (R&R) DAMAGED TILE AND THE TIME NEEDED TO REWATERPROOF AFTER FLIGHT ARE MAJOR CONSTRAINTS TO REDUCING TURNAROUND TIME.\*

\*\*\*\*\*  
ID: < 610.00>                    Issue(s): TIME/OFF-LINE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC            >                    USAF SHUTTLE ASSESSMENT REPORT OCT. '84  
Operation: <FLIGHT               >                    :  
Location: <SC                     >                    PAGE 3-56, PAGE 35  
Orb.No/Mission: <STS-1 TO -13>                    :  
Hardware/Software:<SRB           >                    :  
Reference Data:    N/A  
Description:  
 \*PROBLEMS WITH THE RETRIEVAL SYSTEM PARACHUTES OR OTHER COMPONENTS HAVE OCCURED TO SOME DEGREE ON ALL MISSIONS.\* PRIMARILY PARACHUTE(S) BECOMING ENTANGLED.

\*\*\*\*\*  
ID: < 611.00>                    Issue(s): TIME/OFF-LINE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC            >                    STS LAUNCH RATE CAPABILITY, P. 34  
Operation: <REPLACEMENT/LRU >                    :  
Location: <OPF                   >                    :  
Orb.No/Mission: <6               >                    :  
Hardware/Software:<ORBITER     >                    :  
Reference Data:    N/A  
Description:  
 ROCKWELL MANAGES ORBITER SPARES. SPC INSTALLS SPARES. ROCKWELL & SPC DO NOT HAVE COMPATIBLE COMPUTER SYSTEMS. A SPARE MIGHT BE RETURNED TO ROCKWELL FOR REFURB WHERE IT IS UPGRADED, RENUMBERED AND RETURNED TO SPC. SPC MIGHT THEN CALL FOR OLD NUMBER AND FIND NONE. WHEN THIS SCENARIO IS ACTED OUT THERE IS AN UNNECESSARY WASTE OF PROCESSING TIME.

\*\*\*\*\*



ID: < 612.00>                    Issue(s): TIME/OFF-LINE                    : MANAGEMENT  
Issue(s) cont.:                    :  
Issue Source: <AFOTEC                    >                    STS LAUNCH RATE CAPABILITY, P. 35  
Operation: <MAINTENANCE                    >                    (UNDATED DRAFT)  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A

Description:  
MOST ITEMS OF GSE DO NOT HAVE MAINTENANCE MANUALS. TECHNICIANS OFTEN REQUIRE ENGINEERING ASSISTANCE TO REPAIR GSE. ENGINEERS HAVE PRIMARY RESPONSIBILITY TO WORK FLIGHT PROBLEMS. WHEN THE WORK BUCKET FELL AND DAMAGED THE ORBITER A TEAM OF ENGINEERS SPENT A MONTH REPAIRING IT AND IDENTIFYING DESIGN DISCREPANCIES. "THIS LEADS TO THE PRESUMPTION THAT THE STS PROGRAM PHILOSOPHY IS TO REPAIR EQUIPMENT ONLY WHEN DISCREPANCIES WOULD IMPACT THE LAUNCH SCHEDULE AND TO INSPECT GSE WHEN CONVENIENT."

\*\*\*\*\*  
ID: < 613.00>                    Issue(s): MANAGEMENT                    : PAPERWORK  
Issue(s) cont.:                    :  
Issue Source: <AFOTEC                    >                    STS LAUNCH RATE CAPABILITY, P. 35  
Operation: <MAINTENANCE                    >                    (UNDATED DRAFT)  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A

Description:  
THE DUAL DISCREPANCY REPORTING SYSTEMS LIMIT ABILITY TO ACCUMULATE HISTORICAL INFORMATION ON GSE DISCREPANCIES. PRACA IS AUTOMATED WHILE DR IS MANUAL. THESE DATA SYSTEMS (INCLUDING NUMBERING) HAVE CONTINUALLY BEEN INTERMINGLED. INPUT DATA IS INCONSISTENT. THE MISONOMER IN PRACA IS DUE TO THE FACT THAT CORRECTIVE ACTIONS ARE NOT RECORDED FOR THOSE PREVENTIVE MAINTENANCE, OPERATIONAL MAINTENANCE INSTRUCTIONS (PMOMIS) WHICH DO EXIST. GSE MAINTENANCE MANAGERS, THEREFORE, ARE LIMITED IN THEIR KNOWLEDGE OF TIME AND RESOURCE REQUIREMENTS FOR THE GSE MAINTENANCE PROGRAM.

\*\*\*\*\*  
ID: < 614.00>                    Issue(s): PLANNING                    : MANAGEMENT  
Issue(s) cont.: MAINTAINABILITY                    :  
Issue Source: <AFOTEC                    >                    STS LAUNCH RATE CAPABILITY, P. 36  
Operation: <MAINTENANCE                    >  
Location: <OPF                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A

Description:  
"SINCE MAINTENANCE MANUALS DO NOT EXIST FOR MOST GSE MODELS, AN ENGINEER MUST DEVELOP REPAIR PROCEDURES FOR EACH DISCREPANCY ON EACH GSE MODEL. ... COMMON PRACTICE IS FOR THE ENGINEER TO PERSONALLY EXAMINE THE FAULTY ITEM THEN HAND-SCRIBE CORRECTIVE ACTION PROCEDURES ON THE ACTUAL PROBLEM REPORT. ... FIRST EXAMINATION, HOWEVER, DOES NOT USUALLY OCCUR UNTIL THE FAULTY EQUIPMENT IS REQUIRED TO SUPPORT SOME PROCESSING ACTIVITY. ... THE POINT IS THE ENGINEER DETERMINES THE REPAIR SCHEDULE RATHER THAN A WORK FLOW SCHEDULER. ...IT IS ESTIMATED THAT ONLY MINIMAL WORK WOULD BE REQUIRED TO WRITE A MAINTENANCE MANUAL BY ORGANIZING THE PREVIOUSLY DEVELOPED CORRECTIVE ACTIONS.

\*\*\*\*\*

ID: < 615.00>                    Issue(s): MAINTAINABILITY        : DISCIPLINE  
Issue(s) cont.: PLANNING                    : LOGISTICS/SPARES        :  
Issue Source: <AFOTEC                    >        STS LAUNCH RATE CAPABILITY, P. 36  
Operation: <REPLACEMENT/LRU >  
Location: <OPF >  
Orb.No/Mission: <6                    >  
Hardware/Software:<GSE                    >  
Reference Data: N/A

Description:

\*GSE SPARES IS ANOTHER AREA OF CONCERN. JUST AS WITH THE ORBITER PROJECT, ACQUISITION OF SPARES IS A MATTER OF PRIORITIES WITH SPARES INVENTORY FALLING BEHIND OPERATIONAL SCHEDULES AND PERFORMANCE CONCERNS. ATTENTION TO GSE SPARES IS EVEN LESS THAN TO ORBITER SPARES. THE BIGGEST DIFFERENCE IS THAT MANY GSE MODELS ARE UNIQUE, THUS EVEN CANNIBALIZATION IS NOT AN OPTION AVAILABLE TO RETURN AN ITEM TO SERVICE. THE END RESULT IS THE GSE SPARES INVENTORY IS INADEQUATE FOR COST EFFECTIVE SUPPORT OF GSE. THIS, IN TURN, TRANSLATES TO A LOWER LEVEL OF SUPPORT TO THE STS PROGRAM AND LESS THAN MAXIMUM LAUNCH RATE CAPABILITY.

\*\*\*\*\*

ID: < 617.00>                    Issue(s): TIME/ON-LINE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC                    >        SHUTTLE SYSTEM ASSESSMENT, OCT'84 P.013  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <G                    >  
Hardware/Software:<ORBITER                    >  
Reference Data: N/A

Description:

- \* ORBITER DOES NOT HAVE ALL-WEATHER CAPABILITY
- . \* ORBITER THERMAL PROTECTION SYSTEM (TPS) SUSCEPTIBLE TO PRECIPITATION
- . \* LIMITED FLIGHT EXPERIENCE HAS RESULTED IN CONSERVATIVE CEILING AND VISIBILITY FLIGHT RULES
- . \* BRAKE PROBLEMS LIMIT CAPABILITY FOR HIGH CROSSWIND LANDINGS
- . \* LAUNCH PROBABILITY REDUCED DUE TO WEATHER LIMITATIONS AT ABORT SITES
- . \* CURRENT PROCEDURE OF WEATHER ALTERNATE SITES REASONABLE APPROACH FOR NEAR-TERM
- . \* SOME IMPROVEMENT FOR OPERATIONS IN DEGRADED WEATHER MAY BE POSSIBLE

\*\*\*\*\*

ID: < 618.00>                    Issue(s): RELIABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC                    >        SHUTTLE SYSTEM ASSESSMENT, OCT'84 P.024  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <G                    >  
Hardware/Software:<APU                    >  
Reference Data: N/A

Description:

\*NUMEROUS PROBLEMS WITH THE COMBINED APU, HYDRAULICS, WATER SPRAY BOILER SUBSYSTEM INDICATE DEFICIENCIES REQUIRING SOME REDESIGN TO REDUCE THE NUMBER OF POTENTIAL FAILURES\*

\*\*\*\*\*

ID: < 619.00>                    Issue(s): RELIABILITY                    :  
 Issue(s) cont.:                    :                    :  
 Issue Source: <AFOTEC            >            SHUTTLE SYSTEM ASSESSMENT, OCT'84 P.024  
 Operation: <LANDING            >            :  
 Location: <ORBITR>                    :  
 Orb.No/Mission: <6               >            :  
 Hardware/Software:<LANDING    >            BRAKES  
 Reference Data:    N/A  
 Description:  
 \*BRAKE DAMAGE INDICATES DEFICIENCIES YET TO BE UNDERSTOOD\*

\*\*\*\*\*  
 ID: < 620.00>                    Issue(s): LOGISTICS/SPARES                : CANNIBALIZATION  
 Issue(s) cont.:                    :                    :  
 Issue Source: <AFOTEC            >            SHUTTLE SYSTEM ASSESSMENT, OCT'84 P.040  
 Operation: <REPLACEMENT/LRU >            :  
 Location: <ALL >                    :  
 Orb.No/Mission: <6               >            :  
 Hardware/Software:<N/A           >            :  
 Reference Data:    N/A  
 Description:  
 \*SUPPLY SUPPORT ADEQUATE TO DATE WITH FOLLOWING CONCERNS  
 \* SUPPLY SUPPORT POLICIES UNDERGOING TRANSITION FROM DDT&E TO OPERATIONAL ERA  
 \* OFF-THE-SHELF FILL RATE 12%-36% FOR ORBITER COMPONENTS  
 \* LONG VENDOR TURNAROUND TIME  
 \* CONTINUED USE OF CANNIBALIZATION PRACTICES INTO THE OPERATIONS ERA  
 . MAY HAVE IMPACTS TO FUTURE PROCESSING  
 \* SHUTTLE PROCESSING CONTRACTOR DOES NOT HAVE DIRECT AUTHORITY OR CONTROL  
 . OF FLIGHT SPARES PROVISIONING OR PROCUREMENTS

\*\*\*\*\*  
 ID: < 621.00>                    Issue(s): TIME/DN-LINE                    :  
 Issue(s) cont.:                    :                    :  
 Issue Source: <AFOTEC            >            USAF SHUTTLE ASSESSMENT REPORT    OCT.'84  
 Operation: <LANDING            >            :  
 Location: <KSC >                    PAGE 12  
 Orb.No/Mission: <6               >            :  
 Hardware/Software:<STRUCTURE   >            BRAKES  
 Reference Data:    N/A  
 Description:  
 \*THE ORBITER HAS DEMONSTRATED THE CAPABILITY TO LAND ON 15,000-FT RUNWAYS.  
 HOWEVER, FULL COMMITMENT TO LANDING ROUTINELY AT KSC IS CURRENTLY BEING  
 IMPACTED BY WEATHER-RELATED FACTORS AND BRAKING SYSTEM DEFICIENCIES.\*

\*\*\*\*\*



ID: < 624.01> Issue(s): TIME/ON-LINE :  
Issue(s) cont.: : :  
Issue Source: <AFOTEC > USAF SHUTTLE ASSESSMENT REPORT OCT. '84  
Operation: <GENERIC >  
Location: <KSC > PAGE 32 (CONTINUED FROM 624.00)  
Orb.No/Mission: <6 >  
Hardware/Software:<ORBITER >  
Reference Data: N/A

Description:  
IMPACTS TO LAUNCH AVAILABILITY (GROUND SUPPORT EQUIP) FLT DELAY  
NITROGEN TETROXIDE QUICK DISCONNECT STS-2 42 DA  
PAYLOAD CONTAMINATION STS-6 2 DA  
(ADVERSE WEATHER)  
STS-3 LANDING DIVERTED FROM EAFB TO WHITE SANDS STS-4 5 DA  
STS-7 LANDING DIVERTED FROM KSC TO EAFB DUE TO CLOUD COVERAGE STS-8 5 DA  
IUS FAILURE ON STS-6 ( PAYLOAD UPPER STAGE) STS-8 16 DA  
STS-9 30 DA  
TWO PAM-D SRM FAILURES STS-12 CANC.  
STS-14 UNKNOWN

\*\*\*\*\*

ID: < 626.00> Issue(s): LOGISTICS/SPARES : CANNIBALIZATION  
Issue(s) cont.: : :  
Issue Source: <AFOTEC > USAF SHUTTLE ASSESSMENT REPORT OCT. '84  
Operation: <REPLACEMENT/LRU >  
Location: <ALL > PAGE 42  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
\*FOR ORBITER SUPPLY SUPPORT, COMPONENT OFF-THE-SHELF AVAILABILITY (12 TO 36%)  
AND VENDOR TURNAROUND TIME (AVERAGING UP TO 131 DAYS FOR SOME COMPONENTS)  
CONTINUE TO BE CONTRIBUTING FACTORS AFFECTING THE SSV PROCESSING ACTIVITIES.  
OFF-THE-SHELF (ORBITER SPARES) AVAILABILITY IS DETERMINED BY EVALUATING THE  
NUMBER OF SPARES READILY AVAILABLE VERSUS THOSE REQUIRED IMMEDIATELY AFTER A  
MISSION, DURING THE GROUND PROCESSING ACTION OF INTERIM PROBLEM REPORTS  
ASSIGNED FOR INFLIGHT ANOMALIES. LACK OF SPARES HAS RESULTED IN SSV PROCESSING  
IMPACTS BUT, BECAUSE OTHER ORBITERS HAVE BEEN AVAILABLE AS A SUPPLY SOURCE,  
SIGNIFICANT IMPACTS TO THE LAUNCH SCHEDULE HAVE BEEN PREVENTED.\*

\*\*\*\*\*

ID: < 627.00> Issue(s): TIME/ON-LINE :  
Issue(s) cont.: : :  
Issue Source: <AFOTEC > USAF SHUTTLE ASSESSMENT REPORT OCT. '84  
Operation: <ASSEMBLY >  
Location: <VLS > PAGE 2-16  
Orb.No/Mission: <6 >  
Hardware/Software:<SRB >  
Reference Data: N/A FILAMENT WOUND CASES

Description:  
\*FIRST, CONCERN EXISTS AT SEGMENT INTERFACES DUE TO THE WAY IN WHICH THE CASE  
COMPONENTS ARE MADE. THE CYLINDRICAL COMPOSITE SECTION OF EACH CASE COMPONENT  
IS PINNED TO STEEL INTERFACE RINGS. PINNING REQUIRES A SMALL CLEARANCE BETWEEN  
PIN AND HOLE WHICH LEADS TO FLEXIBILITY BETWEEN MATED COMPONENTS. THIS  
INTERPLAY AT THE SEGMENT INTERFACES, COUPLED THE GREATER FLEXIBILITY OF THE  
COMPOSITE OVER STEEL, WILL PRODUCE GREATER BENDING DEFLECTIONS IN THE STACKED  
SOLID ROCKET BOOSTER. CURRENT ANALYSIS SUGGESTS THAT, DURING WORST-CASE  
PRELAUNCH CONDITIONS, DIMINISHED STIFFNESS IN THE FWC COULD, ONCE THE SRBS ARE  
MATED TO THE EXTERNAL TANK, ALLOW EXCESSIVE MOTION IN THE TOTAL VEHICLE ON THE  
PAD.\*

\*\*\*\*\*



ORIGINAL PAGE IS  
OF POOR QUALITY

ID: < 630.00>                    Issue(s): TIME/ON-LINE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC                    >                    USAF SHUTTLE ASSESSMENT REPORT    OCT. '84  
Operation:                    <FLIGHT                    >                    :  
Location:                    <ORBITR>                                       PAGE 2-178  
Orb.No/Mission:                    <6                    >                    :  
Hardware/Software:<SRB                    >                    :  
Reference Data:                    N/A

Description:  
"ABNORMAL SRB NOZZLE EROSION OCCURRED ON STS-8. INVESTIGATION DETERMINED IT TO BE A MANUFACTURING PROBLEM AND SELECTION OF PROPERLY MANUFACTURED NOZZLES CORRECTED THE PROBLEM. ONE SRB NOZZLE ON STS-11 UNEXPECTEDLY EXPERIENCED EROSION GREATER THAN PREDICTED. SUBSEQUENT INVESTIGATION REVEALED A DIFERENT MECHANISM THAN THAT WHICH CAUSED THE EROSION OF STS-8. THIS EROSION MECHANISM IS ALSO UNDERSTOOD AND CAN BE TOLERATED. MEANWHILE, MANUFACTURING PROCESSES ARE BEING REVISED TO MINIMIZE THE EFFECT OF NOZZLE EROSION. SUBSEQUENT FLIGHTS HAVE DEMONSTRATED TOLERABLE EROSION EFFECTS."

\*\*\*\*\*  
ID: < 631.00>                    Issue(s): TIME/ON-LINE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFOTEC                    >                    USAF SHUTTLE ASSESSMENT REPORT    OCT. '84  
Operation:                    <FLIGHT                    >                    :  
Location:                    <ORBITR>                                       PAGE 2-178  
Orb.No/Mission:                    <6                    >                    :  
Hardware/Software:<ORBITER                    >                    :  
Reference Data:                    N/A

Description:  
"AN EXCESSIVE AMOUNT OF ICE FORMED AROUND THE WATER-DUMP NOZZLES DURING STS-11 ON-ORBIT OPERATIONS. AS A RESULT OF ENTRY HEATING, THE ICE BROKE FREE AND CAUSED STRUCTURAL DAMAGE TO THE OMS POD. INSULATION AND OPERATIONAL IMPROVEMENTS WERE INVESTIGATED TO PRECLUDE RECURRENCE OF THIS PROBLEM. THE STS-14, HOWEVER, EXPERIENCED EXCESSIVE ICE FORMATION AROUND THE WATER-DUMP NOZZLES ALSO. PRIOR TO ENTRY, TAPS BY THE RMS DISLODGED THE EXCESSIVE ICE AND PREVENTED POSSIBLE STRUCTURAL DAMAGE DURING DESCENT. THE RECURRENCE OF THIS PROBLEM INDICATES THAT ADDITIONAL SAFEGUARDS NEED TO BE TAKEN TO PREVENT POSSIBLE DAMAGE ON FUTURE FLIGHTS."

\*\*\*\*\*

ID: < 700.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, PAGE 3-3  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A

Description:  
 \*GOAL: A MAJOR REDUCTION IN PER-FLIGHT DELIVERY COSTS, CORRESPONDING TO A 5 TO 10-FOLD COST REDUCTION IN DOLLARS PER POUND TO LOW EARTH ORBIT AS COMPARED TO SHUTTLE/CENTAUR .

\*\*\*\*\*  
ID: < 701.00>                    Issue(s): COST/MANHOURS                    : SECURITY  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, PAGE 3-43  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A

Description:  
 \*LESSONS LEARNED                    --- (CONT. ON 701.01) ---  
 . BE AFFORDABLE                    \* FACTOR OF TEN OPERATIONS COST REDUCTION  
 .                    \* LOW LIFE CYCLE COST PRESENT VALUE  
 .                    \* LOW SENSITIVITY TO FLIGHT RATE  
 .                    \* LOW NON-RECURRING COST  
 . HAVE HIGH OPERATIONAL                    \* ALL WEATHER                    \* FAULT TOLERANT  
 . AVAILABILITY                    \* UNDEMANDING ABORT  
 . BE FLEXIBLE                    \* EASY PAYLOAD INTEGRATION  
 .                    \* PROVIDE ASSURED ACCESS                    \* EXCESS PERFORMANCE  
 .                    \* PAYLOAD VOLUME FLEXIBILITY

\*\*\*\*\*  
ID: < 701.01>                    Issue(s): COST/MANHOURS                    : SECURITY  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, PAGE 3-43  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A

Description:  
 \*LESSONS LEARNED                    --- (CONT. FROM 701.00) ---  
 . BE INVULNERABLE                    \* DUAL COAST CAPABILITY FOR CRITICAL MISSIONS  
 . AND SURVIVABLE                    \* LOW ASSET RISK PER FLIGHT  
 .                    \* FEATURE MATURE TECHNOLOGY  
 . HAVE LOW COST/  
 . SCHEDULE RISK  
 . BE SECURE                    \* ABORT/FAILURE SECURITY  
 .                    \* MULTI-SITE OPERATIONS  
 . BE ENVIRONMENTALLY                    \* LACK OF POLLUTANTS  
 . ACCEPTABLE



ID: < 702.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, ANNEX 6 PAGE 2  
Operation: <GENERIC                    >  
Location: <ALL >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A

Description:  
"OPERATIONS AND SUPPORT GOALS TO REDUCE COSTS. IN ORDER TO REDUCE THE OPERATION AND SUPPORT COSTS TO THE REQUIRED LEVELS, THE MANHOURS REQUIRED TO SUPPORT AND OPERATE THE SYSTEM MUST BE REDUCED BY AT LEAST AN ORDER OF MAGNITUDE. REDUCED MANHOURS WILL SHORTEN THE VEHICLE TURNAROUND TIMES AND THE LAUNCH-TO-LAUNCH CYCLE DURATIONS OF THE FACILITIES. THIS WILL INCREASE THE THROUGHPUT OF THE FACILITIES AND UTILIZATION OF THE FLIGHT HARDWARE."

\*\*\*\*\*  
ID: < 703.00>                    Issue(s): RELIABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, ANNEX 6 PAGE 3  
Operation: <GENERIC                    >  
Location: <ALL >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A

Description:  
"TO INCREASE RELIABILITY, SYSTEMS AND COMPONENTS MUST BE SIMPLIFIED AND RUGGEDIZED AS MUCH AS PRACTICABLE TO REDUCE FAILURE MODES. PERFORMANCE MARGINS MUST BE INCREASED AND MORE EXTENSIVE QUALIFICATION TESTIN PERFORMED TO INCREASE MEAN TIME BETWEEN FAILURES (MTBF). HARDWARE DESIGNS MUST INCLUDE STATUS MONITORING FEATURES SO THAT SYSTEM HEALTH CAN EASILY AND QUICKLY DETERMINED. HARDWARE PERFORMANCE MUST BE COMPLETELY MAPPED AS A FUNCTION OF TIME IN SERVICE SO THAT REPLACEMENT AND MAINTENANCE CAN BE PLANNED TO MINIMIZE OPERATIONAL IMPACTS. WHERE REDUNDANCY IS REQUIRED FOR RELIABILITY OR SAFETY, SYSTEM DESIGNS AND FLIGHT RULES WILL ALLOW NGRMAL OPERATIONS DESPITE SINGLE FAILURES OCCURING AFTER THE LAST PLANNED CHECKOUT AND PRIOR TO LAUNCH."

\*\*\*\*\*  
ID: < 704.00>                    Issue(s): MAINTAINABILITY                    : MODULARIZATION  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, ANNEX 6 PAGE 3  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A

Description:  
"MAINTAINABILITY MUST BE IMPROVED MANYFOLD OVER THAT OF CURRENT SYSTEMS. WHERE POSSIBLE, MAJOR SYSTEMS MUST BE MODULARIZED FOR RAPID REPLACEMENT WITH SIMPLE INTERFACES BETWEEN REPLACEABLE MODULES, THE VEHICLE, AND ASSOCIATED GROUND SYSTEMS. RAPID CHANGEDOUT CAPABILITY FOR LINE REPLACEABLE UNITS (LRU'S) MUST BE EXPEDITED IN THE DESIGN STAGE. IN PARTICULAR, LRU CHANGEDOUT MUST NOT REQUIRE COMPROMISING THE INTEGRITY OF SYSTEMS OF WHICH IT IS NOT A PART. POST CHANGEDOUT LRU VERIFICATIONS SHALL BE MINIMIZED AND/OR ELIMINATED."

\*\*\*\*\*



ID: < 708.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, ANNEX 6 PAGE 6  
Operation: <HAZARDOUS                    >  
Location: <ALL                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A  
Description:  
 "FACILITY LOCATIONS"-FOR HAZARDOUS MATERIALS-"MUST BE SUCH THAT PLANNED OPERATIONS DO NOT PRECLUDE NORMAL OPERATIONS IN ADJACENT FACILITIES."

\*\*\*\*\*

ID: < 709.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, TABLE 6-1  
Operation: <ASSEMBLY                    >  
Location: <ALL                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A                    A.

Description:  
 \* LOGISTIC SYSTEM                    :                    OPERATIONAL CONCEPTS                    :                    SYSTEM  
 . COST DRIVER                    :                    :                    REQUIREMENTS  
 .  
 MECHANICAL INTERFACES                    \* MINIMIZES MATING                    \* MINIMIZE STAGING  
 LARGE VEHICLE MATE                    FUNCTIONS                    \* SELF ALIGNING, SIMPLE  
 . - SHIMMING                    MATING  
 . - NUMBER OF BOLTS                    \* MECHANICAL-NO ACCESS,  
 . - ACCESS                    NO CLOSEOUT LATCHING  
 .

\*\*\*\*\*

ID: < 710.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, TABLE 6-1  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A                    B.

Description:  
 \* LOGISTIC SYSTEM                    :                    OPERATIONAL CONCEPTS                    :                    SYSTEM  
 . COST DRIVER                    :                    :                    REQUIREMENTS  
 .  
 UMBILICAL INTERFACES                    \* DEMATE PRIOR TO LAUNCH                    \* T-0 UMBILICALS AT BASE  
 .- HAZARDOUS ACCESS                    \* PRELAUNCH VERIFICATION                    \* SELF-ALIGN/AUTO MATE  
 .- MATE VERIFICATION                    CONDUCTED WITHOUT                    \* INSTRUMENTATION  
 .- MAINTENANCE                    UMBILICALS                    DATA THROUGH NON  
 .- T-0 FUNCTIONING                    MECHANICAL LINKS

\*\*\*\*\*

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ID: < 711.00>          Issue(s): COST/MANHOURS      :
Issue(s) cont.:          :                          :
Issue Source: <NSTS     >      DRAFT DATED 5/86, TABLE 6-1
Operation:   <TEST      >
Location:    <ALL      >
Orb.No/Mission: <6      >
Hardware/Software:<AVIONICS >
Reference Data:  N/A          C.
Description:
* LOGISTIC SYSTEM      : OPERATIONAL CONCEPTS : SYSTEM
. COST DRIVER          :                   : REQUIREMENTS
.
AVIONICS/PAYLOAD CHECKOUT * SHIP AND SHOOT          * USE BUILT-IN-TEST
.- IN-LINE CALIBRATION   * ELIMINATE RETEST OF      * FUNCTIONAL VERIFICATION
.- IN-LINE FUNCTION      OPERATING SYSTEMS          OFF LINE
. VERIFICATION          * SELF CONTAINED CHECKOUT

```

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*****
ID: < 712.00>          Issue(s): COST/MANHOURS      : SAFETY
Issue(s) cont.:          :                          :
Issue Source: <NSTS     >      DRAFT DATED 5/86, TABLE 6-1
Operation:   <HAZARDOUS >
Location:    <ALL      >
Orb.No/Mission: <6      >
Hardware/Software:<MPS    >
Reference Data:  N/A          D.
Description:
* LOGISTIC SYSTEM      : OPERATIONAL CONCEPTS : SYSTEM
. COST DRIVER          :                   : REQUIREMENTS
.
PYRO DEVICES          * USE NON ELECTRICAL      * MINIMIZE PYRO DEVICES
.- HAZARDOUS OPERATIONS PYROTECHNIC INITIATORS * USE LASER INITIATED
.- REFURBISHMENTS      * CONDUCT ORDINANCE      PYRO DEVICES
.INSTALLATION OFF-LINE * USE MECHANICAL/
. ELECTRO/PNEUMATIC
. DEVICES

```

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*****
ID: < 713.00>          Issue(s): COST/MANHOURS      :
Issue(s) cont.:          :                          :
Issue Source: <NSTS     >      DRAFT DATED 5/86, TABLE 6-1
Operation:   <MAINTENANCE >
Location:    <ALL      >
Orb.No/Mission: <6      >
Hardware/Software:<TPS    >
Reference Data:  N/A          E.
Description:
* LOGISTIC SYSTEM      : OPERATIONAL CONCEPTS : SYSTEM
. COST DRIVER          :                   : REQUIREMENTS
.
THERMAL PROTECTION    * MINIMIZE INSPECTIONS   * NO BETWEEN FLIGHT
.- SYSTEM MAINTENANCE AND CLOSEDOUTS          SERVICING
. MINIMIZE REPAIR      * WEATHERPROOF

```

ID: < 714.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, TABLE 6-1  
Operation: <GENERIC                    >                    :  
Location: <ALL >                    :  
Orb.No/Mission: <G                    >                    :  
Hardware/Software:<SCAR                    >                    :  
Reference Data: N/A                    F.

Description:  
 \* LOGISTIC SYSTEM                    ;                    OPERATIONAL CONCEPTS                    ;                    SYSTEM  
 . COST DRIVER                    ;                    :                    REQUIREMENTS  
 .  
 PAYLOAD ACCOMMODATIONS                    \* MINIMIZE PAYLOAD                    \* P/L TO BE AUTONOMOUS  
 .- MISSION UNIQUE MODS                    UNIQUE FEATURES                    FROM LAUNCH VEHICLE  
 .- INLINE FUNCTION                    \* P/L TESTING OFF-LINE  
 . VERIFICATION                    PRIOR TO LAUNCH VEHICLE  
 .- ON-BOARD SERVICES                    INTEGRATION

\*\*\*\*\*

ID: < 715.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, TABLE 6-1  
Operation: <GENERIC                    >                    :  
Location: <ALL >                    :  
Orb.No/Mission: <G                    >                    :  
Hardware/Software:<N/A                    >                    :  
Reference Data: N/A                    G.

Description:  
 \* LOGISTIC SYSTEM                    ;                    OPERATIONAL CONCEPTS                    ;                    SYSTEM  
 . COST DRIVER                    ;                    :                    REQUIREMENTS  
 .  
 WEATHER DELAYS                    \* SHELTERED PREP FACILITIES/                    \* LAUNCH AND LANDING  
 .- LAUNCH                    MINIMIZE EXPOSURE (BASING)                    WEATHER LIMITS  
 .- LANDING                    \* ALL-WEATHER TPS                    SIMILAR TO AIRCRAFT  
 .                    AND SUB SYSTEMS                    \* ALL AIRFIELD CAPABILITY

\*\*\*\*\*

ID: < 716.00>                    Issue(s): COST/MANHOURS                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NSTS                    >                    DRAFT DATED 5/86, TABLE 6-1  
Operation: <LANDING                    >                    :  
Location: <ALL >                    :  
Orb.No/Mission: <G                    >                    :  
Hardware/Software:<N/A                    >                    :  
Reference Data: N/A                    H.

Description:  
 \* LOGISTIC SYSTEM                    ;                    OPERATIONAL CONCEPTS                    ;                    SYSTEM  
 . COST DRIVER                    ;                    :                    REQUIREMENTS  
 .  
 DESERVICING                    \* USE COMMODITIES THAT                    \* RETURNED COMMODITIES  
 .- HAZARDOUS OPERATIONS                    DO NOT REQUIRE                    PERMIT LONG TERM  
 .- INLINE FUNCTION                    DESERVICING                    STORAGE

\*\*\*\*\*



ID: < 720.00>  
Issue(s) cont.:  
Issue Source: <NSTS  
Operation: <TEST  
Location: <ALL >  
Orb.No/Mission: <G  
Hardware/Software:<N/A  
Reference Data: N/A

Issue(s): COST/MANHCURS :  
 :  
 > DRAFT DATED 5/86, TABLE G-1  
 >  
 >  
 >  
 L.

<p><u>Description:</u>          * LOGISTIC SYSTEM          . COST DRIVER          .          OPERATIONAL          SUPPORTABILITY          .- UNIQUE HANDLING          .- UNIQUE TESTING          .          .</p>	<p>OPERATIONAL CONCEPTS          :          :          * ESTABLISH COMMON          ATTACH APPROACH          * TEST AT SYSTEM LEVEL          ONLY</p>	<p>SYSTEM          REQUIREMENTS          * MINIMIZE MULTIPLE          DIAMETER STAGES          * USE "OFF-THE-SHELF"          CRANES, SLINGS, TRUCKS          TRACTORS, MOTIVE POWER</p>
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\*\*\*\*\*

ID: < 900.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: < LUCAS LTR TO HQ >                    5/13/82 "OPERATIONS EFFECTIVENESS"  
Operation: < GENERIC                    >                    (ED. NOTE: WRITTEN AFTER THE)  
Location: < KSC                    >                    (                    FIRST THREE FLIGHTS)  
Orb.No/Mission: < GENERIC                    >  
Hardware/Software: < SRB                    >  
Reference Data:    N/A                    PROGRAM REQ REDUCTION REVIEW--SRB TEAM

Description:  
RRR NO.                    TITLE  
SRB-1    DELETE SRB RECOVERY SYSTEM  
SRB-2    DELETE ONE BOOSTER SEPARATION MOTOR (BSM)  
SRB-3    DELETE SRB PARACHUTE FLASHING LIGHTS  
SRB-4    ELIMINATE SRB RATE BYRD ASSEMBLY  
SRB-5    REDUCE TPS REQUIREMENTS BASED ON DDT&E HEAT LOAD DATA  
SRB-6    REDUCE IGNITION OVERPRESSURE ON THERMAL CURTAIN  
SRB-7    REDUCE REQUIREMENTS FOR TVC SYSTEM TO ALLOW ALTERNATE APPROACHES  
SRB-8    RE-EVALUAUTE DESIGN FACTOR OF SAFETY FOR MOTOR CASE INSULATION BASED  
.                    UPON FIRED MOTOR STATISTICS                    (CONTINUED ON 901.00)

\*\*\*\*\*  
ID: < 901.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: < LUCAS LTR TO HQ >                    5/13/82 "OPERATIONS EFFECTIVENESS"  
Operation: < GENERIC                    >  
Location: < KSC                    >  
Orb.No/Mission: < GENERIC                    >  
Hardware/Software: < SRB                    >  
Reference Data:    N/A                    PROGRAM REQ REDUCTION REVIEW--SRB TEAM

Description:  
RRR NO.                    TITLE                    (CONTINUED FROM 900.00)  
SRB-9    RE-EVALUATE MEDP USING STASTICAL VARIABILITY OF TEMPERATURE AND PRESS.  
SRB-10   REDUCE ADHESION STRENGTH REQUIREMENT ON MSA  
SRB-11   ELIMINATE TOPCOAT PAINT FROM SRM/SRB  
SRB-12   RE-EVALUATE SRB RE-USE ACCEPTANCE CRITERIA  
SRB-13   REVIEW ALL REUSE REQUIREMENTS WHICH HAVE DRIVEN SRB DESIGN  
SRB-14   DELETE FLASHING LIGHT AND RF BEACON FROM FORWARD SKIRT  
SRB-15   REDUCE MSA-1 AND MSA-2 CURE TEMPERATURE  
SRB-16   REWORK ICD'S TO ELIMINATE NON-ICD DATA AND RELAX TOLERANCES ON  
.                    REMAINING ICD REQUIREMENTS                    (CONTINUED ON 902.00)

\*\*\*\*\*  
ID: < 902.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: < LUCAS LTR TO HQ >                    5/13/82 "OPERATIONS EFFECTIVENESS"  
Operation: < GENERIC                    >  
Location: < KSC                    >  
Orb.No/Mission: < GENERIC                    >  
Hardware/Software: < SRB                    >  
Reference Data:    N/A                    PROGRAM REQ REDUCTION REVIEW--SRB TEAM

Description:  
RRR NO.                    TITLE                    (CONTINUED FROM 901.00)  
SRB-17   REDUCE DATA REQUIREMENTS CURRENTLY INCLUDED IN ACCEPTANCE DATA PACKAGES  
SRB-18   REDUCE DATA PACKAGE REQUIREMENTS BASED ON HARDWARE CRITICALITY  
SRB-19   REDUCE REQUIREMENTS FOR MAINTENANCE MANUALS  
SRB-20   DELETE REQUIREMENTS FOR TC TO SUPPORT MSFC PROBLEM ASSESSMENT CENTER  
SRB-21   REDUCE REQUIREMENTS FOR DCAS-USBI DUAL INSPECTIONS  
SRB-22   ELIMINATE CUSTOMIZED SOURCE INSPECTION PLAN ON HARDWARE OTHER THAN  
.                    CRITICALITY 1.  
SRB-23   OPTIMIZE AND MINIMIZE THE MIP'S IN MANUFACTURING OPS  
.                    (CONTINUED ON 903.00)

\*\*\*\*\*

























ID: <1000.00>            Issue(s): CANNIBALIZATION        : MAINTAINABILITY  
Issue(s) cont.: LOGISTICS/SPARES                                :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE        >  
Location: <KSC        >  
Orb.No/Mission: <G                >  
Hardware/Software:<FCE                >        PROGRAM REF: STS  
Reference Data:    N/A

Description:  
FCE SHOULD BE REFURBISHED AND MAINTAINED AT LAUNCH SITE TO ASSURE AVAILABILITY OF EQUIPMENT TO SUPPORT VEHICLE PROCESSING FLOW SCHEDULES.

\*\*\*\*\*

ID: <1001.00>            Issue(s): LOGISTICS/SPARES        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE        >  
Location: <KSC        >  
Orb.No/Mission: <G                >  
Hardware/Software:<N/A                >        PROGRAM REF: STS  
Reference Data:    N/A

Description:  
FUND AND MAINTAIN A SUITABLE SPARES PROGRAM FROM THE BEGINNING OF THE PROGRAM.

\*\*\*\*\*

ID: <1002.00>            Issue(s): DESIGN CRITERIA        : LOGISTICS/SPARES  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE        >  
Location: <KSC        >  
Orb.No/Mission: <G                >  
Hardware/Software:<N/A                >        PROGRAM REF: STS  
Reference Data:    N/A

Description:  
USE STANDARD INDUSTRY HARDWARE RATHER THAN UNIQUE HARDWARE. UNIQUE HARDWARE LIMITS THE AVAILABILITY OF SPARES AND DRIVES UP THE COST.

\*\*\*\*\*



ID: <1006.00>            Issue(s): MAINTAINABILITY    : LOGISTICS/SPARES  
Issue(s) cont.:            :            :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <MAINTENANCE    >  
Location:    <KSC    >  
Orb.No/Mission:    <G            >  
Hardware/Software:<FCE            >    PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
FLIGHT CREW EQUIPMENT (FCE) TURNAROUND MUST BE IMPROVED TO ACCOMODATE  
ACCELERATED LAUNCH SCHEDULES.

\*\*\*\*\*  
ID: <1007.00>            Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:            :            :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <TEST            >  
Location:    <LCC    >  
Orb.No/Mission:    <G            >  
Hardware/Software:<GDAL            >    PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
DEVELOP METHOD FOR CONSOLE OPERATOR TO IDENTIFY WHICH VEHICLE/FACILITY HE IS  
CONTROLLING. WITH FOUR ALMOST IDENTICAL FIRING ROOMS/CONSOLES, AN AUTOMATED  
ELECTRONIC SIGN ON EACH MIGHT PREVENT DISASTER.

\*\*\*\*\*  
ID: <1008.00>            Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:            :            :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <MAINTENANCE    >  
Location:    <ORBITR>  
Orb.No/Mission:    <G            >  
Hardware/Software:<PV&D            >    PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
PROTECTIVE COVERS SHOULD BE PROVIDED FOR DUCTS IN HIGH TRAFFIC AREAS.

\*\*\*\*\*





ID: <1015.00>                    Issue(s): ACCESSABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
ACCESSIBILITY OF LRU'S SHOULD BE A PRIME CONSIDERATION AS WELL AS EASE OF  
REMOVAL AND REPLACEMENT

\*\*\*\*\*  
ID: <1016.00>                    Issue(s): COMMONALITY                    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE                    >  
Location: <KSC >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
DESIGN FOR COMMON FITTINGS, FASTENERS AND TOOLS.

\*\*\*\*\*  
ID: <1017.00>                    Issue(s): ACCESSABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE                    >  
Location: <ORBTR>  
Orb.No/Mission: <6                    >  
Hardware/Software:<PV&D                    >                    PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
PRESENT COOLING SYSTEM HINDERS THE REMOVAL AND REPLACEMENT OF LRU'S/SRU'S.

\*\*\*\*\*



ID: <101B.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <REPAIR                    >  
Location: <ORBITR>  
Orb.No/Mission: <G                    >  
Hardware/Software:<PV&D               >        PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
A STRENGTHENED DUCT MATERIAL SHOULD BE SOUGHT.

\*\*\*\*\*  
ID: <1020.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <TEST                    >  
Location: <KSC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A               >        PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
DESIGN EACH SYSTEMS READOUT AND DISPLAYS IN A SINGLE AREA FOR USER COMFORT AND AVOIDANCE OF THE ARTHRITIC NECK SYNDROME.

\*\*\*\*\*  
ID: <1021.00>                    Issue(s): MAINTAINABILITY                    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <REPAIR                    >  
Location: <KSC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A               >        PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
SPECIAL CARE SHOULD BE TAKEN WITH FLUID LINES. THEY SHOULD BE DESIGNED WITH OPTIMUM PROTECTION. FOR FUTURE PROGRAMS, A QUICK REPAIR PATCH KIT SHOULD BE DESIGNED.



























ID: <1063.00> Issue(s): DESIGN CRITERIA : MAINTAINABILITY  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
MAINT REQ'S SHOULD BE: I.D. PRIOR TO DESIGN START; IMPOSED AT SUB CONTACTOR  
LEVEL. I/F DESIGN REQ'S MUST ADDRESS MAINTENANCE.

\*\*\*\*\*  
ID: <1065.00> Issue(s): DESIGN CRITERIA : MAINTAINABILITY  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
DESIGN SYSTEM TO ENABLE FUSE CHANGEDOUT/CIRCUIT BREAKER/RESET WITHOUT DISTURBING  
SYSTEM INTEGRITY.

\*\*\*\*\*  
ID: <1066.00> Issue(s): DESIGN CRITERIA : MANAGEMENT  
Issue(s) cont.: RELIABILITY : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
DESIGN IS A COMPROMISE BETWEEN PERFORMANCE, RELIABILITY, MAINTAINABILITY,  
WEIGHT, SPACE RESTRICTIONS, SAFETY, ETC. MGMT. MUST RE-PRIORITIZE THESE FACTORS  
SO MAINTAINABILITY RECEIVED IT'S DESERVED ATTENTION.

\*\*\*\*\*



ID: <1071.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >                    PROGRAM REF: STS  
Reference Data: N/A  
Description:  
REPLACEMENT PROCEDURES MUST BE DEVELOPED FOR ALL LINE REPLACEABLE UNITS.

\*\*\*\*\*  
ID: <1072.00>                    Issue(s): DESIGN CRITERIA                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <HAZARDOUS >  
Location: <KSC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >                    PROGRAM REF: STS  
Reference Data: N/A  
Description:  
SEEK A LESS HAZARDOUS FUEL TO SUBSTITUTE FOR THE PRESENTLY USED HYDRAZINE.

\*\*\*\*\*  
ID: <1073.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >                    PROGRAM REF: STS  
Reference Data: N/A  
Description:  
ALL ACCESS DOORS SHOULD BE DESIGNED KEEPING ATTACHMENT HARDWARE TO THE MINIMUM  
REQUIRED.

\*\*\*\*\*













ID: <1100.00> Issue(s): TECHNOLOGY :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <ORBITR>  
Orb.No/Mission: <S >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
BUILD ON-BOARD DATA ANALYSIS AND ARTIFICIAL INTELLIGENCE INTO THE SYSTEM.

\*\*\*\*\*  
ID: <1101.00> Issue(s): DESIGN CRITERIA : FAULT DETECTION  
Issue(s) cont.: AUTOMATION :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <S >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
DESIGN SELF-DIAGNOSIS INTO SYSTEMS WHICH IDENTIFY SYSTEM DEGRADATION AS WELL AS  
HARD FAILURES.

\*\*\*\*\*  
ID: <1102.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <S >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
FUNCTIONAL COMPONENTS SHOULD BE NEITHER BRAZED NOR WELDED INTO THE SYSTEM.

\*\*\*\*\*



ID: <1107.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <FAULT ISOLATION >  
Location: <KSC >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data: N/A

Description:  
THE LACK OF PRE-DEVELOPED TROUBLE SHOOTING PROCEDURES REQUIRE THE PERSONNEL ON STATION TO RESOLVE THE PROBLEM. THIS RESULTS IN EXPENDED MANHOURS TO REDOCUMENT TROUBLE SHOOTING, REMOVAL AND REPLACEMENT AND RETEST PROCEDURES.

\*\*\*\*\*  
ID: <1108.00>                    Issue(s): MAINTAINABILITY                    : PROCEDURE  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data: N/A

Description:  
MAINTENANCE PROCEDURES SHOULD BE PROGRAMMED INTO A DATA BASE THAT WOULD INCLUDE TROUBLESHOOTING, LRU AND RETEST PROCEDURES FOR ALL SUB-SYSTEMS.

\*\*\*\*\*  
ID: <1109.00>                    Issue(s): ACCESSABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data: N/A

Description:  
DUE TO WEIGHT RESTRICTIONS, THE GN&C SYSTEM HAVE BEEN INCORPORATED WITH OTHER SYSTEMS IN ORBITER AVIONIC BAYS. THIS INCORPORATION LIMITS ACCESSIBILITY TO SYSTEM COMPDNENTS.

\*\*\*\*\*



ID: <1110.00> Issue(s): ISOLATION :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <TEST >  
Location: <ORBITR>  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
POTABLE AND WASTE WATER SYSTEMS SHOULD NOT BE INTERCONNECTED.

\*\*\*\*\*  
ID: <1111.00> Issue(s): DRAWING SYSTEM :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
ANY MODIFICATION OF CONTRACTOR OR GOVERNMENT FURNISHED EQUIPMENT SHOULD BE CLEARLY IDENTIFIED ON THE PART AND DRAWING.

\*\*\*\*\*  
ID: <1112.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ORBITR>  
Orb.No/Mission: <G >  
Hardware/Software:<SSME > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
THE USE OF LIGHT-WEIGHT HEAT SHIELDS PROVIDES AN EXAMPLE OF MAINTAINABILITY BEING BUILT INTO THE ORBITER. SINCE THEY ARE SEGMENTED, ONLY A SECTION HAS TO BE REMOVED TO WORK ON THE ENGINES.

\*\*\*\*\*



























ID: <1164.00>                    Issue(s): PROCEDURE                    : MAINTAINABILITY  
Issue(s) cont.:                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <MAINTENANCE                    >  
Location:                    <KSC                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data:                    N/A

Description:  
MAINTENANCE PROCEDURES COULD BE AUTOMATED AND APPLIED AT THE RECEIVING GROUND STATION WHERE MEASUREMENTS CAN BE MONITORED INDIVIDUALLY VIA COMPUTER.

\*\*\*\*\*

ID: <1165.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <TEST                    >  
Location:                    <LCC                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<GOAL                    >                    PROGRAM REF: STS  
Reference Data:                    N/A

Description:  
LATEST TECHNOLOGY SHOULD BE PURSUED, AS CCMS TECHNOLOGY USED ON STS IS FIFTEEN YEARS OLD.

\*\*\*\*\*

ID: <1166.00>                    Issue(s): COST/MANHOURS                    : SAFETY  
Issue(s) cont.: DESIGN CRITERIA                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <TEST                    >  
Location:                    <KSC                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data:                    N/A

Description:  
MANY RESOURCES WERE EXPENDED GATHERING GAS SAMPLES OF RESTRICTED/CONFINED AREAS . FIXED SAMPLING EQUIPMENT WITH EXTERNAL READOUTS WOULD HAVE SAVED RESOURCES.

\*\*\*\*\*











ID: <1190.00> Issue(s): TECHNOLOGY :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
UTILIZE ENABLED TOUCH PADS WHEREVER PRACTICAL.

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\*\*\*\*\*  
ID: <1193.00> Issue(s): FAULT DETECTION : MAINTAINABILITY  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
USE SELF TESTING LRUS TO AVOID THE REQUIREMENT OF SYSTEM CHECKOUT FOLLOWING  
CHANGEOUT.

\*\*\*\*\*  
ID: <1194.00> Issue(s): ISOLATION : DESIGN CRITERIA  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ORBITR>  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
DESIGN THE VEHICLE TO BE AS INDEPENDENT OF GSE AS POSSIBLE.

\*\*\*\*\*



ID: <1199.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:   <TEST                    >  
Location:   <ORBITR>  
Orb.No/Mission:   <6                    >  
Hardware/Software: <AVIONICS                    >                    PROGRAM REF: STS  
Reference Data:   N/A  
Description:  
USE LASER GYROS RATHER THAN MECHANICAL GYROS.

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ID: <1223.00>                    Issue(s): COMMONALITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A

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Description:  
CREW-USE HARDWARE SUCH AS FASTENERS, ELECTRICAL & PLUMBING CONNECTORS, SWITCHES  
, CIRCUIT BREAKERS & SCREWS SHOULD BE STANDARDIZED TO FACILITATE CREW  
OPERATIONS, REDUCE CREW ERRORS, AND REDUCE CREW TRAINING REQUIREMENTS.

\*\*\*\*\*  
ID: <1224.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A

Description:  
A VISUAL ATTITUDE REFERENCE SHOULD BE PROVIDED IN MANNED SPACECRAFT. LOSS OF  
THE STAR TRACKER ON SKYLAB RESULTED IN LOSS OF Z-AXIS ATTITUDE DETERMINATION  
CAPABILITY. CREW REQUIRED INSTRUCTIONS FROM THE GROUND TO CORRECT ATTITUDE.

\*\*\*\*\*  
ID: <1226.00>                    Issue(s): PROCEDURE                    : CHANGE CONTROL  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A

Description:  
A MINIMUM NUMBER OF COORDINATE SYSTEMS SHOULD BE ADOPTED TO AVOID THE CONFUSION  
AND NUMBER OF COORDINATION MEETINGS RESULTING FROM MULTIPLE COORDINATE SYSTEMS.  
SKYLAB PROGRAM USED 10 DIFFERENT SYSTEMS WHICH REQUIRED MUCH EFFORT TRANSFERING  
FROM ONE SYSTEM TO ANOTHER.

\*\*\*\*\*

ID: <1227.00>                    Issue(s): SAFETY                    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                    >  
Location:    <SC                    >  
Orb.No/Mission:    <6                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:    N/A

Description:  
CONTROL CONSOLES SHOULD NOT BE LOCATED IN MAJOR CREW TRAFFIC ROUTES. WHEN CONTROL PANELS ARE LOCATED IN TRAFFIC AREAS, BUMP-PROOF SWITCH GUARDS SHOULD BE INCORPORATED TO PRECLUDE INADVERTANT SWITCH ACTUATIONS.

\*\*\*\*\*

ID: <1228.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                    >  
Location:    <SC                    >  
Orb.No/Mission:    <6                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:    N/A

Description:  
BACKUP SYSTEM SHOULD BE DIFFERENT & SIMPLER IN DESIGN TO PROVIDE "TRUE" REDUNDANCY. SKYLAB CAME VERY CLOSE TO LOSING ALL RATE GYROS IN A SINGLE AXIS BECAUSE OF GENERIC DESIGN PROBLEMS WITH THE GYROS.

\*\*\*\*\*

ID: <1233.00>                    Issue(s): PROCEDURE                    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                    >  
Location:    <SC                    >  
Orb.No/Mission:    <6                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:    N/A

Description:  
TRASH SHOULD BE SEPERATED INTO BIOLOGICALLY ACTIVE AND INACTIVE MATERIAL. DAILY DISPOSAL OF ACTIVE MATERIAL IS NECESSARY, WHEREAS LESS FREQUENT DISPOSAL OF INACTIVE MATERIAL IS SATISFACTORY.

\*\*\*\*\*



ID: <1238.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                    >  
Location:    <SC                        >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A               >                PROGRAM REF: SKYLAB  
Reference Data:    N/A

Description:  
SCRAMBLING OF A/G COMM SHOULD BE CONSIDERED TO ENSURE PRIVACY. IF PRIVATE A/G COMM IS TO BE IMPLEMENTED, IT SHOULD NOT BE DEPENDENT ON MULTIPLE WORK-AROUND PROCEDURES.

\*\*\*\*\*  
ID: <1239.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation:   <GENERIC                    >  
Location:    <ALL                        >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A               >                PROGRAM REF: SKYLAB  
Reference Data:    N/A

Description:  
ESTABLISH SINGLE CONTROL AUTHORITY FOR COMPLETE EXPERIMENT DATA PROCESSING TO ENSURE MAXIMUM COMMONALITY, INCLUDING REVIEW ANALYSIS AND RESOLUTION OF EXPERIMENT DATA PROCESSING PROBLEMS AND INTERFACES.

\*\*\*\*\*  
ID: <1240.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation:   <SCHEDULING                    >  
Location:    <ALL                        >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A               >                PROGRAM REF: SKYLAB  
Reference Data:    N/A

Description:  
ASSIGN EXPERIMENT DATA DECOMPRESSION PROCESSING TO A SINGLE ORGANIZATION. USE ONLY ONE COMPUTER SYSTEM IN EACH DATA PROCESSING OPERATION IN WHICH VARIOUS MANUFACTURER'S TAPE DRIVERS ARE USED.

\*\*\*\*\*



ID: <1242.00>                    Issue(s): DESIGN                    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <GENERIC                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A

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Description:  
HARDWARE NOMENCLATURE SHOULD BE STANDARDIZED THROUGHOUT THE PROGRAM. ON SKYLAB, MANY NAMES EXISTED FOR A SINGLE ITEM, AND THIS NONSTANDARDIZATION RESULTED IN CONFUSION, AMBIGUITY AND LOST TIME.

\*\*\*\*\*  
ID: <1244.00>                    Issue(s): DESIGN CRITERIA                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <FLIGHT                    >  
Location:                    <SC                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A

Description:  
WASTE GASES & LIQUIDS VENTED FROM SPACECRAFT COULD BE USED FOR ATTITUDE CONTROL BY VENTING THROUGH DIRECTIONAL NOZZLES. ENERGY COULD BE USED TO IMPROVE MOMENTUM POSITIONS OF CONTROL MOMENT GYROSCOPES.

\*\*\*\*\*  
ID: <1245.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <FLIGHT                    >  
Location:                    <SC                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A

Description:  
STOWAGE OF TRASH "EXTERNAL" TO THE HABITABLE VOLUME OF THE SPACECRAFT IS HIGHLY DESIRABLE. A COMPACTOR SEEMS LIKE A DESIRABLE FEATURE.

\*\*\*\*\*







ID: <1277.00>                    Issue(s): PROCEDURE                    : EFFICIENCY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <FLIGHT                    >  
Location:                    <SC                    >  
Orb.No/Mission:                    <6                    >  
Hardware/Software: <N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A  
Description:  
A PRACTICAL AND STREAMLINED EQUIPMENT STOWAGE INVENTORY MANAGEMENT AND ACCOUNTING SYSTEM.

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\*\*\*\*\*  
ID: <1278.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <FLIGHT                    >  
Location:                    <SC                    >  
Orb.No/Mission:                    <6                    >  
Hardware/Software: <N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A  
Description:  
OPERATIONAL CONSTRAINTS AND/OR CAPABILITIES SHOULD BE CONSIDERED BEFORE USING A COMMON SYSTEM FOR MORE THAN ONE EXPERIMENT.

\*\*\*\*\*  
ID: <1279.00>                    Issue(s): DESIGN CRITERIA                    : LOGISTICS/SPARES  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <FLIGHT                    >  
Location:                    <SC                    >  
Orb.No/Mission:                    <6                    >  
Hardware/Software: <N/A                    >                    PROGRAM REF: SKYLAB  
Reference Data:                    N/A  
Description:  
ACCURATE, RELIABLE INDICATIONS OF USAGE OF FILM AND TAPE CONSUMABLES ARE NECESSARY FOR EFFECTIVE CONSUMABLES MANAGEMENT AND PROPER DATE-RECORDING VERIFICATION.

\*\*\*\*\*

ID: <1280.00> Issue(s): CONSTRAINTS : ISOLATION  
Issue(s) cont.: DESIGN CRITERIA :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB  
Reference Data: N/A

Description:  
PERFORMANCE OF AN EXPERIMENT SHOULD BE INDEPENDENT OF SPACECRAFT. THE DAY-TO-  
DAY ACTIVITIES IN THE SPACECRAFT SHOULD NOT BE SEVERELY RESTRICTED BECAUSE  
OF THE VARIOUS OPERATION CONSTRAINTS ON THE EXPERIMENT.

\*\*\*\*\*

ID: <1281.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB  
Reference Data: N/A

Description:  
USE CONVENTIONAL, WELL-PROVEN PIECE PARTS WITH GENEROUS TOLERANCES.

\*\*\*\*\*

ID: <1282.00> Issue(s): MAINTAINABILITY : DESIGN CRITERIA  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB  
Reference Data: N/A

Description:  
CRITERIA GOVERNING THE DESIGN OF EXPERIMENT HARDWARE OVERRIDE SHOULD INCLUDE  
EASE OF OPERATION, SPACECRAFT INTERFACE, MANUAL OVERRIDE AND MAINTAINABILITY.

\*\*\*\*\*

ID: <1284.00>                    Issue(s): DESIGN CRITERIA        : FAULT DETECTION  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >        PROGRAM REF: SKYLAB  
Reference Data:    N/A  
Description:  
AUTOMATIC CONTROL LIMITS SHOULD BE BASED ON MEASUREMENTS OF THE CRITICAL  
CONDITION, NOT ON AN INTERMEDIATE COMPUTATION.

\*\*\*\*\*  
ID: <1286.00>                    Issue(s): FAULT DETECTION        : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >        PROGRAM REF: SKYLAB  
Reference Data:    N/A  
Description:  
AVOID LOGIC RACE CONDITIONS THAT IMPOSE TIME-DELAY CONSTRAINTS ON SWITCH  
ACTUATIONS BY THE CREW.

\*\*\*\*\*  
ID: <1287.00>                    Issue(s): DESIGN CRITERIA        : FAULT DETECTION  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >        PROGRAM REF: SKYLAB  
Reference Data:    N/A  
Description:  
AVOID MULTIPLE SYSTEM CONTROLS THAT INCLUDE NUMEROUS INVALID MODES IN THE  
VARIOUS PERMUTATIONS OF SWITCH SETTINGS.

\*\*\*\*\*

ID: <1288.00>                Issue(s): DESIGN CRITERIA        :  
Issue(s) cont.:   :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                     >  
Location: <SC                         >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A               >        PROGRAM REF: SKYLAB  
Reference Data:   N/A  
Description:  
DESIGN TO FACILITATE LAST-MINUTE LOADING OF SENSITIVE EXPENDABLES REQUIRING A CONTROLLED ENVIRONMENT.

\*\*\*\*\*

ID: <1289.00>                Issue(s): COMMONALITY                 : DESIGN CRITERIA  
Issue(s) cont.:   :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                     >  
Location: <SC                         >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A               >        PROGRAM REF: SKYLAB  
Reference Data:   N/A  
Description:  
STANDARDIZATION FOR THE DESIGN OF OPERATING CONTROLS AND DISPLAYS.

\*\*\*\*\*

ID: <1290.00>                Issue(s): DESIGN CRITERIA        : SAFETY  
Issue(s) cont.: ACCESSABILITY   :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                     >  
Location: <SC                         >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A               >        PROGRAM REF: SKYLAB  
Reference Data:   N/A  
Description:  
NEED FOR SIMPLE IN-ORBIT RESTRAINTS FOR LOOSE EQUIPMENT. SIMPLER CONCEPTS WOULD HAVE PROBABLY SAVED COST, WEIGHT, COMPLEXITY AND CREW TIME.

\*\*\*\*\*



ID: <1291.00>                Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:    :        :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                        >  
Location:     <SC                              >  
Orb.No/Mission: <G                           >  
Hardware/Software:<N/A                     >        PROGRAM REF: SKYLAB  
Reference Data:    N/A  
Description:  
STANDARDIZATION FOR THE DESIGN OF OPERATING CONTROLS AND DISPLAYS.

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ID: <1292.00>                Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:    :        :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                        >  
Location:     <SC                              >  
Orb.No/Mission: <N/A                           >  
Hardware/Software:<N/A                     >        PROGRAM REF: SKYLAB  
Reference Data:    N/A  
Description:  
MULTILAYER FILM-TYPE INSULATION, ADEQUATELY PROTECTED BY PURGE DURING GROUND OPERATIONS, VENTS READILY IN ORBIT TO PROVIDE THE REQUIRED THERMAL PROTECTION.

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ID: <1294.00>                Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:    :        :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                        >  
Location:     <SC                              >  
Orb.No/Mission: <G                           >  
Hardware/Software:<N/A                     >        PROGRAM REF: SKYLAB  
Reference Data:    N/A  
Description:  
EXPERIMENT DATA IDENTIFICATION, RECORDING AND TELEMETERING. EACH TELESCOPE SHOULD HAVE ITS OWN INDEPENDENT ALIGNMENT AND POINTING SYSTEM.

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ID: <1295.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB  
Reference Data: N/A  
Description:  
PRESTORE BUFFER VIEWING CAPABILITY. THIS PERMITS GROUND OR ONBOARD VIEWING OF  
THE INFORMATION BEFORE ITS PLACEMENT IN THE SOFTWARE WORKING MEMORY.

\*\*\*\*\*  
ID: <1297.00> Issue(s): COMMONALITY : DESIGN CRITERIA  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB  
Reference Data: N/A  
Description:  
CAMERAS, FILM CANISTERS, STORAGE CONTAINERS AND FILM PROCESSING EQUIPMENT  
SHOULD NOT UTILIZE NON-ANODIZE ALUMINUM OR COPPER WHERE SCHULMAN TYPE FILMS  
ARE EMPLOYED.

\*\*\*\*\*  
ID: <1298.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB  
Reference Data: N/A  
Description:  
ONBOARD EXPERIMENT DATA READOUT AND ASSESSMENT CAPABILITY SHOULD BE DESIGNED IN  
TO ALL FUTURE MANNED SPACECRAFT.

\*\*\*\*\*

ID: <1299.00>                    Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:                                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                            >  
Location:   <SC                                    >  
Orb.No/Mission: <G                                    >  
Hardware/Software:<N/A                                    >       PROGRAM REF: SKYLAB  
Reference Data:    N/A

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Description:  
AN ALARM TO INDICATE LOSS OF GROUND POWER TO FOOD FREEZERS WAS ISOLATED TO THE  
SAME GROUND POWER SOURCE, AUTO SWITCHING WAS NOT A DESIGN FEATURE. EMERGENCY  
INDICATORS SHOULD BE INDEPENDENTLY ENERGIZED.

\*\*\*\*\*

ID: <1300.00>                    Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:                                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                            >  
Location:   <SC                                    >  
Orb.No/Mission: <G                                    >  
Hardware/Software:<N/A                                    >       PROGRAM REF: SKYLAB  
Reference Data:    N/A

Description:  
SUFFICIENT MONITORING CAPABILITY TO VERIFY PROPER SYSTEM OPERATION.

\*\*\*\*\*

ID: <1304.00>                    Issue(s): DESIGN CRITERIA     : STANDARDS  
Issue(s) cont.:                                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                            >  
Location:   <SC                                    >  
Orb.No/Mission: <G                                    >  
Hardware/Software:<N/A                                    >       PROGRAM REF: SKYLAB  
Reference Data:    N/A

Description:  
STANDARDIZATION FOR THE DESIGN OF OPERATING CONTROLS AND DISPLAYS.

\*\*\*\*\*

ID: <1306.00> Issue(s): PROCEDURE :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB  
Reference Data: N/A

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Description:  
CARRYING MORE EXPERIMENT CONSUMABLES (FILMS, TAPES, ETC.) THAN HAD BEEN INCLUDED IN THE PLANNING REQUIREMENT.

\*\*\*\*\*

ID: <1308.00> Issue(s): DESIGN CRITERIA : COMMONALITY  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB  
Reference Data: N/A

Description:  
DRY AIR RATHER THAN INERT GAS SHOULD BE THE PURGE MEDIUM. THE RELATIVELY MODEST DECREASE IN CONTAMINATION POTENTIAL DOES NOT JUSTIFY THE RISK OF LARGE-VOLUME INERT GAS PURGES.

\*\*\*\*\*

ID: <1311.00> Issue(s): COMMONALITY :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A

Description:  
STRESS COMMONALITY OF COMPONENTS THROUGHOUT SYSTEMS.

\*\*\*\*\*

ID: <1312.00>                    Issue(s): MAINTAINABILITY       :  
Issue(s) cont.:                                        :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                    >  
Location:    <SC                        >  
Orb.No/Mission:   <G                        >  
Hardware/Software:<N/A                >       PROGRAM REF: SPACE LAB  
Reference Data:    N/A  
Description:  
CONTRACTOR TO POSSESS ABILITY TO TROUBLESHOOT AND FUNCTIONALLY TEST HIS PRODUCT

\*\*\*\*\*  
ID: <1313.00>                    Issue(s): ACCESSABILITY       : DESIGN CRITERIA  
Issue(s) cont.:                                        :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                    >  
Location:    <SC                        >  
Orb.No/Mission:   <G                        >  
Hardware/Software:<N/A                >       PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
PROVIDE USER FRIENDLY EASY TO LEARN INTERFACES AND TOOLS. DESIGN FOR ACCESSIBILITY TO ALL COMPONENTS.

\*\*\*\*\*  
ID: <1314.00>                    Issue(s): DESIGN CRITERIA   : ACCESSABILITY  
Issue(s) cont.: MAINTAINABILITY       :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                    >  
Location:    <SC                        >  
Orb.No/Mission:   <G                        >  
Hardware/Software:<N/A                >       PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
CONSIDER EVA INSPECTION AND REPAIR DURING THE DESIGN REQUIREMENTS PHASE OF A PROGRAM.

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ID: <1318.00>                      Issue(s): MAINTAINABILITY        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                      >  
Location: <SC                              >  
Orb.No/Mission: <G                              >  
Hardware/Software:<N/A                      >        PROGRAM REF: STS  
Reference Data:        N/A

Description:  
THE AVAILABILITY OF SYSTEMS AND EQUIPMENT, IE, AMOUNT OF TIME A SYSTEM IS AVAILABLE TO PERFORM ITS INTENDED FUNCTION CAN BE SIGNIFICANTLY IMPROVED BY EMPHASIZING MAINTAINABILITY FEATURES.

\*\*\*\*\*

ID: <1319.00>                      Issue(s): FAULT DETECTION        : LOGISTICS/SPARES  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                      >  
Location: <SC                              >  
Orb.No/Mission: <G                              >  
Hardware/Software:<N/A                      >        PROGRAM REF: SKYLAB-KSC  
Reference Data:        N/A

Description:  
ENSURE OPERATIONAL MAINTENANCE REQUIREMENTS ARE ON LRU TAPE SCALE. THIS WILL MINIMIZE SKILLS EFFORTS NEEDED WHEN REPLACEMENT IS REQUIRED.

\*\*\*\*\*

ID: <1320.00>                      Issue(s): CHANGE CONTROL        : DESIGN CRITERIA  
Issue(s) cont.: DRAWING SYSTEM        : COMM'LIZATION        :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                      >  
Location: <SC                              >  
Orb.No/Mission: <G                              >  
Hardware/Software:<N/A                      >        PROGRAM REF: SKYLAB-KSC  
Reference Data:        N/A

Description:  
USE COMMERCIAL EQUIPMENT ALTHOUGH IT MAY REQUIRE OUTGASSING, SPECIAL LUBRICANTS , ETC.

\*\*\*\*\*

ID: <1321.00>            Issue(s): MAINTAINABILITY    : PROCEDURE  
Issue(s) cont.: DESIGN CRITERIA            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                            >  
Orb.No/Mission: <G                       >  
Hardware/Software:<N/A                >        PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
VERIFY SS DESIGNS AND SATISFY MAINTAINABILITY BY USING COMMON DATA BASE  
COMPUTER/ACCESS SYSTEMS. USE PROPER DATA, RECORDS, PROCEDURES AND DATA BASE.  
TEST WITH PROPER OBJECTIVES.

\*\*\*\*\*

ID: <1322.00>            Issue(s): DESIGN CRITERIA        : FAULT DETECTION  
Issue(s) cont.: MAINTAINABILITY            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                            >  
Orb.No/Mission: <G                       >  
Hardware/Software:<N/A                >        PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
CONFIGURE SYSTEMS WITH FAULT TOLERANCE AND AUTOMATIC RECOVERY SUCH THAT ONLY  
PERIODIC MAINTENANCE IS REQUIRED.

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ID: <1324.00>            Issue(s): PROCEDURE                : FAULT DETECTION  
Issue(s) cont.:                                :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                            >  
Orb.No/Mission: <G                       >  
Hardware/Software:<N/A                >        PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
USE ROBOTICS AND CONSTANT SELF CHECKING. HAVE ALL MAINTENANCE PROCEDURES ON  
VIDEODISK (OR EQUIVALENT) IN LIEU OF PAPER.

\*\*\*\*\*



ID: <1325.00> Issue(s): DESIGN CRITERIA : COST/MANHOURS  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A

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Description:  
SET UP A GOOD QUALIFICATION TEST PROGRAM, I.E., USE STS PROGRAM TO TEST  
HARDWARE IN SPACE.

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ID: <1326.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SATURN  
Reference Data: N/A

Description:  
ALL SYSTEMS DESIGNED FOR EMERGENCY ACTION SHOULD BE SIMPLE TO OPERATE AND HAVE  
RAPID RESPONSE. OPERATION, CONTROLS, COLOR CODING, ETC., SHOULD ALL BE  
STANDARDIZED TO ALLOW SAFE, RAPID OPERATION.

\*\*\*\*\*

ID: <1327.00> Issue(s): ACCESSABILITY : MAINTAINABILITY  
Issue(s) cont.: COMMONALITY :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A

Description:  
A MAINTAINABILITY PROGRAM SHOULD BE EMPHASIZED. SPECIFIC EMPHASIS SHOULD BE  
PLACED ON ACCESSIBILITY FOR MAINTENANCE, STANDARDIZATION OF PARTS, MODULARITY,  
REDUNDANCE AND ASSET INTERCHANGEABILITY.

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ID: <1328.00>          Issue(s): FAULT DETECTION      : MAINTAINABILITY
Issue(s) cont.:      :                               :
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986
Operation:  <MAINTENANCE    >
Location:   <SC             >
Orb.No/Mission: <G         >
Hardware/Software:<N/A      >    PROGRAM REF: SKYLAB-KSC
Reference Data:  N/A
Description:
ORBITAL MAINTENANCE CAN BE BETTER CONDUCTED THROUGH ON BOARD, BUILT IN TEST
EQUIPMENT.

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ID: <1329.00>          Issue(s): MAINTAINABILITY      :
Issue(s) cont.:      :                               :
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986
Operation:  <MAINTENANCE    >
Location:   <SC             >
Orb.No/Mission: <G         >
Hardware/Software:<N/A      >    PROGRAM REF: SATURN
Reference Data:  N/A
Description:
USE BOLTED FABRICATION DESIGN IN PREFERENCE TO RIVETS OR BONDING ALLOWING FOR
QUICK CHANGEDOUT OF ASSEMBLIES OR SUBASSEMBLIES.

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ID: <1330.00>          Issue(s): FAULT DETECTION      :
Issue(s) cont.:      :                               :
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986
Operation:  <FLIGHT        >
Location:   <SC             >
Orb.No/Mission: <G         >
Hardware/Software:<N/A      >    PROGRAM REF: SATURN
Reference Data:  N/A
Description:
DISCRETE HIGH AND/OR LOW LEVEL INDICATIONS IN CONSUMABLE CONTAINERS SHOULD BE
LOCATED TO GIVE ADEQUATE WARNING SO THAT CORRECTIVE ACTION CAN BE TAKEN
IF REQUIRED.

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ID: <1334.00>                Issue(s): DESIGN CRITERIA        :  
Issue(s) cont.:                 :                                        :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:     <FLIGHT             >  
Location:      <SC                 >  
Orb.No/Mission: <G                 >  
Hardware/Software:<N/A            >        PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
DESIGN EQUIPMENT TO FACILITATE POTENTIAL IN-FLIGHT MAINTENANCE.

\*\*\*\*\*

ID: <1335.00>                Issue(s): DESIGN CRITERIA        :  
Issue(s) cont.:                 :                                        :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:     <MAINTENANCE       >  
Location:      <KSC                 >  
Orb.No/Mission: <G                 >  
Hardware/Software:<N/A            >        PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
A SINGLE "LESSON LEARNED" IS THAT THE DESIGN PHASE SHOULD PROVIDE GREATER CONSIDERATION FOR TRANSPORTABILITY AND HANDLING FOR HIGH FAILURE ITEMS AS WELL AS OTHER REPAIRABLE ITEMS.

\*\*\*\*\*

ID: <1336.00>                Issue(s): ACCESSABILITY         : DESIGN CRITERIA  
Issue(s) cont.:                 :                                        :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:     <FLIGHT             >  
Location:      <SC                 >  
Orb.No/Mission: <G                 >  
Hardware/Software:<N/A            >        PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
DESIGN "PLUG-IN" PRINTED CIRCUITRY BOARDS WHICH CAN BE EASILY CHANGED.

\*\*\*\*\*

ID: <1337.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE                    >  
Location: <SC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SPACE LAB  
Reference Data: N/A  
Description:  
ENSURE THAT LOGISTICS AND MAINTENANCE DOCUMENTATION AND DATA REQUIREMENTS ARE ESTABLISHED UP FRONT.

\*\*\*\*\*  
ID: <1338.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU                    >  
Location: <KSC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data: N/A  
Description:  
DEPTH/COMPLETENESS OF LEA IS SIGNIFICANT & MUST INCLUDE ASSESSMENTS OF RESOURCES SUCH AS REPAIR PARTS, CONSUMABLES, TECH DOCUMENTATION, PERSONNEL SKILL LEVELS, TRAINING, TOOLS TEST EQUIPMENT, AND FACILITIES.

\*\*\*\*\*  
ID: <1339.00>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE                    >  
Location: <KSC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SATURN  
Reference Data: N/A  
Description:  
AVOID TIGHT TOLERANCES AND USE OF SPECIAL TOOLING FOR HARDWARE WHICH MIGHT REQUIRE REPLACEMENT ON INITIAL INSTALLATION IN THE FIELD.

\*\*\*\*\*

ID: <1340.00>                 Issue(s): FAULT DETECTION         :  
Issue(s) cont.:                 :  
Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986  
Operation: <FAULT ISOLATION >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >         PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A  
Description:

BUILD IN TEST THAT NOT ONLY DETECTS THE PROBLEM BUT DESCRIBES IT IN ENOUGH  
 DETAIL SO THAT A REMOVE/REPLACE DECISION CAN BE MADE WITHOUT A LOT OF  
 ADDITIONAL TROUBLESHOOTING.

\*\*\*\*\*

ID: <1341.00>                 Issue(s): COMMONALITY         :  
Issue(s) cont.:                 :  
Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >         PROGRAM REF: SPACE LAB  
Reference Data: N/A  
Description:

AVOID, AS MUCH AS POSSIBLE, COMPLEX, UNIQUE PARTS REQUIRING UNIQUE SKILLS (I.E.  
 , STACKED PCBS, ETC.).

\*\*\*\*\*

ID: <1342.00>                 Issue(s): DESIGN CRITERIA         : ISOLATION  
Issue(s) cont.: MAINTAINABILITY         :  
Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >         PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A  
Description:

AVOID THE NEED TO MIX USER DATA WITH SPACE STATION "UPKEEP" DATA, THUS  
 ELIMINATING THE CONSTANT NEED TO REALLOCATE LINK, BANDWIDTH AND AREAS.

\*\*\*\*\*

ID: <1343.00>                    Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:                                :                                :  
Issue Source: <STS MT STDY (RI)>          PHASE III, MAY 30, 1986  
Operation:   <GENERIC                       >  
Location:    <KSC                               >  
Orb.No/Mission:   <G                               >  
Hardware/Software:<N/A                       >                PROGRAM REF: STS  
Reference Data:    N/A

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OF POOR QUALITY

Description:  
OPTIMIZED COSTS CANNOT BE ACHIEVED UNLESS THE SYSTEMS THEMSELVES ARE DESIGNED  
AND OPERATED TO BE MORE EASILY AND COST EFFECTIVELY SUPPORTED.

\*\*\*\*\*  
ID: <1345.00>                    Issue(s): COMMONALITY                :  
Issue(s) cont.:                                :                                :  
Issue Source: <STS MT STDY (RI)>          PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                               >  
Location:    <SC                               >  
Orb.No/Mission:   <GENERIC                       >  
Hardware/Software:<N/A                       >                PROGRAM REF: SATURN  
Reference Data:    N/A

Description:  
ALL SYSTEMS DESIGNED FOR EMERGENCY ACTION SHOULD BE SIMPLE TO OPERATE AND HAVE  
RAPID RESPONSE. OPERATION, CONTROLS, COLOR CODING, ETC., SHOULD ALL BE  
STANDARDIZED TO ALLOW SAFE, RAPID OPERATION.

\*\*\*\*\*  
ID: <1346.00>                    Issue(s): DESIGN CRITERIA                :  
Issue(s) cont.:                                :                                :  
Issue Source: <STS MT STDY (RI)>          PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE                       >  
Location:    <KSC                               >  
Orb.No/Mission:   <G                               >  
Hardware/Software:<N/A                       >                PROGRAM REF: SATURN  
Reference Data:    N/A

Description:  
MINIMIZE THE NUMBER OF PROPRIETARY COMPONENTS AND PROCESSES IN ORDER TO PREVENT  
PROBLEMS WITH REFURBISHMENT AND FAILED HARDWARE ANALYSIS.

\*\*\*\*\*

ID: <1347.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A

Description:  
STATISTICAL ANALYSIS OF SPECIFIC SPECIFICATIONS OF INDIVIDUAL SUBSYSTEMS/  
COMPONENTS CAN BE USED TO VERIFY SPACE STATION DESIGNS AND SATISFY  
MAINTAINABILITY CRITERIA.

\*\*\*\*\*

ID: <1348.00> Issue(s): CHANGE CONTROL : DRAWING SYSTEM  
Issue(s) cont.: DESIGN CRITERIA : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A

Description:  
VERIFY THAT REPLACEMENT MODULES ARE TRULY SYSTEM COMPATIBLE.

\*\*\*\*\*

ID: <1349.00> Issue(s): LOGISTICS/SPARES : MANAGEMENT  
Issue(s) cont.: COST/MANHOURS : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A

Description:  
MATERIAL MANAGEMENT RESULTS SHOULD BE IDENTIFIED AND ESTABLISHED AND OBJECTIVES  
INTERNAL TO MATERIAL MANAGEMENT SHOULD BE PREDICATED ON MEETING EXPECTED  
OPERATIONAL OBJECTIVES.

\*\*\*\*\*





ID: <1356.00>            Issue(s): ACCESSABILITY        : DESIGN CRITERIA  
Issue(s) cont.: COMMONALITY            : COMM'LIZATION        :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:    <FLIGHT            >  
Location:    <SC            >  
Orb.No/Mission: <G            >  
Hardware/Software:<N/A            >        PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
DESIGN FOR EASY ACCESS, COMMON COMPONENTS, MINIMUM OF DIFFERENT COMPONENTS. USE  
COMMERCIAL COMPONENTS (PROVEN) INSTEAD OF SPECIAL DESIGN, UNIQUE TO SPACE  
STATION.

\*\*\*\*\*  
ID: <1357.00>            Issue(s): FAULT DETECTION        : DESIGN CRITERIA  
Issue(s) cont.:                            :                            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:    <TEST            >  
Location:    <ALL            >  
Orb.No/Mission: <G            >  
Hardware/Software:<N/A            >        PROGRAM REF: SATURN  
Reference Data:    N/A  
Description:  
PROVIDE FOR HAZARDOUS GAS DETECTION (WHEN NEEDED) WITH AUTOMATIC MEANS TO ALERT  
APPROPRIATE STATIONS.

\*\*\*\*\*  
ID: <1358.00>            Issue(s): TECHNOLOGY            : EXPERT SYSTEM  
Issue(s) cont.:                            :                            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:    <MAINTENANCE        >  
Location:    <SC            >  
Orb.No/Mission: <G            >  
Hardware/Software:<N/A            >        PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
USE STATE-OF-THE-ART CONTROL, MONITOR AND MAINTENANCE COMPUTER/SOFTWARE SYSTEMS  
UTILIZING "EXPERT SYSTEM" TECHNIQUES.

\*\*\*\*\*



ID: <1362.00> Issue(s): FAULT DETECTION : DESIGN CRITERIA  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A

Description:  
DESIGN WITH FAULT ISOLATION AS A PRIMARY REQUIREMENT AND PROVIDE SUFFICIENT TEST POINTS TO ALLOW FAULT ISOLATION TO BE UTILIZED THROUGH THE REPLACEABLE UNIT LEVEL.

\*\*\*\*\*

ID: <1363.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A

Description:  
UTILIZE DEADFACE SWITCHES THAT WILL ALLOW ORU CHANGEDOUT WITHOUT EXTENSIVE POWER DOWNS. UTILIZE A HI-FI SPACE STATION MOCKUP IN WHICH EVERY SPARE IS FIRST CYCLED TO ASSURE COMPATIBILITY.

\*\*\*\*\*

ID: <1364.00> Issue(s): MAINTAINABILITY : PROCEDURE  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A

Description:  
WHILE O&M PERSONNEL SHOULD BE KEPT APPRAISED WITH LEA DETERMINATIONS, FEW DEVIATIONS FROM THE ASSIGNED PROVISIONING LEVELS SHOULD BE PERMITTED TO OCCUR.

\*\*\*\*\*

ID: <1365.00>                    Issue(s): COST/MANHOURS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SPACE LAB  
Reference Data:    N/A  
Description:  
ENSURE ADP IS DESIGN DISCLOSURE PACKAGE ON ALL MATERIAL RECEIVED (INCLUDING DATA BELOW LRU LEVEL).

\*\*\*\*\*  
ID: <1366.00>                    Issue(s): COMMONALITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
TAKE CARE WITH COMMONALITY AMONG SOFTWARE COMPONENTS. TOO MUCH COMMONALITY WILL CAUSE PROBLEMS WITH FUTURE CHANGES AND MODS. TOOLS ARE NEEDED TO TRACE COMPONENT LINKS AND DATA EXCHANGES.

\*\*\*\*\*  
ID: <1367.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
UTILIZE CURRENT/NEW TECHNOLOGY/METHODS.

\*\*\*\*\*

ID: <1368.00> Issue(s): COMMONALITY : COMM'LIZATION  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A  
Description:  
USE AN EXISTING COMMERCIAL SOFTWARE LANGUAGE, OR AT LEAST AN EXISTING LANGUAGE.

\*\*\*\*\*  
ID: <1369.00> Issue(s): MAINTAINABILITY : DESIGN CRITERIA  
Issue(s) cont.: EFFICIENCY : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SATURN  
Reference Data: N/A  
Description:  
CHECKOUT EQUIPMENT SHOULD BE DESIGNED SUCH THAT IT IS EASY TO OPERATE, STORE,  
AND HANDLE.

\*\*\*\*\*  
ID: <1370.00> Issue(s): MAINTAINABILITY : ACCESSABILITY  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SATURN  
Reference Data: N/A  
Description:  
KEEP FREQUENTLY ADJUSTED COMPONENTS ACCESSIBLE. COMPONENTS REQUIRING ROUTINE  
MAINTENANCE (SUCH AS FILTERS) SHOULD BE LOCATED SO AS TO MINIMIZE THE  
MAINTENANCE EFFORT AND PROBLEMS.

\*\*\*\*\*

ID: <1371.00>                    Issue(s): DRAWING SYSTEM        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:        <GENERIC            >  
Location:        <ALL            >  
Orb.No/Mission:        <6            >  
Hardware/Software:<N/A            >        PROGRAM REF: SKYLAB-KSC  
Reference Data:        N/A  
Description:  
DEVISE A CONTROLLED PART NUMBERING SYSTEM TO AVOID A MAZE AND LOST TIME.

\*\*\*\*\*  
ID: <1372.00>                    Issue(s): MANAGEMENT                :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:        <GENERIC            >  
Location:        <ALL            >  
Orb.No/Mission:        <6            >  
Hardware/Software:<N/A            >        PROGRAM REF: STS  
Reference Data:        N/A  
Description:  
THE PROGRAM SHOULD DICTATE ORGANIZATION AND IT'S POLICIES, IN LIEU OF THE  
OPPOSITE OCCURRING

\*\*\*\*\*  
ID: <1373.00>                    Issue(s): PROCEDURE                : COMMONALITY  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:        <REPLACEMENT/LRU >  
Location:        <ALL            >  
Orb.No/Mission:        <6            >  
Hardware/Software:<N/A            >        PROGRAM REF: STS  
Reference Data:        N/A  
Description:  
PARTS INTERCHANGEABILITY AND/OR SUBSTITUTION MUST BE ESTABLISHED.

\*\*\*\*\*

ID: <1375.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <FLIGHT                    >  
Location:                    <SC                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB-KSC  
Reference Data:                    N/A  
Description:  
DEVELOP A SYSTEM OF DATA STORAGE WITH NO MOVING PARTS.

\*\*\*\*\*  
ID: <1377.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <REPAIR                    >  
Location:                    <SC                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SPACE LAB  
Reference Data:                    N/A  
Description:  
ENSURE CONTRACTORS ESTABLISH AND MAINTAIN REPAIR/RE-VERIFICATION PROCEDURES.

\*\*\*\*\*  
ID: <1378.00>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation:                    <MAINTENANCE                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SATURN  
Reference Data:                    N/A  
Description:  
AIRBORNE AND GSE COMPONENTS SHOULD BE CAPABLE OF BEING CALIBRATED ONCE  
INSTALLED AND WITHOUT SUBSEQUENT REMOVAL.

\*\*\*\*\*



ID: <1379.00>            Issue(s): MAINTAINABILITY        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE               >  
Location:    <ALL                         >  
Orb.No/Mission: <G                         >  
Hardware/Software:<N/A                     >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A

Description:  
BITE AND A UNIVERSAL UNIT TESTER CAN BE USED TO VERIFY SS DESIGNS AND SATISFY MAINTAINABILITY CRITERIA. STANDARDIZED CONNECTORS WOULD ALSO ALLOW A UNIT TESTER TO TEST MANY DIFFERENT "BLACK BOXES".

\*\*\*\*\*

ID: <1380.00>            Issue(s): COMMONALITY                                :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <GENERIC                         >  
Location:    <ALL                         >  
Orb.No/Mission: <G                         >  
Hardware/Software:<N/A                     >        PROGRAM REF: STS  
Reference Data:   N/A

Description:  
OVERALL LIFE OF THE PROGRAM COSTS CAN BE ACHIEVED THROUGH STANDARDIZATION AND OTHER METHODS WHICH REDUCE THE NUMBER OF UNIQUE ITEMS TO BE SUPPORTED.

\*\*\*\*\*

ID: <1381.00>            Issue(s): FAULT DETECTION                            :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <FAULT ISOLATION                 >  
Location:    <SC                                 >  
Orb.No/Mission: <G                         >  
Hardware/Software:<N/A                     >        PROGRAM REF: SPACE LAB  
Reference Data:   N/A

Description:  
DESIGN SYSTEMS SUCH THAT FAILURES CAN BE ISOLATED TO DRUS.

\*\*\*\*\*

ID: <1383.00>            Issue(s): DESIGN CRITERIA        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                         >  
Location:   <SC     >  
Orb.No/Mission: <G     >  
Hardware/Software:<N/A     >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A

Description:  
SPACE STATION DATA PROCESSING USING SHARED PROCESSORS VIA A LOCAL AREA NETWORK  
TYPE CONCEPT WOULD ENHANCE THE DATA PROCESSING THROUGH PART OF SPACE STATION  
WHILE CONSERVING HARDWARE.

\*\*\*\*\*

ID: <1384.00>            Issue(s): DRAWING SYSTEM        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <GENERIC                         >  
Location:   <ALL     >  
Orb.No/Mission: <G     >  
Hardware/Software:<N/A     >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A

Description:  
MODIFICATION OF THE PARTS OF ONE CONTRACTOR BY A SECOND CONTRACTOR SHOULD BE  
CLEARLY STATED.

\*\*\*\*\*

ID: <1385.00>            Issue(s): FAULT DETECTION        : COMMONALITY  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE                         >  
Location:   <ALL     >  
Orb.No/Mission: <G     >  
Hardware/Software:<N/A     >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A

Description:  
BITE AND A UNIVERSAL UNIT TESTER CAN BE USED TO VERIFY SS DESIGNS AND SATISFY  
MAINTAINABILITY CRITERIA. STANDARDIZED CONNECTORS WOULD ALSO ALLOW A UNIT  
TESTER TO TEST MANY DIFFERENT "BLACK BOXES".

\*\*\*\*\*

ID: <1387.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <REPAIR                    >  
Location: <KSC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: STS  
Reference Data:    N/A

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OF POOR QUALITY

Description:  
ITEM MANAGEMENT MUST CONSIDER AND KEEP UP TO DATE ON ITEM REPAIR STATUS.

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ID: <1388.00>                    Issue(s): MAINTAINABILITY                    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
ASSURE SPACE STATION CREW IS TRAINED IN-DEPTH AND CROSS TRAINED TO OPERATE AND MAINTAIN ALL SYSTEMS.

\*\*\*\*\*

ID: <1389.00>                    Issue(s): INTEGRATION                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <ASSEMBLY                    >  
Location: <SC                    >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
PROVIDE A FULL FIDELITY SIMULATOR FOR SUB-SYSTEM VERIFICATION AND SOFTWARE DEVELOPMENT. GROUND TEST SHOULD INCLUDE FULLY INTEGRATED SPACE STATION END TO END TEST.

\*\*\*\*\*

ID: <1390.00> Issue(s): MAINTAINABILITY : DESIGN CRITERIA  
Issue(s) cont.:  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A  
Description:  
USE SOLID STATE MEMORY TO MINIMIZE MAINTENANCE RESUPPLY COSTS.

\*\*\*\*\*  
ID: <1391.00> Issue(s): CHANGE CONTROL : PROCEDURE  
Issue(s) cont.: LOGISTICS/SPARES :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
LOGISTICS ENGINEERING IS A CONTINUING LIFE OF PROGRAM ACTIVITY DEALING WITH  
HARDWARE CONFIGURATION AND USE CHANGES, AS WELL AS PROGRAM ADJUSTMENTS DUE  
TO CHANGE IN REPAIR SOURCE STATUS, MATERIAL CONDITIONS.

\*\*\*\*\*  
ID: <1392.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.:  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
STRONG NEED TO PROVIDE CONSISTENT AND COHESIVE MANAGEMENT OF THE MAINTENANCE  
FUNCTION.

\*\*\*\*\*

\*\*\*\*\*  
ID: <1393.00>            Issue(s): DRAWING SYSTEM        : LOGISTICS/SPARES  
Issue(s) cont.: COST/MANHOURS                                :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >            PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
AVOID THE VENDOR CONTROLLED CONCEPT WHEN DEALING WITH COMPONENTS.

\*\*\*\*\*  
ID: <1395.00>            Issue(s): MAINTAINABILITY        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >            PROGRAM REF: STS  
Reference Data:    N/A  
Description:  
DESIGN EQUIPMENT TO FACILITATE POTENTIAL IN-FLIGHT MAINTENANCE.

\*\*\*\*\*  
ID: <1398.00>            Issue(s): COST/MANHOURS        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A >            PROGRAM REF: SPACE LAB  
Reference Data:    N/A  
Description:  
CONFIGURATION MANAGEMENT MUST BE IMPOSED (WITH PENALTY CLAUSE).

ID: <1400.00>                    Issue(s): MAINTAINABILITY    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                    >  
Location:    <SC                    >  
Orb.No/Mission:    <G                    >  
Hardware/Software: <N/A                    >                    PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
PERFORM THOROUGH QUALIFICATION TEST PROGRAMS TO INSURE MAINTAINABILITY IN SPACE  
. DURING GROUND (EARTH) CHECKOUT, MAINTAIN LOCAL CONTROL.

\*\*\*\*\*

ID: <1402.00>                    Issue(s): MAINTAINABILITY    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                    >  
Location:    <SC                    >  
Orb.No/Mission:    <G                    >  
Hardware/Software: <N/A                    >                    PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
REALISTIC DESIGN REQUIREMENTS ARE NEEDED. RECOGNIZE SIGNIFICANT ADDITIONAL COST  
IS NECESSARY TO INCREASE RELIABILITY AND MAINTAINABILITY AND MAY BE RECOUPED BY  
DECREASED STS LOGISTIC LIFT REQUIREMENTS.

\*\*\*\*\*

ID: <1403.00>                    Issue(s): COMMONALITY           :  
Issue(s) cont.:   :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                    >  
Location:    <SC                        >  
Orb.No/Mission: <G                     >  
Hardware/Software:<N/A                >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A

Description:  
ENSURE THAT USERS (PAYLOAD TYPE SUPPORT) HAVE ADEQUATE PULSE CODE MODULATOR (PCM) LINKS WITH SUFFICIENT BANDWIDTH THAT ARE INDEPENDENT OF PCM LINKS NEEDED TO OPERATION AND MAINTAIN SS ENVIRONMENT.

\*\*\*\*\*

ID: <1404.00>                    Issue(s): MAINTAINABILITY         : PROCEDURE  
Issue(s) cont.:   :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                    >  
Location:    <SC                        >  
Orb.No/Mission: <G                     >  
Hardware/Software:<N/A                >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A

Description:  
PROVIDE COMPLETE TECH MANUALS ON COMPUTER STORAGE TO FACILITATE REPAIR, PREVENTATIVE MAINTENANCE AND CALIBRATION SCHEDULES.

\*\*\*\*\*

ID: <1405.00>                    Issue(s): COMMONALITY           :  
Issue(s) cont.:   :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                    >  
Location:    <SC                        >  
Orb.No/Mission: <G                     >  
Hardware/Software:<N/A                >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A

Description:  
AVOID SYSTEMS THAT ARE TIED TOGETHER SO THAT THE FAILURE OF ONE SYSTEM AND THE SUBSEQUENT REPLACEMENT OF PARTS, REQUIRE THE REATEST OF OTHER SYSTEMS.

\*\*\*\*\*

ID: <1408.00>            Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)>      PHASE III, MAY 30, 1986  
Operation:     <N/A                    >  
Location:      <KSC                    >  
Orb.No/Mission:     <G                         >  
Hardware/Software: <N/A                     >        PROGRAM REF: STS  
Reference Data:     N/A  
Description:  
DESIGN AROUND PASSIVE SYSTEMS.

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ID: <1409.00>            Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)>      PHASE III, MAY 30, 1986  
Operation:     <FLIGHT                    >  
Location:      <SC                        >  
Orb.No/Mission:     <G                         >  
Hardware/Software: <N/A                     >        PROGRAM REF: SKYLAB-KSC  
Reference Data:     N/A  
Description:  
INITIAL DESIGN FOR SS COMM AND DATA SYSTEM SHOULD HAVE A FIBER OPTIC TRANSFER SYSTEM. GROUND OPERATIONS AND RADIATED ELECTRO-MECHANICAL INTERFACES SHOULD BE ELIMINATED. SYSTEM SHOULD BE LIGHTER.

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ID: <1410.00>            Issue(s): DESIGN CRITERIA     : MAINTAINABILITY  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)>      PHASE III, MAY 30, 1986  
Operation:     <FLIGHT                    >  
Location:      <SC                        >  
Orb.No/Mission:     <G                         >  
Hardware/Software: <N/A                     >        PROGRAM REF: SKYLAB-KSC  
Reference Data:     N/A  
Description:  
AVOID CONNECTORS THAT HAVE ATTACHMENT SCREWS IN THE MIDDLE (SUCH AS RAAB HARNES S CONNECTORS). IT IS DIFFICULT TO INSTALL/REMOVE THESE WITHOUT ACCIDENTALLY PULLING OUT WIRES.



ID: <1411.00>            Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation: <FLIGHT            >  
Location: <SC            >  
Orb.No/Mission: <G            >  
Hardware/Software:<N/A            >            PROGRAM REF: SKYLAB-KSC  
Reference Data:     N/A

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Description:  
THE REMOTE MANIPULATOR SYSTEM (RMS) END EFFECTOR AND THE CONTROL AND DISPLAY  
SUBSYSTEM SHOULD BE REDESIGNED FOR SPACE STATION ON-ORBIT OPERATIONS. PALLET  
TRAIN INTERFACE TO SPACE STATION ALSO REQUIRES STUDY.

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*****
ID: <1412.00>            Issue(s): DESIGN CRITERIA     :
Issue(s) cont.:                                                                    :
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986
Operation: <ASSEMBLY            >
Location: <ALL            >
Orb.No/Mission: <G            >
Hardware/Software:<N/A            >            PROGRAM REF: SATURN
Reference Data:     N/A
Description:
DESIGN COMPONENTS AND SYSTEMS WITH REALISTIC REQUIREMENTS AND TOLERANCES.

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*****
ID: <1413.00>            Issue(s): DESIGN CRITERIA     :
Issue(s) cont.:                                                                    :
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986
Operation: <ASSEMBLY            >
Location: <ALL            >
Orb.No/Mission: <G            >
Hardware/Software:<N/A            >            PROGRAM REF: SATURN
Reference Data:     N/A
Description:
AVOID PRECISION FITTINGS AND "FANCY" SEALS.

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ID: <1415.00>                     Issue(s): DESIGN CRITERIA     : MAINTAINABILITY  
Issue(s) cont.:                     :                     :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation: <FLIGHT                 >  
Location: <SC                     >  
Orb.No/Mission: <G                 >  
Hardware/Software:<N/A             >     PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
 USE TWIST LOCK/SNAP FASTENING CONNECTIONS TO REDUCE STRUCTURAL FAILURES DUE TO  
 THREADED CONNECTIONS LOOSENING.

\*\*\*\*\*

ID: <1416.00>                     Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:                     :                     :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation: <GENERIC                 >  
Location: <ALL                     >  
Orb.No/Mission: <G                 >  
Hardware/Software:<N/A             >     PROGRAM REF: SATURN  
Reference Data:    N/A

Description:  
 PROVIDE CONTRACTION/EXPANSION SECTIONS IN COLD SYSTEMS, INCLUDING GSE CONSOLES.

\*\*\*\*\*

ID: <1417.00>                     Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:                     :                     :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation: <FLIGHT                 >  
Location: <SC                     >  
Orb.No/Mission: <G                 >  
Hardware/Software:<N/A             >     PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
 THE DESIGN SHOULD PROVIDE A MAINTENANCE PLAN COST ESTIMATE FOR ALL PROVIDED  
 EQUIPMENT AS PART OF EACH DESIGN REVIEW.

\*\*\*\*\*

ID: <1418.00>                    Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:                    :                                    :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation:     <FLIGHT             >  
Location:     <LV                 >  
Orb.No/Mission:     <6                     >  
Hardware/Software: <N/A             >             PROGRAM REF: SATURN  
Reference Data:     N/A

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Description:  
 DESIGN RELIEF VALVES THAT WILL ALLOW ADEQUATE FLOW TO MAINTAIN THE SYSTEMS NEAR  
 NORMAL OPERATING PRESSURE IN THE EVENT OF COMPONENT FAILURE.

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ID: <1419.00>                    Issue(s): DESIGN CRITERIA     : DRAWING SYSTEM  
Issue(s) cont.: COMMONALITY         :                                    :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation:     <FLIGHT             >  
Location:     <SC                 >  
Orb.No/Mission:     <6                     >  
Hardware/Software: <N/A             >             PROGRAM REF: SKYLAB-KSC  
Reference Data:     N/A

Description:  
 COMPONENTS AND PARTS SHOULD BE CAPABLE OF WORKING IN A VACUUM.

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ID: <1422.00>                    Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:                    :                                    :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation:     <TEST                 >  
Location:     <KSC                 >  
Orb.No/Mission:     <6                     >  
Hardware/Software: <N/A             >             PROGRAM REF: SATURN  
Reference Data:     N/A

Description:  
 PROVIDE RELIEF VALVES IN THE GSE THAT WILL PREVENT OVERPRESSURIZATION OF THE  
 VEHICLE SYSTEM.

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#####  
ID: <1423.00>            Issue(s): DESIGN CRITERIA     : MAINTAINABILITY  
Issue(s) cont.:            :    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                     >  
Location:     <SC                        >  
Orb.No/Mission: <6                             >  
Hardware/Software:<N/A                 >         PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
USE MULTI-PLEX ELECTRONICS ARCHITECTURE WITH FIBER OPTICS TO REDUCE CABLE  
VOLUME AND WEIGHT.

#####  
ID: <1425.00>            Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:            :    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                     >  
Location:     <SC                        >  
Orb.No/Mission: <6                             >  
Hardware/Software:<N/A                 >         PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
SINCE A SPACE STATION WILL HAVE PROLONGED EXPOSURE TO IONIZING RADIATION, SOLID  
STATE ELECTRONICS SHOULD SOMEHOW BE "SHIELDED" OR MADE LESS SUSCEPTABLE.

#####  
ID: <1427.00>            Issue(s): MAINTAINABILITY     :  
Issue(s) cont.:            :    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                     >  
Location:     <SC                        >  
Orb.No/Mission: <6                             >  
Hardware/Software:<N/A                 >         PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A

Description:  
APPROACH OPERATIONAL MAINTENANCE AS A DAILY AND NOT AS AN UNUSUAL PROBLEM, I.E.  
, ADEQUATE SPARES, EASY REPLACEMENTS AND SIMPLE PROCEDURES.

ID: <1428.00>            Issue(s): MAINTAINABILITY    : DESIGN CRITERIA  
Issue(s) cont.:                                         :                                         :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE         >  
Location:   <ALL                   >  
Orb.No/Mission: <G                   >  
Hardware/Software:<N/A             >         PROGRAM REF: SATURN  
Reference Data:   N/A  
Description:  
 ANTICIPATE MAINTENANCE DIFFICULTIES; AVOID DESIGN THAT CAUSES ADDITIONAL  
 PROBLEMS WHEN CORRECTING ONE PROBLEM.

\*\*\*\*\*  
ID: <1429.00>            Issue(s): COMMONALITY                 : EFFICIENCY  
Issue(s) cont.:                                         :                                         :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:   <FLIGHT                   >  
Location:   <SC                       >  
Orb.No/Mission: <G                   >  
Hardware/Software:<N/A             >         PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A  
Description:  
 PROVIDE STANDARD CONNECTORS SO THAT ONLY A FEW ADAPTER CABLES WILL BE REQUIRED  
 FOR TESTING.

\*\*\*\*\*  
ID: <1431.00>            Issue(s): DESIGN CRITERIA             :  
Issue(s) cont.:                                         :                                         :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:   <ASSEMBLY                 >  
Location:   <KSC                       >  
Orb.No/Mission: <G                   >  
Hardware/Software:<N/A             >         PROGRAM REF: SATURN  
Reference Data:   N/A  
Description:  
 DURING THE DESIGN PHASE, ALL CONNECTIONS, WIRING, PLUMBING AND ADJUSTMENTS  
 POINTS NECESSARY FOR CHECKOUT SHOULD BE PERMANENTLY, SIMPLY AND POSITIVELY  
 IDENTIFIED.

ID: <1432.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
PROVIDE VIDEOTAPED INSTRUCTIONS FOR ON-ORBIT MAINTENANCE TROUBLESHOOTING.

\*\*\*\*\*  
ID: <1434.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A  
Description:  
PROVIDE A FRAME OF REFERENCE FOR "UP". IN SKYLAB, ORIENTATION WAS NOT PROVIDED  
AND THIS PROVED DISTURBING TO ASTRONAUTS.

\*\*\*\*\*  
ID: <1437.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
PROVIDE FOR EFFECTIVE CONTAINMENT OF NUTS, BOLTS, WASHERS, TOOLS, HARDWARE COMP  
ONENTS, ETC., BY MEANS OF TOOL AND/OR RETAINER BOXES, BUNGE CORDS, ETC.

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ID: <1440.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SATURN  
Reference Data: N/A

Description:  
REDUCE NOISE, FOR EXAMPLE, FROM GAS FLOWS IN VENTING AND PURGING WHICH  
INTERFERE WITH COMMUNICATION.

\*\*\*\*\*  
ID: <1441.00> Issue(s): DESIGN CRITERIA : LOGISTICS/SPARES  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A

Description:  
AVOID SUPPLYING INSUFFICIENT TEST POINTS, BASELINE DATA, DOCUMENTATION AND  
SPARES.

\*\*\*\*\*  
ID: <1442.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SPACE LAB  
Reference Data: N/A

Description:  
USE "KITS" (TESTED ASSEMBLIES READY TO GO) TO TROUBLESHOOT/REPAIR.

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\*\*\*\*\*  
ID: <1443.00>                   Issue(s): MAINTAINABILITY    :  
Issue(s) cont.:                   :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:   <REPAIR            >  
Location:    <SC                >  
Orb.No/Mission: <6               >  
Hardware/Software:<N/A           >     PROGRAM REF: STS  
Reference Data:   N/A

Description:  
PROVIDE FOR A WORKSITE REPAIR BENCH OR EQUIVALENT, EQUIPPED WITH ADEQUATE RESTRAINTS FOR TOOLS AND EQUIPMENT.

\*\*\*\*\*  
ID: <1445.00>                   Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:                   :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:   <FLIGHT            >  
Location:    <SC                >  
Orb.No/Mission: <6               >  
Hardware/Software:<AVIONICS       >     PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A

Description:  
ELIMINATE MECHANICALLY STEERED ANTENNA SYSTEMS AND SUBSTITUTE ELECTRICALLY POINTED SYSTEMS LIKE "PHASED ARRAYS".

\*\*\*\*\*  
ID: <1446.00>                   Issue(s): DESIGN CRITERIA     :  
Issue(s) cont.:                   :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE        >  
Location:    <ALL                >  
Orb.No/Mission: <6               >  
Hardware/Software:<N/A           >     PROGRAM REF: SATURN  
Reference Data:   N/A

Description:  
AVOID TIGHT TOLERANCES AND USE OF SPECIAL TOOLING ON FIELD INSTALLED HARDWARE.



ID: <1447.00>                Issue(s): COST/MANHOURS        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <ASSEMBLY                >  
Location:    <ALL                     >  
Orb.No/Mission:   <6                     >  
Hardware/Software: <N/A               >        PROGRAM REF: SPACE LAB  
Reference Data:    N/A  
Description:  
 MAKE SURE ALL PARTS ARE SECOND SOURCED U.S.

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ID: <1448.00>                Issue(s): REQUIREMENTS            :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <GENERIC                    >  
Location:    <ALL                     >  
Orb.No/Mission:   <6                     >  
Hardware/Software: <N/A               >        PROGRAM REF: SPACE LAB  
Reference Data:    N/A  
Description:  
 CONTRACTOR TO POSSESS ABILITY TO TROUBLESHOOT AND FUNCTIONALLY TEST HIS PRODUCT

\*\*\*\*\*

ID: <1450.00>                Issue(s): MAINTAINABILITY        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE                >  
Location:    <KSC                               >  
Orb.No/Mission:   <6                     >  
Hardware/Software: <N/A               >        PROGRAM REF: SPACE LAB  
Reference Data:    N/A  
Description:  
 KSC INTERMEDIATE LEVEL MAINTENANCE TO CORRECT ALL REPAIR.

\*\*\*\*\*

ID: <1451.00> Issue(s): LOGISTICS/SPARES :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A  
Description:  
PROVIDE SUFFICIENT FUNDING FOR SPARES.

\*\*\*\*\*  
ID: <1453.00> Issue(s): TIME/OFF-LINE :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SPACE LAB  
Reference Data: N/A  
Description:  
FLIGHT RE-CERTIFICATION CAPABILITY AT KSC.

\*\*\*\*\*  
ID: <1455.00> Issue(s): LOGISTICS/SPARES : COST/MANHOURS  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SPACE LAB  
Reference Data: N/A  
Description:  
WHEN LISTING PARTS INTO COMPUTER, INCLUDE ALL DATA (I.E., SIZE, WEIGHT).

\*\*\*\*\*

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ID: <1456.00>           Issue(s): DESIGN CRITERIA      :
Issue(s) cont.:                :
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986
Operation: <FAULT ISOLATION >
Location: <ALL >
Orb.No/Mission: <G >
Hardware/Software:<N/A >      PROGRAM REF: SATURN
Reference Data: N/A

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Description:  
LEAK CHECK PORTS SHOULD BE PROVIDED, SUCH THAT INTERNAL LEAKAGE MAY BE ISOLATED TO A SPECIFIC FAULTY SEAL.

\*\*\*\*\*

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ID: <1466.00>           Issue(s): LOGISTICS/SPARES      :
Issue(s) cont.:                :
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986
Operation: <REPLACEMENT/LRU >
Location: <ALL >
Orb.No/Mission: <G >
Hardware/Software:<N/A >      PROGRAM REF: SKYLAB-KSC
Reference Data: N/A

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Description:  
DO NOT USE COMPONENTS UNTIL THEY HAVE GONE THROUGH A QUALITY TEST ACCEPTANCE PROGRAM.

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ID: <1468.00>           Issue(s): LOGISTICS/SPARES      :
Issue(s) cont.:                :
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986
Operation: <REPLACEMENT/LRU >
Location: <ALL >
Orb.No/Mission: <G >
Hardware/Software:<N/A >      PROGRAM REF: SPACE LAB
Reference Data: N/A

```

Description:  
ENSURE EQUIVALENT PARTS LISTING IS AVAILABLE

\*\*\*\*\*

ID: <1469.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SPACE LAB  
Reference Data: N/A  
Description:  
WHEN DESIGNING FUTURE PROGRAMS, HUMAN FACTORS TO BE UTILIZED.

\*\*\*\*\*  
ID: <1470.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: SATURN  
Reference Data: N/A  
Description:  
DESIGN SELF-SEALING FILL DISCONNECTS.

\*\*\*\*\*  
ID: <1473.00> Issue(s): DESIGN CRITERIA : COMMONALITY  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <ASSEMBLY >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: STS  
Reference Data: N/A  
Description:  
STANDARDIZATION DURING DESIGN COULD RESULT IN SUPPORTABILITY IMPROVEMENTS AT  
SIGNIFICANTLY REDUCED COSTS. PROGRAMS SHOULD DEVELOP "STANDARDIZED" PARTS,  
COMPONENTS, AND EQUIPMENT LISTS. THERE IS A NEED FOR IMPROVED COMMUNICATION  
BETWEEN DESIGNERS AND SUPPORT PLANNING ELEMENTS.

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ID: <1474.00>            Issue(s): COST/MANHOURS        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:     <REPLACEMENT/LRU >  
Location:     <ALL >  
Orb.No/Mission:   <G                >  
Hardware/Software: <N/A               >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A  
Description:  
INITIATE A CLEAR POLICY OF PURCHASING FROM THE ORIGINAL EQUIPMENT MANUFACTURER  
(OEM) AND FOLLOW THIS POLICY THROUGHOUT THE PROGRAM.

\*\*\*\*\*  
ID: <1475.00>            Issue(s): MAINTAINABILITY        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:     <MAINTENANCE        >  
Location:     <KSC >  
Orb.No/Mission:   <G                >  
Hardware/Software: <N/A               >        PROGRAM REF: SKYLAB-KSC  
Reference Data:   N/A  
Description:  
ASSUME LONG TERM REPAIR/MFG POSTURE WILL BE REQUIRED AT KSC SHOPS. THEY SHOULD  
BE STRUCTURED TO SUPORT LONG TERM PROGRAM AND PROGRAM LIFE MATERIAL SHOULD BE  
LAID TO PREVENT VENDOR RECALL LATER IN PROGRAM.

\*\*\*\*\*  
ID: <1477.00>            Issue(s): COST/MANHOURS        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:     <REPLACEMENT/LRU >  
Location:     <ALL >  
Orb.No/Mission:   <G                >  
Hardware/Software: <N/A               >        PROGRAM REF: STS  
Reference Data:   N/A  
Description:  
LOGISTICS PROCUREMENT ACTIVITIES SHOULD BE AN INTEGRAL PART OF THE LOGISTICS  
FUNCTION

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\*\*\*\*\*  
ID: <1479.00>                 Issue(s): DESIGN CRITERIA         :  
Issue(s) cont.:                                 :                                 :  
Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986  
Operation:     <TEST                 >  
Location:     <ALL                 >  
Orb.No/Mission:   <6                 >  
Hardware/Software:<N/A                 >         PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
HAVE OPERATOR IN ON EARLY DESIGN REVIEW.

\*\*\*\*\*  
ID: <1480.00>                 Issue(s): COMMONALITY                 :  
Issue(s) cont.:                                 :                                 :  
Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986  
Operation:     <TEST                 >  
Location:     <ALL                 >  
Orb.No/Mission:   <6                 >  
Hardware/Software:<N/A                 >         PROGRAM REF: SKYLAB-KSC  
Reference Data:    N/A  
Description:  
STANDARDIZE WIRE, CONNECTORS, AND PIN SIZE EARLY SO THAT BREAK OUT BOXES ARE HELD TO A MINIMUM.

\*\*\*\*\*  
ID: <1483.00>                 Issue(s): TECHNOLOGY                 :  
Issue(s) cont.:                                 :                                 :  
Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986  
Operation:     <REPLACEMENT/LRU >  
Location:     <ALL                 >  
Orb.No/Mission:   <6                 >  
Hardware/Software:<N/A                 >         PROGRAM REF: SPACE LAB  
Reference Data:    N/A  
Description:  
PROVISIONING FOR UPGRADING EQUIPMENT AS DEVELOPED (NEWER SYSTEMS).

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ID: <1485.00>                    Issue(s): COMMONALITY                    :  
Issue(s) cont.:                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <ASSEMBLY                    >  
Location: <ALL >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SATURN  
Reference Data: N/A  
Description:  
STANDARDIZE COMPONENTS WHERE POSSIBLE, BUT DON'T MAKE THE SYSTEMS MORE COMPLEX  
BECAUSE OF IT.

\*\*\*\*\*  
ID: <1486.00>                    Issue(s): COMMONALITY                    :  
Issue(s) cont.:                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <REPAIR                    >  
Location: <ALL >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SPACE LAB  
Reference Data: N/A  
Description:  
WHERE POSSIBLE, ENSURE ALL REPAIR PIECE PARTS ARE STANDARD OFF-THE-SHELF.

\*\*\*\*\*  
ID: <1487.00>                    Issue(s): COMMONALITY                    :  
Issue(s) cont.:                    :  
Issue Source: <STS MT STDY (RI)>                    PHASE III, MAY 30, 1986  
Operation: <GENERIC                    >  
Location: <ALL >  
Orb.No/Mission: <G                    >  
Hardware/Software:<N/A                    >                    PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A  
Description:  
STANDARDIZE COMPONENTS, KEEP MODS TO A MINIMUM

ID: <1488.00>            Issue(s): PROCEDURE            :  
Issue(s) cont.:    :    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A >            PROGRAM REF: STS  
Reference Data:        N/A

Description:  
UP FRONT LEA MODULES, METHODS, TECHNIQUES ARE ESSENTIAL TO LOGISTICS PROGRAM TECHNICAL RESOURCE MANAGEMENT. SUCH MODELS REQUIRE ACROSS THE BOARD IMPLEMENTATION AS WELL AS PROVIDING END-TO-END ANALYSIS.

\*\*\*\*\*  
ID: <1493.00>            Issue(s): MAINTAINABILITY            :  
Issue(s) cont.:    :    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A >            PROGRAM REF: SKYLAB-KSC  
Reference Data:        N/A

Description:  
PROVIDE ADEQUATE PROJECT PLANNING AND SOFTWARE DEVELOPMENT AND MAINTENANCE.

\*\*\*\*\*  
ID: <1496.00>            Issue(s): DESIGN                        :  
Issue(s) cont.:    :    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <TEST >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A >            PROGRAM REF: SATURN  
Reference Data:        N/A

Description:  
CONSIDER USE OF VALVES AND REGULATORS THAT HAVE DETENTS AND POSITION INDICATORS THAT ALIGN WITH THE DETENTS WHERE APPLICABLE.

\*\*\*\*\*



ID: <1498.00>            Issue(s): DESIGN CRITERIA        :  
Issue(s) cont.:                            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <ASSEMBLY             >  
Location:    <ALL                   >  
Orb.No/Mission: <G                   >  
Hardware/Software:<N/A             >        PROGRAM REF: SATURN  
Reference Data:   N/A  
Description:  
ALL ITEMS WHICH MUST BE MATED, ASSEMBLED, OR INSTALLED IN THE FIELD SHOULD BE  
FIT-CHECKED.

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ID: <1499.00>            Issue(s): MAINTAINABILITY        :  
Issue(s) cont.:                            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <TEST                   >  
Location:    <KSC                    >  
Orb.No/Mission: <G                   >  
Hardware/Software:<N/A             >        N/AGRAM REF: SPACE LAB  
Reference Data:   N/A  
Description:  
ENSURE RE-VERIFICATION "TEST BEDS" ARE AVAILABLE AT KSC.

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ID: <1500.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FLIGHT >  
Location: <SC >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SKYLAB-KSC  
Reference Data: N/A

Description:  
UTILIZE DEADFACE SWITCHES THAT WILL ALLOW ORU CHANGEOUT WITHOUT EXTENSIVE POWER  
DOWNS. UTILIZE A HI-FI SPACE STATION MOCKUP IN WHICH EVERY SPARE IS FIRST  
CYCLED TO ASSURE COMPATIBILITY.

\*\*\*\*\*

ID: <1505.00> Issue(s): COMMONALITY :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SPACE LAB  
Reference Data: N/A

Description:  
STANDARDIZE EQUIPMENT/PARTS IDENTIFICATION NUMBERS BY LOCATION (RACK-LEVEL-ROW)

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ID: <1509.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <6 >  
Hardware/Software:<N/A > PROGRAM REF: SATURN  
Reference Data: N/A

Description:  
USE ORIFICES INSTEAD OF REGS FOR PRESSURE MAINTENANCE WHEN POSSIBLE.

\*\*\*\*\*

ID: <1516.00>                    Issue(s): LOGISTICS/SPARES    : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A               >               PROGRAM REF: TRIDENT  
Reference Data: N/A  
Description:  
INCORPORATE TRIDENT PROGRAM FEATURES INTO THE SPACE STATION PROGRAM SUPPLY  
SUPPORT CONCEPT.

\*\*\*\*\*  
ID: <1517.00>                    Issue(s): LOGISTICS/SPARES    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation: <TEST                    >  
Location: <ALL >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A               >               PROGRAM REF: TRIDENT  
Reference Data: N/A  
Description:  
REQUIRE THE SELECTION AND USE OF INSTALLED INSTRUMENTATION WHICH DOES NOT REQUI  
RE CALIBRATION.

\*\*\*\*\*  
ID: <1518.00>                    Issue(s): LOGISTICS/SPARES    : ACCESSABILITY  
Issue(s) cont.: MAINTAINABILITY    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <SC >  
Orb.No/Mission: <6                    >  
Hardware/Software:<N/A               >               PROGRAM REF: TRIDENT  
Reference Data: N/A  
Description:  
DEVELOP AND INVOKE A SET OF DRU-TO-SPACE STATION AND DRU-TO-LOGISTICS MODULE  
MAINTENANCE ACCESSIBILITY REQUIREMENTS. SPECIFY AND VERIFY DRU REMOVAL  
AND TRANSPORT TIMES. USE A FULL SCALE MOCK-UP TO PRECLUDE MAINTENANCE  
DEGRADATION CAUSED BY THE INSTALLATION OF INTERFERENCES. PROVIDE ON GOING  
NASA MAINTENANCE ACCESSABILITY OVERSIGHT.

\*\*\*\*\*

ID: <1519.00>                    Issue(s): PROCEDURE                    : COST/MANHOURS  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <REPLACEMENT/LRU >  
Location:    <SC >  
Orb.No/Mission:    <E >  
Hardware/Software:<N/A >        PROGRAM REF: TRIDENT  
Reference Data:    N/A

Description:  
IMPLEMENT A CM PROGRAM AT THE ORU LEVEL FOR FLIGHT HARDWARE AND AT THE LRU LEVEL FOR GROUND SUPPORT EQUIPMENT AS A MINIMUM. DEVELOP AND IMPLEMENT A HARDWARE IDENTIFICATION SCHEME WHICH IDENTIFIES ALL FLIGHT HARDWARE ORUS AND ALL GROUND SUPPORT EQUIPMENT LRUS. THE NEED TO IMPLEMENT A CM PROGRAM AT THE SRU LEVEL FOR BOTH FLIGHT HARDWARE AND GROUND SUPPORT HARDWARE SHOULD BE EVALUATED,

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ID: <1522.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <N/A >  
Location:    <SC >  
Orb.No/Mission:    <G >  
Hardware/Software:<N/A >        PROGRAM REF: TRIDENT  
Reference Data:    N/A

Description:  
REQUIRE A RELIABILITY PREDICTION/DEMONSTRATION TO PM/FL CORRELATION BE ESTABLISHED AND VERIFIED PRIOR TO ESTABLISHING A HARDWARE DESIGN OR PM/FL COMPUTER SOFTWARE DESIGN BASELINE. THIS CORRELATION SHOULD BE MAINTAINED AND REVERIFIED IN RESPONSE TO SUBSEQUENT HARDWARE DESIGN CHANGES AND PM/FL COMPUTER SOFTWARE DESIGN CHANGES.

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ID: <1523.00>                    Issue(s): DESIGN CRITERIA                    : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <MAINTENANCE >  
Location:    <ALL >  
Orb.No/Mission:    <G >  
Hardware/Software:<N/A >        PROGRAM REF: TRIDENT  
Reference Data:    N/A

Description:  
USE EQUIPMENT DESIGNS WHICH ELIMINATE OR REDUCE THE NEED FOR MAINTENANCE. DESIGN AND IMPLEMENT MAINTAINABILITY DESIGN REVIEW GUIDELINES WHICH FOCUS ON ORGANIZATIONAL, INTERMEDIATE AND DEPOT LEVEL MAINTENANCE MAN-HOUR REDUCTION AND MEAN LOGISTICS DOWN TIME REDUCTION. SELF LUBRICATING, SELF-ALIGNING, SELF-ADJUSTING, SELF-CALIBRATING AND FAULT TOLERANT DESIGNS SHOULD BE AGGRESSIVELY SOUGHT. VALIDATE CRITICAL MAINTENANCE EVOLUTION PRIOR TO IOC.

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ID: <1526.00> Issue(s): DRAWING SYSTEM :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: TRIDENT  
Reference Data: N/A

Description:  
DEVELOP A LOGISTICS INTEGRATION CONCEPT WHICH INCORPORATES SINGLE HARDWARE I.D.  
PLAN DOWN TO THE ORU LEVEL, USE OF A LOGISTICS SUPORT BASELINE, A DISTRIBUTED  
VERSUS CENTRALIZED LOGISTICS DATA SYSTEM CONCEPT.

\*\*\*\*\*  
ID: <1527.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: TRIDENT  
Reference Data: N/A

Description:  
DEVELOP A SPACE STATION MAINTENANCE BASELINE WHICH CAN BE USED AS A TOOL TO  
IDENTIFY GROUND SUPPORT FACILITY CAPABILITY AND CAPACITY REQUIREMENTS.

\*\*\*\*\*  
ID: <1528.00> Issue(s): FAULT DETECTION :  
Issue(s) cont.: : :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <FAULT ISOLATION >  
Location: <SC >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF: TRIDENT  
Reference Data: N/A

Description:  
INVESTIGATE THE USE OF AUTOMATED TECHNDLOS Y FOR LTD DEVELOPMENT AND MAINTENANCE

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\*\*\*\*\*  
ID: <1529.00>                Issue(s): TRAINING/CERTIF        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                            >  
Orb.No/Mission: <G                     >  
Hardware/Software:<N/A                >        PROGRAM REF: TRIDENT  
Reference Data:        N/A  
Description:  
ESTABLISH A SEPARATELY VISIBLE TRAINING PROGRAM FOR THE DN-ORBIT SPACE STATION  
AND EACH UNIQUE GROUND SUPPORT FACILITY.

\*\*\*\*\*  
ID: <1530.00>                Issue(s): MAINTAINABILITY        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE                >  
Location: <SC                            >  
Orb.No/Mission: <G                     >  
Hardware/Software:<N/A                >        PROGRAM REF: TRIDENT  
Reference Data:        N/A  
Description:  
MAKE MAINTENANCE PLANNING THE CENTRAL THRUST OF SPACE STATION LOGISTICS SUPPORT  
PROGRAM AND DEVELOP A MODEL WHICH PROJECTS THE MAINTENANCE WORKLOAD IMPACT  
OF ALTERNATE DESIGNS. IDENTIFY KEY DRIVERS SIMILIAR TO TRIDENT WHICH ENHANCE  
RATHER THAN DEGRADE TO PLANNED SPACE STATION OPERATING PROFILE. USE THE  
MAINTENANCE PLANNING MODEL TO DRIVE GROUND SUPPORT FACILITY CAPABILITY AND  
CAPACITY REQUIREMENTS. EVOLVE THE MODEL INTO AN OPERATIONAL PHASE  
MAINTENANCE PLANNING AND SCHEDULING TOCL.

\*\*\*\*\*  
ID: <1532.00>                Issue(s): COST/MANHOURS        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <SCHEDULING                >  
Location: <KSC                            >  
Orb.No/Mission: <G                     >  
Hardware/Software:<N/A                >        PROGRAM REF: TRIDENT  
Reference Data:        N/A  
Description:  
ENSURE MANPOWER PHASING PLANS RECOGNIZE AND ACCOMMODATE THE PERSONNEL DEPTH  
REQUIREMENTS ASSOCIATED WITH GROUND SUPPORT FACILITY OPERATIONAL SHAKEDOWN

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ID: <1533.00>            Issue(s): COMMONALITY            :  
Issue(s) cont.:                            :                            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <FLIGHT                    >  
Location: <SC                            >  
Orb.No/Mission: <G                      >  
Hardware/Software:<N/A                >        PROGRAM REF: TRIDENT  
Reference Data: N/A  
Description:  
MINIMIZE THE NUMBER OF ON-ORBIT LTD DOCUMENTATION TYPES.

\*\*\*\*\*  
ID: <1535.00>            Issue(s): LOGISTICS/SPARES            :  
Issue(s) cont.:                            :                            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU            >  
Location: <KSC                            >  
Orb.No/Mission: <G                      >  
Hardware/Software:<N/A                >        PROGRAM REF: TRIDENT  
Reference Data: N/A  
Description:  
ESTABLISH A SPACE STATION PROGRAM LOGISTICS MANAGEMENT ORGANIZATION WITH INDIVIDUAL VICE AGENCY/CENTER RESPONSIBILITY FOR DELIVERY OF AN OPERABLE LOGISTICS CAPABILITY. THE SUPERIOR QUALITY FACTORS OF THE TRIDENT SUBMARINE PROGRAM SHOULD BE INCORPORATED INTO THE SPACE STATION PROGRAM LOGISTICS MANAGEMENT ORGANIZATION.

\*\*\*\*\*  
ID: <1536.00>            Issue(s): MANAGEMENT                :  
Issue(s) cont.:                            :                            :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <SCHEDULING                   >  
Location: <ALL                            >  
Orb.No/Mission: <G                      >  
Hardware/Software:<N/A                >        PROGRAM REF: TRIDENT  
Reference Data: N/A  
Description:  
PLACE RESPONSIBILITY AND ACCOUNTABILITY FOR SPACE STATION PHS&T MATTERS WITH MANAGERS WHO HAVE A VESTED INTEREST IN THE SUCCESSFUL RESULTS OF SPACE STATION PHS&T INITIATIVES.

\*\*\*\*\*

ID: <1538.00>                    Issue(s): MAINTAINABILITY        :  
Issue(s) cont.:     :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE                 >  
Location: <ALL                             >  
Orb.No/Mission: <G                        >  
Hardware/Software:<N/A                   >        PROGRAM REF: TRIDENT  
Reference Data:        N/A  
Description:  
USE A MAINTENANCE PLANNING MODEL TO IDENTIFY THE GROUND SUPPORT FACILITY PERSONNEL REQUIREMENTS.

\*\*\*\*\*  
ID: <1539.00>                    Issue(s): COMMONALITY                 :  
Issue(s) cont.:     :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE                 >  
Location: <ALL                             >  
Orb.No/Mission: <G                        >  
Hardware/Software:<N/A                   >        PROGRAM REF: TRIDENT  
Reference Data:        N/A  
Description:  
STRICKLY ENFORCE THE USE OF STANDARD TOOLS.

\*\*\*\*\*  
ID: <1541.00>                    Issue(s): SAFETY                        : ACCESSABILITY  
Issue(s) cont.:     :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <HAZARDOUS                     >  
Location: <ALL                             >  
Orb.No/Mission: <GENERIC                 >  
Hardware/Software:<N/A                   >  
Reference Data:        N/A  
Description:  
LOCATION OF FIRE DETECTION ELECTRONIC UNIT SHOULD BE SELECTED TO ASSURE EASE OF MAINTENANCE AND TO ENHANCE OPTIMUM RELIABILITY.

\*\*\*\*\*



ID: <1542.00> Issue(s): MAINTAINABILITY : COST/MANHOURS  
Issue(s) cont.: DESIGN CRITERIA :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
CONSIDER USE OF LVDT POSITION SENSORS IN LIEU OF POTENTIOMETERS, WHICH HAVE PROBLEMS SUCH AS WIPER LIFT-OFF, HIGH OR INTERMITTENT WIPER CONTACT RESISTANCE, FRICTION, CORROSION.

\*\*\*\*\*  
ID: <1543.00> Issue(s): DESIGN CRITERIA : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
SYSTEM DESIGN SPECS SHOULD REQUIRE THAT ACCESSIBILITY FOR MAINTENANCE SERVICING BE A CONSIDERATION WHEN DETERMINING EQUIPMENT LOCATIONS.

\*\*\*\*\*  
ID: <1544.00> Issue(s): COMMONALITY : DESIGN CRITERIA  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <ASSEMBLY >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
DESIGN SPECIFICATIONS MUST ESTABLISH A REQUIREMENT FOR STANDARDIZED PANEL FASTENERS.

\*\*\*\*\*

ID: <1545.00>                    Issue(s): DESIGN CRITERIA        :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE        >  
Location:   <ALL                >  
Orb.No/Mission: <GENERIC         >  
Hardware/Software:<N/A           >  
Reference Data:   N/A

Description:  
EL LIGHTING SUBSTANTIALLY INCREASES RELIABILITY OF COCKPIT LIGHTING AND ASSOCIATED LRUS, REDUCES WEIGHT, COOLING REQUIREMENTS, GLARE & MAINTENANCE COSTS . EL LIGHTING SHOULD BE CONSIDEREED FOR ALL NEW SYSTEMS/EQUIPMENT.

\*\*\*\*\*

ID: <1546.00>                    Issue(s): SAFETY                : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE        >  
Location:   <ALL                >  
Orb.No/Mission: <GENERIC         >  
Hardware/Software:<N/A           >  
Reference Data:   N/A

Description:  
OPERATIONAL HAZARDS AND MAINTENANCE DIFFICULTIES SHOULD BE TAKEN INTO ACCOUNT DURING CABLE DESIGN/SELECTION.

\*\*\*\*\*

ID: <1547.00>                    Issue(s): COMMONALITY         : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:   <REPLACEMENT/LRU >  
Location:   <ALL                >  
Orb.No/Mission: <GENERIC         >  
Hardware/Software:<N/A           >  
Reference Data:   N/A

Description:  
SYSTEM SPECIFICATION SHOULD REQUIRE ALL ELECTRIC SYSTEM LRUS SHOULD HAVE QUICK DISCONNECT CAPABILITY.

\*\*\*\*\*

ID: <1548.00>                Issue(s): MAINTAINABILITY                : DESIGN CRITERIA  
Issue(s) cont.:                :                :  
Issue Source: <STS MT STDY (RI)>                PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE                >  
Location: <ALL                >  
Orb.No/Mission: <GENERIC                >  
Hardware/Software:<N/A                >  
Reference Data: N/A  
Description:  
DESIGN ACCESS COVERS IN HIGHLY RESTRICTIVE AREAS. COMPONENTS INSTALLED IN AREAS  
WITH LIMITED ACCESS SHOULD HAVE HIGH RELIABILITY TO REDUCE MAINT.  
RELIABILITY/ACCESSABILITY SHOULD BE REVIEWED AT PDR/CDR.

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ID: <1549.00>                Issue(s): SAFETY                : DESIGN CRITERIA  
Issue(s) cont.: MAINTAINABILITY                :                :  
Issue Source: <STS MT STDY (RI)>                PHASE III, MAY 30, 1986  
Operation: <FLIGHT                >  
Location: <SC                >  
Orb.No/Mission: <GENERIC                >  
Hardware/Software:<N/A                >  
Reference Data: N/A  
Description:  
AVOID USE OF PFIW. ALTHOUGH LIGHT IN WEIGHT AND CONSERVATIVE OF SPACE, IT WILL  
DEGRADE UNDER MOISTURE, HEAT AND PRESSURE WHICH REDUCES THE PHYSICAL PROPERTIES  
OF THE INSULATION.

\*\*\*\*\*  
ID: <1550.00>                Issue(s): DESIGN CRITERIA                :  
Issue(s) cont.:                :                :  
Issue Source: <STS MT STDY (RI)>                PHASE III, MAY 30, 1986  
Operation: <ASSEMBLY                >  
Location: <ALL                >  
Orb.No/Mission: <GENERIC                >  
Hardware/Software:<N/A                >  
Reference Data: N/A  
Description:  
CONNECTORS SHOULD BE DESIGNED SO THAT METAL USED IN THE ALIGNMENT KEYS IS AS  
DURABLE AS THAT USED IN CONNECTORS. CONNECTORS DESIGN WITH SOFT METAL  
ALIGNMENT PINS DO NOT HAVE A HIGH MEAN-TIME BETWEEN FAILURES.

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ID: <1552.00>               Issue(s): DESIGN CRITERIA       :  
Issue(s) cont.:                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation:   <GENERIC        >  
Location:     <ALL         >  
Orb.No/Mission: <GENERIC     >  
Hardware/Software:<N/A       >  
Reference Data:   N/A

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Description:  
CORROSION ENVIRONMENTS SHOULD BE CONSIDERED WHEN CHOOSING METALS FOR HIGH STRESS APPLICATIONS. METALS USED IN HIGH-STRESS LOADING DETERIORATE IN ENVIRONMENTS THAT WOULD NOT AFFECT MATERIAL WHEN NOT STRESSED.

\*\*\*\*\*  
ID: <1553.00>               Issue(s): MAINTAINABILITY       : DESIGN CRITERIA  
Issue(s) cont.:                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE    >  
Location:     <ALL         >  
Orb.No/Mission: <GENERIC     >  
Hardware/Software:<N/A       >  
Reference Data:   N/A

Description:  
PCBS IN HORIZONTAL POSITION ARE SUSCEPTIBLE TO DIRT, DUST, DEBRIS, CONDENSATION & SPILLAGE ACCUMULATIONS. THESE CONSTITUTE A CORROSIVE ATMOSPHERE RESULTING IN CIRCUIT AND COMPONENT FAILURES.

\*\*\*\*\*  
ID: <1554.00>               Issue(s): PROCEDURE            :  
Issue(s) cont.:                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE    >  
Location:     <ALL         >  
Orb.No/Mission: <GENERIC     >  
Hardware/Software:<N/A       >  
Reference Data:   N/A

Description:  
SERVICING NICKEL-CADMIIUM (NICAD) BATTERIES AT NO LONGER THAN 90 DAY INTERVALS, USING REFLEX TYPE BATTERY CHARGES INSTEAD OF CONSTANT CURRENT TYPES, WILL INCREASE RELIABILITY & AVAILABILITY OF NICAD BATTERIES.

ID: <1555.00>            Issue(s): PROCEDURE            : DESIGN CRITERIA  
Issue(s) cont.: MAINTAINABILITY            :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:    <MAINTENANCE            >  
Location:     <OREITR>  
Orb.No/Mission: <GENERIC            >  
Hardware/Software: <LANDING            >            BRAKES  
Reference Data:    N/A  
Description:  
LOCATING THE GRAVITY FEED HYDRAULIC BRAKE RESERVOIR AWAY FROM THE PRESSURE CYLINDER CAN LEAD TO REDUCED CAPABILITY TO ENSURE POSITIVE BLEEDING.

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ID: <1556.00>            Issue(s): MAINTAINABILITY            : DESIGN CRITERIA  
Issue(s) cont.: EFFICIENCY            :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:    <MAINTENANCE            >  
Location:     <ALL            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software: <N/A            >  
Reference Data:    N/A  
Description:  
INSTALLATION OF COMPONENT SOCKETS ON SOME PCBs USED ON FLIGHT SIMULATORS WILL EXTEND THE LIFE OF PCBs, REDUCE DOWNTIME OF FLIGHT SIMULATORS, AND AFFORD SIMPLICITY OF SERVICING AND TESTING.

\*\*\*\*\*  
ID: <1557.00>            Issue(s): MAINTAINABILITY            :  
Issue(s) cont.:            :  
Issue Source: <STS MT STDY (RI)>            PHASE III, MAY 30, 1986  
Operation:    <MAINTENANCE            >  
Location:     <ALL            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software: <N/A            >  
Reference Data:    N/A  
Description:  
SERVICING NICKEL-CADMIUM (NICAD) BATTERIES AT NO LONGER THAN 90 DAY INTERVALS, USING REFLEX TYPE BATTERY CHARGES INSTEAD OF CONSTANT CURRENT TYPES, WILL INCREASE RELIABILITY & AVAILABILITY OF NICAD BATTERIES.

\*\*\*\*\*

ID: <1558.00>                    Issue(s): MAINTAINABILITY         : DESIGN CRITERIA  
Issue(s) cont.:   :                                 :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE        >  
Location:    <ALL        >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A        >        PROGRAM REF: DDD  
Reference Data: N/A

Description:  
 DESIGNERS OF BLACK BOXES SHOULD LOCATE CARD CONNECTORS ON THE SIDE OR BACK, NOT ON BOTTOM. NOT USE MATERIALS THAT EMIT CORROSIVE VAPORS LIKE PVC, SARAN, TYGON, ETC. INSTALL A DRAIN HOLE AT THE BOTTOM OF BOX.

\*\*\*\*\*  
ID: <1559.00>                    Issue(s): MAINTAINABILITY         : DESIGN CRITERIA  
Issue(s) cont.:   :                                 :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE        >  
Location:    <ALL        >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A        >  
Reference Data: N/A

Description:  
 DURING DESIGN PROCESS, REQUIREMENT FOR HINGES ON REAR ACCESS PANELS SHOULD BE CONSIDERED IN ORDER TO IMPROVE TEST STATION MAINTAINABILITY.

\*\*\*\*\*  
ID: <1560.00>                    Issue(s): TECHNOLOGY                : DESIGN CRITERIA  
Issue(s) cont.: SAFETY   :                                 :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE        >  
Location:    <ORBITR>  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<AVIONICS     >  
Reference Data: N/A

Description:  
 ON AVIONICS EQUIP INSTALL RESILIENT METAL SHOCK MOUNTS IN PLACE OF FOAM MOUNTS. FOAM MOUNTS DELAMINATE, TEAR AWAY FROM BOND STRUCTURE, AND PLASTIC OR RUBBERIZED MATERIAL DETERIORATES.

ID: <1563.00> Issue(s): DESIGN CRITERIA : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
DESIGN SHOULD BE PREDICATED ON MAXIMUM ACCESSIBILITY TO COMPONENTS WITH FINITE SERVICE LIFE.

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ID: <1564.00> Issue(s): DESIGN CRITERIA : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
USE OF FLEXIBLE HYDRAULIC LINES & QUICK DISCONNECT HYDRAULIC FITTINGS SHOULD BE CONSIDERED DURING DESIGN. DURING VARIOUS SYSTEM REVIEWS AND TESTS, ENSURE THE ABOVE REQUIREMENTS HAVE BEEN MET.

\*\*\*\*\*  
ID: <1565.00> Issue(s): DESIGN CRITERIA : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
DESIGN SPECS MUST REQUIRE, AND DESIGN REVIEWS MUST VERIFY, THAT CONNECTORS ARE IN EASILY ACCESSIBLE LOCATIONS.

\*\*\*\*\*

ID: <1566.00>                    Issue(s): DESIGN CRITERIA    : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                    >  
Location:    <SC                            >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <AVIONICS                    >  
Reference Data:    N/A  
Description:  
SYSTEMS REQUIRING RLGS IN PLACE OF CONVENTIONAL SPINNING GYROS WILL EXPERIENCE AN INCREASE IN OPERATIONAL AVAILABILITY & SURVIVABILITY, A REDUCTION IN MAINTENANCE M/H & LOWER LIFE CYCLE COST (LCC).

\*\*\*\*\*  
ID: <1567.00>                    Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <FLIGHT                    >  
Location:    <SC                            >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                            >  
Reference Data:    N/A  
Description:  
PROGRAM MANAGERS OF NEW SYSTEMS USING INERTIAL NAVIGATION, STABILIZATION DEVICES, SHOULD CONSIDER USE OF RL6 INSTEAD OF SPINNING, GIMBALLED GYROSCOPES.

\*\*\*\*\*  
ID: <1570.00>                    Issue(s): DESIGN CRITERIA    : ACCESSABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>    PHASE III, MAY 30, 1986  
Operation:    <MAINTENANCE                    >  
Location:    <ALL                            >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                            >  
Reference Data:    N/A  
Description:  
ACCESS PANELS WITH QUICK-ACTION FASTENERS, SUCH AS "HARTWELL" LATCHES, SHOULD BE CONSIDERED FOR USE IN AREAS WHERE FREQUENT ACCESS IS REQUIRED.

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ID: <1571.00>                    Issue(s): DESIGN CRITERIA         : ACCESSABILITY  
Issue(s) cont.:                         :                             :

Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986

Operation:     <MAINTENANCE         >

Location:     <ALL                 >

Orb.No/Mission:   <GENERIC         >

Hardware/Software:<N/A             >

Reference Data:    N/A

Description:

REQUIRE THAT ELECTRONIC EQUIPMENT BE DESIGNED WITH ELECTRIC TEST POINTS PROVIDED ON EQUIPMENT DRAWER FRONT PANELS AND CIRCUIT CARDS, AND THAT DRAWERS SHOULD BE MOUNTED ON PULL-OUT SLIDES.

\*\*\*\*\*

ID: <1572.00>                    Issue(s): DESIGN CRITERIA         : ACCESSABILITY  
Issue(s) cont.:                         :                             :

Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986

Operation:     <MAINTENANCE         >

Location:     <ALL                 >

Orb.No/Mission:   <GENERIC         >

Hardware/Software:<N/A             >

Reference Data:    N/A

Description:

SYSTEM SPECS SHOULD REQUIRE THAT REPAIRABLE/REPLACEABLE COMPONENTS OF SYSTEMS AND EQUIPMENT CAN BE REMOVED WITHOUT REMOVING OTHER EQUIPMENT, HYDRAULIC LINES, ETC.

\*\*\*\*\*

ID: <1573.00>                    Issue(s): DESIGN CRITERIA         : ACCESSABILITY  
Issue(s) cont.:                         :                             :

Issue Source: <STS MT STDY (RI)>         PHASE III, MAY 30, 1986

Operation:     <REPLACEMENT/LRU     >

Location:     <ALL                 >

Orb.No/Mission:   <GENERIC         >

Hardware/Software:<N/A             >

Reference Data:    N/A

Description:

DESIGN SPECS FOR RACK MOUNTED LRUS SHOULD SPECIFY LOCKING MECHANISMS LOCATED ON FRONT OF UNIT. POORLY DESIGNED OR CONSTRUCTED LOCKING MECHANISMS ON LRUS CAUSE EXCESSIVE MANHOURS TO BE EXPECTED.

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ID: <1574.00>                    Issue(s): DESIGN CRITERIA        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
 WHEN CABLES ARE TO BE ATTACHED TO FRONT OF LRUS, DESIGN SPECS SHOULD CALL FOR  
 ROUNDED CORNERS AND EDGES ON THE LRUS. SHARP CORNERS AND EDGES CHAFE THE  
 INSULATION ON ELECTRICAL CABLES.

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ID: <1575.00>                    Issue(s): DESIGN CRITERIA        : ACCESSABILITY  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <INSPECTION >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS >  
Reference Data: N/A  
Description:  
 REQUIREMENT TO VISUALLY INSPECT MOVEABLE ANTENNAS SHOULD BE CRITICALLY REVIEWED  
 AND VALIDATED. IF A VALID REQUIREMENT EXISTS, CONSIDERATION SHOULD BE  
 GIVEN TO DESIGNING A MEANS OF GAINING VISUAL ACCESS.

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ID: <1577.00>                    Issue(s): DESIGN CRITERIA        :  
Issue(s) cont.:    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
 DESIGN SPECIFICATIONS SHOULD PROHIBIT USE OF MATERIALS SUBJECT TO AGE  
 DETERIORATION IN HIGHLY INACCESSIBLE AREAS.

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ID: <1578.00>                     Issue(s): DESIGN CRITERIA     : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE     >  
Location:    <ALL     >  
Orb.No/Mission:   <GENERIC     >  
Hardware/Software: <N/A       >  
Reference Data:    N/A  
Description:  
DESIGN SPECS FOR ELECTRONIC SUPPORT EQUIP SHOULD SPECIFY ZIF TYPE RACK AND  
PANEL CONNECTORS. THIS CONNECTOR CAN INCREASE RELIABILITY OF ELECTRONIC  
SUPPORT EQUIPMENT AND MAINTENANCE EFFECTIVENESS.

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ID: <1588.00>                     Issue(s): DESIGN CRITERIA     : ACCESSABILITY  
Issue(s) cont.: MAINTAINABILITY         :                    :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE     >  
Location:    <ALL     >  
Orb.No/Mission:   <GENERIC     >  
Hardware/Software: <N/A       >  
Reference Data:    N/A  
Description:  
DESIGN SPECS SHOULD REQUIRE SIMPLICITY OF DESIGN/ACCESSIBILITY TO FACILITATE  
BATTERY MAINT. MAINTAINABILITY DEMOS SHOULD BE CONDUCTED TO IDENTIFY & CORRECT  
MAINTENANCE DEFICIENCIES BEFORE DESIGN IS "FROZEN".

\*\*\*\*\*  
ID: <1582.00>                     Issue(s): ACCESSABILITY         :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>     PHASE III, MAY 30, 1986  
Operation:   <MAINTENANCE     >  
Location:    <ORBITR>  
Orb.No/Mission:   <GENERIC     >  
Hardware/Software: <AVIONICS    >  
Reference Data:    N/A  
Description:  
RECOMMEND PLACEMENT OF A SMALL ACCESS PANEL IN FLOOR BOARDS ABOVE OR IN  
FUSELAGE SKIN ADJACENT TO ANTENNAS IN ORDER TO PROVIDE FOR MORE ACCESSIBLE  
SERVICING AND/OR REPLACEMENT.

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ID: <1583.00> Issue(s): ACCESSABILITY :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF:  
Reference Data: N/A  
Description:  
DESIGN SPECIFICATIONS FOR RACK MOUNTED LRUS SHOULD SPECIFY THAT THE LOCKING MECHANISM BE LOCATED ON THE FRONT OF THE UNIT.

\*\*\*\*\*  
ID: <1584.00> Issue(s): DESIGN CRITERIA : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF:  
Reference Data: N/A  
Description:  
DESIGN SPECS SHOULD MINIMIZE OR ELIMINATE PLACEMENT OF EQUIP REQUIRING MAINTENANCE BEHIND STRESS PANELS. WHEN THIS CANNOT BE AVOIDED, RAPID OPENING FASTENERS DESIGNED FOR LIFE SHOULD BE USED.

\*\*\*\*\*  
ID: <1585.00> Issue(s): ACCESSABILITY :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF:  
Reference Data: N/A  
Description:  
DESIGN ACCESS COVERS IN HIGHLY RESTRICTIVE AREAS. COMPONENTS INSTALLED IN AREAS WITH LIMITED ACCESS SHOULD HAVE HIGH RELIABILITY TO REDUCE MAINT. RELIABILITY/ACCESSABILITY SHOULD BE REVIEWED AT PDR/CDR.

\*\*\*\*\*

ID: <1586.00>                    Issue(s): DESIGN CRITERIA            : ACCESSABILITY  
Issue(s) cont.:                    :                                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE       >  
Location: <ALL       >  
Orb.No/Mission: <G               >  
Hardware/Software:<N/A           >         PROGRAM REF:  
Reference Data:       N/A  
Description:  
DESIGN FOR ADEQUATE ACCESS TO LRUS LOCATED FORWARD OF THE INSTRUMENT PANEL  
WITHOUT REMOVAL OF THE PANEL, OR DESIGN FOR EASIER PANEL REMOVAL.

\*\*\*\*\*  
ID: <1587.00>                    Issue(s): RELIABILITY                : DESIGN CRITERIA  
Issue(s) cont.:                    :                                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation: <FLIGHT               >  
Location: <ORBITR>  
Orb.No/Mission: <G               >  
Hardware/Software:<N/A           >         PROGRAM REF:  
Reference Data:       N/A  
Description:  
PROVISIONS MUST BE MADE FOR SHOCK MOUNTING OF GYROS. PROTECTION FROM EXCESSIVE  
VIBRATION MUST BE VERIFIED DURING PDP & CDR. RIGID MOUNTING OF VERTICAL GYROS  
IN A HIGH VIBRATION LOCATION LEAD TO FAILURES.

\*\*\*\*\*  
ID: <1588.00>                    Issue(s): DESIGN CRITERIA            : MAINTAINABILITY  
Issue(s) cont.:                    :                                    :  
Issue Source: <STS MT STDY (RI)>       PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE       >  
Location: <ALL       >  
Orb.No/Mission: <G               >  
Hardware/Software:<N/A           >         PROGRAM REF:  
Reference Data:       N/A  
Description:  
DESIGNERS OF BLACK BOXES SHOULD POSITION PCBs SO THEY WILL BE VERTICAL WHEN THE  
BLACK BOX IS INSTALLED IN THE SYSTEM. LOCATE ELECTRICAL FEED THROUGH CONNECTORS  
ON THE SIDE OR BACK, NOT ON THE BOTTOM.

```
ID: <1589.00> Issue(s): COST/MANHOURS : MAINTAINABILITY
Issue(s) cont.: : :
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986
Operation: <MAINTENANCE >
Location: <ALL >
Orb.No/Mission: <G >
Hardware/Software:<N/A > PROGRAM REF:
Reference Data: N/A
Description:
INCLUDE IN ALL CONTRACTS THE REQUIREMENT THAT SPARE PARTS BE SUBJECTED TO SAME
STRINGENT REALIABILITY AND MAINTAINABILITY SPECS AND QUALITY ASSURANCE
AS ORIGINAL EQUIPMENT.
```

```
*****
ID: <1598.00> Issue(s): COST/MANHOURS : DESIGN CRITERIA
Issue(s) cont.: SAFETY : :
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986
Operation: <MAINTENANCE >
Location: <ALL >
Orb.No/Mission: <G >
Hardware/Software:<N/A > PROGRAM REF:
Reference Data: N/A
Description:
HYGROSCOPIC ADHESIVE IN COMPOSITE CONSTRUCTION RESULTS IN BOND FAILURE. THIS
ADHESIVE ALLOWS WATER TO MIGRATE OR WICK INTO THE HONEYCOMB CAUSING
DELAMINATION, CORROSION, AND STRUCTURAL FAILURE.
```

```
*****
ID: <1592.00> Issue(s): DESIGN CRITERIA : ACCESSABILITY
Issue(s) cont.: : :
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986
Operation: <MAINTENANCE >
Location: <ALL >
Orb.No/Mission: <G >
Hardware/Software:<N/A > PROGRAM REF:
Reference Data: N/A
Description:
WHEN WRITING DESIGN SPECS, CONSIDER SPECIFYING THE USE OF CAPTIVE NUTS AS A
MEANS OF FASTENING REMOVABLE COMPONENTS AND PANELS, PARTICULARLY WHERE ACCESS
TO THE NUTS IS DIFFICULT.
```

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*****
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ID: <1594.00>                    Issue(s): DESIGN CRITERIA        : ACCESSABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:       <MAINTENANCE        >  
Location:        <ALL        >  
Orb.No/Mission:   <G                >  
Hardware/Software: <N/A               >        PROGRAM REF:  
Reference Data:    N/A

ORIGINAL PAGE IS  
OF POOR QUALITY

Description:  
ACCESSIBILITY FOR MAINTENANCE MUST BE ADDRESSED DURING PREPARATION OF SYSTEM SPEC. THE REPAIRABLE COMPONENTS SHOULD BE ACCESSIBLE WITHOUT REMOVAL OF OTHER COMPONENTS.

\*\*\*\*\*

ID: <1595.00>                    Issue(s): COST/MANHOURS        : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:       <REPAIR                >  
Location:        <ALL        >  
Orb.No/Mission:   <G                >  
Hardware/Software: <N/A               >        PROGRAM REF:  
Reference Data:    N/A

Description:  
PROCUREMENT SHOULD BE AWARE OF MAGNESIUM SUSCEPTIBILITY TO CORROSION. COMPONENT COMPONENTS MADE FROM MAGNESIUM ARE EXPERIENCING HIGH FAILURE RATES AND REPAIR COSTS CAUSED BY CORROSION.

\*\*\*\*\*

ID: <1596.00>                    Issue(s): SAFETY                :  
Issue(s) cont.:                    :                    :  
Issue Source: <STS MT STDY (RI)>        PHASE III, MAY 30, 1986  
Operation:       <SCHEDULING               >  
Location:        <ALL        >  
Orb.No/Mission:   <G                >  
Hardware/Software: <N/A               >        PROGRAM REF:  
Reference Data:    N/A

Description:  
COMPRESSION OF FSED SCHEDULE REDUCES EFFECTIVENESS OF A RELIABILITY PROGRAM AND INCREASES THE GOVERNMENTS RISK OF ACQUIRING AN UNRELIABLE AND UNSUPPORTABLE SYSTEM.

\*\*\*\*\*

ID: <1597.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <N/A >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF:  
Reference Data: N/A

Description:  
THE BENEFITS THAT CAN BE REALIZED BY USING EXISTING EQUIP, DESIGN PROCESS, AND MATERIALS SHOULD BE CAREFULLY WEIGHED BEFORE A NEW SYSTEM IS DESIGNED.

\*\*\*\*\*  
ID: <1598.00> Issue(s): COMMONALITY :  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF:  
Reference Data: N/A

Description:  
PROJECT OFFICES MUST REVIEW DESIGN INPUTS DURING CDR & PDR. PROLIFERATION OF NON-STANDARD CABLE & CONNECTORS INCREASES SUPPORT COSTS, MAINTENANCE MAN-HOURS, TECHNICAL DATA AND TRAINING.

\*\*\*\*\*  
ID: <1599.00> Issue(s): DESIGN CRITERIA : MAINTAINABILITY  
Issue(s) cont.: :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A > PROGRAM REF:  
Reference Data: N/A

Description:  
MAINTAINABILITY FACTORS FOR A SYSTEM MUST BE REQUIRED FROM CONCEPTION AND BE REFLECTED IN THE DESIGN CONCEPT REVIEWS, ITEM SELECTION, DESIGN REVIEWS, AND DESIGN TRADE-OFF STUDIES.

\*\*\*\*\*





ID: <1605.00> Issue(s): COST/MANHOURS : SAFETY  
Issue(s) cont.: MAINTAINABILITY :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
RECOMMEND A REQUIREMENT THAT NO HOLLOW FASTENERS BE USED AND HOLLOW MECHANICAL ASSEMBLIES BE SELF DRAINING AND NOT ABLE TO TRAP WATER. HOLLOW FASTENERS AND MECHANICAL ASSEMBLIES ARE PRONE TO CRACK.

\*\*\*\*\*

ID: <1606.00> Issue(s): DESIGN CRITERIA : ACCESSABILITY  
Issue(s) cont.: MAINTAINABILITY :  
Issue Source: <STS MT STDY (RI)> PHASE III, MAY 30, 1986  
Operation: <MAINTENANCE >  
Location: <ALL >  
Orb.No/Mission: <G >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
SYSTEM DESIGN SPECS SHOULD REQUIRE CABLE-ACTUATED CONTROL SYSTEMS BE DESIGNED WITH PLANNED ACCESS TO PULLEY AREAS TO FACILITATE INSPECTION AND SIMPLE ADJUSTMENTS.

\*\*\*\*\*















ID: <1700.00>                    Issue(s): STANDARDS                    : AUTOMATION  
Issue(s) cont.: INTEGRATION                    :  
Issue Source: <AFSC/NSIA                    >                    AFSC/NSIA OPPORTUNITY LIST                    5 JUNE '86  
Operation: <GENERIC                    >  
Location: <ORBITR>  
Orb.No/Mission: <6                    >  
Hardware/Software:<ORBITER                    >  
Reference Data:    N/A  
Description:  
 "STANDARDIZE, SIMPLIFY, AND/OR AUTOMATE PAYLOAD INTEGRATION, OPERATIONS  
 AND DEPLOYMENT. (C. FORD)"

\*\*\*\*\*  
 ID: <1701.00>                    Issue(s): PLANNING                    :  
Issue(s) cont.:                    :  
Issue Source: <AFSC/NSIA                    >                    AFSC/NSIA OPPORTUNITY LIST                    5 JUNE '86  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <6                    >  
Hardware/Software:<ORBITER                    >  
Reference Data:    N/A  
Description:  
 "FURTHER INCREASE STANDARDIZATION IN THE AREAS OF MISSION PLANNING AND  
 OPERATIONS. (M. CASSETTI)"

\*\*\*\*\*  
 ID: <1702.00>                    Issue(s): PLANNING                    : TRAINING/CERTIF  
Issue(s) cont.:                    :  
Issue Source: <AFSC/NSIA                    >                    AFSC/NSIA OPPORTUNITY LIST                    5 JUNE '86  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <6                    >  
Hardware/Software:<ORBITER                    >  
Reference Data:    N/A  
Description:  
 "BROADEN SHUTTLE CREW RESPONSIBILITIES. COMPARE WITH FUNCTIONAL SPLIT  
 AND OVERLAP AMONG AIRLINE CAPTAINS, AIRCRAFT DISPATCHERS, AND AIR  
 TRAFFIC CONTROLLERS. (J. HARPER)"

\*\*\*\*\*

ID: <1703.00>                    Issue(s): ISOLATION                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        AFSC/NSIA OPPORTUNITY LIST        5 JUNE '86  
Operation: <FLIGHT               >  
Location: <ORBITR>  
Orb.No/Mission: <G               >  
Hardware/Software:<AVIONICS     >  
Reference Data:    N/A

Description:  
"UPGRADE AVIONICS ON ORBITER TO INCREASE AUTONOMY. SUGGESTIONS INCLUDE INCORPORATION OF GPS AND UPGRADE OF GENERAL PURPOSE COMPUTING SYSTEM (INCLUDING BOTH GPC HARDWARE AND SOFTWARE). (J. HARPER)"

\*\*\*\*\*

ID: <1704.00>                    Issue(s): ISOLATION                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        AFSC/NSIA OPPORTUNITY LIST        5 JUNE '86  
Operation: <FLIGHT               >  
Location: <ORBITR>  
Orb.No/Mission: <G               >  
Hardware/Software:<ORBITER     >  
Reference Data:    N/A

Description:  
"CONSIDER FEASIBILITY AND COST EFFECTIVENESS OF AN UNMANNED ORBITER. (G. HANLEY)"

\*\*\*\*\*

ID: <1705.00>                    Issue(s): COST/MANHOURS                :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        AFSC/NSIA OPPORTUNITY LIST        5 JUNE '86  
Operation: <N/A                   >  
Location: <SC                     >  
Orb.No/Mission: <G               >  
Hardware/Software:<N/A           >  
Reference Data:    N/A

Description:  
"EVALUATE NEAR-TERM SAVINGS BY MOTHBALLING SLC-6 TEMPORARILY WHILE AWAITING ORBITER FLEET REPLENISHMENT AND/OR EXPANSION."

\*\*\*\*\*

ID: <1786.00>                    Issue(s): STANDARDS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA            >            AFSC/NSIA OPPORTUNITY LIST    5 JUNE '86  
Operation: <GENERIC                >  
Location: <ORBITR>  
Orb.No/Mission: <G                 >  
Hardware/Software: <ORBITER       >  
Reference Data:    N/A  
Description:  
\*ESTABLISH STANDARD ORBITER CONFIGURATION AND WORK TOWARD THAT GOAL  
FOR BOTH NEW AND EXISTING ORBITERS. (W. GOOD)\*

\*\*\*\*\*  
ID: <1787.00>                    Issue(s): LOGISTICS/SPARES                    : CANNIBALIZATION  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA            >            AFSC/NSIA OPPORTUNITY LIST    5 JUNE '86  
Operation: <REPLACEMENT/LRU >  
Location: <ALL >  
Orb.No/Mission: <G                 >  
Hardware/Software: <N/A            >  
Reference Data:    N/A  
Description:  
\*ASSURE ADEQUACY OF STANDARDIZED SPARES TO DECREASE LABOR INTENSIVE  
CANNIBALIZATION AMONG ORBITERS BETWEEN FLIGHTS. (W. GOOD)\*

\*\*\*\*\*  
ID: <1788.00>                    Issue(s): STANDARDS                    : INTERFACE  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA            >            AFSC/NSIA OPPORTUNITY LIST    5 JUNE '86  
Operation: <GENERIC                >  
Location: <ALL >  
Orb.No/Mission: <G                 >  
Hardware/Software: <N/A            >  
Reference Data:    N/A  
Description:  
\*MINIMIZE SERVICES AND STANDARDIZE MECHANICAL/STRUCTURAL INTERFACES.\*

\*\*\*\*\*

ID: <1709.00>                    Issue(s): RELIABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA            >            AFSC/NSIA OPPORTUNITY LIST    5 JUNE '86  
Operation:   <GENERIC            >            :  
Location:   <ALL               >            :  
Orb.No/Mission: <6               >            :  
Hardware/Software:<N/A            >            :  
Reference Data:   N/A  
Description:  
"MOVE TOWARD PAYLOAD CONTAINERIZATION."

\*\*\*\*\*  
ID: <1710.00>                    Issue(s): TECHNOLOGY                    : COST/MANHOURS  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA            >            AFSC/NSIA OPPORTUNITY LIST    5 JUNE '86  
Operation:   <GENERIC            >            :  
Location:   <ALL               >            :  
Orb.No/Mission: <6               >            :  
Hardware/Software:<SOFTWARE       >            :  
Reference Data:   N/A  
Description:  
"PURSUE ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN ORDER TO ACHIEVE A TENFOLD  
IMPROVEMENT IN SOFTWARE DEVELOPMENT AND MAINTENANCE COSTS."

\*\*\*\*\*  
ID: <1711.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA            >            AFSC/NSIA OPPORTUNITY LIST    5 JUNE '86  
Operation:   <GENERIC            >            :  
Location:   <ALL               >            :  
Orb.No/Mission: <6               >            :  
Hardware/Software:<N/A            >            :  
Reference Data:   N/A  
Description:  
"INCORPORATE SMALLER SENSORS WHICH WEIGH LESS AND USE LESS POWER."

\*\*\*\*\*

\*\*\*\*\*  
ID: <1712.00>                    Issue(s): TECHNOLOGY                    : DESIGN CRITERIA  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA           >           AFSC/NSIA OPPORTUNITY LIST     5 JUNE '86  
Operation:    <GENERIC           >  
Location:    <ALL           >  
Orb.No/Mission: <6           >  
Hardware/Software:<N/A           >  
Reference Data:    N/A  
Description:  
"INCREASE DESIGN MARGINS IN WEIGHT, VOLUME, AND POWER."

\*\*\*\*\*  
ID: <1713.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA           >           AFSC/NSIA OPPORTUNITY LIST     5 JUNE '86  
Operation:    <GENERIC           >  
Location:    <ALL           >  
Orb.No/Mission: <6           >  
Hardware/Software:<N/A           >  
Reference Data:    N/A  
Description:  
"REDUCE LABOR INTENSITY BY CHANGING MANAGEMENT CULTURE TO A MORE PARTICIPATIVE  
MANAGEMENT ORGANIZATION STYLE."

\*\*\*\*\*  
ID: <1714.00>                    Issue(s): MANAGEMENT                    : METHODS  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA           >           AFSC/NSIA OPPORTUNITY LIST     5 JUNE '86  
Operation:    <GENERIC           >  
Location:    <ALL           >  
Orb.No/Mission: <6           >  
Hardware/Software:<N/A           >  
Reference Data:    N/A  
Description:  
"IMPROVE MANAGEMENT INFORMATION AND DECISION SUPPORT SYSTEMS WHILE REDUCING  
DATA DEMANDS."

\*\*\*\*\*

ID: <1715.00>                    Issue(s): MANAGEMENT                    : PLANNING  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        AFSC/NSIA OPPORTUNITY LIST    5 JUNE '86  
Operation:    <GENERIC        >        :  
Location:    <ALL        >        :  
Orb.No/Mission: <G            >        :  
Hardware/Software:<SOFTWARE    >        :  
Reference Data:    N/A  
Description:  
 "IMPROVE SOFTWARE DEVELOPMENT PROCESSES AND APPLY TO MISSION PLANNING AND MISSION SUPPORT ACTIVITIES."

"REMAIN VIGILANT FOR COST-EFFECTIVE STANDARDIZATION OPPORTUNITIES WHICH CAN BE IMPLEMENTED TOP-DOWN."

\*\*\*\*\*

ID: <1716.00>                    Issue(s): COMM'LIZATION                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        (P.011)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC        >        :  
Location:    <ALL        >        :  
Orb.No/Mission: <GENERIC        >        :  
Hardware/Software:<N/A            >        :  
Reference Data:    N/A                    AMERICAN ROCKET CO./J.C. BENNETT  
Description:  
 --"THE SPACE MERCHANT FLEET: COMMERCIAL SPACE TRANSPORTATION & COST REDUCTION"--  
 \* GOVERNMENT SPACE PROJECFDTs NEED MAJOR COST REDUCTIONS.  
 \* NEITHER NEW TECHNOLOGY NOR PROCCUREMENT SYSTEM CHANGES WILL BE SUFFICIENT TO  
 . OBTAIN LOW COSTS TO THE EXTENT REQUIRED.  
 \* SPACE MERCHANT FLEET CAPABILITIES NOW EMERGING PROMISE LOWER SPACE TRANS-  
 . PORTATION COSTS THROUGH PRIVATE SECTOR.  
 \* NAVY, AIR FORCE, SCIENCE HAVE HISTORICALLY TAKEN ADVANTAGE OF PRIVATE SECTOR  
 . CAPABILITIES TO BENEFIT OF ALL CONCERNED.  
 \* EXPERIENCE TO DATE WITH PRIVATE SECTOR IN SPACE PROMISING.  
 . (CONT. ON ID:3200.01)

\*\*\*\*\*

ID: <1716.01>                    Issue(s): COMM'LIZATION                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        (P.011)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC        >        :  
Location:    <ALL        >        :  
Orb.No/Mission: <GENERIC        >        :  
Hardware/Software:<N/A            >        :  
Reference Data:    N/A                    AMERICAN ROCKET CO./J.C. BENNETT  
Description:  
 --"THE SPACE MERCHANT FLEET(SMF): (CONT. FROM ID:3200)  
 \* NO POLICY BARRIERS PREVENT GOV USE OF SMF CAPABILITIES; ONLY OLD HABITS.  
 \* GOV USE OF COMM. SPACE TRANSP. NO DIFFERENT THAN USE OF AIR, SEA, LAND TRANS  
 \* BENEFITS INCLUDE LOWER COSTS, MORE DIVERSITY, MORE FLIGHT OPPORTUNITIES,  
 . RESERVE CAPABILITY, EXPANDED INFRASTRUCTURE.  
 \* FUTURE SPACE ACTIVITY WILL INCLUDE DEFENSE, CIVIL GOVERNMENT, AND  
 . COMMERCIAL OPERATORS AS ON EARTH  
 \* PLANNERS MUST NOW ASK "WHY SHOULDN'T THIS PAYLOAD GO COMMERCIAL?"  
 \* ALL FUTURE PLANNING SHOULD TAKE COMMERCIAL TRANSPORTATION CAPABILITIES INTO  
 . ACCOUNT, ANTICIPATE RAPID DEVELOPMENT.

\*\*\*\*\*

ID: <1717.00> Issue(s): COMM'LIZATION : COST/MANHOURS  
Issue(s) cont.: MODULARIZATION :  
Issue Source: <AFSC/NSIA > (P.016)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <SC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > SPACEHAB  
Reference Data: N/A BOB CITRON, SPACEHAB, INC.

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OF POOR QUALITY

Description:

"THE SPACEHAB MODULE IS A COMMERCIAL PRESSURIZED RESEARCH VOLUME IN THE PAYLOAD BAY OF THE SPACE SHUTTLE. IT IS IN DEVELOPMENT BY A PRIVATE COMPANY AND WILL PROVIDE BY 1989, A COMMERCIAL RESEARCH VOLUME CAPABLE OF LOW COST ACCESS TO SPACE. THE SPACEHAB MODULE IS LOCATED IN THE FORWARD SECTION OF THE SHUTTLE PAYLOAD BAY." "SPACEHAB IS CURRENTLY IN PHASE B DEVELOPMENT AND A FORM 100 HAS BEEN SUBMITTED TO NASA FOR A FLIGHT AFTER THE SHUTTLE IS OPERATIONAL AGAIN. OVER TWO MILLION DOLLARS OF PRIVATE FINANCING HAVE BEEN RAISED TOWARD A TOTAL OF THE \$55M DEVELOPMENT FUNDS REQUIRED."

\*\*\*\*\*

ID: <1718.00> Issue(s): COMM'LIZATION : COST/MANHOURS  
Issue(s) cont.: :  
Issue Source: <AFSC/NSIA > (P.062)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <N/A >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A CRONIER/HUMPHRYES/LINGER PAN AM

Description:  
"THE DEVELOPMENT OF A STS EMULATING COMMERCIAL AIRLINE PRACTICES IS A VIABLE APPROACH FOR REDUCING OPERATING COST. FOR OPTIMUM RESULTS, THE PHILOSOPHY OF OPERATION MUST BE CONSIDERED AT THE ONSET OF THE PROGRAM. AN INDUSTRY RELATIONSHIP CONSISTING OF A DESIGNER/MANUFACTURER, AN OPERATOR AND A REGULATOR MUST EXIST TO ASSURE AN ADEQUATE SYSTEM OF CHECKS & BALANCES. THE VEHICLE, SUPPORT EQUIP & OPERATING FACILITY DESIGNS NEED TO REFLECT THE TOTAL LIFE CYCLE COST IMPLICATIONS OF THE TRANSPORTATION SYSTEM.-----"

\*\*\*\*\*  
ID: <1719.00> Issue(s): MANAGEMENT : REQUIREMENTS  
Issue(s) cont.: :  
Issue Source: <AFSC/NSIA > (P.064)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <N/A >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A NAT.SP.TRANSP & SUPT STDY/DUROCHER,ET AL

Description:  
"DOD AND NASA WILL JOINTLY STUDY THE DEVELOPMENT OF A SECOND-GENERATION STS-- MAKING USE OF MANNED AND UNMANNED SYSTEMS TO MEET THE REQUIREMENTS OF ALL USERS . A FULL RANGE OF OPTIONS WILL BE STUDIED, INCLUDING SHUTTLE-DERIVED TECHNOLOGIES AND OTHERS" THE STUDY DIRECTIVE ALSO DEFINED THE FOLLOWING PRINCIPLES OR GOALS:

- . # "SATISFY THE FUTURE NEEDS OF AUTHORIZED USERS;"
- . # "SUBSTANTIALLY REDUCE THE COSTS OF SPACE OPERATIONS;"
- . # "DEVELOP A FLEXIBLE AND ROBUST SPACE TRANSPORTATION SYSTEM;"
- . # "MAINTAIN WORLD LEADERSHIP IN SPACE TRANSPORTATION."

(CONTINUED ON 1719.01)

\*\*\*\*\*  
ID: <1719.01> Issue(s): MANAGEMENT : REQUIREMENTS  
Issue(s) cont.: :  
Issue Source: <AFSC/NSIA > (P.064)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <N/A >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A NAT.SP.TRANSP & SUPT STDY/DUROCHER,ET AL

Description:  
(CONT.FROM 1719.00) TO IMPLEMENT THIS NSDD, THE PRESIDENT SIGNED A NSDD IN MAY 1985, TITLED "NATIONAL SPACE TRANSP & SUPPORT STUDY". THE DOC DIRECTED THAT THE JOINT DOD/NASA STUDY BE ACCOMPLISHED WITHIN ONE YEAR & DELINEATED FOUR TASKS: TASK 1: COMPILE A NATIONAL MISSION MODEL FOR THE 1995 PERIOD & BEYOND. TASK 2: DETERMINE ST ARCHITECTURE AND SYSTEM OPTIONS WHICH COULD MOST COST-EFFECTIVELY SATISFY THE REQ IN TASK 1. TASK 3: IDENTIFY THE TRANSP TECHNOLOGIES THAT COULD BE MADE AVAILABLE FOR USE IN THE PDST-1995 PERIOD. TASK 4: BASED ON TECHNOLOGY NEEDS AND OPPORTUNITIES IDENTIFIED IN TASKS 2 & 3, IDENTIFY THE TECHNOLOGY DEVELOPMENT PROGRAMS NEEDED FOR THEIR TIMELY REALIZATION."

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ID: <1720.00>                    Issue(s): COST/MANHOURS            : DESIGN CRITERIA  
Issue(s) cont.:                    :                                    :  
Issue Source: <AFSC/NSIA        >       (P.072)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC         >  
Location:     <N/A            >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<N/A        >  
Reference Data:    N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL  
Description:

"-----ONE OF THE LESSONS TO BE LEARNED FROM THE HIGH SHUTTLE OPERATIONS COST IS THAT OPERATIONAL CONCEPTS MUST BE AN INTEGRAL PART OF THE FLIGHT SYSTEMS HARDWARE DESIGN, BOTH VEHICLE AND PAYLOAD, AT THE OUTSET. IF TOTAL SYSTEMS COST IS TO BE AFFORDABLE, THE OPERATIONAL CONCEPT MUST DRIVE THE VEHICLE AND PAYLOAD SYSTEM DESIGN TO THE EXTENT THAT THE LOWEST SYSTEMS COST IS ACHIEVED. IT CANNOT PERSISTENTLY BE IGNORED OR CONSIDERED JUST A "NICE GUIDELINE" FOR THE DESIGNER. IT MUST BE A DESIGN REQUIREMENT."

\*\*\*\*\*  
ID: <1721.00>                    Issue(s): DESIGN CRITERIA        : STANDARDS  
Issue(s) cont.: INTEGRATION        : COST/MANHOURS            :  
Issue Source: <AFSC/NSIA        >       (P.072)COST RED & CRED WORKSHOP 9/18/86  
Operation:     <N/A            >  
Location:     <N/A            >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<N/A        >  
Reference Data:    N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL  
Description:

"FUTURE LAUNCH VEHICLES MUST BE DESIGNED WITH VERY LARGE PERFORMANCE MARGINS & SYST REDUNDANCY TO ALLOW OPERATION AT LOWER STRESSES, TO ENSURE MISSION COMPLETION DESPITE HARDWARE FAILURES, AND TO REQUIRE LESS PRELAUNCH TESTING.THE LARGE LIFT CAPABILITY & LOWER COST-TO-ORBIT OF SUCH VEHICLES WILL ALLOW PAYLOADS TO BE DESIGNED WITH GREATER REDUNDANCY & INCREASED RELIABILITY THROUGH USE OF STANDARDIZED COMPONENTS & SYST AT REDUCED COST. WHERE POSSIBLE, PL SHOULD BE DESIGNED TO BE COMPATIBLE WITH ALL LV TYPES CONTAINED WITHIN THE ARCHITECTURE. THIS WILL MINIMIZE INTEGR COSTS IF IT BECOMES NECESSARY TO SWITCH PL FROM ONE LV TO ANOTHER. PL'S MUST BE CONSTRAINED TO PREVENT INFRINGING ON LV PERF MARGIN TO AVOID ADDITIONAL COSTS AND/OR JEOPARDIZING MISSION SUCCESS."

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ID: <1722.00>                    Issue(s): ISOLATION                : INTERFACE  
Issue(s) cont.: TIME/OFF-LINE       :                                   :  
Issue Source: <AFSC/NSIA        >       (P.072)COST RED & CRED WORKSHOP 9/18/86  
Operation:     <N/A            >  
Location:     <N/A            >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<N/A        >  
Reference Data:    N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL  
Description:

"ALL VEHICLE ELEMENTS, INCLUDING PAYLOADS, MUST UTILIZE SYSTEMS WITH A GREAT DEAL OF AUTONOMY SO THAT INTERFACES CAN BE SIMPLIFIED AND INTERFACE VERIFICATION OPERATIONS CAN BE MINIMIZED. ALL VEHICLE AND PAYLOAD INTEGRATION AND VERIFICATION ACTIVITIES MUST BE PERFORMED IN PARALLEL STRINGS AT OFF-PAD FACILITIES. ONLY COMPLETELY LAUNCH-READY VEHICLES AND PAYLOADS WOULD BE TRANSPORTED TO THE LAUNCH PAD FOR PROPELLANT LOADING, CREW INGRESS(AS REQUIRED), AND LAUNCH."

\*\*\*\*\*

ID: <1723.00>                    Issue(s): TIME/OFF-LINE                    : INTEGRATION  
Issue(s) cont.: INTERFACE                    :  
Issue Source: <AFSC/NSIA                    >                    (P.073)COST RED & CRED WORKSHOP 9/18/86  
Operation: <TEST                    >  
Location: <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<ORBITER                    >  
Reference Data:    N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL

Description:  
 "THE NEW LAUNCH SYSTEMS WILL REQUIRE SIGNIFICANT CHANGES IN OPERATING PHILOSOPHY, COMPARED TO THE PRESENT WAY OF DOING BUSINESS. THE LAUNCH PAD, AND PROBABLY THE LAUNCH VEHICLE, WILL BE A HIGHLY-UTILIZED NATIONAL ASSET WHOSE SCHEDULING CANNOT BE SERIOUSLY INTERRUPTED. THE LAUNCH VEHICLE WILL HAVE A GREATLY REDUCED DWELL TIME AT THE LAUNCH PAD, LEAVING TIME ONLY FOR SIMPLIFIED VEHICLE-TO-GROUND INTERFACE CHECKS AND PROPELLANT SERVICING PRIOR TO STARTING THE TERMINAL COUNTDOWN. PAYLOAD INTEGRATION, VALIDATION, AND ENCAPSULATION MUST BE ACCOMPLISHED OFF-LINE FROM THE MAIN VEHICLE PREPARATION FLOW. THIS PROBABLY WILL REQUIRE THAT ADDITIONAL OFF-LINE PAYLOAD FACILITIES BE CREATED AT THE LAUNCH SITE."

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ID: <1724.00>                    Issue(s): EFFICIENCY                    : METHODS  
Issue(s) cont.: TIME/ON-LINE                    :  
Issue Source: <AFSC/NSIA                    >                    (P.073)COST RED & CRED WORKSHOP 9/18/86  
Operation: <COUNTDOWN                    >  
Location: <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL

Description:  
 "THE VERY SHORT TURNAROUND TIME AT THE LAUNCH PAD AND LONG QUEUE OF VEHICLES AND PAYLOADS IN PROCESS FOR SCHEDULED LAUNCHES WILL REQUIRE THAT FLIGHT HARDWARE PROBLEMS DISCOVERED AFTER MOVING THE VEHICLE TO THE PAD WILL RESULT IN THE VEHICLE BEING REMOVED FROM THE PAD FOR NECESSARY REPAIRS WHILE SUBSEQUENTLY SCHEDULED VEHICLES UTILIZE THE FACILITIES. REPAIRED VEHICLES WILL BE REINTEGRATED INTO THE LAUNCH FLOW ACCORDING TO ESTABLISHED PRIORITIES. -----  
 -----THIS WILL BE A STRONG INCENTIVE TO INSURE THAT THE VEHICLE IS FLIGHT READY AT THE SCHEDULED TIME THROUGH GOOD DESIGN AND PROCESSING PRACTICES."

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ID: <1725.00>                    Issue(s): ISOLATION                    : INTERFACE  
Issue(s) cont.: SECURITY                    : STANDARDS                    :  
Issue Source: <AFSC/NSIA                    >                    (P.074)COST RED & CRED WORKSHOP 9/18/86  
Operation: <ASSEMBLY                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL

Description:  
 "TO REDUCE PAYLOAD TO VEHICLE INTERFACES TO THE ABSOLUTE MINIMUM, PAYLOADS WILL PROBABLY BE ENCAPSULATED IN SOME KIND OF MODULE AT AN OFFLINE FACILITY. THE MODULE WILL THEN BE INSTALLED ON THE LAUNCH VEHICLE. DEPENDING ON VEHICLE CONFIGURATION, THE MODULE SHELL MAY FUNCTION AS THE PAYLOAD FAIRING AS ON CURRENT EXPENDABLE VEHICLES. ON VEHICLES WITH INTEGRAL PAYLOAD BAYS, THE MODULE MIGHT PERFORM A THERMAL SHIELDING FUNCTION AND SERVE AS CLEANLINESS PROTECTION, LIKE THE CURRENT PAM HEAT SHIELDS, AS WELL AS ENSURE SECURITY. PROVISIONS FOR MOUNTING THE MODULE TO THE VEHICLE MUST BE STANDARDIZED ASSUMING ONLY POWER AND AIR CONDITIONING ARE PROVIDED AS BASIC STANDARD SERVICES. THIS IS TO AVOID THE CURRENT PROBLEMS OF RECONFIGURING THE PAYLOAD/VEHICLE INTERFACES.(COMT.1725.01)

\*\*\*\*\*

ID: <1725.01>                    Issue(s): ISOLATION                    : INTERFACE  
Issue(s) cont.: SECURITY                    : STANDARDS                    :  
Issue Source: <AFSC/NSIA                    >                    (P.074)COST RED & CRED WORKSHOP 9/18/86  
Operation: <ASSEMBLY                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<STS                    >  
Reference Data:    N/A                    NAT.SP.TRANSP & SUPT STDY/DUROCHER,ET AL  
Description:

(CONT. FROM ID 1725.00)

PAYLOAD CONTROL AND DATA LINKS MUST BE INDEPENDENT OF LAUNCH VEHICLE INTERFACES OTHER THAN A SIMPLE ANTENNA CONNECTION, IF REQUIRED. SECURITY WILL BE ENHANCED BY SUCH A SYSTEM BECAUSE ALL ENCAPSULATED PAYLOADS HAVE SIMILAR APPEARANCE AND HANDLING.

\*\*\*\*\*

ID: <1726.00>                    Issue(s): SURFACE TRANSP                    : MODULARIZATION  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.074)COST RED & CRED WORKSHOP 9/18/86  
Operation: <ASSEMBLY                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<STS                    >                    PAYLOADS  
Reference Data:    N/A                    NAT.SP.TRANSP & SUPT STDY/DUROCHER,ET AL  
Description:

\*FOR FUTURE PAYLOADS WHOSE DIMENSIONS INCREASE BEYOND THE LIMITS OF THE CURRENT ORBITER BAY, THE PROBLEMS OF TRANSPORT TO THE LAUNCH SITE WILL ESCALATE. IT MAY BE NECESSARY TO FABRICATE THESE PAYLOADS IN FACILITIES CLOSE TO THE LAUNCH SITE . THIS FACTOR MAY DECREASE THE OVERALL PAYLOAD EFFORT SINCE LARGE PAYLOADS COULD BE MOVED DIRECTLY FROM THE FINAL FACTORY CHECKOUT TO THE LAUNCH VEHICLE, WITHOUT THE TEARDOWN, SHIPMENT, REASSEMBLY, AND REVALIDATION CURRENTLY NECESSARY. ALTERNATIVELY, LARGE PAYLOADS MAY BE MODULARIZED INTO SMALLER PIECES THAT CAN BE MORE EASILY TRANSPORTED AND LAUNCHED FOR FINAL ASSEMBLY ON ORBIT.\*

\*\*\*\*\*

ID: <1727.00>                    Issue(s): AUTOMATION                    : STANDARDS  
Issue(s) cont.: COST/MANHOURS                    : DESIGN CRITERIA                    :  
Issue Source: <AFSC/NSIA                    >                    (P.074)COST RED & CRED WORKSHOP 9/18/86  
Operation: <ASSEMBLY                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    PAYLOADS  
Reference Data:    N/A                    NAT.SP.TRANSP & SUPT STDY/DUROCHER,ET AL  
Description:

\*FUTURE PAYLOADS THAT ARE DESIGNED TO BE SERVICED BY UNMANNED ROBOTIC SERVICERS MUST BE BUILT TO TIGHT STANDARDS TO ENSURE COMPATIBILITY WITH THE SERVICING ROBOT. IF THE OPERATIONAL COST IS TO BE COMPETITIVE, THE DESIGNER MUST UNDERSTAND HIS IMPACT ON LAUNCH OPERATIONS AND SERVICING, AND THE DESIGNER MUST INCORPORATE THESE CONCEPTS AT THE OUTSET. POTENTIAL AREAS WHERE PAYLOAD PROCESSING COSTS CAN BE REDUCED BY APPLYING SUITABLE REQUIREMENTS DURING THE DESIGN PROCESS.\*

\*\*\*\*\*

ID: <1728.00>            Issue(s): TIME/OFF-LINE            : COST/MANHOURS  
Issue(s) cont.: INTEGRATION                                    :  
Issue Source: <AFSC/NSIA            >            (P.075)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <TEST                    >  
Location:    <ALL                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A               >            PAYLOADS  
Reference Data:   N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL  
Description:  
POTENTIAL AREAS OF PAYLOAD PROCESSING COST REDUCTIONS:  
ACTION: DO ALL TESTING AT THE FACTORY OR OFF-LINE AND TRANSFER LAUNCH-READY FOR  
.            INSTALLATION AND INTEGRATION.

COMMENT: \* MUST BE DESIGNED TO BE TRANSPORTABLE WITHOUT REQUIRING RETEST.  
.            \* NO TESTING AT THE PAD   \* PRECLUDE DUPLICATION OF EFFORT, TEST  
.            EQUIPMENT, AND DOCUMENTATION   \*CONSIDER ALL PAYLOAD TESTING BE  
.            CONTROLLED FROM THE RESPECTIVE PAYLOAD OPERATIONS CONTROL CENTER  
.            WITH ONLY COMM LINES REQUIRED TO THE LAUNCH SITE (REDUCES CREW SIZE  
.            AND POSSIBLY EQUIPMENT COSTS).   (SEE ALSO ID:1729 & 1730)

\*\*\*\*\*  
ID: <1729.00>            Issue(s): INTERFACE                                    : COST/MANHOURS  
Issue(s) cont.: STANDARDS                                    : MODULARIZATION                                    :  
Issue Source: <AFSC/NSIA            >            (P.075)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <TEST                    >  
Location:    <ALL                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A               >            PAYLOADS  
Reference Data:   N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL  
Description:  
POTENTIAL AREAS OF PAYLOAD PROCESSING COST REDUCTIONS:  
ACTION: PROVIDE ELECTRICAL & FLUID INTERFACE PLATES.  
COMMENT: MINIMIZE THE NUMBER OF INTERFACE CONNECTORS TO BE HANDLED: \* LESS  
.            CHANCE OF DAMAGE.            \* REDUCTION IN PROCESSING COSTS.

ACTION: STANDARDIZE SPACECRAFT HARDWARE.            \*INCORPORATE STANDARD INTER-  
.            FACE FORMATTING INTO UPPER STAGE OR LAUNCH VEHICLE.   \* MODULARIZE FOR  
.            GROWTH AND REDUCED COST.            \* REDUCES INTEGRATION COSTS.

\*\*\*\*\*  
ID: <1730.00>            Issue(s): MAINTAINABILITY                                    : ACCESSABILITY  
Issue(s) cont.: MODULARIZATION                                    : REQUIREMENTS                                    :  
Issue Source: <AFSC/NSIA            >            (P.075)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <TEST                    >  
Location:    <ALL                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A               >            PAYLOADS  
Reference Data:   N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL  
Description:  
POTENTIAL AREAS OF PAYLOAD PROCESSING COST REDUCTIONS:  
ACTION: DESIGN FOR MAINTAINABILITY.  
COMMENT: \* PLACE CRITICAL OR LOW MEAN-TIME-BETWEEN-FAILURES COMPONENTS IN  
.            ACCESSIBLE AREAS - DO NOT REQUIRE "MAJOR SURGERY" TO REMOVE AND  
.            REPLACE A COMPONENT.            \* BUILD IN MODULAR FASHION.

ACTION: ESTABLISH CLEANLINESS REQUIREMENTS.  
COMMENT: \* ENCAPSULATE OR USE BAGS AND LOCAL PURGES WHENEVER POSSIBLE TO  
.            REDUCE DEMANDS ON FACILITIES.

\*\*\*\*\*

ID: <1731.00>                    Issue(s): DESIGN CRITERIA       : MODULARIZATION  
Issue(s) cont.: INTERFACE                    : STANDARDS                    : COST/MANHOURS  
Issue Source: <AFSC/NSIA        >       (P.077)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC         >  
Location:    <ALL         >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<N/A         >       PAYLOADS  
Reference Data:   N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL  
Description:

          ---PAYLOAD COMMUNITY RECOMMENDATIONS---  
\* DEVELOPMENT OF DESIGN STANDARDS       \* DESIGN FOR MAXIMUM AUTONOMY  
\* PAYLOAD ENCAPSULATION                 \* SIMPLER INTERFACES  
\* PROVISION OF ON-ORBIT SERVICING       \* GREATER PERFORMANCE MARGINS  
. AND REPAIR  
\* USE OF FEWER "UNIQUE" COMPONENTS     \* DESIGN OF PAYLOADS TO BE COMPATIBLE WITH  
\* APPLICATION OF NEW AND INNOVATIVE     ALL LAUNCH VEHICLES CONTAINED IN AN  
. DESIGN AND MANUFACTURING CONCEPTS   ARCHITECTURE.  
. AND TECHNOLOGIES.

\*\*\*\*\*  
ID: <1732.00>                    Issue(s): COST/MANHOURS       : MANAGEMENT  
Issue(s) cont.:                               :  
Issue Source: <AFSC/NSIA       >       (P.078)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC         >  
Location:    <ALL         >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<STS         >       COST BREAKDOWN  
Reference Data:   N/A                    NAT.SP.TRANSF & SUPT STDY/DUROCHER,ET AL  
Description:

          ---COST PER FLIGHT DATA---  
OPERATION-----PERCENTAGE---COMMENT  
  
GROUND OPERATIONS    19%   STREAMLINE PROCESSING  
FLIGHT OPERATIONS    18%   REDUCE VEHICLE FLIGHT TIME  
EXPENDABLES          17%   DESIGN TO MIN COST; LOW COST MFG  
RECOVERABLES         19%   DESIGN FOR MIN REFURB; FLYBACK HOME CONCEPTS  
SPARES                13%  
CONSUMABLES          1%    LOW COST PROPELLANTS  
OVERHEAD             13%   REDUCE MULTI-AGENCY RESP; SIMPLIFY ORGANIZATIONS  
\*\*\*\*\*

ID: <1733.00>                    Issue(s): TECHNOLOGY           : COST/MANHOURS  
Issue(s) cont.:                               :  
Issue Source: <AFSC/NSIA       >       (P.090)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <FLIGHT         >  
Location:    <ALL         >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<SRB         >       SRB SUBSTITUTE  
Reference Data:   N/A                    INST.DEF.ANALYSIS/FINKE, DONLAN, SWANSON  
Description:

-----ADVANTAGES OF PRESSURE-FED LIQUID BOOSTERS VS. SOLID ROCKET BOOSTERS-----  
\* SAFETY: +FLIGHT (NO BURN-THROUGH HAZARD) +GROUND-HANDLING (NON-EXPLOSIVE)  
\* PERFORMANCE: +GROWTH CAPABILITY >INCREASED PAYLOAD AND/OR ORBITAL ENERGY  
.                >TAILORED SIZE        >SCALABILITY  
.                +THROTTLEABILITY >DYNAMIC PRESSURE CONTROL >ACCELERATION  
.                CONTROL >ALLOWS DE-RATING MAIN ENGINES (IMPROVED RELIABILITY)  
\* COST: +LOW COST PROPELLANTS +LOW COST REFURBISHMENT >SIMPLE DESIGN (UN-  
.                SEGMENTED) >LOCAL HANDLING (EMPTY) + REDUCED ENVIRONMENTAL  
.                IMPACT >COOLER FLAME, NO PARTICULATES, NO HYDROCHLORIC ACID  
(SEE ALSO ID: 1734, 1735, 1736)  
\*\*\*\*\*

ID: <1734.00> Issue(s): TECHNOLOGY : COST/MANHOURS  
 Issue(s) cont.: : :  
 Issue Source: <AFSC/NSIA > (P.105)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC >  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<SRB > SRB SUBSTITUTE (PFLB)  
 Reference Data: N/A INST.DEF.ANALYSIS/FINKE, DONLAN, SWANSON  
 Description:

---PERFORMANCE & COST SUMMARY FOR CANDIDATE LAUNCH VEHICLES (COST IN 1982 \$M)---

VEHICLE	PAYLOAD (#) (LED 28.5)	ANNUAL COSTS(N LAUNCHES)	R&D	OTHER
		FIXED VARIABLE AMORT*		(FACIL, ETC.)
TLDC/SRB	100,000	134.4 + 72.1N + 0N	750	500
SHUTTLE	65,000	(1212) + 32.8N + 20N	0	0
SHUTTLE/PFLB	130,000	(1212) + 26.3 + 20N	2000	1000
SDV	150,000	99 + 41.1N + 5N	4000	1000
SDV/PFLB	220,000	99 + 34.6N + 5N	6000	2000
HLLV	300,000	507 + 12.9N + 15N	15000	5000

\*REPL. COST OF NEW ORB OR P/A MOD AMORT. OVER 100FLTS. HLLV OVER 300 FLIGHTS.

\*\*\*\*\*  
 ID: <1735.00> Issue(s): COST/MANHOURS : TECHNOLOGY  
 Issue(s) cont.: : :  
 Issue Source: <AFSC/NSIA > (P.111)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC >  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<SRB > SRB SUBSTITUTE (PFLB)  
 Reference Data: N/A INST.DEF.ANALYSIS/FINKE, DONLAN, SWANSON  
 Description:

-----COMPARATIVE LAUNCH VEHICLE COSTS-----

LAUNCH VEHICLE	LED P/L (#)	RECURRING COST/# (1982 \$)	TOTAL COST/# @40M # (1982 \$)
SHUTTLE	65000	810	810
TITAN LARGE DIA CORE/SRB	100000	720	720
SHUTTLE/PFLB	130000	360	430
SHUTTLE DERIVATIVE VEHICLE	150000	310	470
SDV/LHFB	150000	499	874
SHUTTLE DERIV VEHICLE/PFLB	220000	180	420
HEAVY LIFT LAUNCH VEHICLE	300000	90	780

\*\*\*\*\*  
 ID: <1736.00> Issue(s): TECHNOLOGY : COST/MANHOURS  
 Issue(s) cont.: SAFETY : :  
 Issue Source: <AFSC/NSIA > (P.113)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC >  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<SRB > SRB SUBSTITUTE (PFLB)  
 Reference Data: N/A INST.DEF.ANALYSIS/FINKE, DONLAN, SWANSON  
 Description:

-----CONCLUSIONS-----

- \* PFLB HAS ADVANTAGES IN SAFETY, FLIGHT COSTS, AND FLEXIBILITY OVER SRB
  - \* SHUTTLE/PFLB HAS GROWTH
  - . + MAY SATISFY SDI PAYLOAD REQUIREMENTS
  - . + EVOLUTIONARY (MAXIMUM USE OF EXISTING INVESTMENTS)
  - . + LOW RISK (ONE NEW COMPONENT)
  - . + LOWER COST PER POUND THAN HEAVY-LIFT LAUNCH VEHICLE
- (SEE ALSO ID:1733 THRU 1735) -----

ID: <1737.00>                    Issue(s): PLANNING                    :  
Issue(s) cont.:                    :  
Issue Source: <AFSC/NSIA        >        (P.114)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC            >  
Location:    <ALL                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<SRB            >        SRB SUBSTITUTE (PFLB)  
Reference Data:   N/A                INST.DEF.ANALYSIS/FINKE, DONLAN, SWANSON

Description:  
.                    -----POST-ACCIDENT SHUTTLE POSTURE-----  
\* SHUTTLE IS MANDATED TO FLY AGAIN -- REGARDLESS OF FLIGHT FREQUENCY.  
\* SHUTTLE MODIFICATIONS INVOLVING BOOSTERS & ORBITER WILL DEGRADE PERFORMANCE.  
\* FILAMENT-WOUND-CASE SOLID-ROCKET BOOSTERS WILL SEE LIMITED USE (IF ANY).  
\* NASA CURRENTLY HAS NO PLAN TO ENHANCE SHUTTLE PERFORMANCE TO MEET REQUIRE-  
.                    MENTS FOR SPACE STATION OR FOR DOD AND SPACELAB POLAR PROJECTS.  
\* PFLB (PRESSURE FED LIQUID BOOSTER) OPTION PROPOSED BY IDA CAN SATISFY  
.                    FORESEEABLE DOD AND NASA REQUIREMENTS FROM EITHER KSC OR VAFB.

\*\*\*\*\*

ID: <1738.00>                    Issue(s): COMM'LIZATION                    : MODULARIZATION  
Issue(s) cont.: SAFETY                    : REDUNDANCY                    :  
Issue Source: <AFSC/NSIA        >        (P.115)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC            >  
Location:    <ALL                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<SRB            >        SRB SUBSTITUTE (PFLB)  
Reference Data:   N/A                INST.DEF.ANALYSIS/FINKE, DONLAN, SWANSON

Description:  
.                    -----AIRLINE-TYPE OPERATIONS?-----  
\* CURRENT ORBITER WEIGHT RESTRICTIONS TOO TIGHT FOR:  
.                    + ADDING AUTONOMOUS CHECKOUT SUBSYSTEMS  
.                    + INCREASING REDUNDANCY  
.                    + INCREASING SAFETY  
.                    + CONTAINERIZED PAYLOADS  
\* INCREASED LIFT CAPABILITY WITH PFLB'S ALLOWS INCORPORATION OF AIRLINE-TYPE  
.                    FLIGHT EXPERIENCE.

\*\*\*\*\*

ID: <1739.00>                    Issue(s): PLANNING                    : INTEGRATION  
Issue(s) cont.: INTERFACE                    : STANDARDS                    : DESIGN CRITERIA  
Issue Source: <AFSC/NSIA        >        (P.121)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC            >  
Location:    <ALL                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A            >        PAYLOADS  
Reference Data:   N/A                SCITOR CORP./ FORD/GUTTO

Description:  
.                    -----STS PAYLOAD INTEGRATION/INTERFACE-----  
\* ESTABLISH COMMON ORBITER/PAYLOAD INTERFACES  
.                    + STANDARDIZE ELECTRICAL AND ATTACH POINT FITTINGS/DEVICES  
.                    + POWER AND CONTROL WIRING ON STARBOARD AND PORT SIDES OF THE CARGO BAY  
.                    + ATTEMPT TO MINIMIZE OR ELIMINATE ACTIVE HEATING REJECTION REQUIREMENTS  
.                    WHILE IN THE PAYLOAD BAY  
.                    + DESIGN PAYLOADS TO FUNCTION IN NORMAL ORBITER ENVIRONMENT (AVOIDS  
.                    SPECIAL ATTITUDE AND THERMAL CONSTRAINTS)

(CONT. ID:1739.01)

\*\*\*\*\*

ID: <1739.01>                    Issue(s): PLANNING                    : INTEGRATION  
Issue(s) cont.: INTERFACE                    : STANDARDS                    : DESIGN CRITERIA  
Issue Source: <AFSC/NSIA                    >                    (P.121)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    PAYLOADS  
Reference Data:    N/A                    SCITOR CORP./ FORD/GUTTO  
Description:

- STS PAYLOAD INTEGRATION/INTERFACE--(CONT. FROM ID:1739.00)  
 \* AUTONOMOUS STS PAYLOADS  
 . + STANDARDIZE TT&C PACKAGES ON ALL SPACECRAFT WITH ACTIVE DOWNLINK  
 . + ORBITER/PAYLOAD COMMUNICATION EQUIPMENT SHOULD BE SEGREGATED  
 . + SEPARATE COMPUTER FOR PAYLOAD INTERFACE  
 . + SELF-CONTAINED POWER AND COOLING CAPABILITY FOR PAYLOADS  
 \* CARGO INTEGRATION  
 . + INCREASED USE OF TELECONS(SECURE & NON-SECURE) FOR LA MEETINGS  
 . + ONE LAUNCH SUPPORT INTEGRATION CONTRACTOR  
 . + EARLY JSC/PAYLOAD CONTACT

\*\*\*\*\*  
ID: <1740.00>                    Issue(s): COST/MANHOURS                    : TECHNOLOGY  
Issue(s) cont.: COMM'LIZATION                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.127)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
Reference Data:    N/A                    AMERICAN ROCKET CO./J.R.FRENCH  
Description:

THE PRACTICAL APPROACH TO LOW-COST SPACE TRANSPORT: \* LOW COST REQUIRES A NEW APPROACH. \* "AIRLINE" TYPE OPERATIONS REQUIRE TECHNOLOGY SUBSTANTIALLY BEYOND PRESENT LEVELS. \* MUST HAVE LOW-COST NOW WHILE NEW TECHNLGY DEVELOPS. \* CURRENT EXPENDABLE VEHICLES STILL EXPENSIVE. \* TECHNOLOGY EXISTS FOR LOW COST EXPENDABLE \* GOV & MOST EXISTING AEROSPACE INDUSTRY DO NOT HAVE LOW COST ATTITUDE. \* GOV PROCUREMENT REGS DO NOT ENCOURAGE LOW COST. \* PRIVATE COMPANIES SPECIALIZING IN LOW-COST SPACE TRANSPORT OFFER BEST HOPE FOR NEAR TERM. \* GOV PROCUREMENT OF LAUNCHES RATHER THAT VEHICLES MORE EFFICIENT. \* IMMEDIATE STUDY OF IMPLEMENTING THIS APPROACH IS VITAL TO MEET CURRENT LAUNCH CRISIS.

\*\*\*\*\*  
ID: <1741.00>                    Issue(s): TECHNOLOGY                    : REQUIREMENTS  
Issue(s) cont.: PLANNING                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.136)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
Reference Data:    N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:

- \*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 \* MANY TECHNOLOGIES CRITICAL TO THE FUTURE OF SPACE TRANSPORTATION ARE POISED FOR MAJOR ADVANCES THAT COULD GREATLY BENEFIT BOTH EXISTING AND NEW SYSTEMS IN THE POST-1995 TIME PERIOD.  
 \* CURRENT LOW LEVELS OF RESEARCH ACTIVITY SEVERELY INHIBIT THE TIMELY DEVELOPMENT OF A MAJORITY OF THESE KEY TECHNOLOGIES. CONTINUED LOW-LEVEL, INTERMITTENT SUPPORT OF THESE ACTIVITIES WILL INTRODUCE HIGH RISK INTO THE INITIAL OPERATIONAL PHASES OF NEW SYSTEMS AND, AS A CONSEQUENCE, COULD LEAD TO EXTENSIVE DELAYS IN THEIR AVAILABILITY. A NATIONAL COMMITMENT TO AN ADEQUATELY FUNDED, MULTI-YEAR TECHNOLOGY EFFORT, FOCUSED (CONT. ON ID:1741.01)



ID: <1741.01>                    Issue(s): TECHNOLOGY                    : REQUIREMENTS  
Issue(s) cont.: PLANNING                    :  
Issue Source: <AFSC/NSIA                    >                    (P.136)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
Reference Data:    N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL

Description:  
\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
(CONTINUED FROM ID:1741.00)

---BY A SERIES OF SELECTED DEMONSTRATION PROGRAMS, IS REQUIRED TO REVERSE THIS  
. TREND AND REVITALIZE THE NATION'S TECHNOLOGY BASE.  
\* EXISTING GROUND TEST FACILITIES IN THE CRITICAL AREAS OF PROPULSION, STRUC-  
. TURES, AND AEROTHERMODYNAMICS ARE DEMONSTRATABLY INADEQUATE TO PROVIDE THE  
. BASIC DATA AND TEST VERIFICATIONS NEEDED TO AVOID UNACCEPTABLE RISKS AND  
. PERFORMANCE PENALTIES IN THE DESIGN OF COMPLEX NEW SYSTEMS. SUBSTANTIAL NEAR  
. TERM INVESTMENT IN NEW AND UPGRADED FACIL. MUST BE GIVEN NATIONAL PRIORITY.  
(CONT. ON ID:1741.02)

\*\*\*\*\*

ID: <1741.02>                    Issue(s): TECHNOLOGY                    : REQUIREMENTS  
Issue(s) cont.: PLANNING                    :  
Issue Source: <AFSC/NSIA                    >                    (P.137)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
Reference Data:    N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL

Description:  
\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
(CONTINUED FROM ID:1741.01)

\* TECHNOLOGY PLANNING IS FRAGMENTED AMONG MANY GOV. AGENCIES, RESULTING IN UN-  
. NECESSARY DUPL OF SOME EFFORTS & BENIGN NEGLECT IN OTHERS. MANY ONGOING PRO-  
. GRAMS HAVE SHORT-TERM, SPECIFIC OBJECTIVES THAT DO NOT RESULT IN A COHERENT  
. DATA BASE. A DIALOGUE BETWEEN THE PAYLOAD & LAUNCH SYSTEM COMMUNITIES IS  
. URGENTLY NEEDED TO EFFECT COST REDUCTIONS IN THE LAUNCH & FLT OPS ARENA. IM-  
. PLEMENTATION OF THE PROPOSED TECHNOLOGY PLAN WILL GREATLY STRENGTHEN PRESENT  
. COORDINATION ACTIVITIES & ALLOW FOR EFFICIENT USE OF LIMITED RESOURCES.  
(CONT. ON ID:1741.03)

\*\*\*\*\*

ID: <1741.03>                    Issue(s): TECHNOLOGY                    : REQUIREMENTS  
Issue(s) cont.: PLANNING                    :  
Issue Source: <AFSC/NSIA                    >                    (P.137)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
Reference Data:    N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL

Description:  
\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
(CONTINUED FROM ID:1741.02)

\* TIME IS OF THE ESSENCE IF THE VEHICLES OF THE FUTURE ARE NOT TO BE BUILT  
. WITH THE TECHNOLOGIES OF THE PAST.

\* THE TECHNOLOGY PLAN PRESENTED HEREIN, IF PURSUED, WOULD PROVIDE THE COUNTRY  
. WITH THE GREATEST POSSIBLE NUMBER OF VIABLE ALTERNATIVES PRIOR TO THE  
. DEVELOPMENT OF NEW SYSTEMS AND SHOULD ASSURE THAT THE NATION WILL ACHIEVE  
. THE OBJECTIVES & GUIDING PRINCIPLES OF THE NATIONAL SPACE TRANSPORTATION AND  
. SUPPORT STUDY.

\*\*\*\*\*

ID: <1742.00>            Issue(s): TECHNOLOGY            : AUTOMATION  
Issue(s) cont.: INTERFACE            : COST/MANHOURS            : FAULT DETECTION  
Issue Source: <AFSC/NSIA            >            (P.138)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC            >  
Location:    <ALL            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A            >            SPACE TRANSPORTATION  
Reference Data:    N/A                            TRANSP TECHNOLOGY TEAM/GASPERICH ET AL

Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 .        --REFERENCE ARCHITECTURES--    --PRE-2000-- LOGISTICS & OPERATIONS  
 \* COMPUTER INTEGRATED MANUFACTURING  
 \* GREATLY SIMPLIFIED PAYLOAD/VEHICLE INTERFACES  
 \* REDUCED MANPOWER LOADING FOR LAUNCH & MISSION CONTROL OPERATIONS  
 \* EXTENSIVE INCORPORATION OF NEAR-TERM COMPUTER BASED TECHNOLOGIES IN PRESENT  
 . LAUNCH & MISSION CONTROL FACILITIES AND PROCEDURES  
 \* SIGNIFICANTLY INCREASED VEHICLE AUTONOMY  
 \* SPACE STATION AS LEO TRANSPORTATION MODE

\*\*\*\*\*

ID: <1743.00>            Issue(s): TECHNOLOGY            : AUTOMATION  
Issue(s) cont.: INTERFACE            : COST/MANHOURS            : ISOLATION  
Issue Source: <AFSC/NSIA            >            (P.138)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC            >  
Location:    <ALL            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A            >            SPACE TRANSPORTATION  
Reference Data:    N/A                            TRANSP TECHNOLOGY TEAM/GASPERICH ET AL

Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 .        --REFERENCE ARCHITECTURES---POST 2000---LOGISTICS & OPERATIONS----  
 \* HIGHLY AUTOMATED, COMPUTER-INTEGRATED MANUFACTURING  
 \* MINIMAL PAYLOAD/VEHICLE INTERFACES  
 \* EXTENSIVE REDUCTION IN M/P LOADING FOR ALL PHASES OF LAUNCH & MISSION CONTRL  
 \* HIGHLY AUTOMATED PAYLOAD INTEGRATION, C/O AND LAUNCH, BOTH ON EARTH & IN-ORB  
 \* NEAR-COMPLETE VEHICLE AUTONOMY DURING FLIGHT  
 \* LEO AND GEO TRANSPORTATION MODES  
 \* HIGHLY AUTOMATED VEHICLE TURNAROUND

\*\*\*\*\*

ID: <1744.00>            Issue(s): TECHNOLOGY            :  
Issue(s) cont.:                            :  
Issue Source: <AFSC/NSIA            >            (P.138)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC            >  
Location:    <ALL            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A            >            SPACE TRANSPORTATION  
Reference Data:    N/A                            TRANSP TECHNOLOGY TEAM/GASPERICH ET AL

Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 .        --REFERENCE ARCHITECTURES----PRE-2000---LAUNCH VEHICLES-----

\* PRESENT/IMPROVED SHUTTLE/CELV  
 \* PARTIALLY REUSABLE CARGO VEHICLE  
 . + FLY-BACK BOOSTERS  
 . + RECOVERABLE PROPULSION/AVIONICS MODULES

\*\*\*\*\*

ID: <1745.00> Issue(s): TECHNOLOGY :  
Issue(s) cont.: : :  
Issue Source: <AFSC/NSIA > (P.138)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > SPACE TRANSPORTATION  
Reference Data: N/A TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
--REFERENCE ARCHITECTURES---POST-2000---LAUNCH VEHICLES-----

- \* TREND TO FULLY REUSABLE VEHICLE FLEET
- \* CONTINUED USE OF PRE-2000 PARTIALLY REUSABLE CARGO VEHICLE
- \* HEAVY-LIFT VEHICLE TO SUPPORT SDI DEPLOYMENT
- \* MANNED, FULLY REUSABLE VEHICLE
- . +ROCKET-POWERED OR AIRBREATHING

\*\*\*\*\*

ID: <1746.00> Issue(s): TECHNOLOGY :  
Issue(s) cont.: : :  
Issue Source: <AFSC/NSIA > (P.138)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > SPACE TRANSPORTATION  
Reference Data: N/A TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
--REFERENCE ARCHITECTURES---PRE-2000---ORBITAL TRANSFER VEHICLES(OTV)

- \* PRESENT/IMPROVED EXPENDABLE OTV'S
- \* ORBITAL MANEUVERING VEHICLE (OMV)
- \* REUSABLE OTV
- . + GROUND AND/OR SPACE BASED

\*\*\*\*\*

ID: <1747.00> Issue(s): TECHNOLOGY :  
Issue(s) cont.: : :  
Issue Source: <AFSC/NSIA > (P.138)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > SPACE TRANSPORTATION  
Reference Data: N/A TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
--REFERENCE ARCHITECTURES---POST-2000---ORBITAL TRANSFER VEHICLES(OTV)

- \* EVOLUTION OF PRE-2000 REUSABLE VEHICLE
- . + GROWTH TO SUPPORT HEAVIER PAYLOADS
- \* HIGHLY AUTONOMOUS ORBITAL MANEUVERING VEHICLE (OMV)
- \* SPACE BASED OTV

\*\*\*\*\*

ID: <1748.00>                    Issue(s): TECHNOLOGY                    : EXPERT SYSTEM  
Issue(s) cont.: FAULT DETECTION                    : PLANNING                    : AUTOMATION  
Issue Source: <AFSC/NSIA                    >                    (P.139)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
Reference Data: N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:

- \*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 .     ---HIGH LEVERAGE TECHNOLOGY AREAS---     ---OPERATIONS/LOGISTICS---  
 \* EXPERT SYSTEMS/ARTIFICIAL INTELLIGENCE  
 .     + FAULT DETECTION & ISOLATION  
 .     + VEHICLE CHECKOUT & LAUNCH  
 .     + MISSION PLANNING & CONTROL  
 \* AUTOMATED SOFTWARE GENERATION  
 \* FAULT TOLERANT AVIONICS  
 \* COMPUTER INTEGRATED MANUFACTURING  
 \* TELEOPERATIONS AND REMOTE SERVICING

\*\*\*\*\*

ID: <1749.00>                    Issue(s): AUTOMATION                    : TECHNOLOGY  
Issue(s) cont.: DESIGN CRITERIA                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.139)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
Reference Data: N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:

- \*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 .     ---HIGH LEVERAGE TECHNOLOGY AREAS---     ---PERFORMANCE/REUSABILITY  
 \* ADVANCED PROPULSION SYSTEMS  
 \* LIGHTWEIGHT HIGH TEMPERATURE STRUCTURES  
 \* ROBUST THERMAL PROTECTION SYSTEMS  
 \* AUTONOMOUS GUIDANCE, NAVIGATION, AND CONTROL  
 \* AEROASSISTED ORBITAL TRANSFER VEHICLES  
 \* CRYOGENIC FLUID MANAGEMENT  
 \* PRECISION RECOVERY SYSTEMS  
 \* INTERDISCIPLINARY ANALYSES

\*\*\*\*\*

ID: <1750.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.142)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
Reference Data: N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:

- \*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 ---DEMONSTRATION PROGRAMS (SUPPORTING NEAR-TERM SYSTEMS)---  
 \* AUTOMATED LAUNCH/FLIGHT OPS     \* ON ORBIT FLUID MGMT (ON-GOING PROGRAM)  
 \* PROXIMITY OPERATIONS             \* LOX/H2 TEST BED (ON-GOING PROGRAM)  
 \* CLEAN/LOW-COST SOLID ROCKET     \* AERDASSIST QTV FLIGHT EXPERIMENT  
 \* STORABLE QTV ENGINE (ON-GOING)  
 \* PRECISION RECOVERY SYSTEMS  
 \* COMPUTER INTEGRATED MANUFACTURING

\*\*\*\*\*

ID: <1751.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :  
Issue Source: <AFSC/NSIA        >                    (P.142)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC            >  
Location:    <ALL                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A           >                    SPACE TRANSPORTATION  
Reference Data:   N/A                TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:  
\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
---DEMONSTRATION PROGRAMS (SUPPORTING FAR-TERM SYSTEMS)---

- \* AUTONOMOUS SPACE OPERATIONS
- \* HIGH ORBIT SERVICING
- \* HIGH THRUST REUSABLE LIQUID ROCKET
- \* NATIONAL AEROSPACE PLANE (ON-GOING PROGRAM)
- \* MANEUVERABLE ENTRY RESEARCH VEHICLE
- \* FULL-SCALE THERMOSTRUCTURE/CRYOTANKAGE
- \* SPACE-BASED CRYOGENIC OTV ENGINE (ON-GOING PROGRAM)

\*\*\*\*\*  
ID: <1752.00>                    Issue(s): TECHNOLOGY                    : EXPERT SYSTEM  
Issue(s) cont.:                    :  
Issue Source: <AFSC/NSIA        >                    (P.145)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC            >  
Location:    <ALL                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A           >                    SPACE TRANSPORTATION  
Reference Data:   N/A                TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:  
\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
-----KEY TECHNOLOGIES: IMPROVED SHUTTLE/CELV-----

- \* EXPERT SYSTEMS/ARTIFICIAL INTELLIGENCE
- \* FAULT TOLERANT AVIONICS
- \* ADVANCED PROPULSION SYSTEMS
- \* AUTONOMOUS GUIDANCE, NAVIGATION & CONTROL
- \* PRECISION RECOVERY SYSTEM

\*\*\*\*\*  
ID: <1753.00>                    Issue(s): EXPERT SYSTEM                    : TECHNOLOGY  
Issue(s) cont.: AUTOMATION                    :  
Issue Source: <AFSC/NSIA        >                    (P.146)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC            >  
Location:    <ALL                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A           >                    SPACE TRANSPORTATION  
Reference Data:   N/A                TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
Description:  
\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
-----KEY TECHNOLOGIES: PARTIALLY REUSABLE CARGO VEHICLE-----

- \* EXPERT SYSTEMS/ARTIFICIAL INTELLIGENCE
  - \* AUTOMATED SOFTWARE GENERATION
  - \* FAULT TOLERANT AVIONICS
  - \* COMPUTER INTEGRATED MANUFACTURING
  - \* ADVANCED PROPULSION SYSTEMS
  - \* ROBUST THERMAL PROTECTION SYSTEMS
  - \* AUTONOMOUS GUIDANCE NAVIGATION AND CONTROL
  - \* PRECISION RECOVERY SYSTEMS
- \*\*\*\*\*

ID: <1754.00>                    Issue(s): AUTOMATION                    : TECHNOLOGY  
 Issue(s) cont.: EXPERT SYSTEM                    :  
 Issue Source: <AFSC/NSIA                    >                    (P.146)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC                    >  
 Location: <ALL                    >  
 Orb.No/Mission: <GENERIC                    >  
 Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
 Reference Data: N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
 Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 -----KEY TECHNOLOGIES: SPACE BASED OTV-----

- \* EXPERT SYSTEMS/ARTIFICIAL INTELLIGENCE
- \* AUTOMATED SOFTWARE GENERATION
- \* FAULT TOLERANT AVIONICS
- \* COMPUTER INTEGRATED MANUFACTURING
- \* ADVANCED PROPULSION SYSTEMS
- \* TELEOPERATIONS AND REMOTE SENSING
- \* AUTONOMOUS GUIDANCE NAVIGATION AND CONTROL
- \* AEROBRAKING                    \* CRYOGENIC FLUID MGMT

\*\*\*\*\*

ID: <1755.00>                    Issue(s): AUTOMATION                    : EXPERT SYSTEM  
 Issue(s) cont.: TECHNOLOGY                    :  
 Issue Source: <AFSC/NSIA                    >                    (P.147)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC                    >  
 Location: <ALL                    >  
 Orb.No/Mission: <GENERIC                    >  
 Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
 Reference Data: N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
 Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 -----KEY TECHNOLOGIES: MANNED FULLY REUSABLE LAUNCH VEHICLES-----

- \* EXPERT SYSTEMS/ARTIFICIAL INTELLIGENCE
- \* AUTOMATED SOFTWARE GENERATION
- \* FAULT TOLERANT AVIONICS
- \* LIGHTWEIGHT HIGH TEMPERATURE STRUCTURES
- \* ADVANCED PROPULSION SYSTEMS
- \* ROBUST THERMAL PROTECTION SYSTEMS
- \* AUTONOMOUS GUIDANCE NAVIGATION AND CONTROL
- \* INTERDISCIPLINARY ANALYSES

\*\*\*\*\*

ID: <1756.00> -                    Issue(s): TECHNOLOGY                    :  
 Issue(s) cont.:                    :  
 Issue Source: <AFSC/NSIA                    >                    (P.153)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC                    >  
 Location: <ALL                    >  
 Orb.No/Mission: <GENERIC                    >  
 Hardware/Software:<N/A                    >                    SPACE TRANSPORTATION  
 Reference Data: N/A                    TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
 Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 -----KEY TECHNOLOGIES DEMONSTRATED BY NATIONAL AEROSPACE PLANE PROGRAM-----

- \* PROPULSION-AIRFRAME INTEGRATION
- \* COMPUTATIONAL FLUID DYNAMICS
- \* COMBINED CYCLE AIRBREATHING PROPULSION
- \* CRYOGENIC TANKAGE
- \* ADVANCED LIGHTWEIGHT MATERIALS AND STRUCTURAL CONCEPTS
- \* ACTIVE COOLING
- \* ADAPTIVE CONTROL & GUIDANCE; STABILITY AUGMENTATION

\*\*\*\*\*

ID: <1757.00> Issue(s): TECHNOLOGY :  
 Issue(s) cont.: :  
 Issue Source: <AFSC/NSIA > (P.155)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC >  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A > SPACE TRANSPORTATION  
 Reference Data: N/A TRANSP TECHNOLOGY TEAM/GASPERICH ET AL  
 Description:

\*\*\* NATIONAL SPACE TRANSP. & SUPPORT STUDY/TECHNOLOGY REQUIREMENTS & PLANS \*\*\*  
 --AEROASSIST FLIGHT EXPERIMENT (AFE)-[MISSION PROFILE SIMULATES OTV AEROPASS]--

1. DEPLOY FROM SHUTTLE
2. ACCELERATE TO ATMOSPHERIC ENTRY
3. SIMULATE GEOSYNCHRONOUS RETURN AEROPASS
4. RETURN TO EARTH ORBIT FOR SHUTTLE PICKUP

\*\*\*\*\*

ID: <1758.00> Issue(s): TECHNOLOGY :  
 Issue(s) cont.: :  
 Issue Source: <AFSC/NSIA > (P.183)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC >  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A > SPACE TRANSPORTATION  
 Reference Data: N/A ASSESSMENT OF IDA PFLB CONCEPT/AEROSPACE  
 Description:

--REFERENCE: INSTITUTE FOR DEFENSE ANALYSIS PAPER ON PFLB ADVANTAGES (ID:1733)  
 --RECOMMENDATIONS BASED ON ANALYSIS OF IDA PAPER/ AEROSPACE CORP./GOLDSTEIN:  
 \* PRESSURE-FED LIQUID ROCKET BOOSTERS SHOULD BE CONSIDERED AS ALTERNATIVES  
 . TO SRB'S IN FUTURE AIR FORCE LAUNCH PLANNING IS THERE IS STRONG NEED FOR:  
 . + REDUCED EXHAUST POLLUTION/CORROSION CONTROL(HIGH LAUNCH RATES FROM VAFB)  
 . + IMPROVEMENTS OVER SRB SAFETY/RELIABILITY LEVELS  
 . + IMPROVED SHUTTLE PERFORMANCE FROM VAFB  
 \* DO NOT CONDUCT ANY ADDITIONAL STUDIES OF THE CONCEPT AT THIS TIME  
 . + HOLD PHASE 2 IN ABEYANCE

\*\*\*\*\*

ID: <1759.00> Issue(s): COST/MANHOURS : LOGISTICS/SPARES  
 Issue(s) cont.: MANAGEMENT :  
 Issue Source: <AFSC/NSIA > (P.213)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC >  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A > SPACE TRANSPORTATION  
 Reference Data: N/A MDAC/ R.J. GUNKEL  
 Description:

-----MULTI-YEAR PROCUREMENT RESULTS IN SAVINGS-----  
 \* CONTRACTOR IN-HOUSE SAVINGS  
 . + LARGE QUANTITY BUYS OF MATERIAL PROCUREMENT  
 . + SCHEDULING OF FABRICATION AND ASSEMBLY OF HARDWARE FOR COST OPTIMUM  
 . + CONTINUOUS FLOW MANUFACTURING PROCESS WITH OPTIMUM PERIOD FOR WORK  
 . PERFORMANCE  
 . + RATE SAVINGS ASSOCIATED WITH EARLIER MID-POINT  
 \* SELECTION OF HIGHER QUANTITY OPTION BUY FOR SOLID ROCKET MOTOR PROCUREMENT  
 \* SINGLE LOT RELEASE OF VENDOR HARDWARE

\*\*\*\*\*

ID: <1760.00>            Issue(s): MANAGEMENT            : LOGISTICS/SPARES  
Issue(s) cont.: INTEGRATION            : EFFICIENCY            : COST/MANHOURS  
Issue Source: <AFSC/NSIA            >            (P.216)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC            >  
Location: <ALL            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A            >            DELTA  
Reference Data:    N/A                            MDAC/ R.J. GUNKEL

Description:

-----COST EFFECTIVE TECHNIQUES TO REDUCE LAUNCH VEHICLE COSTS (DELTA)-----  
 UTILIZE PROVEN SYSTEMS IN BUILDING BLOCK CONCEPT: SUBSYSTEMS AND TECHNOLOGIES  
 ALREADY PROVEN BY PRIOR USE IN SIMILAR APPLICATIONS WERE INCORPORATED. ITEMS  
 UTILIZED IN VARIOUS MANNED & UNMANNED SPACE PROGRAMS WERE TAILORED TO FIT CUR-  
 RENT LV REQ. THE USAF-DEVELOPED STRAP-ON MOTORS FOR THOR WERE ADAPTED. THE NASA  
 SURVEYOR RETRO MOTOR & USAF FW4 MOTOR WERE USED AS THE DELTA 3RD STAGE. THE  
 APOLLO PROG LEM DESCENT ENGINE THRUST CHAMBER ASSBLY WAS INCORP. INTO THE DELTA  
 2ND STAGE. THESE "BORROWED" SYSTEMS KEEP COSTS DOWN & MAXIMIZE RELIABILITY.

\*\*\*\*\*  
ID: <1761.00>            Issue(s): COST/MANHOURS            : EFFICIENCY  
Issue(s) cont.: INTEGRATION            : LOGISTICS/SPARES            : MANAGEMENT  
Issue Source: <AFSC/NSIA            >            (P.217)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC            >  
Location: <ALL            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A            >            DELTA  
Reference Data:    N/A                            MDAC/ R.J. GUNKEL

Description:

-----COST EFFECTIVE TECHNIQUES TO REDUCE LAUNCH VEHICLE COSTS (DELTA)-----  
 MODIFY EXISTING QUALIFIED SYSTEMS FOR GREATER PERFORMANCE: WITHOUT COMPROMIS-  
 ING THEIR FUNDAMENTAL DESIGN FEATURES, SEVERAL FLIGHT-PROVEN SYSTEMS WERE  
 MODIFIED TO PROVIDE GREATER PERFORMANCE. THE STRUCTURAL EXTENSION OF BOTH THE  
 FIRST AND SECOND STAGE PROPELLANT TANKS WAS ACCOMPLISHED, REQUIRING ONLY A  
 PREQUALIFIED EXTENDED BURNING OF THE ROCKET ENGINES. SUBSTITUTION OF THE CASTOR  
 II STRAP-ON MOTOR FOR CASTOR I PROVIDED A SIGNIFICANT ENERGY INCREASE DUE TO  
 HIGHER SPECIFIC IMPULSE. ONLY MINOR FLT QUAL COSTS WERE REQ FOR THIS CHANGE.  
 IMPLEMENTATION OF CONVERTED THOR/AGENA LAUNCH COMPLEX AT VAFB AT RELATIVELY LOW  
 COST, PROVIDED THE CAPABILITY OF LAUNCHING SATELLITES TO POLAR ORBITS.

\*\*\*\*\*  
ID: <1762.00>            Issue(s): MANAGEMENT            : EFFICIENCY  
Issue(s) cont.: COST/MANHOURS            :                            :  
Issue Source: <AFSC/NSIA            >            (P.217)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC            >  
Location: <ALL            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<N/A            >            DELTA  
Reference Data:    N/A                            MDAC/ R.J. GUNKEL

Description:

-----COST EFFECTIVE TECHNIQUES TO REDUCE LAUNCH VEHICLE COSTS (DELTA)-----  
 SINGLE LAUNCH CREW FOR BOTH EASTERN & WESTERN LAUNCH SITES: THE EXPERIENCED  
 LAUNCH CREW UTILIZED FOR EASTERN LAUNCH SITE LAUNCHES IS ALSO UTILIZED FOR  
 THE LESS FREQUENT WESTERN LAUNCH SITE LAUNCHES. IN ADDITION, IMPLEMENTATION  
 OF A CONVERTED THOR/AGENA LAUNCH COMPLEX AT THE WESTERN LAUNCH SITE PROVIDED  
 A POLAR ORBIT CAPABILITY AT RELATIVELY LOW COST.

\*\*\*\*\*



ID: <1763.00>                    Issue(s): COST/MANHOURS            : MANAGEMENT  
 Issue(s) cont.: DESIGN CRITERIA            :  
 Issue Source: <AFSC/NSIA            >            (P.217)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC                >  
 Location: <ALL                    >  
 Orb.No/Mission: <GENERIC            >  
 Hardware/Software:<N/A                >            DELTA  
 Reference Data:    N/A                MDAC/ R.J. GUNKEL  
 Description:

-----COST EFFECTIVE TECHNIQUES TO REDUCE LAUNCH VEHICLE COSTS (DELTA)-----  
 MGMT HAS OCCASIONALLY ELECTED TO DESIGN & QUALIFY CHANGES TO THE HIGHEST ENVIRONMENTS THAT MIGHT BE EXPERIENCED WITH THE NEXT SEVERAL PROJECTED GROWTH CHANGES. MINIMAL COST IS INCURRED IN THE OVER-DESIGN THAT RESULTS & GREATER CONFIDENCE IS GENERATED FOR THE EARLY USERS BECAUSE UNUSUALLY HIGH MARGINS EXIST. THE SYSTEMS, DESIGNED & QUALIFIED FOR FUTURE GROWTH, DO NOT THEN NEED TO BE REQUALIFIED WHEN THE NEXT GROWTH CHANGE OCCURS. THIS PRIOR QUALIFICATION MINIMIZES THE COST OF THE NEW CHANGE & REDUCES THE MAGNITUDE OF ITS UNKNOWNNS.

----OVERQUALIFY VEHICLE IN ANTICIPATION OF FUTURE GROWTH-----

\*\*\*\*\*

ID: <1764.00>                    Issue(s): COST/MANHOURS            : MANAGEMENT  
 Issue(s) cont.:                               :  
 Issue Source: <AFSC/NSIA            >            (P.218)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC                >  
 Location: <ALL                    >  
 Orb.No/Mission: <GENERIC            >  
 Hardware/Software:<N/A                >            DELTA  
 Reference Data:    N/A                MDAC/ R.J. GUNKEL  
 Description:

-----COST EFFECTIVE TECHNIQUES TO REDUCE LAUNCH VEHICLE COSTS (DELTA)-----

\*\*ELIMINATE DEVELOPMENT FLIGHTS\*\*

THROUGHOUT ITS LONG AND SUCCESSFUL HISTORY, DELTA'S POLICY OF USING FLIGHT-PROVEN SYSTEMS IN ITS BUILDING-BLOCK GROWTH PROGRAM HAS ELIMINATED THE NEED FOR TEST FLIGHTS, THEREBY CONSIDERABLY REDUCING OVERALL PROGRAM COSTS. THERE HAS NEVER BEEN A SPACECRAFT LOST AS A RESULT OF THIS CONCEPT OF NOT REQUIRING DEVELOPMENT FLIGHTS FOR VEHICLE IMPROVEMENTS.

\*\*\*\*\*

ID: <1765.00>                    Issue(s): MANAGEMENT               : PLANNING  
 Issue(s) cont.: COST/MANHOURS            : MISSION                        : INTEGRATION  
 Issue Source: <AFSC/NSIA            >            (P.218)COST RED & CRED WORKSHOP 9/18/86  
 Operation: <GENERIC                >  
 Location: <ALL                    >  
 Orb.No/Mission: <GENERIC            >  
 Hardware/Software:<N/A                >            DELTA  
 Reference Data:    N/A                MDAC/ R.J. GUNKEL  
 Description:

-----COST EFFECTIVE TECHNIQUES TO REDUCE LAUNCH VEHICLE COSTS (DELTA)-----

MINIMIZE PRE-LAUNCH MISSION ANALYSES DOCUMENTATION COSTS: THE LV PROGRAM SPACECRAFT INTEGRATION PERSONNEL WORK VERY CLOSELY WITH USERS, PARTICULARLY DURING EARLY PHASES, TO DETERMINE THEIR REQUIREMENTS. IN SOME CASES, PRELIMINARY MISSION ANALYSES CAN UTILIZE A PREVIOUSLY COMPLETED TRAJECTORY. REPEAT MISSIONS CAN ALSO ELIMINATE INITIAL TRAJECTORY WORK. CONTINUAL SURVEILLANCE OF SCHEDULED 'SET BACK' DATES IS REQUIRED TO AVOID UNNECESSARY EXPENSE OF OVERTIME TO COMPENSATE FOR LATE INPUTS. JUDICIOUS USE OF TEST HARDWARE, SUCH AS PAYLOAD ATTACH FITTINGS, IS ALSO EXERCISED.

\*\*\*\*\*

ID: <1766.00>                    Issue(s): PLANNING                    : COST/MANHOURS  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        (P.219)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC         >                    :  
Location:     <ALL             >                    :  
Orb.No/Mission: <GENERIC       >                    :  
Hardware/Software: <N/A         >        DELTA  
Reference Data:   N/A                    MDAC/ R.J. GUNKEL  
Description:

-----COST EFFECTIVE TECHNIQUES TO REDUCE LAUNCH VEHICLE COSTS (DELTA)-----  
 PROVIDE FLEXIBLE AND DEPENDABLE LAUNCH SCHEDULE MANAGEMENT: THROUGHOUT THE TWO TO THREE-YR TIME PERIOD REQUIRED FOR A TYPICAL SPACECRAFT DESIGN AND DEVELOPMENT, VARIOUS UNKNOWNNS COULD RESULT IN A SLIP OF THE INITIALLY ASSIGNED LAUNCH SLOT. LAUNCH VEHICLE HARDWARE ASSIGNMENTS COULD BE MODIFIED AS A RESULT OF SPACECRAFT LAUNCH DATE CHANGES. MAINTAINING A FLEXIBLE POSITION WITH RESPECT TO MISSION SPECIFIC MODIFICATIONS TO THE BOOSTER AND THE ACCOMODATION OF LAUNCH DATE CHANGES HAS RESULTED DIN COST SAVINGS FOR BOTH THE SPACECRAFT AND LAUNCH VEHICLE PROJECTS.

\*\*\*\*\*  
 ID: <1767.00>                    Issue(s): COST/MANHOURS                    : STANDARDS  
Issue(s) cont.: LOGISTICS/SPARES       : AUTOMATION                    :  
Issue Source: <AFSC/NSIA        >        (P.224)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC         >                    :  
Location:     <ALL             >                    :  
Orb.No/Mission: <GENERIC       >                    :  
Hardware/Software: <N/A         >        DELTA  
Reference Data:   N/A                    MDAC/ R.J. GUNKEL  
Description:

-----PAYLOAD ASSIST MODULE SYSTEMS (PAM-D, -DII, -A)-----

- \* DESIGN SYSTEM TO BE REUSABLE TO THE MAXIMUM EXTENT POSSIBLE
- \* UTILIZE STS CAPABILITY FOR ON-ORBIT CHECKOUT
- \* MINIMIZE ORBITER CREW ACTIVITY
- \* STREAMLINE INTEGRATION PROCESS WITH GENERIC DOCUMENTATION
- \* PROVIDE GROWTH AND VERSATILITY THROUGH COMPONENT COMMONALITY
- \* PROVIDE BACK-UP/SPARE CRITICAL COMPONENTS TO ASSURE LAUNCH SUCCESS
- \* AUTOMATE RECHECK/REFURBISHMENT FOR TIMELY TURNAROUND

\*\*\*\*\*  
 ID: <1768.00>                    Issue(s): EFFICIENCY                    : MANAGEMENT  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        (P.245)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC         >                    :  
Location:     <ALL             >                    :  
Orb.No/Mission: <GENERIC       >                    :  
Hardware/Software: <N/A         >                    :  
Reference Data:   N/A                    :  
Description:

---POINT PAPER, "CREW IN COMMAND", WITH DESIGN & COST IMPLICATIONS FOR SHUTTLE OPS & PLANNING COMPLEX (SOPC) BY JOHN HARPER, 6/18/86: ON-BD AUTONOMY CONCEPTS:

- \* PREFLIGHT SYSTEM CHECK                    \* ASCENT FLIGHT CONTROL
- \* ORBIT INSERTION                            \* ORBIT MANAGEMENT
- \* SYST/CONSUMABLES MGMT (INCL ANOMALIES) \* MISSION COMMAND
- \* MISSION SYST MGMT AND OPERATION         \* ORBIT MANEUVER
- \* MISSION REPLANNING
- \* EARTH RETURN ENERGY MGMT AND FLIGHT CONTROL

\*\*\*\*\*

ID: <1769.00>                    Issue(s): MANAGEMENT                    : AUTOMATION  
Issue(s) cont.: EFFICIENCY                    : PAPERWORK                    :  
Issue Source: <AFSC/NSIA                    >                    (P.259)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A                    LSOC/HEIMBOLD  
Description:

-----SHUTTLE PROCESSING COST REDUCTION (LSOC-HEIMBOLD)-----

\*\*\*RECOMMEND LOW COST HIGH YIELD INVESTMENTS IN COMPUTERS & AUTOMATION SOFTWARE

- \* WIPS                    -    COMPUTERIZED WORK-IN-PROGRESS SYSTEM
- \* LSDN                    -    LPS SOFTWARE DEVELOPMENT NETWORK
- \* SCAN                    -    SHUTTLE CONNECTOR ANALYSIS NETWORK
- \* AWAD                    -    AUTOMATED WORK AUTHORIZATION DOCUMENT SYSTEM
- \* ATPS                    -    AUTOMATED TILE PROCESSING SYSTEM
- \* SIM LAUNCH            -    SIMULATED LAUNCH TEAM COUNTDOWN TRAINING

\*\*\*\*\*

ID: <1770.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.262)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A                    NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN  
Description:

-----FUTURE SPACE TRANSPORTATION OPTIONS--OVERVIEW-----

\*NATIONAL SPACE TRANSPORTATION & SUPPORT STUDY (JOINT STEERING GROUP)\*\*

.	DOD	NASA
. CO CHAIRMAN	LT GEN RANDOLPH	R ADM TRULY
.	LT GEN ABRAMSON	DR LUCAS
.	DR WOODRUFF	MR TERRELL
.		DR COLLADAY

\*\*\*\*\*

ID: <1771.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.262)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A                    NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN  
Description:

-----FUTURE SPACE TRANSPORTATION OPTIONS--OVERVIEW-----

\*NATIONAL SPACE TRANSPORTATION & SUPPORT STUDY (NSSD JOINT TASK TEAM)\*\*

JOINT TASK TEAM	COL ZERSEN	P. HOLLOWAY
TECHNOLOGY TEAM	L/C GASPERICH	J. WALBERG
ARCHITECTURE TEAM	C. DARWIN	L/C DUROCHER
MISSION REQ TEAM	L. TILTON	L/C DUROCHER
OPS & SUPPRT TEAM	H. BECK	I. FEASTER
.	L/C SAWAYA	

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ID: <1772.00> Issue(s): MANAGEMENT :  
Issue(s) cont.: :  
Issue Source: <AFSC/NSIA > (P.267)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN

Description:  
-----SPACE TRANSPORTATION ARCHITECTURE SCREENING CRITERIA-----  
...COST.... ...RISK...  
\* RECURRING COST \* COST RISK  
\* NON-RECURRING COST \* SCHEDULE UNCERTAINTY  
...PERFORMANCE/OPERATIONS... ...SAFETY...  
\* OPERATIONAL FLEXIBILITY ...WORLD TRANSP/TECHNOLOGY LEADERSHP  
\* FLEXIBILITY ...PROGRAM/POLITICAL CONSIDERATION..  
\* INVULNERABILITY/SURVIVABILITY  
\* ENVIRONMENTAL ACCEPTABILITY

\*\*\*\*\*  
ID: <1773.00> Issue(s): EXPERT SYSTEM : FAULT DETECTION  
Issue(s) cont.: STANDARDS : LOGISTICS/SPARES : TECHNOLOGY  
Issue Source: <AFSC/NSIA > (P.270)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN

Description:  
---HIGH LEVERAGE TECHNOLOGIES APPLICABLE TO ARCHITECTURES (LAUNCH OPERATIONS)--  
\* EXPERT SYSTEMS & ARTIFICIAL INTELLIGENCE FOR USE IN SUBSYST FAULT DETECTION  
. & ISOLATION, VEHICLE CHECKOUT, & LAUNCH.  
\* AVIONICS SYSTEM IMPROVEMENTS SUCH AS ON-BOARD FAULT DETECTION, ISOLATION,  
. & DIAGNOSIS.  
\* PRECISION RECOVERY SYSTEMS THAT WILL PERMIT RECOVERY OPERATIONS IN CLOSE  
. PROXIMITY TO REFURBISHMENT AREAS, THUS REDUCING LOGISTICS COSTS & TURN-  
. AROUND TIMES.

(CONT. ON ID:1773.01)

\*\*\*\*\*  
ID: <1773.01> Issue(s): EXPERT SYSTEM : FAULT DETECTION  
Issue(s) cont.: STANDARDS : LOGISTICS/SPARES : TECHNOLOGY  
Issue Source: <AFSC/NSIA > (P.270)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN

Description:  
---HIGH LEVERAGE TECHNOLOGIES APPLICABLE TO ARCHITECTURES (LAUNCH OPERATIONS)--  
\* ADVANCED THERMOSTRUCTURES, INCLUDING ADVANCED TANKAGE CONCEPTS, THERMAL  
. PROTECTION SYSTEMS (TPS) AND LIGHTWEIGHT, HIGH TEMPERATURE STRUCTURES THAT  
. WILL NEED MINIMAL REFURBISHMENT BETWEEN FLIGHTS.  
\* SIMPLICATION AND STANDARDIZATION OF PAYLOAD INTERFACES WITH THE LAUNCH  
. VEHICLES APPROACHING THE CONTAINERIZATION-TYPE PROCEDURES USED IN MOST OTHER  
. MATURE TRANSPORT SYSTEMS.  
\* VEHICLE PROPULSION SYSTEMS DESIGNED TO OPERATE AT LESS THAT MAXIMUM PERFORM-  
. ANCE CAPABILITY, THUS REQUIRING LESS MAINTENANCE AND REFURBISHMENT.  
. (ABOVE CONT. FROM ID:1773.00)



ID: <1775.01>                    Issue(s): TECHNOLOGY                    : EXPERT SYSTEM  
Issue(s) cont.: AUTOMATION                    : PAPERWORK                    : FAULT DETECTION  
Issue Source: <AFSC/NSIA                    >                    (P.272)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data:    N/A                    NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN

Description:  
 ---HIGH LEVERAGE TECHNOLOGY AREAS (PERFORMANCE/REUSABILITY)(CONT.FR ID:1775.00)  
 \* ADVANCED ROCKET AND AIRBREATHING PROPULSION SYSTEMS.  
 \* LIGHTWEIGHT, HIGH TEMPERATURE MATERIALS AND STRUCTURES.  
 \* DURABLE, REUSABLE THERMAL PROTECTION SYSTEMS.  
 \* ADAPTIVE GUIDANCE & CONTROL, AUTONOMOUS NAVIGATION.  
 \* AEROASSIST FOR ORBITAL TRANSFER SYSTEMS.  
 \* ZERO-G CRYOGENIC FLUID STORAGE AND MANAGEMENT.  
 \* PRECISION RECOVERY SYSTEMS FOR PARTIALLY REUSABLE LAUNCH VEHICLE.  
 \* COMPUTATIONAL FLUID DYNAMICS AND STRUCTURAL ANALYSIS.

\*\*\*\*\*

ID: <1776.00>                    Issue(s): COST/MANHOURS                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.406)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    PROPULSION  
Reference Data:    N/A                    BOEING AEROSPACE/GORDON R. WOODCOCK

Description:  
 -----LOWER BOUNDS ON LAUNCH COST-----  
 CONCLUSIONS: LOWER BOUNDS ON LAUNCH COST FOR CONVENTIONAL CHEMICAL ROCKETS ARE MORE THAN TWO ORDERS OF MAGNITUDE BELOW PRESENT COSTS. SUCH LOW COSTS CAN BE OBTAINED BY FUTURE FULLY REUSABLE SYSTEMS SHORT TURNAROUND TIMES, BUT ONLY AT HIGH TRAFFIC LEVELS. FIGURES FOR AIRBREATHING PROPULSION ARE UNCERTAIN DUE TO UNCERTAINTIES IN THE TECHNOLOGY, BUT INDICATIONS ARE THAT AIRBREATHING PROPULSION OFFERS NO ADVANTAGE IN LOWER BOUNDS ON COST. ADVANCED TECHNOLOGIES SUCH AS LASER PROPULSION MAY OFFER SIGNIFICANT ADVANTAGES BY OVERCOMING THE LOW PROPULSIVE EFFICIENCY INHERENT IN CHEMICAL ROCKET PROPULSION. THIS LOW EFFICIENCY ARISES DUE TO ENERGY LIMITS ON THE (CONT. ON ID:3201.01)

\*\*\*\*\*

ID: <1776.01>                    Issue(s): COST/MANHOURS                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.406)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    PROPULSION  
Reference Data:    N/A                    BOEING AEROSPACE/GORDON R. WOODCOCK

Description:  
 -----LOWER BOUNDS ON LAUNCH COST--(CONT. FROM ID:3201.00)-----  
 JET VELOCITY OF CHEMICAL ROCKETS;ADVANCED TECHNOLOGIES MAY EXCEED THESE LIMITS. FOR ANY OF THESE TECHNOLOGIES TO APPROACH THEIR LOWER BOUNDS IN PRACTICE, OPERATIONAL MATURITY AND TOTAL TRAFFIC MUCH GREATER THAN THAT OF TODAY ARE INDICATED. PROFOUND CHANGES IN MANY ASPECTS OF SPACE OPERATIONS MUST OCCUR. AT TODAY'S SPACECRAFT COSTS, FOR EXAMPLE, THE COST OF PAYLOADS FOR THE 35 LAUNCHES/DAY DESCRIBED WOULD EXCEED THE CURRENT U.S. GNP. -----THESE PROJECTIONS SEEM VERY "FAR OUT", BUT WE ARE LOOKING FORWARD TO 25 YEARS OF OPERATION OF A LAUNCH SYSTEM THAT WE HAVE NOT YET BEGUN TO DEVELOP.---TODAY'S LAUNCH COSTS ARE A BARRIER TO OPENING OF THE SPACE FRONTIER. TOMORROW'S NEED NOT BE.

\*\*\*\*\*

ID: <1777.00> Issue(s): TECHNOLOGY :  
Issue(s) cont.: :  
Issue Source: <AFSC/NSIA > (P.274)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN  
Description:

-----NATIONAL TRANSPORTATION AND SUPPORT STUDY-----KEY FINDINGS-----

\* MANY TECHNOLOGIES CRITICAL TO FUTURE OF SPACE TRANSPORTATION ARE POISED  
. FOR MAJOR ADVANCES THAT COULD GREATLY BENEFIT BOTH EXISTING AND NEW SYSTEMS  
. IN THE POST-1995 TIME PERIOD.

\*\*\*\*\*

ID: <1778.00> Issue(s): TECHNOLOGY : COST/MANHOURS  
Issue(s) cont.: :  
Issue Source: <AFSC/NSIA > (P.274)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN  
Description:

-----NATIONAL TRANSPORTATION AND SUPPORT STUDY-----KEY FINDINGS-----

\* CURRENT FUNDING LEVELS SEVERELY INHIBIT THE TIMELY DEVELOPMENT OF A  
. MAJORITY OF NECESSARY KEY TECHNOLOGIES. MANY ONGOING PROGRAMS HAVE SHORT-  
. TERM, SPECIFIC OBJECTIVES THAT DO NOT RESULT IN A COHERENT DATA BASE.  
. CONTINUED SUPPORT OF THESE ACTIVITIES ON AN INTERMITTENT BASIS WILL INTRO-  
. DUCE HIGH RISK INTO PROJECTED TECHNOLOGY AVAILABILITY DATES.

\*\*\*\*\*

ID: <1779.00>                    Issue(s): TECHNOLOGY                    : REQUIREMENTS  
Issue(s) cont.: PLANNING                    :  
Issue Source: <AFSC/NSIA                    >                    (P.274)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A                    NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN

Description:  
-----NATIONAL TRANSPORTATION AND SUPPORT STUDY-----KEY FINDINGS-----

- \* FACILITIES IN THE AREAS OF PROPULSION, STRUCTURES, AND AEROTHERMODYNAMICS
- . ARE DEMONSTRABLY INADEQUATE TO COPE WITH TESTING REQUIREMENTS INHERENT IN
- . THE REALIZATION OF COMPLEX NEW TECHNOLOGIES AND SYSTEMS.

\*\*\*\*\*  
ID: <1780.00>                    Issue(s): TECHNOLOGY                    : DESIGN CRITERIA  
Issue(s) cont.: COST/MANHOURS                    :  
Issue Source: <AFSC/NSIA                    >                    (P.274)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A                    NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN

Description:  
-----NATIONAL TRANSPORTATION AND SUPPORT STUDY-----KEY FINDINGS-----

- \* FUTURE U.S. LAUNCH SYSTEMS DESIGN MUST BE DRIVEN BY OPERATIONS AND SUPPORT,
- . AS WELL AS ASSURED ACCESS CONSIDERATIONS IN ORDER TO ACHIEVE OPERATIONAL
- . FLEXIBILITY AND COST EFFECTIVENESS. A SUBSTANTIAL REDUCTION IN RECURRING
- . OPERATIONS COST IS ACHIEVABLE IF LAUNCH VEHICLES ARE DESIGNED FOR
- . OPERATIONAL EFFICIENCY RATHER THAN MAXIMUM PERFORMANCE.

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ID: <1781.00>                    Issue(s): COST/MANHOURS                    : ACCESSABILITY  
Issue(s) cont.: MISSION                    :  
Issue Source: <AFSC/NSIA                    >                    (P.274)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data: N/A                    NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN

Description:  
-----NATIONAL TRANSPORTATION AND SUPPORT STUDY-----KEY FINDINGS-----

- \* PREFERRED ARCHITECTURES EMPLOY TWO NEW LAUNCH SYSTEMS, AN UNMANNED CARGO
- . VEHICLE & A NEW MANNED VEHICLE(WITH POTENTIAL SUPPLEMENTARY USE OF ELV'S
- . FOR SPECIFIC MISSIONS), A NEW REUSABLE OTS, & NEW LAUNCH & FLT OPERATIONS
- . APPROACHES. THIS ARCHITECTURAL APPROACH IS COST EFFECTIVE ACROSS A WIDE
- . RANGE OF MISSION SCENARIOS AND WOULD IMPROVE ASSURED ACCESS CAPABILITIES.

\*\*\*\*\*



ID: <1782.00>                    Issue(s): TECHNOLOGY                    : INTEGRATION  
Issue(s) cont.: METHODS                    : COST/MANHOURS                    :  
Issue Source: <AFSC/NSIA                    >                    (P.274)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data:    N/A                    NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN  
Description:

-----NATIONAL TRANSPORTATION AND SUPPORT STUDY-----KEY FINDINGS-----  
 \* INTEGRATION OF PAYLOADS WITH THE LAUNCH SYSTEM IS A SIGNIFICANT OPERATIONAL  
 . COST. NEW PROCESSING & INTEGRATION METHODS APPROACHING THOSE APPLIED TO  
 . CARGO AIRCRAFT & OTHER TRULY "OPERATIONAL" TRANSPORTATION SYSTEMS MUST BE  
 . DEVELOPED.  
 \* BECAUSE OF THE NUMEROUS SYSTEM & TECHNOLOGY OPTIONS WHICH MUST BE EXPLORED  
 . IN PARALLEL, FINAL SELECTION OF U.S. SPACE TRANSPORTATION VEHICLES FOR THIS  
 . NEW ARCHITECTURE IS NEITHER POSSIBLE NOR NECESSARY AT THIS TIME.

\*\*\*\*\*  
ID: <1783.00>                    Issue(s): COST/MANHOURS                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.274)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data:    N/A                    NASA LANGLEY/HOLLOWAY; AFSD/COL.ZERSEN  
Description:

-----NATIONAL TRANSPORTATION AND SUPPORT STUDY-----KEY FINDINGS-----  
 \* THE GENERIC TECHNOLOGY INVESTMENT PLAN REQUIRED TO ACHIEVE LOW OPERATIONS  
 . COST, ROBUSTNESS, FLEXIBILITY, AND WORLD LEADERSHIP IN SPACE TRANSPORTATION  
 . HAS BEEN DEFINED. THE RECOMMENDED PLAN PROVIDES A ROAD MAP WITH DECISION  
 . DATES FOR FINAL ARCHITECTURE SELECTION.  
 \* IMPLEMENTATION OF THE RECOMMENDATIONS RESULTING FROM THIS STUDY WILL ASSURE  
 . THAT THE U.S. HAS A SOLID BEGINNING TOWARD REVITALIZING ITS NATIONAL LAUNCH  
 . SYSTEM TECHNOLOGY AND INDUSTRIAL BASE AND RETAINING UNCONTESTED LEADERSHIP  
 . IN SPACE.

\*\*\*\*\*  
ID: <1784.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA                    >                    (P.277)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC                    >  
Location: <ALL                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    LIBERTY  
Reference Data:    N/A                    GARY HUDSON/PACIFIC AMERICAN LAUNCH SYST  
Description:

"THE LIBERTY LAUNCH VEHICLE SYSTEM" GARY HUDSON/PACIFIC AMERICAN LAUNCH SYS,INC  
 --LIBERTY IS A 2-STAGE, EXPENDABLE, CRYOGENIC PRESSURE-FED LAUNCH VEHICLE WHICH  
 CAN PLACE 2-3 TONS INTO THE GEOSYNCHRONOUS TRANSFER ORBIT OR UP TO 10 TONS INTO  
 LOW EARTH ORBIT. THE VEHICLE WILL UNDERGO TESTING IN LATE 1987, LEADING TO FULL  
 OPERATIONAL CAPABILITY IN 1988. UP TO 12 FLIGHTS/YR MAY BE FLOWN IN THE FIRST  
 YEAR OF OPERATION.    LIBERTY WILL BE DEVELOPED COMPLETELY WITH PRIVATE FUND-  
 ING, THOUGH BOTH THE EASTERN & WESTERN TEST RANGES WILL BE USED FOR LAUNCHES.  
 LAUNCH SITE IMPROVEMENTS FOR LIBERTY ARE MINIMAL DUE TO THE HIGHLY AUSTERE  
 LAUNCH PAD, PROPELLANT LOADING SYSTEMS AND EXISTING TRACKING AND CONTROL  
 FACILITIES ALREADY IN PLACE AT THESE RANGES.

\*\*\*\*\*

ID: <1785.00>                    Issue(s): TECHNOLOGY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        (P.277)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC            >  
Location:     <ALL               >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A           >        PHOENIX  
Reference Data:    N/A                                GARY HUDSON/PACIFIC AMERICAN LAUNCH SYST

Description:  
"THE PHOENIX SPACE TRANSP. SYST. "/GARY HUDSON, PACIFIC AMERICAN LAUNCH SYS, INC.  
---THE PHOENIX VEHICLE SYST IS A FULLY REUSABLE, VERT-LAUNCHED & VERT-RECOVERED  
SINGLE-STAGE-TO-ORBIT SPACE TRANSPORT SYST. NOT JUST A LAUNCHER, IT CAN BE RE-  
FUELED ON ORBIT BY OTHER VEHICLES OF ITS KIND TO PROVIDE AN ORBIT-TO-ORBIT CAP-  
ABILITY, AND IT CAN LAND ON THE LUNAR SURFACE. THE PROPELLANTS ARE LIQUID O2  
AND H2, AND THE STRUCTURE IS ALUMINUM. THE PHOENIX CAN BE LAUNCHED BY A CREW OF  
FEWER THAN A DOZEN PEOPLE IN LESS THAN TWO HOURS FROM HANGAR TO ORBIT. COST/LB  
IN LED UNDER \$100. UNIT COST OF THE VEHICLE COMPARABLE TO MODERN COMMERCIAL OR  
MILITARY AIRCRAFT. (NOTE: THESE CLAIMS ARE DISPUTED BY ROCKWELL REPORT TO AFSC.)

\*\*\*\*\*  
ID: <1786.00>                    Issue(s): TECHNOLOGY                    : DESIGN CRITERIA  
Issue(s) cont.: CONSTRAINTS                    : SURFACE TRANSP                    : EFFICIENCY  
Issue Source: <AFSC/NSIA        >        (P.308)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC            >  
Location:     <ALL               >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A           >  
Reference Data:    N/A                                SAWAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\*        (SAWAYA/FEASTER/ET AL)  
----KENNEDY SPACE CENTER GUIDANCE---- (GENERAL)  
\* VEHICLE CHECKOUT, MOVEMENT, LAUNCH, LANDING, AND RECOVERY SHALL NOT BE CON-  
. STRAINED BY WEATHER OR ELEMENTS.  
\* SINGLE SYSTEM/SUBSYS FAILURE SHALL NOT RESULT IN AN UNSAFE CONDITION OR  
. DELAYED LAUNCH.  
\* ELEMENTS SHALL BE EASILY TRANSPORTABLE BETWEEN LAUNCH SITE FACILITIES BY  
. CONVENTIONAL MEANS (ROAD, RAIL, WATER, AIR).  
\* CONTINGENCY LANDING LOCATIONS SHALL NOT BE CONSTRAINED BY VEHICLE DESIGN.  
\* REUSABLE ELEMENTS SHALL BE RECOVERED NEAR LAUNCH SITE. (CONT.ID:1786.01)

\*\*\*\*\*  
ID: <1786.01>                    Issue(s): TECHNOLOGY                    : DESIGN CRITERIA  
Issue(s) cont.: CONSTRAINTS                    : SURFACE TRANSP                    : EFFICIENCY  
Issue Source: <AFSC/NSIA        >        (P.308)COST RED & CRED WORKSHOP 9/18/86  
Operation:    <GENERIC            >  
Location:     <ALL               >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A           >  
Reference Data:    N/A                                SAWAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\*        (SAWAYA/FEASTER/ET AL)  
(CONT. FR. ID:1786.00) ----KENNEDY SPACE CENTER GUIDANCE---- (GENERAL)

- \* DESIGN FOR MAINTAINABILITY AND TURNAROUND EFFICIENCY.
- \* STANDARDIZE TYPES OF FUELS.
- \* MINIMIZE CONNECTIONS BETWEEN LAUNCH VEHICLE AND THE GROUND SYSTEMS.
- \* VEHICLE DESIGN SHALL INCORPORATE AUTOMATED SERVICING CAPABILITY.

\*\*\*\*\*

ORIGINAL PAGE IS  
OF POOR QUALITY

ID: <1787.00>                    Issue(s): STANDARDS                    : INTERFACE  
Issue(s) cont.:                    :  
Issue Source: <AFSC/NSIA                    >                    (P.308)COST RED & CRED WORKSHOP 9/18/86  
Operation:                    <GENERIC                    >  
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Hardware/Software: <N/A                    >  
Reference Data:                    N/A                    SAWAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\*                    (SAWAYA/FEASTER/ET AL)  
-----KENNEDY SPACE CENTER GUIDANCE----- (GENERAL)  
\* VEHICLE CHECKOUT, MOVEMENT, LAUNCH, LANDING, AND RECOVERY SHALL NOT BE CON-  
. STRAINED BY WEATHER OR ELEMENTS.  
\* SINGLE SYSTEM/SUBSYS FAILURE SHALL NOT RESULT IN AN UNSAFE CONDITION OR  
. DELAYED LAUNCH.  
\* ELEMENTS SHALL BE EASILY TRANSPORTABLE BETWEEN LAUNCH SITE FACILITIES BY  
. CONVENTIONAL MEANS (ROAD, RAIL, WATER, AIR).  
\* CONTINGENCY LANDING LOCATIONS SHALL NOT BE CONSTRAINED BY VEHICLE DESIGN.  
\* REUSABLE ELEMENTS SHALL BE RECOVERED NEAR LAUNCH SITE. (CONT.ID:1787.01)

\*\*\*\*\*  
ID: <1787.01>                    Issue(s): STANDARDS                    : INTERFACE  
Issue(s) cont.:                    :  
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Operation:                    <GENERIC                    >  
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Hardware/Software: <N/A                    >  
Reference Data:                    N/A                    SAWAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\*                    (SAWAYA/FEASTER/ET AL)  
(CONT. FR. ID:1787.00) -----KENNEDY SPACE CENTER GUIDANCE----- (GENERAL)

- \* DESIGN FOR MAINTAINABILITY AND TURNAROUND EFFICIENCY.
- \* STANDARDIZE TYPES OF FUELS.
- \* MINIMIZE CONNECTIONS BETWEEN LAUNCH VEHICLE AND THE GROUND SYSTEMS.
- \* VEHICLE DESIGN SHALL INCORPORATE AUTOMATED SERVICING CAPABILITY.

\*\*\*\*\*  
ID: <1798.00>                    Issue(s): INTERFACE                    : STANDARDS  
Issue(s) cont.: MISSION                    : REQUIREMENTS                    :  
Issue Source: <AFSC/NSIA                    >                    (P.308)COST RED & CRED WORKSHOP 9/18/86  
Operation:                    <GENERIC                    >  
Location:                    <ALL                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <N/A                    >  
Reference Data:                    N/A                    SAWAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\*                    (SAWAYA/FEASTER/ET AL)  
-----KENNEDY SPACE CENTER GUIDANCE----- (PAYLOAD ACCOMMODATION)

- \* ACCOMMODATIONS FOR PAYLOADS/CARGOS SHALL BE DESIGNED FOR EASE OF INSTALLA-  
. TION, REMOVAL, AND INTERFACE VERIFICATION.
- \* SIMPLIFY, MINIMIZE, AND STANDARDIZE INTERFACE REQUIREMENTS BETWEEN PAYLOADS  
. /CARGOS AND LAUNCH VEHICLES.
- \* SIMPLIFY MISSION-TO-MISSION CARGO BAY RECONFIGURATION REQUIREMENTS.

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ID: <1789.00>            Issue(s): REQUIREMENTS        : FAULT DETECTION  
Issue(s) cont.: CONSTRAINTS        : MAINTAINABILITY        : DESIGN CRITERIA  
Issue Source: <AFSC/NSIA        >        (P.308)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC        >  
Location:    <ALL        >  
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Hardware/Software:<N/A        >  
Reference Data:   N/A                    SAWAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\*        (SAWAYA/FEASTER/ET AL)  
-----KENNEDY SPACE CENTER GUIDANCE----- (TURNAROUND TEST & CHECKOUT)

- \* MINIMIZE REQUIREMENT FOR REDUNDANT TESTING.
- \* MAXIMIZE ONBOARD CHECKOUT/FAULT ISOLATION CAPABILITY.
- \* DESIGN VERIFICATION TESTING SHALL NOT BE IMPOSED ON THE LAUNCH SITE.
- \* MINIMIZE REQ FOR ROUTINE MAINTENANCE, REFURBISHMENT, AND INSPECTION.
- \* DO NOT RETEST IF THE SYSTEM WORKED THE LAST TIME AND HAS NOT BEEN DISTURBED SINCE.
- \* THERMAL PROTECTION SYSTEM SHALL BE DURABLE, REUSABLE, AND EASILY INSTALLED, INSPECTED, REPAIRED, AND REPLACED.

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ID: <1790.00>            Issue(s): DESIGN CRITERIA        : MISSION  
Issue(s) cont.: STANDARDS        : INTERFACE        : TRAINING/CERTIF  
Issue Source: <AFSC/NSIA        >        (P.309)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC        >  
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Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A        >  
Reference Data:   N/A                    SAWAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\*        (SAWAYA/FEASTER/ET AL)  
-----JOHNSON SPACE CENTER GUIDANCE-----

- \* SPACECRAFT DESIGNER SHALL BE PROVIDED STANDARD HARDWARE INTERFACE DEFINITION AND STD OPERATIONS PROCEDURES EARLY IN THE SPACECRAFT DESIGN CYCLE.
- \* OPERATIONS ORBITS SHALL BE STANDARD--INCLINATION AND ALTITUDE.
- \* FLIGHT PHASES SHALL BE STANDARD: ASCENT/PROXIMITY OPERATIONS/DEPLOYMENT/SPACECRAFT HANDLING-RMS/SPACECRAFT SEPARATION/THERMAL PROFILES/RENDEZVOUS/ENTRY.
- \* SPACECRAFT DEPLOYMENT SYSTEMS AND PROCEDURES SHALL BE STANDARD.
- \* THE PAYLOAD MISSION REQUIREMENTS DOCUMENTATION PROCESS SHALL BE STANDARD.

\*\*\*\*\*

ID: <1790.01>            Issue(s): DESIGN CRITERIA        : MISSION  
Issue(s) cont.: STANDARDS        : INTERFACE        : TRAINING/CERTIF  
Issue Source: <AFSC/NSIA        >        (P.309)COST RED & CRED WORKSHOP 9/18/86  
Operation:   <GENERIC        >  
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Orb.No/Mission: <GENERIC        >  
Hardware/Software:<N/A        >  
Reference Data:   N/A                    SAWAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\*        (SAWAYA/FEASTER/ET AL)  
-----JOHNSON SPACE CENTER GUIDANCE----- (CONT.)

- \* PAYLOAD HARDWARE & OPS INTERFACE DESIGN REQUIREMENTS SHALL BE STANDARD-POWER, COOLING, COMMAND, DATA, INTEGRATION HARDWARE, RMS, DOCKING MECHANISMS, CREW INTERFACES.
- \* SPACECRAFT SERVICING FUNCTIONS, INTERFACES, & PROCEDURES SHALL BE STANDARD.

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ID: <1790.02> Issue(s): DESIGN CRITERIA : MISSION  
Issue(s) cont.: STANDARDS : INTERFACE : TRAINING/CERTIF  
Issue Source: <AFSC/NSIA > (P.309)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A ->  
Reference Data: N/A SAMAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\* (SAMAYA/FEASTER/ET AL)  
-----JOHNSON SPACE CENTER GUIDANCE-----

- \* FLIGHT CONTROL CENTER FLIGHT RECONFIGURATION:
  - . + DATA REQUIREMENTS SHALL BE MINIMUM AND STANDARD. + GENERATION & VERIFICATION PROCESS SHALL BE STANDARD.
- \* FLIGHT AND GROUND CREW TRAINING AND SIMULATION:
  - . + BASED UPON STD FLIGHT PROFILES/PHASES. + SIMULATION DATA SHALL BE MINIMUM & STANDARD. + BASED UPON STD SPACECRAFT INTERFACES & OPS PROCEDURES.
  - . NECESSARY CARGO MIX FLEXIBILITY SHALL BE INDUCED BY STD P/L INTERFACES, OPS PROCEDURES, AND STANDARD ACCOMMODATION ALLOCATION.

\*\*\*\*\*

ID: <1791.00> Issue(s): COST/MANHOOURS : INTERFACE  
Issue(s) cont.: SURFACE TRANSP : MAINTAINABILITY : EFFICIENCY  
Issue Source: <AFSC/NSIA > (P.309)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A SAMAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\* (SAMAYA/FEASTER/ET AL)  
-----OPERATIONS & SUPPORT GUIDELINE SUMMARY-----

- \* OPERATIONAL CONCEPTS ARE AN INTEGRAL PART OF COST-EFFECTIVE VEH SYST DESIGN.
- \* MINIMIZE ALL EXTERNAL INTERFACES. \* MAXIMIZE ON-BOARD AUTONOMY.
- \* MAKE VEHICLE ELEMENTS EASILY TRANSPORTABLE.
- \* DESIGN FOR MAINTAINABILITY AND TURNAROUND EFFICIENCY.
- \* STANDARDIZE GSE AND ASE AT ALL LOCATIONS.
- \* STANDARDIZE CONSUMABLES.
- \* DESIGN FOR EASE OF SERVICING AND PAYLOAD HANDLING.
- \* DESIGN FOR A "PAPERLESS" INFORMATION PROCESSING SYSTEM.

\*\*\*\*\*

ID: <1792.00> Issue(s): STANDARDS : DESIGN CRITERIA  
Issue(s) cont.: PAPERWORK : :  
Issue Source: <AFSC/NSIA > (P.309)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC >  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A SAMAYA/PORTANOVA/FEASTER/BECK/STEINCAMP

Description:  
\*\*\*OPERATIONS & SUPPORT FOR NEXT GENERATION STS\*\*\* (SAMAYA/FEASTER/ET AL)  
-----OPERATIONS & SUPPORT GUIDELINE SUMMARY-----

- \* OPERATIONAL CONCEPTS ARE AN INTEGRAL PART OF COST-EFFECTIVE VEH SYST DESIGN.
- \* MINIMIZE ALL EXTERNAL INTERFACES. \* MAXIMIZE ON-BOARD AUTONOMY.
- \* MAKE VEHICLE ELEMENTS EASILY TRANSPORTABLE.
- \* DESIGN FOR MAINTAINABILITY AND TURNAROUND EFFICIENCY.
- \* STANDARDIZE GSE AND ASE AT ALL LOCATIONS.
- \* STANDARDIZE CONSUMABLES.
- \* DESIGN FOR EASE OF SERVICING AND PAYLOAD HANDLING.
- \* DESIGN FOR A "PAPERLESS" INFORMATION PROCESSING SYSTEM.

\*\*\*\*\*





ID: <1798.00>                    Issue(s): EFFICIENCY                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        (P.360)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC            >        :  
Location: <ALL                >        :  
Orb.No/Mission: <GENERIC     >        :  
Hardware/Software:<ET           >        AERODYNAMIC SPIKE  
Reference Data:    N/A                    TAYLOR & ASSDC/THOMAS C.TAYLOR  
Description:

-----SHROUD ENHANCEMENT WITH THE AEROSPIKE CONCEPT-----  
 CONCLUSIONS: THE FEASIBILITY OF EMPLOYING AN AERODYNAMIC SPIKE ON THE EXTERNAL  
 TANK OF THE STS WAS EXAMINED:  
 . \* THE AEROSPIKE PROVIDES A CONVENIENT ATTACHMENT POINT IN ORBIT FOR  
 .    COUPLING TO THE "SMART END" OF A TETHER.  
 . \* APPLICATIONS TO THE FUTURE VEHICLES AND THE ENHANCEMENT OF THE PAYLOAD  
 .    WEIGHT CAPABILITY THROUGH COMBINATION WITH TETHERS IS SIGNIFICANT.  
 . \* THE CONCEPT COULD OPEN UP ACCESS TO SPACE STATIONS FOR ANY AEROSPIKE  
 .    EQUIPPED VEHICLE.

\*\*\*\*\*  
ID: <1799.00>                    Issue(s): COST/MANHOURS                    : MANAGEMENT  
Issue(s) cont.:                    :                    :  
Issue Source: <AFSC/NSIA        >        (P.376)COST RED & CRED WORKSHOP 9/18/86  
Operation: <GENERIC            >        :  
Location: <ALL                >        :  
Orb.No/Mission: <GENERIC     >        :  
Hardware/Software:<N/A           >        :  
Reference Data:    N/A                    PRATT & WHITNEY/D.L. WITT  
Description:

.        -----LIQUID ROCKET ENGINE COST REDUCTION-----  
 . \* MULTI-YEAR PROCUREMENT -- COMMIT TO LARGER ORDER QUANTITIES TO LOWER  
 .    ACQUISITION COST.  
 . \* DIRECT BUY OF ENGINES BY THE GOVERNMENT TO ELIMINATE MULTIPLE FEE AND G&A  
 . \* STREAMLINE MANAGEMENT FOR BOTH CONTRACTOR AND GOVERNMENT AGENCIES TO  
 .    REDUCE THE PERSONNEL SUPPORT COST.

\*\*\*\*\*



ID: <1800.00> Issue(s): ACCESSABILITY : DESIGN CRITERIA  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > DAA FIRE & TEMP DETECTORS  
Reference Data: ESR ESR K12180 (8/5)  
Description:  
ARMS(JACKIE SMITH)

ORIGINAL PAGE IS  
OF POOR QUALITY

"A PERMANENT INSTALLATION FOR THE DAA TEMP & FIRE DETECTORS SHOULD BE PROVIDED TO BRING DATA BACK THROUGH THE LPS."

\*\*\*\*\*  
ID: <1802.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > DAA RETRACTED SWITCH  
Reference Data: ESR ESR 88690 (43/5)  
Description:  
ARMS(JACKIE SMITH)

"PROVIDE REDUNDANT DAA RETRACTED SWITCH TO INITIATE THE BLS DAA PROGRAM POC5."

\*\*\*\*\*  
ID: <1804.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > OXIDIZER VENT & DRAIN SYSTEM  
Reference Data: N/A STUDY ITEM (9/1)  
Description:  
CARGO (CONWAY)

"PROVIDE OXIDIZER VENT AND DRAIN SYSTEM FOR VPF."

\*\*\*\*\*

ID: <1805.00> Issue(s): DESIGN CRITERIA : SAFETY  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > TELEPHONES  
Reference Data: N/A STUDY ITEM (9/2)  
Description:  
CARGO (CONWAY)

"PROVIDE EXPLOSIVE PROOF TELEPHONES FOR VPF WORK STANDS AND ELEVATOR."

\*\*\*\*\*

ID: <1806.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PAGING  
Reference Data: N/A STUDY ITEM (9/3)  
Description:  
CARGO (CONWAY)

"PROVIDE PAGING CAPABILITY FROM D&C CITE CONTRDL ROOM TO VPF."

\*\*\*\*\*

ID: <1807.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > AIR BEARING PLATFORM  
Reference Data: N/A STUDY ITEM (9/4)  
Description:  
CARGO (CONWAY)

"PROVIDE A MECHANICAL GUIDE TO ALIGN THE AIR BEARING PLATFORM UNDER VPF CELLS."

\*\*\*\*\*

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OF POOR QUALITY

ID: <1808.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >  
Location: <VPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    PLATFORM CANNISTER DOOR  
Reference Data:    N/A                    STUDY ITEM                    (9/5)  
Description:  
CARGO (CONWAY)

"PROVIDE SAFETY RESTRAINTS ON END OF PLATFORM CANISTER DOORS."

\*\*\*\*\*  
ID: <1809.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >  
Location: <VPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    EMERGENCY FIRE SPRINKLER SYSTEM  
Reference Data:    N/A                    STUDY ITEM                    (15/1)  
Description:  
CARGO (CONWAY)

"ADD ON TO THE EMERGENCY FIRE SPRINKLER SYSTEM IN THE CHSF SERVICING HIGH BAY AND OTHER PAYLOAD PROCESSING FACILITIES AS APPROPRIATE SO THAT THE AIRLOCKS ARE ALSO PROTECTED WITH A SPRINKLER SYSTEM."

\*\*\*\*\*  
ID: <1810.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >  
Location: <VPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    ELECTROMECHANICAL REELS  
Reference Data:    N/A                    STUDY ITEM                    (15/6)  
Description:  
CARGO (CONWAY)

"PROVIDE ELECTRO-MECHANICAL REELS OR OTHER MEANS OF HANDLING PAYLOAD CANISTER TRANSPORTER AND MARKLIFT SHORE POWER CABLES AND PAYLOAD CANISTER DOOR AIR SUPPLY HOSES."

\*\*\*\*\*

ID: <1811.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <N/A                    >  
Location:                    <VPP                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software:<GSE                    >                    PSTF SPIN BALANCE MACHINE  
Reference Data:                    N/A                    STUDY ITEM                    (15/8)  
Description:  
CARGO (CONWAY)

"MODIFY THE PSTF SPIN BALANCE MACHINE TO PROVIDE EXPLOSION-PROOF ELECTRICAL COMPONENTS AND HYPERGOLIC FUEL COMPATIBLE HOSES AND FITTINGS."

\*\*\*\*\*  
ID: <1812.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <N/A                    >  
Location:                    <VPP                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software:<GSE                    >                    FREON LOOP  
Reference Data:                    N/A                    STUDY ITEM                    (36/5)  
Description:  
CARGO (CONWAY)

"A DESIGN EFFORT IS PLANNED TO DEVELOP SPACELAB FREON LOOP GSE DURING THE "STANDDOWN" PERIOD. MDAC-KSC IS PLANNING TO ACQUIRE HARDWARE AND BUILD THE UNIT."

\*\*\*\*\*  
ID: <1813.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <GENERIC                    >  
Location:                    <LCC                    >                    FIRING ROOM  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software:<FACILITIES >                    LIGHTING  
Reference Data:                    N/A                    (3/10)  
Description:  
CCMS -- WARREN KICKLIGHTER

STUDY/ESR/MOD.                    "REDUCE GLARE ON CRT'S FROM OVERHEAD FIRING ROOM LIGHTS"

\*\*\*\*\*

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ID: <1814.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > CDS UPGRADES  
Reference Data: N/A (24/6)  
Description:  
CCMS -- WARREN KICKLIGHTER

STUDY/ESR/MOD. "IMPLEMENTATION OF CDS UPGRADES TO INCORPORATE THE LAST  
AVAILABLE HONEYWELL LARGE MAINFRAMES"

\*\*\*\*\*  
ID: <1815.00> Issue(s): SAFETY :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FIRING ROOM  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > AIR CONDITIONING  
Reference Data: N/A (3/17)  
Description:  
CCMS -- WARREN KICKLIGHTER

REJECTED--

"FIRING ROOM ENVIRONMENT UNCOMFORTABLE, UNHEALTHY FOR PERSONNEL."

\*\*\*\*\*  
ID: <1816.00> Issue(s): SAFETY : AUTOMATION  
Issue(s) cont.: PLANNING : TECHNOLOGY : COST/MANOURS  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FIRING ROOM  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > CCMS  
Reference Data: N/A (24/1)  
Description:  
CCMS -- WARREN KICKLIGHTER

REJECTED--

"IMPLEMENTATION OF CCMS II PRIOR TO FOURTH ORBITER ARRIVAL. ESTIMATED COST  
\$92M (NON-RECURRING + RECURRING COST)."

\*\*\*\*\*

ID: <1817.00> Issue(s): COST/MANHOURS : AUTOMATION  
Issue(s) cont.: TECHNOLOGY :  
Issue Source: <NE-PEG MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FIRING ROOM  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > CCMS  
Reference Data: N/A (24/2)  
Description:  
CCMS -- WARREN KICKLIGHTER

REJECTED--

"IMPLEMENTATION OF STANDALONE OPF CHECKOUT USING CCMS II."

\*\*\*\*\*  
ID: <1818.00> Issue(s): SECURITY : PLANNING  
Issue(s) cont.: COST/MANHOURS :  
Issue Source: <NE-PEG MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FIRING ROOM - 1  
Orb.No/Mission: <DOD >  
Hardware/Software:<LPS > CCMS  
Reference Data: N/A (24/3)  
Description:  
CCMS -- WARREN KICKLIGHTER

REJECT--

"IMPLEMENTATION OF DOD SECURITY MODS TO FR-1"

\*\*\*\*\*  
ID: <1819.00> Issue(s): COST/MANHOURS : ISOLATION  
Issue(s) cont.: AUTOMATION :  
Issue Source: <NE-PEG MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > CCMS  
Reference Data: N/A (24/4)  
Description:  
CCMS -- WARREN KICKLIGHTER

REJECT--

"IMPLEMENTATION OF STANDALONE OMR/CCMS CHECKOUT CAPABILITY."

\*\*\*\*\*

ID: <1820.00>                    Issue(s): AUTOMATION                    : COST/MANHOURS  
Issue(s) cont.: TECHNOLOGY                    : EXPERT SYSTEM                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <LCC >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<LPS                    >                    CCMS  
Reference Data:    N/A                    (24/5)  
Description:  
CCMS -- WARREN KICKLIGHTER

REJECT--

"MODIFICATIONS TO LPS/CCMS CONSOLE DATA PROCESSING DISPLAY UTILIZING AI  
TECHNOLOGY AND EXPERT SYSTEM."

\*\*\*\*\*  
ID: <1821.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS                    >  
Location: <ORBITR>  
Orb.No/Mission: <CENTAUR                    >  
Hardware/Software:<N/A                    >                    LOX FILL LINE  
Reference Data:    N/A                    (5/19)  
Description:  
CENTAUR -- WARREN LACKIE

STUDY/ESR/MOD

"DESIGN HELIUM REPRESS TO CENTAUR LOX FILL LINE FOR RE-ENTRY PURGE."

\*\*\*\*\*  
ID: <1822.00>                    Issue(s): DESIGN CRITERIA                    : SAFETY  
Issue(s) cont.: DESIGN                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >                    LAUNCH DRIFT PATH  
Location: <PAD >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<BSE                    >                    ETVAS  
Reference Data:    N/A                    (42/2)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

MANDATORY

"PROVIDE FAIL SAFE LATCH CAPABILITY FOR ETVAS TO PREVENT LINE, GUCP AND STATIC  
LANYARD FROM INTRUDING BACK INTO THE SHUTTLE DRIFT PATH AT LAUNCH."

\*\*\*\*\*

ID: <1823.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > GOX VENT ARM DUCTS  
Reference Data: N/A (42/3)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

MANDATORY

"GOX VENT ARM O2 VENT DUCTS NEED ADDED WORK TO PREVENT ICE FORMATION AT DUCT EXITS TO PREVENT SHUTTLE DAMAGE."

\*\*\*\*\*  
ID: <1824.00> Issue(s): DESIGN CRITERIA : DESIGN  
Issue(s) cont.: SAFETY :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT > LAUNCH DRIFT PATH  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ETVAS  
Reference Data: N/A (42/4)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

MANDATORY

"MODIFY ETVAS STATIC LANYARD SEPARATION TO PREVENT THE GUCP FROM POSSIBLY HITTING LH SRB SKIRT. VERIFY ADEQUACY OF EXISTING PYRO BOLT VS. LOACS."

\*\*\*\*\*  
ID: <1825.00> Issue(s): MAINTAINABILITY : LOGISTICS/SPARES  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > HVDS(HYPERGOLIC VAPOR DETECTION SYSTEM)  
Reference Data: ESR ESR 94579,94580 (8/7)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"UPGRADE THE HVDS SENSOR TO THE STATE-OF-THE-ART TO LESSEN MAINTENANCE AND LOGISTICS PROBLEMS."

\*\*\*\*\*



ID: <1826.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS >  
Location: <VAB >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > LOUVERS/VENTS  
Reference Data: N/A (13/1)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

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OF POOR QUALITY

STUDY/ESR/MOD

"PROVIDE LOUVERS/VENTS IN THE LC-39 VEHICLE ASSEMBLY BUILDING THAT WOULD PRODUCE A "CHIMNEY EFFECT" FLOW OF AIR BY DESIGN IN THE EVENT OF ACCIDENTAL SRM (OR ORBITER RESIDUAL HYPERGOLIC IGNITION. (13/1)"

\*\*\*\*\*  
ID: <1827.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS >  
Location: <OPF > OMRF  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > FOGGING NOZZLES  
Reference Data: N/A (13/2)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"PROVIDE LOW-LEVEL, WATER FOGGING NOZZLES AROUND ORBITER AIMED AT "HOT SPOTS" TO MORE EFFECTIVELY FIGHT FIRE IN OPF HB'S 1 & 2 AND NEW OMRF. (13/2)"

\*\*\*\*\*  
ID: <1828.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LETF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES >  
Reference Data: N/A (13/4)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"LETF EGRESS ROUTES NEED REVIEW DUE TO INCREASED WORK TASKS. THIS AREA IS ALSO BEING OVERBUILT AND EGRESS ROUTES ARE NOT ADDRESSED. (13/4)"

\*\*\*\*\*

ID: <1829.00>            Issue(s): QA                            : DESIGN  
Issue(s) cont.: RELIABILITY                            :  
Issue Source: <NE-PED MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                            >  
Location:    <MLP                            >  
Orb.No/Mission: <GENERIC                            >  
Hardware/Software: <GSE                            >    O2 ANALYZERS  
Reference Data:    N/A                            (25/15)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"REDESIGN MLP SAMPLE SYSTEMS TO ELIMINATE INACCURACIES IN O2 ANALYZERS. (25/15)"

\*\*\*\*\*  
ID: <1830.00>            Issue(s): RELIABILITY                            :  
Issue(s) cont.:                            :  
Issue Source: <NE-PED MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                            >  
Location:    <KSC                            >  
Orb.No/Mission: <GENERIC                            >  
Hardware/Software: <GSE                            >    HYPERGOLIC VAPOR SENSORS  
Reference Data:    N/A                            (25/17)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"REDESIGN ELECTROMECHANICAL CELLS TO ELIMINATE HIGH FAILURE RATE OF HYPERGOLIC VAPOR SENSORS. (25/17)"

\*\*\*\*\*  
ID: <1831.00>            Issue(s): TECHNOLOGY                            :  
Issue(s) cont.:                            :  
Issue Source: <NE-PED MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                            >  
Location:    <OPF                            >    HB 1 & 2  
Orb.No/Mission: <GENERIC                            >  
Hardware/Software: <GSE                            >    ECS PROCESS CONTROLLERS  
Reference Data:    N/A                            (25/17)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"REPLACE MICRO REDAX-TANDEM PROCESS CONTROLLERS WITH SMART HIM'S AND GRAPHICS TERMINALS AT OPF HB1 & 2 ECS. (25/5)"

\*\*\*\*\*

ID: <1832.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > CRYOGENIC & PNEUMATIC COMPONENTS  
Reference Data: N/A (28/2)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"CONSTRUCT A FACILITY TO QUALIFY COMPONENTS FOR USE IN CRYOGENIC AND PNEUMATIC SYSTEMS. (28/2)"

\*\*\*\*\*  
ID: <1833.00> Issue(s): DESIGN CRITERIA : SAFETY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ORBITER WEATHER PROTECTION  
Reference Data: N/A (28/11)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"IMPLEMENT PAD A ORBITER WEATHER PROTECTION. (28/11)"

\*\*\*\*\*  
ID: <1834.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD > PAD A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > AIRBORNE PARTICLE COUNTERS (APC)  
Reference Data: N/A (29/8)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"AIRBORNE PARTICAL COUNTERS (APC) PAD A & B: NEED TO COMPLETE MOD. (29/8)"

\*\*\*\*\*





ID: <1841.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD > PGHM PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A H78-0534 (30/1.1)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

- \*PGHM - 1 & 2(H78-0534): (30/1.1)
  - \* RSS COMPRESSED AIR SYSTEM FAILURE RENDERS PGHM INOPERABLE.
  - \* J-HOOKS AND HYDRAULIC SYSTEM PROBLEMS THAT REQUIRE REVIEW.
  - \* PGHM LURCHING AT PAD B.
  - \* PGHM LOW SPEED MOTOR AND DRIVE SYSTEM.
  - \* PGHM FRONT END ADJUSTMENT MECHANICS (FPWRX, SIDE 2 & 4. PWR Y, MAN Z)
- \*\*\*\*\*

ID: <1842.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD > PCR PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > WALL PANELS  
Reference Data: N/A (30/1)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"PCR WALL PANELS - PAD A: THE SIDE 1 AND 4 WALL PANELS ARE HEAVILY DAMAGED DUE TO LAUNCHES. (30/1)"

\*\*\*\*\*  
ID: <1843.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD > RSS PAD A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > AIR ROOM  
Reference Data: N/A (30/2)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"PCR WALL PANELS - PAD A: THE SIDE 1 AND 4 WALL PANELS ARE HEAVILY DAMAGED DUE TO LAUNCHES. (30/1)"

\*\*\*\*\*



ID: <1847.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >                    :  
Location: <PAD                    >                    PAD A    PCR  
Orb.No/Mission: <GENERIC                    >                    :  
Hardware/Software:<GSE                    >                    PCR CEILING  
Reference Data:    N/A                    (30/6)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"PCR CEILING - PAD A: NEED TO REPLACE THE PERFORATED PANELS WITH SOLID ONES AND RTV IN PLACE, TO KEEP DEBRIS FROM ABOVE THE CEILING FALLING ONTO THE PAYLOADS. (30/6)"

\*\*\*\*\*

ID: <1848.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >                    :  
Location: <PAD                    >                    PAD A & B    PCR  
Orb.No/Mission: <GENERIC                    >                    :  
Hardware/Software:<GSE                    >                    PCR CEILING GRID TO WALL PANELS  
Reference Data:    N/A                    (30/7)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"PCR CEILING GRID TO WALL PANELS - PAD A & B: NEED A FABRIC ATTACHED BETWEEN THE CEILING GRID "ISLAND" AND PCR WALL PANELS TO KEEP DEBRIS FROM CONTAMINATING THE PCR. (30/7)"

\*\*\*\*\*

ID: <1849.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >                    :  
Location: <PAD                    >                    PAD A & B  
Orb.No/Mission: <GENERIC                    >                    :  
Hardware/Software:<GSE                    >                    RBUS SECONDARY RETRACT  
Reference Data:    N/A                    (32/1)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"RBUS SECONDARY RETRACT CAN CAUSE RECONTACT WITH ORBITER. (31/1)"

\*\*\*\*\*



ID: <1850.00> Issue(s): DESIGN : MAINTAINABILITY  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PCR  
Reference Data: N/A (32/2)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"PCR HARDENING MODIFICATIONS SHOULD BE COMPLETED PRIOR TO RESUMPTION OF LAUNCH OPERATIONS. (32/2)"

\*\*\*\*\*  
ID: <1851.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD > PCR  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PCR  
Reference Data: N/A (32/5)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"PCR STATIC PRESSURE SHOULD BE INCREASED TO ASSURE MINIMUM VALUES OF NOT LESS THAN 0.25 INS. OF WATER. (32/5)"

\*\*\*\*\*  
ID: <1852.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ORBITER PAYLOAD BAY LRU PLATFORM HOIST  
Reference Data: N/A (34/1)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

"REVIEW THE DESIGN OF THE ORBITER PAYLOAD BAY LRU PLATFORM HOIST. (34/1)"

\*\*\*\*\*

ID: <1853.00> Issue(s): DESIGN : RELIABILITY  
Issue(s) cont.: MAINTAINABILITY :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > OPF ENVIRONMENTAL CONTROL SYSTEM (FIXED)  
Reference Data: N/A (43/2)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

\*OPF ENVIRONMENTAL CONTROL SYSTEM (FIXED):  
1. BLOWERS AND MOTORS HAVE HAD REPEATED FAILURES.  
2. MINI-CONTROLLER PROCESSOR HAS NOT BEEN RELIABLE.

\*\*\*\*\*  
ID: <1854.00> Issue(s): DRAWING SYSTEM : DISCIPLINE  
Issue(s) cont.: QA :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PAD ENVIRONMENTAL CONTROL SYSTEM  
Reference Data: N/A (44/9)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

\*PADS A AND B ENVIRONMENTAL CONTROL SYSTEM ELECTRICAL DRAWING NEED UPDATING TO REFLECT ACTUAL INSTALLATION. FOR EXAMPLE, THE ADVANCED ELECTRICAL DRAWING SHOWS AN ELECTRICAL DISTRIBUTOR 5048A1 (AT THE COOLING TOWER SYSTEM) THAT DOES NOT EXIST. (44/9)\*

\*\*\*\*\*  
ID: <1855.00> Issue(s): REQUIREMENTS :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LETF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > LETF  
Reference Data: N/A (50/1)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

STUDY/ESR/MOD

\*RETAIN LETF CAPABILITY FOR LONG TERM FUTURE USE WHEN MAJOR PROBLEMS OR NEW REQUIREMENTS NECESSITATE ITS USE. (50/1)\*

\*\*\*\*\*

ID: <1856.00> Issue(s): REQUIREMENTS : COST/MANHOURS  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <LCC > LPS/CCMS  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > INSTRUMENTATION SUPPORT  
Reference Data: N/A (24/4)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

REJECT

"ADDITIONAL LPS/CCMS HARDWARE IN SUPPORT OF INCREASED FLIGHT INSTRUMENTATION BEING ADDED TO THE STS ELEMENTS (SRB, ET, ORBITER). \$1.3M. (24/4)"

\*\*\*\*\*  
ID: <1857.00> Issue(s): TECHNOLOGY : MAINTAINABILITY  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > INSTRUMENTATION  
Reference Data: N/A (23/2)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

REJECT

"REVIEW SENSOR UPGRADES/REPLACEMENT OF EARLY INSTALLED TRANSDUCERS TO STATE-OF-THE-ART TECHNOLOGY. (23/2)"

\*\*\*\*\*  
ID: <1858.00> Issue(s): SAFETY :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <MLP > MLP 1,2,3  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > HALON SYSTEM  
Reference Data: N/A (23/3)  
Description:  
DESIGN ENGINEERING -- JIM PHILLIPS

REJECT

"REPLACE OR UPGRADE MLP 1,2,3 HALON SYSTEM. (23/3)"

\*\*\*\*\*

ID: <1859.00> Issue(s): ACCESSABILITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > DMS POD ACCESS  
Reference Data: N/A (4/37)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"IMPROVE DMS POD ACCESS. (4/37)"

\*\*\*\*\*  
ID: <1860.00> Issue(s): DESIGN : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY >  
Location: <PAD > PGHM  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PGHM  
Reference Data: N/A (5/5)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"MODIFY PGHM SO IT IS NOT NECESSARY TO REMOVE PLD BAY CCTV CAMERAS DURING  
PAYLOAD INSTALLATION. (5/5)"

\*\*\*\*\*  
ID: <1861.00> Issue(s): ACCESSABILITY :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY >  
Location: <VAB > TOWER D/HB-1  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ACCESS PLATFORM  
Reference Data: N/A (10/12)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"PROVIDE ACCESS PLATFORM FOR VAB-MLP 'D' LEVEL EGRESS TO TOWER 'D' IN HB-1.  
(10/12)"

\*\*\*\*\*

ID: <1862.00>                    Issue(s): ACCESSABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >  
Location: <DPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    STORAGE SPACE  
Reference Data:    N/A                    (10/16)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"LACK OF EQUIPMENT STORAGE SPACE IN THE DPF HIGH BAYS. (10/16)"

\*\*\*\*\*  
ID: <1863.00>                    Issue(s): ACCESSABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY                    >  
Location: <VAB                    >                    TRANSFER AISLE  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    STORAGE SPACE  
Reference Data:    N/A                    (14/2.A)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"NEED FOR STORAGE FACILITY TO HOUSE SUPPORT EQUIPMENT TO RELIEVE CONGESTION  
IN VAB TRANSFER AISLE, I.E., ORBITER LIFTING SLING, PAYLOAD CANNISTER, ETC.  
(14/2.A)

\*\*\*\*\*  
ID: <1864.00>                    Issue(s): DESIGN                    : ACCESSABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY                    >  
Location: <PAD                    >                    PAD A & B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    ET ACCESS PLATFORM  
Reference Data:    N/A                    (28/8)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"MODIFY PAD A AND B ET ACCESS PLATFORM. (28/8)"

\*\*\*\*\*

ID: <1865.00> Issue(s): ACCESSABILITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ORBITER PAYLOAD BAY DOOR TORQUE TUBES  
Reference Data: N/A (34/2)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"MODIFY ORBITER PAYLOAD BAY DOOR TORQUE TUBES. (34/2)"

```
*****  
ID: <1866.00> Issue(s): DESIGN : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > LRU HANDLER ARM  
Reference Data: N/A (34/3)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY
```

STUDY/ESR/MOD

"MODIFY THE LRU HANDLER ARM. (34/3)"

```
*****  
ID: <1867.00> Issue(s): ACCESSABILITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > GSE HDIST PLATFORM  
Reference Data: N/A (34/4)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY
```

STUDY/ESR/MOD

"MODIFY GSE HDIST PLATFORM AT PADS. (35/4)"

```
*****
```

ID: <1868.00>                    Issue(s): DESIGN                    : ACCESSABILITY  
Issue(s) cont.: SAFETY                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    RT6 HOIST  
Reference Data:    N/A                    (35/5)  
Description:  
FACILITY ACCESS    -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"PROVIDE NEW RT6 HOIST" (35/5)"

\*\*\*\*\*  
ID: <1869.00>                    Issue(s): ACCESSABILITY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    PLBD CLOSURE MECHANISM  
Reference Data:    N/A                    (35/6)  
Description:  
FACILITY ACCESS    -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"REDESIGN ZERO-6 PLBD CLOSURE MECHANISM TO PRECLUDE DOOR STICKING, JERKING, OR HANG-UPS DURING DOOR CLOSURE OPERATIONS. ALSO ELIMINATE DEPENDENCY ON BUCKET BRIDGE CRANES FOR ZERO-6 MECHANISM OPERATIONS OR STORAGE OF HEAVY ZERO-6 HARDWARE. (35-6)"

\*\*\*\*\*  
ID: <1878.00>                    Issue(s): MAINTAINABILITY                    : RELIABILITY  
Issue(s) cont.: MAINTAINABILITY                    : LOGISTICS/SPARES                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >  
Location: <PAD                    >                    PGHM  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    PGHM HYDRAULIC/6N2 VALVES  
Reference Data:    N/A                    (35/7)  
Description:  
FACILITY ACCESS    -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"REPLACE ALL LEAKING PGHM HYDRAULIC/6N2 VALVES. (35/7)"

\*\*\*\*\*





ID: <1874.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >        RPSF NOZZLE ELEVATOR  
Reference Data:    N/A                    (44/4)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"PENDANT (ELEVATOR CONTROL BOX & CABLE) LENGTH FOR RPSF NOZZLE ELEVATOR IS TOO SHORT. THIS CREATES AN OPS PROBLEMS/GS RELATED. (44/4)"

\*\*\*\*\*  
ID: <1875.00>                    Issue(s): DESIGN                    : ACCESSABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >        RPS WORKSTAND ENCLOSURE  
Reference Data:    N/A                    (58A/1)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"PROVIDE ENCLOSURE CAPABILITY AT RPS WORKSTANDS FOR FOAMING OPERATIONS ON SRB AFT ASSEMBLIES. (58A/1)"

\*\*\*\*\*  
ID: <1876.00>                    Issue(s): ACCESSABILITY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >        RPS F WORKSTAND ENCLOSURE  
Reference Data:    N/A                    (89/1)  
Description:  
FACILITY ACCESS -- B. LANG/K. COLLEY

STUDY/ESR/MOD

"PROVIDE ENCLOSURE CAPABILITY AT RPS F WORKSTANDS FOR FOAMING OPERATIONS ON SRB AFT ASSEMBLIES. (89/1)"

\*\*\*\*\*

ID: <1877.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > LH2 AND LO2 8" FILL LINES  
Reference Data: N/A (5/12) PCIN 60005  
Description:  
FLUID SYSTEMS -- WARREN WILEY

MANDATORY

"INSTALL SCREEN IN LH2 AND LO2 8" FILL LINES TO PRECLUDE INGESTION OF LARGE CONTAMINATION FROM GSE. (5/12)"

\*\*\*\*\*  
ID: <1878.00> Issue(s): SAFETY : REQUIREMENTS  
Issue(s) cont.: RELIABILITY : QA : MAINTAINABILITY  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > LO2 PUMP IMPELLERS  
Reference Data: N/A (3/6)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"REMOVE CRACKED LO2 PUMP IMPELLERS. REPLACE WITH SOUND PUMP IMPELLERS. PROVIDE CRITERIA FOR PERIODIC FOLLOW-UP INSPECTION OF PUMP IMPELLERS. (3/6)"

\*\*\*\*\*  
ID: <1879.00> Issue(s): RELIABILITY : SAFETY  
Issue(s) cont.: DESIGN CRITERIA : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > T-0 LO2 KSC/ROCKWELL INTERFACE FLANGE  
Reference Data: N/A (3/9)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"T-0 LO2 KSC/ROCKWELL INTERFACE FLANGE WITH HIGH-CONFIDENCE CONNECTION. (3/9)"

\*\*\*\*\*

ID: <1880.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <PROPELLANT                    >  
Location:                    <PAD                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <GSE                    >                    PUMPS  
Reference Data:                    N/A                    (3/14)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"CONSTRUCT BARRIER BETWEEN THE TWO PUMPS. (3/14)"                    (??LH2 AND LQ??)

\*\*\*\*\*  
ID: <1881.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <PROPELLANT                    >  
Location:                    <PAD                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <GSE                    >                    UPPER FLEX FLANGE  
Reference Data:                    N/A                    (3/15)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"INCORPORATE 4.75" ORIFICE INTO RI SUPPORT PLATE OR UPPER FLEX FLANGE TO  
MINIMIZE POTENTIAL LEAK AREAS. (REFERENCE ITEMS 3/6 AND 25/10)

\*\*\*\*\*  
ID: <1882.00>                    Issue(s): QA                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <PROPELLANT                    >  
Location:                    <PAD                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <GSE                    >                    GROUND QD FILTERS  
Reference Data:                    N/A                    (5/11)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"CHANGE THE GROUND QD FILTERS TO ALLOW FOR FILTER ELEMENT INSPECTION. (5/11)"

\*\*\*\*\*

ID: <1883.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > HYDRAZINE LEAK DETECTORS  
Reference Data: N/A (5/3)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"HYDRAZINE LEAK DETECTION SHOULD BE MODIFIED TO MONITOR HYDRAZINE LEAKAGE.  
(5/3)"

\*\*\*\*\*  
ID: <1884.00> Issue(s): DESIGN : REQUIREMENTS  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > H2 FIRE DETECTORS  
Reference Data: N/A (6/8)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"SINCE THE OPERATION OF THE LH2 FLARE STACK HAS BEEN INITIATED, A NUMBER OF  
HYDROGEN FIRE DETECTORS RESPOND TO FLARE STACK OPERATION. THESE SENSORS SHOULD  
BE RELOCATED OR SHIELDED AS REQUIRED TO PRECLUDE RESPONSE TO THE FLARE STACK;  
IF LH2 SYSTEM REQUIREMENTS STILL REQUIRE H2 FIRE DETECTION IN THE PRESENTLY  
DEFINED AREAS. (6/8)"

\*\*\*\*\*  
ID: <1885.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > SENSORS  
Reference Data: N/A (23/1)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"INCREASE SYSTEM VISIBILITY FOR LOX, HYDROGEN, HYDRAZINE TYPE SYSTEMS BY THE  
USE OF ADDITIONAL SENSORS. (23/1)"

\*\*\*\*\*

ID: <1886.00>                    Issue(s): SAFETY                    : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT       >  
Location:    <PAD               >                    OPF  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<GSE           >                    CRYOGENIC FLEX HOSES  
Reference Data:    N/A    (25/10)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

\*REPLACE PADS AND OPF CRYOGENIC FLEX HOSES. (25/10):

\*\*\*\*\*  
ID: <1887.00>                    Issue(s): MAINTAINABILITY                    : LOGISTICS/SPARES  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT       >  
Location:    <PAD               >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<GSE           >                    REPLENISH VALVE (LOX MPS MLP SIDE 1)  
Reference Data:    N/A    (27/6)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

\*PROCURE AND INSTALL A NEW REPLENISH VALVE FOR THE LOX MPS MLP SIDE 1. (27/6)\*

\*\*\*\*\*  
ID: <1888.00>                    Issue(s): LOGISTICS/SPARES                    : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT       >  
Location:    <PAD               >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<GSE           >                    REPLENISH VALVE SOLID STATE CONTROL  
Reference Data:    N/A    (27/7)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

\*PROCURE AND INSTALL SOLID STATE CONTROL FOR NEW LOX MPS REPLENISH VALVE.  
(27/7)\*

\*\*\*\*\*

ID: <1889.00> Issue(s): MAINTAINABILITY : DESIGN  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > LH2 REPLENISH VALVE SOLID STATE ELECTRON  
Reference Data: N/A (27/10)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"PROVIDE SOLID STATE ELECTRONICS ON A100 679 LH2 REPLENISH VALVE TO REMOVE VCA PNEUMATIC CONTROLS, TUBING, ETC. (27/10)"

\*\*\*\*\*

ID: <1890.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > LEAK & FIRE DETECTION  
Reference Data: N/A (31/2)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"PROVIDE LEAK AND FIRE DETECTION PAD A & B IN SUPPORT OF CENTAUR TANKING. (31/2)"

\*\*\*\*\*

ID: <1891.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > RBUS SEPARATION PLATE  
Reference Data: ESR ESR K-12212 (31/3)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"PROVIDE RBUS SEPARATION PLATE LEAK CHECK LINES PAD A & B. (ESR K-12212 IN SYSTEM). (31/3)"

\*\*\*\*\*

ID: <1892.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT    >  
Location:    <PAD    >            PAD A  
Orb.No/Mission: <GENERIC    >  
Hardware/Software:<GSE    >        BACK PRESSURE COMPONENTS  
Reference Data:    N/A            (38/4)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"DELETE BACK PRESSURE COMPONENTS FROM PAD A. (38/4)

\*\*\*\*\*

ID: <1893.00>            Issue(s): DESIGN            : COST/MANHOURS  
Issue(s) cont.:            :            :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT    >  
Location:    <PAD    >  
Orb.No/Mission: <GENERIC    >  
Hardware/Software:<GSE    >        TSM CONTINGENCY PURGE  
Reference Data:    N/A            (38/9)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"REINSTATE FUNDS FOR T-0 TSM CONTINGENCY PURGE TESTING SO THAT MOD CAN BE INCORPORATED. (38/9)"

\*\*\*\*\*

ID: <1894.00>            Issue(s): DESIGN            : TECHNOLOGY  
Issue(s) cont.: SAFETY            : INTERFACE            :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT    >  
Location:    <PAD    >  
Orb.No/Mission: <GENERIC    >  
Hardware/Software:<GSE    >        TSM UPPER FLEX HOSE  
Reference Data:    N/A  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"REDESIGN TSM UPPER FLEX HOSE TO SUPPORT LOX FLANGE TO INCORPORATE A STATE-OF-THE-ART JOINT WHICH WILL PREVENT LEAKAGE. THIS WOULD REQUIRE REDESIGN OF BOTH THE RI AND KSC INTERFACES. ALSO APPLIES TO L02."

\*\*\*\*\*

ID: <1895.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST SI-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PUMP SUCTION INLETS  
Reference Data: N/A (38/3.1)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"REMOVE TEMPERATURE PROBES FROM PUMP SUCTION INLETS WHERE THERE IS NO FILTER OR SCREEN BETWEEN PROBE AND PUMP IMPELLER. (38/3.1)"

\*\*\*\*\*  
ID: <1896.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST SI-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > TEMPERATURE PROBE 12" RETURN LINE  
Reference Data: N/A (38/4.1)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"DELETE TEMPERATURE PROBE FROM 12" RETURN LINE. (38/4.1)"

\*\*\*\*\*  
ID: <1897.00> Issue(s): SAFETY : REQUIREMENTS  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST SI-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PURGE LD2 PUMP DRIVE MOTORS  
Reference Data: N/A (38/5.1)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"PROVIDE HAZARDOUS PURGE FOR LD2 PUMP DRIVE MOTORS. (38/5.1)"

\*\*\*\*\*



ID: <1898.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT    >  
Location:    <PAD    >  
Orb.No/Mission: <GENERIC    >  
Hardware/Software:<GSE       >    BELLOWS  
Reference Data:    N/A            (39/13)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"MODIFY BELLOW'S CENTERING DESIGN FOR NON LATCHING PNEUMATICALLY OPERATED DISCONNECTS. (39/13)"

\*\*\*\*\*

ID: <1899.00>            Issue(s): DESIGN            : REQUIREMENTS  
Issue(s) cont.: SAFETY            :            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT    >  
Location:    <PAD    >  
Orb.No/Mission: <GENERIC    >  
Hardware/Software:<GSE       >    SCREENS  
Reference Data:    N/A            (40/33)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"PROVIDE GSE FOR REMOVAL OF FOREIGN PARTICLES FROM PROPELLANT SYSTEM SCREEN (I.E., CLEAN VACUUM SYSTEMS, SPECIAL BORESCOPE EQUIPMENT, ETC.) (40/33)"

\*\*\*\*\*

ID: <1900.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:     <PROPELLANT            >  
Location:      <PAD                    >  
Orb.No/Mission: <GENERIC                >  
Hardware/Software:<GSE                >        UMBILICALS  
Reference Data:    N/A                    (41/13)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"RE-ASSESS PREMATURE DISCONNECT OF EITHER THE LO2 OR LH2 T-0 UMBILICAL AND DETERMINE POSSIBLE ACTIONS AND/OR DESIGN CHANGES. (41/13)"

\*\*\*\*\*  
ID: <1901.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:     <PROPELLANT            >  
Location:      <PAD                    >  
Orb.No/Mission: <GENERIC                >  
Hardware/Software:<LPS                >        BLEED VENT VALVE CONTROL  
Reference Data:    N/A                    (85/A)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"CHANGE CENTAUR AND HIGHPOINT BLEED VENT VALVES FROM HARDWIRE TO LPS CONTROL. (85/A)"

\*\*\*\*\*  
ID: <1902.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.: REQUIREMENTS                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:     <PROPELLANT            >  
Location:      <PAD                    >  
Orb.No/Mission: <GENERIC                >  
Hardware/Software:<GSE                >        LH2 AND LO2 17" DISCONNECTS  
Reference Data:    ESR                    CRIT. 1S ESR 93904        (85/1.1)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

STUDY/ESR/MOD

"PROVIDE LEAK DETECTION CAPABILITY TO THE ORBITER/ET LIQUID HYDROGEN AND OXYGEN 17" DISCONNECTS. CRIT. 1S ESR 93904. (85/1.1)"

\*\*\*\*\*

ID: <1903.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <PROPELLANT                    >  
Location:                    <PAD                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software:<GSE                    >                    REPLENISH VALVE  
Reference Data:                    N/A                    (3/12)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

REJECT

"STUDY NON-LEAK REPLENISH VALVE. (3/12)"

\*\*\*\*\*  
ID: <1904.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <PROPELLANT                    >  
Location:                    <PAD                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software:<GSE                    >                    LO2 PUMPS  
Reference Data:                    N/A                    (3/13)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

REJECT

"STUDY NON-LEAK LO2 PUMPS. (3/13)"

\*\*\*\*\*  
ID: <1905.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <PROPELLANT                    >  
Location:                    <PAD                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software:<GSE                    >                    LO2 FILL LINE  
Reference Data:                    N/A                    (3/18)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

REJECT

"PROVIDE VACUUM JACKETED 10" CROSS COUNTRY LO2 FILL LINE TO LOAD LOX AT 5,000  
GPM. (3/18)"

\*\*\*\*\*

ID: <1986.88> Issue(s): REQUIREMENTS :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > PRESSURE TRANSDUCERS  
Reference Data: N/A (27/8)  
Description:  
FLUID SYSTEMS -- WARREN WILEY

REJECT

\*INSTALL CLOSE-COUPLED PRESSURE TRANSDUCERS AT THE LOX T-0 DISCONNECT.  
(27/8)\*

\*\*\*\*\*  
ID: <1987.88> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ELECTRICAL EQUIPMENT  
Reference Data: N/A (15/2)  
Description:  
GSE CIL -- TED SASSEEN

STUDY/ESR/MOD

\*ALL ELECTRICAL EQUIPMENT IN TOXIC SERVICING AREA SHOULD BE HAZARD PROOFED OR  
EXPLOSION PROOFED. (15/2)\*

\*\*\*\*\*  
ID: <1988.88> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: RELIABILITY :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > CRANES, SLINGS (ALL CRITICAL HARDWARE)  
Reference Data: N/A (15/3)  
Description:  
GSE CIL -- TED SASSEEN

STUDY/ESR/MOD

\*DESIGN OR REDESIGN ALL CRITICAL HARDWARE (I.E., SLINGS, CRANES) TO ELIMINATE  
ALL SINGLE POINT FAILURES. (15/3)\*

\*\*\*\*\*

ID: <1909.00>                    Issue(s): RELIABILITY                    : REQUIREMENTS  
Issue(s) cont.: DESIGN                    : REDUNDANCY                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <PAD                    >                    PCR  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    PCR DOCK-SEAL  
Reference Data:    N/A                    (33/8)  
Description:  
 GSE CIL -- TED SASSEEN

STUDY/ESR/MOD

"PROVIDE A BACK-UP SYSTEM TO THE PRIMARY PCR DOCK-SEAL. (33/8)"

\*\*\*\*\*

ID: <1910.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<SOFTWARE                    >                    HGDS(VTI)  
Reference Data:    N/A                    (6/11)  
Description:  
 HAZ GAS/EPD    TOM WILLIAMS                    STUDY/ESR/MOD  
 HGDS(VTI) SOFTWARE CHANGES NEEDED: A) VALVE FAULT INDICATION REMOVED FROM  
 DATA INTERLOCK. IF A FEEDBACK SWITCH FAILS, LOSS OF DATA WILL OCCUR AND COULD  
 NOT MEET LAUNCH COMMIT CRITERIA REQUIREMENTS. B) SEPARATE AUTOCAL SO BACKGROUND  
 CAN BE UPDATED TO ZERO THE GASES WITHOUT RUNNING FULL AUTOCAL. C) REMOTE  
 CAPABILITY OF SELECTING A SINGLE GAS. (REMOTE MANUAL MODE). (6/11)

\*\*\*\*\*

ID: <1911.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<POWER                    >                    POWER DISTRIBUTION  
Reference Data:    ESR                    ESR K 12070                    (7/9)  
Description:  
 HAZ GAS/EPD -- TOM WILLIAMS

STUDY/ESR/MOD

"CHANGE POWER DISTRIBUTION TO HIM 6897 TO ELIMINATE EXCESSIVE HIM LOADING ON  
 ONE BACKUP BATTERY DURING FACILITY POWER DOWN. ESR K 12070. (7/9)"

C-5



ID: <1915.00>                    Issue(s): FAULT DETECTION                    : TECHNOLOGY  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE >                    REMOTE SENSOR LEAK DETECTION SYSTEMS  
Reference Data: N/A                    (8/4)  
Description:  
HAZ GAS/EPD -- TOM WILLIAMS

STUDY/ESR/MOD

"THE REMOTE SENSOR LEAK DETECTOR SYSTEMS NEED SOME R&D. EXAMPLE: DO PARALLEL PUMPS CAUSE PROBLEMS AND/OR THE GAS CHROMATOGRAPH? (8/4)"

\*\*\*\*\*  
ID: <1916.00>                    Issue(s): TECHNOLOGY                    : DESIGN  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE >                    HGDS/ION PUMP, FLOW SWITCHES, CALIBR.  
Reference Data: N/A                    (25/13)  
Description:  
HAZ GAS/EPD -- TOM WILLIAMS

STUDY/ESR/MOD

"DEVELOP BETTER ION PUMP, FLOW SWITCHES, AND CAPABILITY TO COMMAND A BACKGROUND CALIBRATION FOR HGDS. (25/13)"

\*\*\*\*\*  
ID: <1917.00>                    Issue(s): DESIGN                    : TECHNOLOGY  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE >                    B/U HGDS FLOW SENSORS  
Reference Data: N/A                    (25/14)  
Description:  
HAZ GAS/EPD -- TOM WILLIAMS

STUDY/ESR/MOD

"DEVELOP BETTER FLOW SENSORS FOR B/U HGDS. (25/14)"

\*\*\*\*\*

ID: <1918.00> Issue(s): REQUIREMENTS :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <OPF > PLATFORM 4 WEST  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > 6H2 SENSORS  
Reference Data: ESR ESR K11382, (39/18)  
Description:  
HAZ GAS/EPD -- TOM WILLIAMS

STUDY/ESR/MOD

"INSTALL 6H2 SENSORS ON OPF PLATFORM 4 WEST, (ESR K11382). (39/18)"

\*\*\*\*\*  
ID: <1919.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > OMBUU SCUPPER PURGE/H2 LEAK DETECTION  
Reference Data: ESR ESR K11382, (39/18)  
Description:  
HAZ GAS/EPD -- TOM WILLIAMS

STUDY/ESR/MOD

"REDESIGN OMBUU SCUPPER PURGE/H2 LEAK DETECTION SYSTEM FOR ADEQUATE PURGE FLOWRATES. (39/22)"

\*\*\*\*\*  
ID: <1920.00> Issue(s): ACCESSABILITY :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > DATA STORAGE  
Reference Data: N/A (16/1)  
Description:  
HAZ GAS/EPD -- TOM WILLIAMS

STUDY/ESR/MOD

"REVIEW SPA DATA STORAGE PROBLEM - KEEP 30 DAYS THEN DESTROY. (16/1)"

\*\*\*\*\*



ID: <1921.00>                    Issue(s): SECURITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >                    )  
Location: <LCC >                    )  
Orb.No/Mission: <GENERIC >                    )  
Hardware/Software:<N/A >                    DIS  
Reference Data: N/A                    (16/2)  
Description:  
LCC OPERATIONS -- GENE THOMAS

STUDY/ESR/MOD

"REVIEW OIS MCU HEADSET CONNECTION PHILOSOPHY IN DOD CONTROLLED AREAS. (16/2)"

\*\*\*\*\*  
ID: <1922.00>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >                    )  
Location: <LCC >                    FR4  
Orb.No/Mission: <GENERIC >                    )  
Hardware/Software:<FACILITIES >                    FR4 AIR HANDLERS  
Reference Data: N/A                    (16/3)  
Description:  
LCC OPERATIONS -- GENE THOMAS

STUDY/ESR/MOD

"FR-4 AIR HANDLERS - TEMPERATURE CONTROL NOT PROPERLY REGULATED BETWEEN FRONT AND BACK SYSTEM. (16/3)"

\*\*\*\*\*  
ID: <1923.00>                    Issue(s): DESIGN                    : ISOLATION  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >                    )  
Location: <LCC >                    FR4  
Orb.No/Mission: <GENERIC >                    )  
Hardware/Software:<FACILITIES >                    HALON PANEL TROUBLE ALARM  
Reference Data: N/A                    (16/4)  
Description:  
LCC OPERATIONS -- GENE THOMAS

STUDY/ESR/MOD

"FR-4 HALON PANEL TROUBLE ALARM TOO LOUD. NOISE OVERRIDES DIS CONVERSATION. (16/4)"

\*\*\*\*\*

ID: <1924.00> Issue(s): SECURITY : REQUIREMENTS  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FR'S  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > COMMERCIAL TELEPHONE  
Reference Data: N/A (16/5)  
Description:  
LCC OPERATIONS -- GENE THOMAS

STUDY/ESR/MOD

\*FIRING ROOM COMMERCIAL TELEPHONE - ALL TELEPHONES SHOULD BE RECORDED, EXCEPT FOR VERY LIMITED FEW. (16/5)\*

\*\*\*\*\*  
ID: <1925.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: ACCESSABILITY :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FR1,3,4  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > LDBM KEYBOARDS  
Reference Data: N/A (16/9)  
Description:  
LCC OPERATIONS -- GENE THOMAS

STUDY/ESR/MOD

\*JFR-1, 3 & 4 LDBM'S - PROVIDE WITH KEYBOARD PROTECTION (NO LDBM IN FR-2)/ (16/9)\*

\*\*\*\*\*  
ID: <1926.00> Issue(s): REQUIREMENTS :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FIRING ROOMS  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > TEMPERATURE & HUMIDITY MONITORS  
Reference Data: N/A (16/10)  
Description:  
LCC OPERATIONS -- GENE THOMAS

STUDY/ESR/MOD

\*PROVIDE ONLINE TEMPERATURE AND HUMIDITY MONITORS ABOVE AND BELOW FLOORS. (16/10)\*

\*\*\*\*\*

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OF POOR QUALITY

ID: <1927.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:     <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    6H2 VENT ARM  
Reference Data:    ESR                    ESR # \_\_\_\_\_                    (1/6)  
Description:  
LSOC --    C. FLOYD

MANDATORY

"INSURE LATCHING OF 6H2 VENT ARM. ESR # \_\_\_\_\_, (1/6)"

\*\*\*\*\*  
ID: <1928.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:     <VAB                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<FACILITIES >                    250 & 175 TON CRANES  
Reference Data:    N/A                    (2/7)  
Description:  
LSOC --    C. FLOYD

MANDATORY

"MODIFY 250 & 175 TON CRANES WITH NEW LOAD INDICATOR LINK AND HOOK ADAPTOR.  
(2/7)"

\*\*\*\*\*  
ID: <1929.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:     <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<FACILITIES >                    HIM,SENSORS, LEAK & FIRE DETECTORS  
Reference Data:    N/A                    (8/6)  
Description:  
LSOC --    C. FLOYD

MANDATORY

"PROVIDE REDUNDANT HIM AND/OR SENSORS FOR PAD LEAK AND FIRE DETECTORS. (8/6)"

\*\*\*\*\*





ID: <1936.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <COUNTDOWN                    >  
Location: <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    H2 VENT HARDLINE  
Reference Data:    N/A                    (42/1)  
Description:  
 LSOC --    C. FLOYD

MANDATORY

"REPLACE H2 VENT HARDLINE(577KL16005-1) ACROSS THE ET H2 VENT ARM WITH AN INSULATED LINE. REASON: ON STS-32 ICE FELL FROM THE HARDLINE AND HIT THE ORBITER LH WING LEADING EDGE. ED CHANGE IS IN WORK BUT WITH INSTRUCTIONS TO RLR LINE WHEN DAMAGED. MAKE LINE REPLACEMENT MANDATORY BEFORE NEXT FLIGHT. NOTE: GUCP ALSO FORMS LARGE BALL OF ICE, SUBJECT TO FALLING AND HITTING VEHICLE. (42/1)"

\*\*\*\*\*

ID: <1937.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <PAD                    >                    PAD B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    ECS PLB FLOW RATE TRANSDUCER  
Reference Data:    N/A                    (43/7)  
Description:  
 LSOC --    C. FLOYD

MANDATORY

"CHANGE PAD B ECS PLB FLOW RATE TRANSDUCER TO ONE WITH HIGHER RANGE CAPABILITY FOR CENTAUR (IS 400 LB/MIN., NEED 460 LB/MIN.). (43/7)"

\*\*\*\*\*

ID: <1938.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <PAD                    >                    PAD A  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    LOX PUMP MOTORS  
Reference Data:    N/A                    (2/1)  
Description:  
 LSOC --    C. FLOYD

HIGHLY DESIRABLE

"REPLACE LOX PUMP MOTORS WITH VARIABLE FREQUENCY DRIVE UNITS. (2/1)"

\*\*\*\*\*

ID: <1939.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <PAD                    >                    PAD A AND PAD B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    LDX/LH2 DISCONNECT TOWER MOTOR CONTROLLR  
Reference Data: N/A                    (2/2)  
Description:  
LSOC -- C. FLOYD

HIGHLY DESIRABLE

"REPLACE LDX/LH2 DISCONNECT TOWER MOTOR CONTROLLERS. PAD A AND PAD B. (2/2)"

\*\*\*\*\*  
ID: <1940.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <PAD                    >                    PAD A  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    FOXBORO INSTRUMENTATION  
Reference Data: N/A                    (2/3)  
Description:  
LSOC -- C. FLOYD

HIGHLY DESIRABLE

"REPLACE PAD A FOXBORO INSTRUMENTATION WITH NEW TRANSDUCER TYPES AS ON PAD B. PAD A. (2/3)"

\*\*\*\*\*  
ID: <1941.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    REMOTE SWITCHING  
Reference Data: N/A                    (2/11)  
Description:  
LSOC -- C. FLOYD

HIGHLY DESIRABLE

"PROVIDE REMOTE SWITCHING CAPABILITY FOR CHILLED WATER UNITS. (2/11)"

\*\*\*\*\*





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ID: <1945.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >                    :  
Location: <PAD                    >                    PAD A  
Orb.No/Mission: <GENERIC                    >                    :  
Hardware/Software: <GSE                    >                    CRYOGENIC SYSTEM  
Reference Data: N/A                    (39/15)  
Description:  
LSOC -- C. FLOYD

HIGHLY DESIRABLE

"UPGRADE PAD A 570-0017 CRYOGENIC SYSTEM TO PAD B CONFIGURATION. (39/15)"

\*\*\*\*\*  
ID: <1946.00>                    Issue(s): REQUIREMENTS                    : SECURITY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >                    :  
Location: <KSC                    >                    ESA AND HOSC(HUNTSVILLE)  
Orb.No/Mission: <GENERIC                    >                    :  
Hardware/Software: <GSE                    >                    ENGINEERING SUPPORT  
Reference Data: N/A                    (46/2)  
Description:  
LSOC -- C. FLOYD

HIGHLY DESIRABLE

"PROVIDE THE CAPABILITY TO CONFIGURE THE HOSC AND ENGINEERING SUPPORT AREA(ESA)  
SYSTEMS (2 EACH) IN THE FOLLOWING MODES: (46/2)

ESA 1 & 2	RED	HOSC 1 & 2	RED
ESA 1 & 2	BLACK	HOSC 1 & 2	BLACK
ESA 1	RED	HOSC 1	RED
ESA 2	BLACK	HOSC 2	BLACK *

\*\*\*\*\*  
ID: <1947.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >                    :  
Location: <PAD                    >                    PAD A  
Orb.No/Mission: <GENERIC                    >                    :  
Hardware/Software: <FACILITIES >                    LOX STORAGE AREA  
Reference Data: N/A                    (49/7)  
Description:  
LSOC -- C. FLOYD

HIGHLY DESIRABLE

"RETROFIT PAD B MODS ON PAD A LOX STORAGE AREA. (49/7)"

\*\*\*\*\*

ID: <1948.00>            Issue(s): REQUIREMENTS            : DESIGN  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY            >  
Location: <VAB            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            LIFT/STACK BEAM  
Reference Data:    N/A            (89/3)  
Description:  
LSOC --    C. FLOYD

HIGHLY DESIRABLE

"PROVIDE LEVELING CAPABILITY FOR THE -384 SRB LIFT/STACK BEAM TO IMPROVE SRB STACKING CAPABILITY. (89/3)"

\*\*\*\*\*  
ID: <1949.00>            Issue(s): DESIGN            : STANDARDS  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC            >  
Location: <PAD            >            PADS A & B  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            HIM'S  
Reference Data:    N/A            (1/9)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"STANDARDIZE PADS A AND B WITH SMART HIM'S AND REGULAR HIM'S BY LOCATION. (1/9)"

\*\*\*\*\*  
ID: <1950.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC            >  
Location: <PAD            >            PADS A & B  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            HIM'S  
Reference Data:    N/A            (1/9)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"MODIFY WCCS GSE TO HARDLINE THE SYSTEM AS MUCH AS POSSIBLE. THE EXISTING LONG (EXPENSIVE) FLEX HOSES ARE DAMAGED NEARLY EVERY FLOW. (1/9.1)"

\*\*\*\*\*

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OF POOR QUALITY

ID: <1951.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <DPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    WCCS LAMINAR FLOW BENCH  
Reference Data: N/A                    (1/12)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE LAMINAR FLOW BENCH IN OPF AREA FOR WCCS REFURBISHMENT. (1/12)"

\*\*\*\*\*

ID: <1952.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    PAYLOAD BAY DOOR ZERO-6 SYSTEM  
Reference Data: N/A                    (2/18)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PAYLOAD BAY DOOR ZERO-6 SYSTEM NEEDS WEIGHT MODIFICATIONS. (2/18)"

\*\*\*\*\*

ID: <1953.00>                    Issue(s): DESIGN                    : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD                    >                    PADS A & B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    CABLING  
Reference Data: N/A                    (2/4)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"RELOCATE CABLING TO 5050A3 (LH2 STORAGE AREA) TO RELIEVE WATER PROBLEM. PAD A & PAD B. (2/4)"

\*\*\*\*\*

ID: <1954.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >        HYPER SPILL PROTECTION  
Reference Data:    N/A                    (4/30)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\* IMPROVE HYPER SPILL PROTECTION DESIGN. (4/30)\*

\*\*\*\*\*

ID: <1955.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <OPF >                    OPF/HMF  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >        LOW PRESSURE EDUCTORS  
Reference Data:    N/A                    (4/32)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\*PROVIDE LOW PRESSURE EDUCTORS FOR DECONTAMINATION OF GSE/FLIGHT HARDWARE.  
(OPF/HMF).                    (4/32)\*

\*\*\*\*\*

ID: <1956.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <OPF >                    OPF  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >        PORTABLE CHECKOUT PANELS  
Reference Data:    N/A                    (4/33)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\*RELOCATE PORTABLE C/O PANELS AND MAKE PERMANENT - OPF. (4/33)\*

\*\*\*\*\*

ID: <1957.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC            >  
Location:    <DPF            >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE            >    VAPOR SCRUBBERS  
Reference Data:   N/A                (4/34)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"REDESIGN VAPOR SCRUBBERS. (4/34)"

\*\*\*\*\*  
ID: <1958.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC            >  
Location:    <DPF            >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<FACILITIES >    VENT STACK  
Reference Data:   N/A                (4/35)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"PROVIDE VENT STACK IN OPF. (4/35)"

\*\*\*\*\*  
ID: <1959.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC            >  
Location:    <DPF            >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE            >    ANTENNAS  
Reference Data:   N/A                (5/7)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"MODIFY OPF ANTENNA CONFIGURATIONS TO PREVENT REFLECTIONS FROM OMRF AND TO  
PROVIDE VISIBILITY TO SEE PAD A & B DUE TO HEIGHT OF OMRF. (5/7)"

\*\*\*\*\*

ID: <1960.00>                    Issue(s): DESIGN                    : REQUIREMENTS  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    PRSD LEAK & FIRE DETECTION SYSTEM  
Reference Data:    ESR                    ESR K11210                    (6/9)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"LOCAL POWER CONTROL SHOULD BE PROVIDED FOR THE PRSD LEAK AND FIRE DETECTION SYSTEM, TO PERMIT POWER APPLICATIONS LOCALLY AS WELL AS FROM THE CONSOLE. THIS WOULD PERMIT THE SYSTEM TO REMAIN POWERED DURING A LOSS OF GSE LINK OR TEMPORARY POWER DOWN OF THE HIM. ESR K11210. (6/9)"

\*\*\*\*\*  
ID: <1961.00>                    Issue(s): REQUIREMENTS                    : REDUNDANCY  
Issue(s) cont.: DESIGN                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >                    PAD/VAB  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    MODEM FOR BACKUP PERKIN ELMER  
Reference Data:    N/A                    (6/10)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"PROVIDE CAPABILITY TO SWITCH MODEM FROM PAD TO VAB FOR BACKUP PERKIN ELMER. (6/10)"

\*\*\*\*\*  
ID: <1962.00>                    Issue(s): DESIGN                    : REQUIREMENTS  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    LH2 LEAK DETECTORS (8" LINE)  
Reference Data:    ESR                    ESR K12156                    (6/2)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"INSTALLATION OF A PERMANENT MEASURING SYSTEM IS REQUIRED FOR THE TWO LH2 LEAK DETECTORS MONITORING THE 8" LH2 LINE IN THE HE PURGE BOX AT THE T-0. ESR K12156 (6/2)"

\*\*\*\*\*







ID: <1969.00> Issue(s): FAULT DETECTION :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > OVERVOLTAGE UNITS  
Reference Data: N/A  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE A MEANS OF IDENTIFYING WHICH MODE OF OPERATION TRIPS OVERVOLTAGE UNITS."

\*\*\*\*\*  
ID: <1970.00> Issue(s): FAULT DETECTION :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > FAN MOTORS  
Reference Data: N/A (7/15)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE A MEANS OF IDENTIFYING "FAN MOTOR" FAILURE AT THE EPD CONSOLE (ALL GROUND POWER SUPPLIES). (7/15)"

\*\*\*\*\*  
ID: <1971.00> Issue(s): REQUIREMENTS :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <MLP > MLP TSM  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > O2 METERS  
Reference Data: N/A (10/10)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE PERMANENT MLP TSM O2 METERS. (10/10)"

\*\*\*\*\*

ID: <1972.00> Issue(s): METHODS :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > WIRE ROPE  
Reference Data: N/A (10/11)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE PERMANENT WIRE ROPE CLIP ATTACHMENTS INSTEAD OF SWAGGED/CRIMPED TYPE  
ON PERMANENT INSTALLATIONS. (10/11)"

\*\*\*\*\*

ID: <1973.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > SCAPE TRAILER LOCATION  
Reference Data: N/A (11/17)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"SCAPE TRAILERS ARE WITHIN A 700' RADIUS OF THE OPF VENT STACKS. (11/17)"

\*\*\*\*\*

ID: <1974.00> Issue(s): SAFETY : DESIGN CRITERIA  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PCR >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > HYPER SPILL SENSING SYSTEM  
Reference Data: N/A (11/19)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE PCR WITH A HYPER SPILL SENSING SYSTEM. (11/19)"

\*\*\*\*\*



ID: <1978.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:    <KSC                            >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <FACILITIES >    SAFETY RADIO NET  
Reference Data:    N/A                    (12/2)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\* PROVIDE ADDITIONAL SAFETY NET (RADIO) FREQUENCY FOR DEDICATED SAFETY USAGE.  
(12/2)\*

\*\*\*\*\*  
ID: <1979.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:    <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER >    RESCUE CAPABILITY IN AFT OF ORBITER  
Reference Data:    N/A                    (12/3)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*PROVIDE RESCUE CAPABILITIES IN AFT OF ORBITER. (12/3)\*

\*\*\*\*\*  
ID: <1980.00>                    Issue(s): MAINTAINABILITY           : TRAINING/CERTIF  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:    <KSC                            >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER >    SIMULATOR  
Reference Data:    N/A                    (12/4)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*PROVIDE MAJOR RENOVATION AND /OR REPLACEMENT OF ORBITER SIMULATOR. (12/4)\*

\*\*\*\*\*



ID: <1984.00>            Issue(s): SAFETY            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS        >  
Location: <KSC        >            HMF  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<FACILITIES >        HARD PAVED EGRESS ROUTE  
Reference Data: N/A            (13/3)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"HMF AREA NEEDS ADDITIONAL HARD-PAVED EGRESS ROUTES DUE TO INCREASED HAZARDOUS WORK TASKS. (13/3)"

\*\*\*\*\*

ID: <1985.00>            Issue(s): SAFETY            : DESIGN  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS        >  
Location: <KSC        >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE        >        TIRE PRESSURIZATION CABE  
Reference Data: N/A            (14/2.B)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"UPGRADE ORBITER TIRE PRESSURIZATION CABE TO MEET SAFETY PROOFLOAD REQUIREMENTS (14/2.B)"

\*\*\*\*\*

ID: <1986.00>            Issue(s): DESIGN            : SAFETY  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS        >  
Location: <PAD        >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE        >        FIREX DELUGE SYSTEM  
Reference Data: N/A            (14/4.A)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"FIREX DELUGE SYSTEM MODIFICATION TO ALLOW SYSTEM TO BE RESET AND FLOW TERMINATED REMOTELY. SOME AREAS NOW REQUIRE ENTERING THE AREA TO RESET SYSTEM TO STOP FLOW, I.E., PAD PROPELLANT FARMS. (14/4.A)"

\*\*\*\*\*

ID: <1987.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <GENERIC                    >  
Location:                    <PCR                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <GSE                    >                    ELECTRICAL POWER CUTOFF  
Reference Data:                    N/A                    (15/7)  
Description:  
LSDC -- C. FLOYD

STUDY/ESR/MOD

\*PROVIDE SINGLE-POINT POWER CUTOFF CAPABILITY FOR PCR ELECTRICAL POWER.  
(15/7)\*

\*\*\*\*\*  
ID: <1988.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.: REDUNDANCY                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <TEST                    >  
Location:                    <LCC                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <GSE                    >                    LPS  
Reference Data:                    N/A                    (21/1)  
Description:  
LSDC -- C. FLOYD

STUDY/ESR/MOD

\*MODIFY THE MASTER, INTEGRATION, AND BACKUP CONSOLE SOFTWARE TO PERFORM  
AUTOMATIC FAILURE RECOVERY AND HAVE THE CAPABILITY TO CONTINUE UNINTERRUPTED  
IN A 2° OF 3° CONFIGURATION. (21/1)\*

\*\*\*\*\*  
ID: <1989.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <GENERIC                    >  
Location:                    <PAD                    >                    PADS A & B  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <FACILITIES >                    COOLING TOWERS  
Reference Data:                    N/A                    (25/2)  
Description:  
LSDC -- C. FLOYD

STUDY/ESR/MOD

\*PROVIDE REMOTE CONTROL FOR PADS A & B COOLING TOWERS. (25/2)\*

\*\*\*\*\*





ID: <1993.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <OPF                    >                    HB 1 & 2  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    CRYOGENIC FCSS  
Reference Data:    N/A                    (25/8)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE NEW CRYOGENIC FCSS FOR OPF BAY 1 (MAKE BAY 1 SAME AS 2). (25/8)"

\*\*\*\*\*

ID: <1994.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <OPF                    >                    HB 1  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    AMMONIA SERVICING UNIT  
Reference Data:    N/A                    (25/9)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE NEW SIMPLIFIED AMMONIA SERVICING UNIT FOR OPF HB1. (25/9)"

\*\*\*\*\*

ID: <1995.00>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >                    PADS AND OPF  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    COOLANT/COOLANT SERVICING FLEX HOSES  
Reference Data:    N/A                    (25/11)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REPLACE COOLANT/COOLANT SERVICING FLEX HOSES AT PADS AND OPF. (25/11)"

\*\*\*\*\*

ID: <1996.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC > PADS AND OPF  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > COOLANT/COOLANT SERVICING COMPONENTS  
Reference Data: N/A (25/12)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REPLACE OBSOLETE COMPONENTS FOR COOLANT/COOLANT SERVICING PADS AND OPF.  
(25/12)"

\*\*\*\*\*  
ID: <1997.00> Issue(s): ISOLATION : DESIGN  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ORBITER/SRB POWER BUS MONITORS  
Reference Data: N/A (25/16)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE IMPROVED ISOLATION IN BUS MONITORS TO ELIMINATE CROSSTALK AND NOISE  
ON ORBITER/SRB POWER BUS MEASUREMENTS. (26/16)"

\*\*\*\*\*  
ID: <1998.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD A AND B  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ET REDUNDANT VENT VALVE  
Reference Data: N/A (26/1)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

DELETE BACKPRESSURE COMPONENTS FROM LC-39A AND PROVIDE LPS CONTROL ON  
A138662 18-INCH ROYAL BUTTERFLY VALVE FOR LC-39A AND B. (ET REDUNDANT  
VENT VALVE). (26/1)"

\*\*\*\*\*

ID: <1999.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC                    >  
Location:   <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    H2 INLINE GAS ANALYZER  
Reference Data:   N/A                    (26/2)  
Description:  
LSOC   --   C. FLOYD

STUDY/ESR/MOD

"INSTALL INLINE GAS ANALYZER TO PRECLUDE BREAKING INTO SYSTEM AFTER A HYDROGEN FLOW OPERATION.   (26/2)"

\*\*\*\*\*

ID: <2000.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC            >  
Location:   <PAD                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<FACILITIES >        LH2 FILL MANIFOLD/GH2 VENT  
Reference Data:   N/A                (26/4)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"EXTEND FILL MANIFOLD TO ACCEPT RAILROAD CARS AND PROVIDE GH2 VENT FOR  
TANKERS AND RAILROAD VENT.    (26/4)"

\*\*\*\*\*  
ID: <2001.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC            >  
Location:   <PAD                >                PAD A  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE            >                ECS CONTROL SYSTEM  
Reference Data:   N/A                (26/5)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"REPLACE PAD A ECS CONTROL SYSTEM WITH SMART HIM AS ACCOMPLISHED ON PAD B.  
(26/5)"

\*\*\*\*\*  
ID: <2002.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC            >  
Location:   <PAD                >                PAD A  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE            >                ECS CONTROL SYSTEM  
Reference Data:   N/A                (26/6)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"REPLACE PAD A ECS PHASE CONTROL TYPE SCR DRIVERS WITH PROPORTIONING (ZERO  
CROSSING TYPE) DRIVERS.    (26/6)"

\*\*\*\*\*

ID: <2003.00> Issue(s): DESIGN : ISOLATION  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD A PTCR  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > 60X VENT HOOD SYSTEM  
Reference Data: N/A (26/7)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\*REMOVE PAD A 60X VENT HOOD HEATER CONTROLLERS SCR'S FROM THE ECS AND  
REPLACE WITH CONTROLLERS AND SCR'S IN THE PTCR FOR INDEPENDENT OPERATION  
BY 60X VENT HOOD SYSTEM. (26/7)\*

\*\*\*\*\*  
ID: <2004.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS  
Reference Data: N/A (26/8)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\*REPLACE PAD A ECS FOXBORO TRANSDUCERS WITH NEW LPS TYPE. (26/8)\*

\*\*\*\*\*  
ID: <2005.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS  
Reference Data: N/A (26/9)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\* ADD ET/TPS REPAIR DUCT TO PAD A ECS. (26/9)\*

\*\*\*\*\*

ID: <2006.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS  
Reference Data: N/A (26/10)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"ADD CHILLER HEALTH MEASUREMENTS FOR PADS A & B ECS. (26/10)"

\*\*\*\*\*  
ID: <2007.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS  
Reference Data: N/A (26/11)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"ADD NEW HVAC FOR PADS A & B ECS. (26/11)"

\*\*\*\*\*  
ID: <2008.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS CHILLER PURGE UNITS  
Reference Data: N/A (26/12)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REPLACE PADS A & B ECS CHILLER PURGE UNITS. (26/12)"

\*\*\*\*\*

ID: <2009.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC                    >  
Location:   <PAD                         >                    PADS A & B  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<GSE                 >                    ECS FLEX DUCTS & EXPANSION JOINTS  
Reference Data:   N/A                    (26/13)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*REPLACE PADS A & B FLEX DUCTS AND EXPANSION JOINTS.    (26/13)\*

\*\*\*\*\*

ID: <2010.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC                    >  
Location:   <PAD                         >                    PADS A & B  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<GSE                 >                    LPAC SYSTEMS  
Reference Data:   N/A                    (26/14)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*MODIFY PADS A & B LPAC SYSTEMS.    (26/14)\*

\*\*\*\*\*

ID: <2011.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <GENERIC                    >  
Location:   <PAD                         >                    PADS A & B  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<GSE                 >                    HYPER SPILL SYSTEMS  
Reference Data:   N/A                    (26/15)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*MODIFY PADS A & B HYPER SPILL SYSTEMS.    (26/15)\*

\*\*\*\*\*

ID: <2012.00> Issue(s): DESIGN : RELIABILITY  
Issue(s) cont.: INTERFACE :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > 9099 INTERFACE  
Reference Data: N/A (27/1)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REDESIGN 9099 INTERFACED TO UTILIZE ENVIRONMENTAL QUALIFIED CONNECTORS AND  
REDUCE NUMBER OF CONNECTIONS. \$250K. (27/1)"

\*\*\*\*\*  
ID: <2013.00> Issue(s): DESIGN : INTERFACE  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > 9055 BULKHEAD PLATE  
Reference Data: N/A (27/2)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REDESIGN 9055 BULKHEAD PLATE TO UTILIZE CONNECTORS DEVELOPED FOR 9099  
INTERFACE. \$50K (27/2)"

\*\*\*\*\*  
ID: <2014.00> Issue(s): DESIGN : EFFICIENCY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > 9099 PAD CABLE DOLLY  
Reference Data: N/A (27/3)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REDESIGN 9099 PAD CABLE DOLLY TO IMPROVE CABLE HOOKUP EFFICIENCY. \$40K  
(27/3)"

\*\*\*\*\*



ID: <2015.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    J-55, J-58 CABLES  
Reference Data:    N/A                    (27/4)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*PROVIDE ADDITIONAL RUNS OF J-55 AND J-58 CABLES TO PRECLUDE "BREAKOUT BOX"  
TYPE WORKAROUNDS. \$95K (27/4)\*

\*\*\*\*\*  
ID: <2016.00>                    Issue(s): DESIGN                    : ISOLATION  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <VAB                    >                    VAB E CELLS  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    RANGE SAFETY CHECKOUT SYSTEM  
Reference Data:    N/A                    (27/5)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*PROVIDE STANDALONE CHECKOUT CAPABILITY OF RANGE SAFETY CHECKOUT SYSTEM IN  
THE VAB E CELLS. \$50K (27/5)\*

\*\*\*\*\*  
ID: <2017.00>                    Issue(s): DESIGN                    : LOGISTICS/SPARES  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD                    >                    PADS A & B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    VAPORIZERS  
Reference Data:    N/A                    (27/9)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*PROCURE NEW VAPORIZERS FOR PAD A AND PAD B. (27/9)\*

\*\*\*\*\*

ID: <2018.00> Issue(s): LOGISTICS/SPARES : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS COOLING TOWER  
Reference Data: N/A (28/3)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REPLACE PAD A ECS COOLING TOWER. (28/3)"

\*\*\*\*\*

ID: <2019.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC > OMRF, ECS STATION, TPS FACILITY  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > COOLING TOWER/CHILLED WATER SYSTEM  
Reference Data: N/A (28/4)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"ADD NEW COOLING TOWER/CHILLED WATER SYSTEM TO SUPPORT OMRF, ECS STATION,  
AND TPS FACILITY. (28/4)"

\*\*\*\*\*

ID: <2020.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC > OMRF ECS STATION  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > CONCRETE SLAB  
Reference Data: N/A (28/5)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"ADD CONCRETE SLAB NEXT TO OMRF ECS STATION. (28/5)"

\*\*\*\*\*

ID: <2021.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >                    534  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<FACILITIES >                    ELECTRICAL  
Reference Data:    N/A                    (28/6)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"ADD ELECTRICAL CAPABILITY FOR 534 SUPPORT.    (28/6)"

\*\*\*\*\*

ID: <2022.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >                    534  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<FACILITIES >                    ECS STATION  
Reference Data:    N/A                    (28/7)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"ADD PERMANENT ECS STATIONS TO REPLACE 534.    (28/7)"

\*\*\*\*\*

ID: <2023.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD                    >                    PAD A RSS  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    RSS TRUCK BEARING  
Reference Data:    N/A                    (28/12)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"CHANGEDOUT PAD A RSS TRUCK BEARING.    \$300K    (28/12)"

\*\*\*\*\*

ID: <2024.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <MLP >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > MLP HANDRAILS  
Reference Data: N/A (28/13)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"MODIFY MLP 1, 2, & 3 HANDRAILS TO A PERMANENT INSTALLATION. \$100K (28/13)"

\*\*\*\*\*

ID: <2025.00> Issue(s): LOGISTICS/SPARES :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > MVAK SYSTEM  
Reference Data: N/A (31/4)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"MDAC-KSC SHOULD INITIATE AN ACTION REQUEST TO ASSESS THE NEED FOR SPARE PARTS TO THE MVAK SYSTEM WHERE NO SPARES EXIST. (31/4)"

\*\*\*\*\*

ID: <2026.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ROTATION STRUCTURE/LAIR  
Reference Data: N/A (31/5)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE SECONDARY ROTATION STRUCTURE FOR THE LAIR DESIGN. (31/5)"

\*\*\*\*\*

ID: <2027.00>                    Issue(s): DESIGN                    : INTERFACE  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD >                    RSS  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    HURRICANE LOCKS FOR RSS  
Reference Data:    N/A                    (32/1)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"RELOCATE THE RSS HURRICANE LOCKS FOR THE RSS IN THE ROTATED POSITION TO  
COINCIDE WITH THE PROPER PCR DOCK-SEAL ORBITER INTERFACE. (32/1)"

\*\*\*\*\*  
ID: <2028.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD >                    PAD B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    J HOOK HYDRAULIC UNIT  
Reference Data:    N/A                    (32/1)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"PROVIDE FREEZE PROTECTION FOR THE PAD B J-HOOK HYDRAULIC UNIT. (32/3)"

\*\*\*\*\*  
ID: <2029.00>                    Issue(s): DESIGN                    : REDUNDANCY  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PCR >                    PAD B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    ECS BACK-UP POWER  
Reference Data:    N/A                    (32/6)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"PROVIDE BACK-UP POWER TO FP&L POWER TO MAINTAIN PCR ENVIRONMENTAL CONTROLS IN  
THE EVENT OF POWER LOSS. (32/6)"

\*\*\*\*\*

ID: <2030.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    TEMPERATURE & HUMIDITY CONTROLS  
Reference Data:    N/A                    (32/7)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\* TEMPERATURE AND HUMIDITY CONTROLS NEED TO BE REVIEWED. (32/7)\*

\*\*\*\*\*  
ID: <2031.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >                    PAYLOAD FACILITIES  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<FACILITIES >                    SHOP AIR OIL SEPARATORS  
Reference Data:    N/A                    (33/9)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"INSTALL OIL SEPARATORS IN SHOP AIR USED IN FACILITIES WHERE PAYLOAD PROCESSING IS CONDUCTED AND VERIFY OIL CONTENT IS WITHIN ACCEPTABLE LIMITS. (33/9)"

\*\*\*\*\*  
ID: <2032.00>                    Issue(s): DESIGN                    : REDUNDANCY  
Issue(s) cont.: SAFETY                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PCR                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    PCR MAIN DOORS  
Reference Data:    N/A                    (33/11)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"STUDY/INSTALL A BACK-UP DRIVE SYSTEM FOR THE PCR MAIN DOORS TO PRECLUDE FAILURE TO OPEN FOR PAYLOAD TRANSFER, OR FAILURE TO CLOSE AFTER PAYLOAD TRANSFER. (33/11)"

\*\*\*\*\*

ID: <2033.00>            Issue(s): MAINTAINABILITY        : RELIABILITY  
Issue(s) cont.: LOGISTICS/SPARES        :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD                            >                    PGHM  
Orb.No/Mission: <GENERIC               >  
Hardware/Software: <GSE                 >                   PGHM HYDRAULIC/GN2 VALVES  
Reference Data:    N/A                    (35/7)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"REPLACE ALL LEAKING PGHM HYDRAULIC/GN2 VALVES.    (35/7)"

\*\*\*\*\*  
ID: <2034.00>            Issue(s): DESIGN                                :  
Issue(s) cont.:                                :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <PAD                            >  
Orb.No/Mission: <GENERIC               >  
Hardware/Software: <GSE                 >                   PLB DEBRIS CURTAIN  
Reference Data:    N/A                    (36/1)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"REDESIGN/RELOCATE THE PLB DEBRIS CURTAIN TO PROVIDE SUFFICIENT CLEARANCE FOR  
PLB DOOR CLOSURE OPERATIONS.    (36/1)"

\*\*\*\*\*  
ID: <2035.00>            Issue(s): DESIGN                                : SAFETY  
Issue(s) cont.:                                :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <OPF                            >                    HB 1 & HB 2  
Orb.No/Mission: <GENERIC               >  
Hardware/Software: <GSE                 >                   ENVIRONMENTAL MONITORING SYSTEMS  
Reference Data:    N/A                    (36/3)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"IMPLEMENT ADEQUATE AUTOMATIC ENVIRONMENTAL MONITORING SYSTEMS IN BOTH OPF  
BAYS, INCLUDING BOTH CONTAMINATION CONTROL AND HAZ GAS SENSORS TO ASSURE  
CONTINUOUS COMPLIANCE WITH SAFETY AND ENVIRONMENTAL REQUIREMENTS.    (36/3)"

\*\*\*\*\*

ID: <2036.00> Issue(s): DESIGN : SURFACE TRANSP  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <ORBITR> DFRF  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PATHWAY STABILITY MONITOR  
Reference Data: N/A 37/4)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE A METHOD TO ASSURE PATHWAY USED TO TOM DRBITER OFF DFRF LAKE BED IS STABLE. (37/4)"

\*\*\*\*\*  
ID: <2037.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: REDUNDANCY :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > LH2 VENT MANIFOLD/WITH PURGE  
Reference Data: N/A (38/3)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\*MODIFY LH2 FILL MANIFOLD: (38/3)

\* INSTALL VENT MANIFOLD W/PURGE SO TANKERS AND RAILCARS COULD BE VENTED TO FLARE STACKS.

\* EXTEND FILL MANIFOLD SO TWO RAILCARS COULD BE OFF-LOADED SIMULTANEOUS-

\*\*\*\*\*  
ID: <2038.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > FLARE STACK CONTROL CABINET  
Reference Data: N/A (38/5)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"SIMPLIFY/UPDATE FLARE STACK CONTROL CABINET. PROVIDE A RAIN SHELTER SO DOORS CAN BE OPENED IN THE RAIN. (38/5)"

\*\*\*\*\*



ID: <2039.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <PROPELLANT            >  
Location:     <PAD            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >    ORBITER PIPE/CENTAUR VENT VALVE  
Reference Data:    N/A                            (38/7)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

- \* (A) CHANGE CENTAUR REDUNDANT VENT VALVE(S) CONTROL FROM HARDWIRE TO LPS CONTROL.
- (B) UPGRADE ORBITER PIPE TO FULLY INSULATED TO PREVENT THE GENERATION OF LIQUID NITROGEN SO THAT THE BULK OF THE DYNAMIC HARDWARE CAN BE REMOVED FROM THE GSE; I.E., BETTER FLY VALVES, PRESSURE SWITCHES, ETC. (38/7)\*

\*\*\*\*\*

ID: <2040.00>            Issue(s): LOGISTICS/SPARES        : MAINTAINABILITY  
Issue(s) cont.:            :            :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:     <PAD            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >    VAPORIZER CHECK VALVES  
Reference Data:    N/A                            (38/8)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

- \*PURSUE THE PROCUREMENT OF TWO STAINLESS STEEL VAPORIZER CHECK VALVES TO REPLACE THE REMAINING ALUMINUM VALVES WHICH ARE PRONE TO LEAKAGE. (38/8)\*

\*\*\*\*\*

ID: <2041.00>            Issue(s): ISOLATION                : SAFETY  
Issue(s) cont.:            :            :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:     <PAD            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >    TEMPERATURE PROBES  
Reference Data:    N/A                            (38/2)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

- \*BUY TEMPERATURE PROBES, THE SMALLEST DIMENSION OF WHICH, WILL NOT PASS THROUGH MULTI-HOLED EQUIVALENT DRIFICE IN (1)\*ABOVE. (38/2)\*

\* (38/1); ID 1934

\*\*\*\*\*

ID: <2042.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <DPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > FC/PRSD  
Reference Data: ESR ESR K11562, K11561, K10534. (39/14)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"SIMPLIFY OPF FC/PRSD O2 + H2 SYSTEMS (ESR'S APPROVED BUT NOT YET IMPLEMENTED.  
REF.: ESR K11562, K11561, K10534. (39/14)"

\*\*\*\*\*

ID: <2043.00> Issue(s): DESIGN : ISOLATION  
Issue(s) cont.: MAINTAINABILITY :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > VACUUM PUMPS  
Reference Data: N/A (39/16)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"MODIFY VACUUM PUMPS AT KSC TO PROVIDE ISOLATION FROM OIL MIGRATION FROM PUMP.  
ALSO, PROVIDE VACUUM BREAK VALVES PROTECTION FROM LOSS OF POWER. (39/16)"

\*\*\*\*\*

ID: <2044.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > LO2 DEWAR ANNULAR SPACE  
Reference Data: N/A (39/17)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"CLEAN VACUUM PUMP OIL FROM PAD A LO2 DEWAR ANNULAR SPACE. (39/17)"

\*\*\*\*\*

ID: <2045.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > BPR ISOLATION VALVES  
Reference Data: N/A (39/19)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"RELOCATE BPR ISOLATION VALVES FROM OUTLET TO INLET (C70-0034-2 AND 570-0698-3)  
OF BPR PANELS. (39/19)"

\*\*\*\*\*  
ID: <2046.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <MLP > T-0 POD, MLP 1,2,3  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PRESSURE SWITCH  
Reference Data: N/A (39/20)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE PRESSURE SWITCH FOR T-0 POD'S ON MLP 1,2,3. (39/20)"

\*\*\*\*\*  
ID: <2047.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD A/B CRYO SKIDS (PRSD)  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > ROLLUP CURTAINS  
Reference Data: N/A (39/21)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE ROLLUP CURTAINS AROUND PAD A/B CRYO SKIDS (PRSD). (39/21)"

\*\*\*\*\*

ID: <2048.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > FCSS VALVE ACTUATORS  
Reference Data: N/A (39/23)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE H2/FREEZE PROOFING OF FCSS VALVE ACTUATORS. (39/23)"

\*\*\*\*\*  
ID: <2049.00> Issue(s): DESIGN : REDUNDANCY  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS CROSSOVER DUCT  
Reference Data: N/A (39/3)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE A CROSSOVER DUCT SYSTEM AT OPF SO BOTH BAYS CAN BE SUPPORTED BY ONE ECS ROOM. (39/3)"

\*\*\*\*\*  
ID: <2050.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <OPF > ECS ROOM  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > ECS CENTRAL CONTROL ROOM  
Reference Data: N/A (39/4)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE A CENTRAL CONTROL ROOM FOR BOTH OPF ECS ROOMS. (39/4)"

\*\*\*\*\*

ID: <2051.00> Issue(s): DESIGN : COST/MANHOURS  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > IN-LINE GAS ANALYZERS  
Reference Data: N/A (40/1)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\* INSTALL IN-LINE GAS ANALYZERS TO SIMPLIFY SYSTEM PURGING, THUS SAVING TIME, HELIUM, AND MONEY. (40/1)\*

\*\*\*\*\*  
ID: <2052.00> Issue(s): MAINTAINABILITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > CHILLER NO. 1,2,3 OIL COOLERS  
Reference Data: N/A (41/1)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\* PAD B CHILLER NO. 1, NO. 2, AND NO. 3 OIL COOLERS ARE DETERIORATING AND NEED REPLACEMENT. (41/1)\*

\*\*\*\*\*  
ID: <2053.00> Issue(s): DESIGN : CONSTRAINTS  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS CHILLER  
Reference Data: N/A (41/5)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\*VERIFY PAD ECS CHILLER OPERATION CAPABILITY ON COLD DAYS, I.E., CAN CHILLERS OPERATE WITH NEGATIVE HEAD PRESSURE. (41/5)\*

\*\*\*\*\*

ID: <2054.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >                    )  
Location: <PAD >                    )  
Orb.No/Mission: <GENERIC >                    )  
Hardware/Software:<GSE >                    )                    CHILLER  
Reference Data:    ESR                    ESR 91928                    (41/6)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"LACK OF REMOTE (LCC) VISIBILITY OF CHILLER HEALTH. REFERENCE ESR 91928  
"PROVIDE CHILLER HEAD PRESSURE AND CONDENSER WATER FLOW INSTRUMENTATION".  
(41/6)

- 3 CHILLER HEAD PRESSURE TRANSDUCERS
- 1 CONDENSER WATER FLOW TRANSDUCER
- 1 WATER GLYCOL FLOW TRANSDUCER

\*\*\*\*\*

ID: <2055.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >                    )  
Location: <ORBITR>                    )  
Orb.No/Mission: <GENERIC >                    )  
Hardware/Software:<GSE >                    )                    ORBITER DUCT HEATERS  
Reference Data:    ESR                    ESR K11147                    (41/7)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"PRESENT USE OF PRIMARY AND SECONDARY HEATERS IN FORWARD AND AFT DUCT SYSTEMS.  
REFERENCE ESR K11147 INCREASE ORBITER DUCT HEATER CAPABILITIES.    (41/7)"

\*\*\*\*\*

ID: <2056.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >                    )  
Location: <PAD >                    )                    PAD B  
Orb.No/Mission: <GENERIC >                    )  
Hardware/Software:<GSE >                    )                    ECS COOLING TOWER SYSTEM  
Reference Data:    N/A                    (41/8)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"PAD B ECS COOLING TOWER SYSTEM NEEDS REMOTE OR AUTOMATIC MEANS OF THROTTLING  
THE COOLING ABILITY FOR COLD WEATHER DAYS.    (41/8)"

\*\*\*\*\*

ID: <2057.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: REDUNDANCY : RELIABILITY :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <POWER > ECS POWER  
Reference Data: N/A (41/9)  
Description:  
LSOC -- C. FLOYD

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STUDY/ESR/MOD

\*CAN ORBITER SYSTEMS SUSTAIN A LOSS OF PAD ECS POWER SHOULD FLORIDA POWER &  
LIGHT FAIL ON A COLD OR HOT DAY. LOSS OF PAD AC POWER WOULD SHUTDOWN: (41/9)

- A. PUMPS
- B. BLOWERS
- C. HEATERS
- D. CHILLERS

\*\*\*\*\*

ID: <2058.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <PAD > PAD B  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ECS INSTRUMENTATION  
Reference Data: N/A (42/5)  
Description:

LSOC -- C. FLOYD STUDY/ESR/MOD

\*PAD B ECS SYSTEM INSTRUMENTATION DEFICIENCIES. KNOWN DEFICIENCIES ARE: (42/5)

- A. CONDENSER WATER TEMPERATURE SCCT 2070A.
- B. AIR/GN2 TEMPERATURE LEAVING NORTH PRECOOL COIL.
- C. AIR/GN2 TEMPERATURE LEAVING COLD COIL.
- D. AIR TEMPERATURE LEAVING CABIN PRECOOL COIL.
- E. AIR TEMP LEAVING SOUTH PRECOOL COIL. F. CABIN DUCT FLOW RATE
- G. PAYLOAD BAY INTERFACE PRESSURE.
- H. CABIN INTERFACE PRESSURE I. WHITE ROOM PRESSURE

\*\*\*\*\*

ID: <2059.00> Issue(s): PROCEDURE :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <PAD > PAD B  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ECS GN2 PURGE ELECTRONIC CONTROLLERS  
Reference Data: N/A (42/6)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

\*PAD B ECS GN2 PURGE ELECTRONIC CONTROLLERS NEED ADJUSTMENTS TO PID LOOPS AND  
GN2 SYSTEM RETESTED. (42/6)\*

\*\*\*\*\*

ID: <2060.00> Issue(s): REDUNDANCY : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > SOUND SUPPRESSION SYSTEM  
Reference Data: ESR ESR K10157 (43/1)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REDUNDANT MEASUREMENTS AND COMMANDS FOR SOUND SUPPRESSION SYSTEM (RE.: ESR K10157). (43/1)"

\*\*\*\*\*  
ID: <2061.00> Issue(s): MAINTAINABILITY : MANAGEMENT  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PORTABLE PURGE UNITS  
Reference Data: N/A (43/3)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PORTABLE PURGE UNITS ARE A HIGH MAINTENANCE ITEM BUT CONTRACTOR DOES NOT PROVIDE SUFFICIENT MANPOWER TO MAINTAIN THEM. (43/3)"

\*\*\*\*\*  
ID: <2062.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > BIACH TENSIONER  
Reference Data: N/A (44/1)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REVIEW BIACH TENSIONER DESIGN TO IMPROVE SAFETY FACTOR. (44/1)"

\*\*\*\*\*



ID: <2063.00> Issue(s): PROCEDURE : LOGISTICS/SPARES  
Issue(s) cont.: METHODS : SURFACE TRANSP :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > . SRB SEGMENT HANDLING  
Reference Data: N/A (44/2)  
Description:  
LSOC -- C. FLOYD

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STUDY/ESR/MOD

"EMPTY SEGMENT HANDLING. (44/2)"

\*\*\*\*\*  
ID: <2064.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > SRM CIRCUMFERENCE ALIGNMENT TOOL  
Reference Data: N/A (44/5)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"EXTERNAL SRM CIRCUMFERENCE ALIGNMENT TOOL. (44/5)"

\*\*\*\*\*  
ID: <2065.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > SHOE HANDLING CLAMP  
Reference Data: N/A (44/6)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"SHOE HANDLING CLAMPS FOR POST LAUNCH. (44/6)"

\*\*\*\*\*

ID: <2066.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > BLAST SHIELD HANDLING SLING  
Reference Data: N/A (44/7)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"BLAST SHIELD HANDLING SLING NEEDS RE-DESIGN. (44/7)"

\*\*\*\*\*  
ID: <2067.00> Issue(s): LOGISTICS/SPARES : SAFETY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > AFT SKIRT DOLLIES  
Reference Data: N/A (44/9)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"BPS (USBI) AFT SKIRT DOLLIES IN SHORT SUPPLY. REQUIRE EXTRA HANDLING OF SKIRTS. DOUBLE HANDLING OF THE AFT SKIRTS INCREASES RISK TO FLIGHT HARDWARE. (44/9)"

\*\*\*\*\*  
ID: <2068.00> Issue(s): DESIGN : REDUNDANCY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > COMMON DATA BUFFER SWITCH  
Reference Data: N/A (45/9)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REDESIGN COMMON DATA BUFFER SWITCH TO PROVIDE REAL BACKUP CAPABILITY. (45/9)"

\*\*\*\*\*

ID: <2069.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >    LAUNCH DATA BUS AND GSE LINKS  
Reference Data:    N/A                    (45/10)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*PROVIDE CAPABILITY IN RPS TO RECORD LAUNCH DATA BUS AND GSE LINKS. (45/10)\*

\*\*\*\*\*  
ID: <2070.00>                    Issue(s): DESIGN                    : STANDARDS  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<POWER                    >    UPS  
Reference Data:    N/A                    (45/11)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*MODIFY THE UPS SYSTEM TO CONFIGURE UPS 1,2, AND 3 LIKE 4,5, AND 6. (45/11)\*

\*\*\*\*\*  
ID: <2071.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                    >    LAUNCH  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<LPS                    >    LDB BY-PASS HARDWARE  
Reference Data:    N/A                    (45/12)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

\*MODIFY LDB BY-PASS HARDWARE AND INDICATORS OR MASTER CONSOLE IN FIRING ROOM 3  
TO INDICATE WHEN SYSTEM IS ARMED AND WHEN SYSTEM IS ACTIVATED. (45/12)\*

\*\*\*\*\*

ID: <2072.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: REDUNDANCY :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST > LAUNCH  
Location: <LCC > FR-3  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > LAUNCH DATA BASE MONITOR  
Reference Data: N/A (45/13)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE BACKUP LAUNCH DATA BUS MONITOR IN FIRING ROOM 3. (45/13)"

\*\*\*\*\*  
ID: <2073.00> Issue(s): REDUNDANCY : DESIGN  
Issue(s) cont.: FAULT DETECTION :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC > FR-2  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > LAUNCH DATA BASE MONITOR  
Reference Data: N/A (45/14)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE LAUNCH DATA BUS MONITOR IN FIRING ROOM 2 FOR VEHICLE TESTING AND TROUBLESHOOTING PURPOSES. (45/14)"

\*\*\*\*\*  
ID: <2074.00> Issue(s): FAULT DETECTION : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > RPS  
Reference Data: N/A (45/15)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE CAPABILITY TO RECORD HOSC DATA IN RPS AND TO PLAYBACK THIS DATA THROUGH THE HOSC LINK TO MSFC. (45/15)."

\*\*\*\*\*

ID: <2075.00> Issue(s): DESIGN : INTERFACE  
Issue(s) cont.: FAULT DETECTION :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <LPS > HARDWARE I/F MODULE I/O CARDS  
Reference Data: N/A (45/16)  
Description:  
LSOC -- C. FLOYD

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STUDY/ESR/MOD

"MODIFY HARDWARE INTERFACE MODULE I/O CARDS TO INDICATE WHEN POWER FAILURE  
HAS OCCURRED. (45/16)"

\*\*\*\*\*  
ID: <2076.00> Issue(s): DESIGN : REDUNDANCY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FR-4  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ALL FR HARDWARE  
Reference Data: N/A (45/17)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"UPGRADE FIRING ROOM 4 TO SUPPORT PAD A AND B TESTING (SEE AND VEHICLE) (45/17)"

\*\*\*\*\*  
ID: <2077.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <LCC > FR-3  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > POWERLINE FILTERS  
Reference Data: N/A (45/18)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"UPGRADE POWERLINE FILTERS IN FIRING ROOM 3. (45/18)"

\*\*\*\*\*



ID: <2081.00>            Issue(s): REQUIREMENTS            : DESIGN  
Issue(s) cont.: INTERFACE            :  
Issue Source: <NE-PEO MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >            VLS/KSC COMMUNICATIONS  
Location: <VLS >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE >            BROAD BAND LINKS  
Reference Data: N/A            (46/30)  
Description:  
LSOC -- C. FLOYD

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STUDY/ESR/MOD

"INSTALL BROAD BAND LINKS BETWEEN KSC AND VLS RED AND BLACK SYSTEMS TO FACILITATE DG'S AND DOWN-LINE-LOAD'S ACCESS FROM KSC AND/OR VLS HOST CONCURRENTLY. (46/30)"

\*\*\*\*\*  
ID: <2082.00>            Issue(s): LOGISTICS/SPARES            : CHANGE CONTROL  
Issue(s) cont.: AUTOMATION            :  
Issue Source: <NE-PEO MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >            AUTOMATED INVENTORY/CONFIGURATION CONTRL  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <N/A >            BARCODE  
Reference Data: N/A            (46/21)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"BARCODE ALL LRU'S ACROSS ALL KSC GSE AND SHUTTLE TEST EQUIPMENT TO ALLOW AUTOMATED INVENTORY AND CONFIGURATION CONTROL. (46/21)"

\*\*\*\*\*  
ID: <2083.00>            Issue(s): DESIGN            : REDUNDANCY  
Issue(s) cont.:            :  
Issue Source: <NE-PEO MOD LIST >            (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >            PADS/MLP/LCC  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <LPS >            LDB CIRCUIT  
Reference Data: N/A            (46/22)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE A THIRD LDB CIRCUIT BETWEEN PAD A/B AND EACH MLP TO THE LCC. (46/22)"

\*\*\*\*\*

ID: <2084.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                    >  
Location:    <KSC                    >                    PADS/MLP/LCC  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<LPS                    >                    HARDWARE I/F MODULES  
Reference Data:    N/A                    (46/23)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"PROVIDE REMOTE CONTROL OF POWER TO ALL HARDWARE INTERFACE MODULES. (46/23)"

\*\*\*\*\*  
ID: <2085.00>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                    >  
Location:    <LCC                    >                    FIRING ROOMS  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<LPS                    >                    CONSOLE CRT'S  
Reference Data:    N/A                    (46/24)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"REPLACE ALL CONSOLE CRT'S IN FIRING ROOMS. (46/24)"

\*\*\*\*\*  
ID: <2086.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST                    >  
Location:    <LCC                    >                    FIRING ROOMS  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<LPS                    >                    CPU MEMORIES  
Reference Data:    N/A                    (46/25)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"REPLACE FIRING ROOM CPU MEMORIES WITH ERROR CORRECTING MEMORIES. (46/25)"

\*\*\*\*\*



ID: <2087.00> Issue(s): REDUNDANCY : SECURITY  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > COMM DATA LINKS  
Reference Data: N/A (46/26)  
Description:  
LSOC -- C. FLOYD

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STUDY/ESR/MOD

"PROVIDE SPARE SECURE COMM DATA LINKS. (46/26)"

\*\*\*\*\*  
ID: <2088.00> Issue(s): SECURITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC > LCC ROOM 4R10  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > REMOTE CONTROL SWITCHING  
Reference Data: N/A (46/3)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE REMOTE CONTROL SWITCHING TO REPLACE PATCH PANELS IN SECURE COMM DATA  
LINKS IN ROOM 4R10. (46/3)"

\*\*\*\*\*  
ID: <2089.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC > FIRING ROOMS  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > REMOTE CONTROL SWITCHING  
Reference Data: N/A (46/4)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"PROVIDE REMOTE CONTROL SWITCHING TO REPLACE THE PATCH PANELS FOR THE ESA  
SLAVE MONITOR SYSTEM IN FIRING ROOMS. (46/4)"

\*\*\*\*\*

ID: <2090.00>                    Issue(s): DESIGN                    : FAULT DETECTION  
Issue(s) cont.: EXPERT SYSTEM                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE >                    NETWORK MONITOR SYSTEM  
Reference Data: N/A                    (47/31)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"INSTALL NETWORK MONITOR SYSTEM FOR CDS AND DMS COMMUNICATION. PROVIDE "AI" TO FACILITATE AUTOMATIC FAULT DETECTION AND CORRECTION WITH STATISTICS TO DETERMINE SYSTEM/NETWORK UTILIZATION. (47/31)"

\*\*\*\*\*  
ID: <2091.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC >                    FIRING ROOMS  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE >                    DISPLAY GENERATORS/PROCESSORS  
Reference Data: N/A                    (47/32)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"REPLACE DISPLAY GENERATORS WITH DISPLAY PROCESSORS IN ALL FIRING ROOMS. (47/32)"

\*\*\*\*\*  
ID: <2092.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <LPS >                    HARDWARE I/F MODULES (HIM)  
Reference Data: N/A                    (47/33)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"MODIFY HARDWARE INTERFACE MODULE (HIM) TYPE A (RELAY) CARDS TO PREVENT NON-COMMANDS DISCRETES FROM CHANGING STATUS DUE TO COMPONENT FAILURE. (47/33)"

\*\*\*\*\*

ID: <2893.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST > COUNTDOWN  
Location: <KSC > PAD/MLP  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > HARDWARE I/F MODULES (HIM)  
Reference Data: N/A (47/34)  
Description:  
LSOC -- C. FLOYD

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OF POOR QUALITY

STUDY/ESR/MOD

"INHIBIT ALL HIM'S NOT REQUIRED AFTER T-10 MINUTES DURING LAUNCH COUNTDOWN.  
(47/34)"

\*\*\*\*\*  
ID: <2894.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <RSS > 107' LEVEL  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > FLOOR  
Reference Data: N/A (47/35)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"INSTALL SOLID FLOOR IN FRONT OF AND BEHIND THE RSS HIM'S (107' LEVEL).(47/35)"

\*\*\*\*\*  
ID: <2895.00> Issue(s): DESIGN : ACCESSABILITY  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > HIM  
Reference Data: N/A (47/36)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

MODIFY HIM BACKPLANES SO THAT I/O CARD PROBLEMS CAN BE ISOLATED WITHOUT  
REMOVING GROUPS OF I/O CARDS. (47/36)"

\*\*\*\*\*

ID: <2096.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > CPU  
Reference Data: N/A (47/37)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"MODIFY ALL CPU TO INCORPORATE MEMORY TRACE CAPABILITY. (47/37)"

\*\*\*\*\*  
ID: <2097.00> Issue(s): DESIGN : FAULT DETECTION  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > MEMORY STORAGE DEVICE  
Reference Data: N/A (47/38)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"ADD MEMORY STORAGE DEVICE TO ALL FRONT END PROCESSORS TO ELIMINATE NEED FOR  
PORTABLE DISK DRIVE WHEN RUNNING DIAGNOSTICS.  
(47/38)"

\*\*\*\*\*  
ID: <2098.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<SOFTWARE > REMOTE CONTROL VIDED SWITCHER  
Reference Data: N/A (47/39)  
Description:  
LSOC -- C. FLOYD

STUDY/ESR/MOD

"ENHANCE REMOTE CONTROL VIDED SWITCHER SOFTWARE FOR BETTER CONFIGURATION  
VISIBILITY AND SYSTEM STATUS. (47/39)"

\*\*\*\*\*



ID: <2100.00>                    Issue(s): DESIGN                    : INTERFACE  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:     <KSC                    >  
Orb.No/Mission:    <GENERIC                    >  
Hardware/Software: <GSE                    >                    S72-0685-3 PANEL  
Reference Data:    N/A                    (48/9)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"MODIFY S72-0685-3 PANEL TO ADD MANUAL VALVE BYPASS TO HELIUM LEAK CHECK  
PURGE, TO FREE ET LO2 GROUP FROM SUPPORTING MPS GROUP. (48/9)"

\*\*\*\*\*  
ID: <2101.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:     <KSC                    >  
Orb.No/Mission:    <GENERIC                    >  
Hardware/Software: <GSE                    >                    LOX SYSTEM INSTRUMENTATION  
Reference Data:    N/A                    (49/3)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"DELETE ALL UNNEEDED INSTRUMENTATION FROM LOX SYSTEM LEFT OVER FROM PREVIOUS  
PROGRAMS. (49/3)"

\*\*\*\*\*  
ID: <2102.00>                    Issue(s): DESIGN                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:     <KSC                    >  
Orb.No/Mission:    <GENERIC                    >  
Hardware/Software: <GSE                    >                    INSTRUMENTATION SYSTEM  
Reference Data:    N/A                    (49/4)  
Description:  
LSOC    --    C. FLOYD

STUDY/ESR/MOD

"REDESIGN INSTRUMENTATION SYSTEM TO STATE-OF-THE-ART. (49/4)"

\*\*\*\*\*

ID: <2103.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <MAINTENANCE >  
Location: <PAD >                    LOX STORAGE TANK  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES >        LADDER  
Reference Data:    N/A                    (49/8)  
Description:  
 LSOC --    C. FLOYD

STUDY/ESR/MOD

"SANDBLAST/PAINT LOX STORAGE TANK. REPAIR LADDER FOR SAFE ACCESS TO TANK TOP. (49/8)"

\*\*\*\*\*  
ID: <2104.00>                    Issue(s): MAINTAINABILITY                : LOGISTICS/SPARES  
Issue(s) cont.: RELIABILITY                :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <MAINTENANCE >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >                    LOX SYSTEM INSTRUMENTATION  
Reference Data:    N/A                    (50/2)  
Description:  
 LSOC --    C. FLOYD                    STUDY/ESR/MOD

"THE LOX/LH2 (MPS) SYSTEMS ARE CURRENTLY OPERATING WITH SADLY OUTDATED ELECTRICAL EQUIPMENT (PRESSURE AND TEMPERATURE TRANSDUCERS, ETC.). THE MAJORITY OF ALL PR'S/IPR'S WRITTEN BY LOX DEAL WITH ELECTRICAL COMPONENTS. A DESIGN REVIEW OF ALL LOX/LH2 RELATED ELECTRICAL TRANSDUCERS SHOULD BE PERFORMED WITH THE AIM OF REPLACING IN STOCK COMPONENTS WITH UP-TO-DATE SPARES. SUBSEQUENTLY, WHEN AN APOLLO-ERA PRESSURE TRANSDUCER FAILED IN SERVICE, IT COULD BE REPLACED WITH A MORE RELIABLE, UP-TO-DATE SPARE. (50/2)"

\*\*\*\*\*  
ID: <2105.00>                    Issue(s): MAINTAINABILITY                : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <MAINTENANCE >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >                    SRB AFT SKIRT SERVICE PORTS  
Reference Data:    N/A                    (50A/2)  
Description:  
 LSOC --    C. FLOYD

STUDY/ESR/MOD

"PROVIDE WATER INTRUSION BARRIERS AT SRB AFT SKIRT SERVICE PORTS TO PREVENT WETTING THE THERMAL CURTAINS DURING RAIN STORMS AT THE PADS. (50A/2)"

\*\*\*\*\*

ID: <2106.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <ASSEMBLY            >  
Location:    <VAB                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >        -384 SRB LIFT/STACK BEAM  
Reference Data:    N/A                    (50A/3)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"PROVIDE LEVELING CAPABILITY FOR THE -384 SRB LIFT/STACK BEAM TO IMPROVE SRB STACKING CAPABILITY. (50/A3)"

\*\*\*\*\*  
ID: <2107.00>            Issue(s): SURFACE TRANSP            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >        OASIS (V771-714983-2 FERRY KIT PANEL  
Reference Data:    N/A                    (85/1)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"OASIS (V771-714983-2) -- FERRY KIT PANEL"

\*\*\*\*\*  
ID: <2108.00>            Issue(s): LOGISTICS/SPARES            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >        PAYLOAD  
Reference Data:    N/A                    (85/2)  
Description:  
LSOC --    C. FLOYD

STUDY/ESR/MOD

"FLIGHT KIT (SED 33101201-303) SSP SPARES. (85/2)"

\*\*\*\*\*





ID: <2112.00> Issue(s): DESIGN : REQUIREMENTS  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC > PAD/LCC  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > VIDEO LINES TO GROUND FOR ON BOARD CRTS  
Reference Data: N/A (1/10)  
Description:  
LSOC -- C. FLOYD

REJECT

"PROVIDE VIDEO LINES TO THE GROUND OF THE ON-BOARD CRT'S FOR VIEWING AND RECORDING ON THE GROUND. (1/10)"

\*\*\*\*\*  
ID: <2113.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <PAD > ALSO OPF/HMF  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > HYPER VAPOR SENSORS  
Reference Data: N/A (4/31)  
Description:  
LSOC -- C. FLOYD

REJECT

"INCREASE LOCATIONS OF HYPER VAPOR SENSORS TO ELIMINATE PERSONNEL AT PAD DURING HYPER SERVICING (SAME FOR OPF/HMF). (4/31)"

\*\*\*\*\*  
ID: <2114.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > REMOTE READOUT/ORBITER INT. PURGE TEMP.  
Reference Data: N/A (4/22)  
Description:  
LSOC -- C. FLOYD

REJECT

"PROVIDE REMOTE READOUT FOR ORBITER INTERNAL PURGE TEMPERATURES. (4/22)"

\*\*\*\*\*



ID: <2118.00>                    Issue(s): METHODS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <ASSEMBLY                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    BREAK-THROUGH BOX ADAPTER CABLES  
Reference Data:    N/A                    (6/4)  
Description:  
LSOC --    C. FLOYD

REJECT

"COLOR CODE BREAK-THROUGH BOX ADAPTER CABLES TO HELP PREVENT IMPROPER CONNECTIONS. (6/4)"

\*\*\*\*\*  
ID: <2119.00>                    Issue(s): ACCESSABILITY                    : EFFICIENCY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >  
Location: <PAD                    >                    PAD B ECS ROOM  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    HP-68000  
Reference Data:    N/A                    (39/1)  
Description:  
LSOC --    C. FLOYD

REJECT

"INSTALL HP 68000 AT PAD B ECS ROOM FOR EFFICIENT USE FOR APPLICATION SOFTWARE UPDATES. (39/1)"

\*\*\*\*\*  
ID: <2120.00>                    Issue(s): ACCESSABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    OIS STATION  
Reference Data:    N/A                    (39/6)  
Description:  
LSOC --    C. FLOYD

REJECT

"PROVIDE OIS STATION IN WORK AREA. (39/6)"

\*\*\*\*\*



ID: <2124.00>            Issue(s): DESIGN            : SAFETY  
Issue(s) cont.: ACCESSABILITY            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST            >  
Location:    <DPF            >            HMF  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            OTV  
Reference Data:    N/A                            (1/39)  
Description:  
OIS/OTV -- JEFF WHEELER

STUDY/ESR/MOD

"O.T.V. IN DPF/HMF. (1/39)"

\*\*\*\*\*  
ID: <2125.00>            Issue(s): DESIGN            :  
Issue(s) cont.:                            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST            >  
Location:    <LCC            >            FR  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            COLOR OTV MONITOR  
Reference Data:    N/A                            (3/8)  
Description:  
OIS/OTV -- JEFF WHEELER

STUDY/ESR/MOD

"COLOR OTV MONITORS IN FIRING ROOM. (3/8)"

\*\*\*\*\*  
ID: <2126.00>            Issue(s): DESIGN            :  
Issue(s) cont.:                            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <TEST            >  
Location:    <LCC            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            REMOTE CAMERA CONTROL AT CONSOLE  
Reference Data:    N/A                            (4/27)  
Description:  
OIS/OTV -- JEFF WHEELER

STUDY/ESR/MOD

"REMOTE CAMERA CONTROL AT CONSOLE. (4/27)"

\*\*\*\*\*

ID: <2127.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > OIS LINK  
Reference Data: N/A (4/28)  
Description:  
OIS/OTV -- JEFF WHEELER

ORIGINAL PAGE IS  
OF POOR QUALITY

STUDY/ESR/MOD

\*PROVIDE OIS LINK WITH LOCAL SAFETY ENGINEER. (4/28)\*

\*\*\*\*\*  
ID: <2128.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <LCC > FIRING ROOMS  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > OIS NETS  
Reference Data: N/A (8/22)  
Description:  
OIS/OTV -- JEFF WHEELER STUDY/ESR/MOD

\*FIRING ROOM COMMUNICATION - VERY LIMITED CROSS COMMUNICATION (OIS NETS)  
BETWEEN THE FIRING ROOMS. THERE IS ONLY ONE OIS NET ON WHICH TO COMMUNICATE  
WITH THE OTHER ACTIVE FIRING ROOMS FROM THE SAFETY CONSOLE. (CH. 131).  
THIS NET CONNECTS OUR CONSOLE IN FR-1 OR FR-3 TO THE OTS IN THE OTHER FIRING  
ROOM. WE CAN USE A SEPARATE NET FROM OUR CONSOLES TO EACH OF THE OTC'S IN  
THE OTHER ACTIVE FIRING ROOMS. (8/22)\*

\*\*\*\*\*  
ID: <2129.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <TEST >  
Location: <KSC > OPF/VAB/PCR  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > OTV  
Reference Data: N/A (13/5)  
Description:  
OIS/OTV -- JEFF WHEELER STUDY/ESR/MOD

\*PROVIDE OTV IN ALL AREAS WHERE MAJOR HAZARDOUS OPERATIONS ARE PERFORMED, I.E.,  
SCAPE, ORDNANCE, PROPELLANT TRANSFER. PRESENTLY OPF, VAB, PCR DO NOT MEET  
SAFETY REQUIREMENTS. (13/5)\*

\*\*\*\*\*

ID: <2130.00>                    Issue(s): SECURITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <TEST                    >  
Location:                    <PAD                    >                    SECURITY POSTS  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <GSE                    >                    TELEPHONE/RADIO NET  
Reference Data:                    N/A                    (17/1)  
Description:  
OIS/DTV -- JEFF WHEELER                    STUDY/ESR/MOD

"SECURITY POSTS - PAD A AND PAD B GATES PRESENTLY HAVE A SECURITY PT. TO PT. TELEPHONE AND RADIO NET 105. (17/1)"

\*\*\*\*\*

ID: <2131.00>                    Issue(s): REDUNDANCY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <TEST                    >  
Location:                    <KSC                    >  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <GSE                    >                    OIS  
Reference Data:                    N/A                    (17/2)  
Description:  
OIS/DTV -- JEFF WHEELER                    STUDY/ESR/MOD

"PROVIDE A BACKUP SYSTEM TO OIS. (17/2)"

\*\*\*\*\*

ID: <2132.00>                    Issue(s): DISCIPLINE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <N/A                    >  
Location:                    <KSC                    >                    LAUNCH TEAM MEETING ROOMS  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <N/A                    >  
Reference Data:                    N/A                    (17/3)  
Description:  
OIS/DTV -- JEFF WHEELER                    STUDY/ESR/MOD

"VOX RECORDING IN LAUNCH TEAM MEETING ROOMS WITH AUTO RECORD OF TIME AND DATE. (17/3)"

\*\*\*\*\*



\*\*\*\*\*  
ID: <2133.00>                    Issue(s): MANAGEMENT                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    DIS  
Reference Data:                    N/A                    (18/1)  
Description:  
DIS/OTV -- JEFF WHEELER                    STUDY/ESR/MOD

"REVIEW AND COMPLETE THE TOTAL DIS OPERATIONS PLAN; MATCH THE PLAN TO THE  
AVAILABLE RESOURCES TO DETERMINE NECESSARY ACTION TO ACCOMPLISH THE REQUIRED  
SUPPORT. (18/1)"

\*\*\*\*\*  
ID: <2134.00>                    Issue(s): DISCIPLINE                    : PROCEDURE  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <N/A                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    DIS  
Reference Data:                    N/A                    (19/1)  
Description:  
DIS/OTV -- JEFF WHEELER                    STUDY/ESR/MOD

"REVIEW VOICE RECORDING POLICY AND PROCEDURE TO ASSURE THAT ALL NECESSARY  
RECORDINGS ARE BEING ACCOMPLISHED AND ADD ADDITIONAL CAPABILITY WHERE  
JUSTIFIED. (19/1)"

\*\*\*\*\*  
ID: <2135.00>                    Issue(s): REQUIREMENTS                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS                    >  
Location: <KSC                    >                    SELECTED AREAS  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<FACILITIES >                    HAZARD WARNING  
Reference Data:                    N/A                    (19/2)  
Description:  
DIS/OTV -- JEFF WHEELER                    STUDY/ESR/MOD

"REVIEW THE REQUIREMENTS TO PROVIDE EMERGENCY PAE HAZARD WARNING TO SELECTED  
AREAS. IMPLEMENT MODERN CONTROL SYSTEM TO PROVIDE THESE NEW REQUIREMENTS AS  
WELL AS ALL EXISTING REQUIREMENTS. (19/2)"

\*\*\*\*\*

ID: <2136.00>            Issue(s): TECHNOLOGY            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:     <KSC            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >    COLOR OTV CAMERAS AND MONITORS  
Reference Data:    N/A            (38/6)  
Description:  
OIS/OTV -- JEFF WHEELER            STUDY/ESR/MOD

"INSTALL COLOR OTV CAMERAS AND MONITORS. (38/6)"

\*\*\*\*\*  
ID: <2137.00>            Issue(s): SAFETY            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT            >    LAUNCH  
Location:     <PAD            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >    FILM CAMERAS  
Reference Data:    N/A            (47/3)  
Description:  
OIS/OTV -- JEFF WHEELER            STUDY/ESR/MOD

"LOSS OF CRITICAL FILM CAMERAS, AT LAUNCH OF STS-33/51-L, DEMONSTRATES NEED FOR MORE CAMERAS. (47/3)"

\*\*\*\*\*  
ID: <2139.00>            Issue(s): DESIGN            : SAFETY  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <ASSEMBLY            >  
Location:     <VAB            >    HIGH BAY  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<FACILITIES >    250 AND 175 TON CRANES  
Reference Data:    N/A            (2/7)  
Description:  
OPERATIONS SUPPORT -- RUSS LLOYD

STUDY/ESR/MOD

"MODIFY 250 AND 175 TON CRANES WITH NEW LOAD INDICATOR LINK AND HOOK ADAPTER. (2/7)"

\*\*\*\*\*

\*\*\*\*\*  
ID: <2140.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:    <PAD            >            PCR  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            RAIN ENTRY PREVENTION (SIDE 1 DOORS)  
Reference Data:    N/A                            (1/7)  
Description:  
PCR -- ROWLAN NORRIS

STUDY/ESR/MOD

"IMPROVE CONTAMINATION PREVENTION OF PAYLOAD CHANGEDOUT ROOM, E.G., SIDE 1 DOORS  
, H2O PROOFING (RAIN ENTRY). (1/7)"

\*\*\*\*\*  
ID: <2141.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:    <PAD            >            PADS A & B  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >            DUCT SEAL SYSTEM  
Reference Data:    N/A                            (25/1)  
Description:  
PCR -- ROWLAN NORRIS

STUDY/ESR/MOD

"REPLACE PADS A & B DUCT SEAL SYSTEM. (25/1)"

\*\*\*\*\*  
ID: <2142.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:    <PAD            >            PTCR 220  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<FACILITIES >  
Reference Data:    N/A                            (28/1)  
Description:  
PCR -- ROWLAN NORRIS

STUDY/ESR/MOD

"ENLARGE PTCR 220 TO ACCOMMODATE P/L EQUIPMENT AND TECHS. \$200K. (28/1)"

\*\*\*\*\*

ID: <2143.80>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:    <PAD                    >                    PAD A STORAGE ROOM/ANTE ROOM  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <FACILITIES                    >  
Reference Data:    N/A                    (28/9)  
Description:  
PCR -- ROWLAN NORRIS

STUDY/ESR/MOD

"IMPLEMENT PAD A STORAGE ROOM/ANTE ROOM MODS. \$1.4M. (28/9)"

\*\*\*\*\*  
ID: <2144.80>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:    <PAD                    >                    PAD A PCR  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    PAD A PCR  
Reference Data:    N/A                    (32/4)  
Description:  
PCR -- ROWLAN NORRIS

STUDY/ESR/MOD

"INCORPORATE THE PLANNED PAD A PCR ENLARGEMENT MODIFICATIONS TO BRING PAD A PCR UP TO PAD B STANDARDS. (32/4)"

\*\*\*\*\*  
ID: <2145.80>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC                    >  
Location:    <PAD                    >                    PAD B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <FACILITIES                    >  
Reference Data:    N/A                    (32/4)  
Description:  
PCR -- ROWLAN NORRIS

REJECT

"COMPLETE PAD B ORBITER WEATHER PROTECTION. (28/10)"

\*\*\*\*\*



ID: <2149.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    TVC ACTUATOR SUPPORT SET  
Reference Data:    ESR                    ESR K-11468                    (48/5)  
Description:  
RI GSE -- RAY EVANS

STUDY/ESR/MOD

\*REVISE TVC ACTUATOR SUPPORT SET. REF.: ESR K-11468. (48/5)\*

\*\*\*\*\*  
ID: <2150.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    RH OMS POD LIFTING FIXTURES  
Reference Data:    ESR                    ESR K-11170                    (48/6)  
Description:  
RI GSE -- RAY EVANS

STUDY/ESR/MOD

\*CORRECT THRUST BEARING DESIGN ON SCREWSHAFT OF THE H70-0679-3 &-4 LH AND RH OMS POD LIFTING FIXTURES. REF.: K-11170. (48/6)\*

\*\*\*\*\*  
ID: <2151.00>                    Issue(s): DESIGN                    : DRAWING SYSTEM  
Issue(s) cont.: CHANGE CONTRCL                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    PNEUMATIC OPERATED DISCONNECTS  
Reference Data:    CCB                    LEVEL 1 CR CL-30724                    (48/7)  
Description:  
RI GSE -- RAY EVANS

STUDY/ESR/MOD

\*REIDENTIFY GROUND HALF PNEUMATIC OPERATED DISCONNECT REFERENCE DESIGNATIONS. REF.: LEVEL I CHANGE REQUEST CL 30724. (48/7)\*

\*\*\*\*\*

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OF POOR QUALITY

ID: <2152.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:    <KSC            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >    C73-0003 CARGO INTERFACE  
Reference Data:    ESR            ESR K-12510            (48/8)  
Description:  
RI GSE -- RAY EVANS

STUDY/ESR/MOD

"PROVIDE CABLE STRAIN RELIEF FOR C73-0003 CARGO INTERFACE. REF.: ESR K-12510.  
(48/8)"

\*\*\*\*\*  
ID: <2153.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:    <PAD            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >    T-0 UMBILICAL COLLET RECEPTACLE  
Reference Data:    N/A            (41/11)  
Description:  
RI-LSS

STUDY/ESR/MOD

"APPROVAL FROM ROCKWELL DOWNEY THAT THE T-0 UMBILICAL COLLET RECEPTACLE  
INSTALLATION IS SATISFACTORY FOR PERMANENT USE.. (41/11)"

\*\*\*\*\*  
ID: <2154.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <GENERIC            >  
Location:    <PAD            >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE            >    T-0 UMBILICALS SET NO. 1  
Reference Data:    N/A            (41/12)  
Description:  
RI-LSS

STUDY/ESR/MOD

"UPGRADE OF THE T-0 UMBILICALS SET NO. 1, I.E., CORROSION PROTECTION OF  
UMBILICAL GROUND PLATE, REPLACE WORN DETENTS, ETC. NOTE: WAS SCHEDULED  
FOR 1986 BUT JSC RENEGED ON DEAL. (41/12)"

\*\*\*\*\*

ID: <2155.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >                    :  
Location: <KSC >                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <GSE >                    PRESSURE TRANSDUCER/DOWNSTREAM LEM 02  
Reference Data: N/A                    (44/10)  
Description:  
RI-LSS

STUDY/ESR/MOD

"ADD PRESSURE TRANSDUCERS DOWNSTREAM LEM 02 SUPPLY PANEL REGULATORS(S).  
(44/10)"

\*\*\*\*\*  
ID: <2156.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >                    :  
Location: <KSC >                    LC-39  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <FACILITIES >                    RPSF-POL/HAZ WASTE BLDG (K6-445)  
Reference Data: N/A                    (10/13)  
Description:  
SAFETY

STUDY/ESR/MOD

"PROVIDE PRSF-POL/HAZ WASTE BUILDING (K6-445) AS CITED IN FACILITY ORI 7/84.  
(10/13)"

\*\*\*\*\*  
ID: <2157.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC >                    :  
Location: <OPF >                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <FACILITIES >                    LIGHTING AT REAR OF OPF  
Reference Data: N/A                    (14/1.D)  
Description:  
SAFETY

STUDY/ESR/MOD

"IMPROVE LIGHTING AT REAR OF OPF TO PROVIDE SCRUBBER MONITORING. (14/1.D)"

\*\*\*\*\*



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OF POOR QUALITY

ID: <2158.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <GENERIC                    >  
Location: <KSC                    >  
Orb.No/Mission: <N/A                    >  
Hardware/Software:<FACILITIES >                    FIREARMS RANGE  
Reference Data:    N/A                    (8/8)

Description:

SAFETY                    -----                    REJECT

"THERE IS NO ADEQUATE FIREARMS RANGE ON KSC. AT THE PRESENT TIME, ALL FIREARMS TRAINING IS CONDUCTED AT THE FIRE TRNG. AREA ON STATIC TEST RD. THIS FACILITY IS ALSO USED FOR VARIOUS OTHER TRAINING ACTIVITIES AND IT IS IMPOSSIBLE TO MEET ALL REQUIREMENTS WITHOUT CONCURRENT USE OF THAT FACILITY. SF-SAF-3 HAS CONSISTENTLY WRITTEN UP THIS SITUATION ON EG&G'S QUARTERLY EVALUATIONS. THERE IS A FACILITY PROJECT, C-572, FOR THE CONSTRUCTION OF A NEW AND SEPARATE FIREARMS RANGE. RECOMMEND THAT THE FACILITY PROJECT BE GIVEN THE HIGHEST PRIORITY FOR ACCOMPLISHMENT. (8/8)"

\*\*\*\*\*

ID: <2159.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS                    >  
Location: <KSC                    >                    LCC (KSC SAFETY CONSOLE)  
Orb.No/Mission: <N/A                    >  
Hardware/Software:<GSE                    >                    TOXIC DISPERSION COMPUTER  
Reference Data:    N/A                    (15/4)

Description:

SAFETY                    -----                    REJECT

"PROVIDE TOXIC DISPERSION COMPUTER FOR HYPERGOLIC EMERGENCIES AT KSC SAFETY CONSOLE. (15/4)"

\*\*\*\*\*

ID: <2160.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <HAZARDOUS                    >  
Location: <LDG                    >                    OCEAN  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    FLIGHT CREW OCEAN RESCUE PLAN  
Reference Data:    N/A                    (15/5)

Description:

SAFETY                    -----                    REJECT

"PROVIDE FLIGHT CREW OCEAN RESCUE PLAN. (15/5)"

\*\*\*\*\*





ID: <2167.00>                    Issue(s): REDUNDANCY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <SOFTWARE                    >  
Reference Data:    N/A                    (69/9)  
Description:  
GDS -- FRANK PENOVICH

STUDY

"HAVE FLIGHT SOFTWARE ISSUE A SWITCHOVER TO THE SECONDARY DATA PATH WHEN EIU  
PRIMARY DATA PATH IS LOST (TO PROVIDE CONTINUOUS DATA)." (69/9)

\*\*\*\*\*  
ID: <2168.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <COUNTDOWN                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <SOFTWARE                    >  
Reference Data:    N/A                    (70/40)  
Description:  
GDS -- FRANK PENOVICH

STUDY

"CHANGE DATA SAMPLE RATE AND/OR FLIGHT SOFTWARE TO PREVENT LAUNCH COUNTDOWN  
HOLD FOR LH2 PREVALVE OPENING AT START ENABLE." (70/40)

\*\*\*\*\*  
ID: <2170.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <COUNTDOWN                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <SOFTWARE                    >  
Reference Data:    N/A                    (69/4)  
Description:  
GDS -- FRANK PENOVICH

STUDY

"IMU FLIGHT SOFTWARE CHANGES TO INCREASE LAUNCH HOLD TIME." (69/4) (MANDATORY)

\*\*\*\*\*

ID: <2171.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <COUNTDOWN        >  
Location:    <ORBITR>  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<SOFTWARE       >  
Reference Data:   N/A                    (70/12)  
Description:  
GDS -- FRANK PENOVICH

STUDY

"ELIMINATE TMBU AND ALL OTHER UPLINKS TO THE BFS LATE IN COUNTDOWN."  
(70/12) (MANDATORY)

\*\*\*\*\*  
ID: <2172.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <COUNTDOWN        >  
Location:    <ORBITR>  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<SOFTWARE       >  
Reference Data:   N/A                    (70/8)  
Description:  
GDS -- FRANK PENOVICH

REJECT

"MODIFY T-20 MINUTE COMPARE TAPES TO ALLOW COMPARISON OF CRITICAL I-LOAD DATA."  
(70/8) (MANDATORY)

\*\*\*\*\*  
ID: <2173.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:   <FLIGHT                    >  
Location:    <ORBITR>  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<APU                    >    APU EXHAUST  
Reference Data:   N/A                    (54/4.1)  
Description:  
APU/HYDR

CATEGORY #1

"APU EXHAUST DUCT HOT GAS LEAK CONCERN (FOR BOTH APU & M PS)."  
(54/4.1) (#1). PCIN 560060

\*\*\*\*\*









ID: <2183.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<APU                    >                    CONTROLLER  
Reference Data:    N/A                    (59/1)  
Description:  
APU/HYDR

STUDY

"PROVIDE HYDRAULIC SYSTEM SERVICE CONNECTIONS AT THE VEHICLE MOLD LINE."  
(59/1) (#2)

\*\*\*\*\*  
ID: <2184.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<APU                    >                    FUEL TANK ISOLATION VALVE  
Reference Data:    N/A                    (53/12)  
Description:  
APU/HYDR

STUDY

"SIMPLIFY THE FUEL TANK ISOLATION VALVE INSULATION."  
(53/12)

\*\*\*\*\*  
ID: <2185.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<APU                    >                    FUEL TANK AND STRUTS  
Reference Data:    N/A                    (53/12)  
Description:  
APU/HYDR

STUDY

"PROVIDE GSE PROTECTIVE SHIELD FOR THE APU FUEL TANK AND STRUTS FOR GROUND  
OPERATIONS."  
(53/13)

\*\*\*\*\*

ID: <2186.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > INSULATION COVERS  
Reference Data: N/A (53/15)  
Description:  
APU/HYDR

STUDY

"REDESIGN INSULATION COVERS TO ELIMINATE HOT SPOTS AND GAPS."  
(53/15)

\*\*\*\*\*  
ID: <2187.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > FUEL PUMP SEAL  
Reference Data: N/A (53/18)  
Description:  
APU/HYDR

STUDY

"REDESIGN FUEL PUMP SEAL SEAT FACE TO PREVENT METAL TO METAL CONTACT."  
(53/18)

\*\*\*\*\*  
ID: <2188.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU >  
Reference Data: N/A (54/7.1)  
Description:  
APU/HYDR

STUDY

"REDESIGN THE FUEL AND GN2 GD'S TO ALLOW FLIGHT CAP REPLACEMENT, ELIMINATING  
THE MATCHED SET REQUIREMENT."  
(54/7.1)

\*\*\*\*\*

ID: <2189.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > CAVITY DRAIN SYSTEM  
Reference Data: N/A (54/8.1)  
Description:  
APU/HYDR

STUDY

"REDESIGN THE OVERBOARD CAVITY DRAIN SYSTEM."  
(54/8.1)

\*\*\*\*\*

ID: <2190.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > HEATER CIRCUITS  
Reference Data: N/A (59/2)  
Description:  
APU/HYDR

STUDY

"PROVIDE TEST POINTS FOR ALL HEATER CIRCUITS SO THAT FUNCTIONAL TESTING COULD  
BE ACCOMPLISHED WITHOUT THERMOSTAT EXCITATION."  
(59/2)

\*\*\*\*\*

ID: <2191.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > ELEVON HEATER TEST POINTS  
Reference Data: N/A (56/5)  
Description:  
APU/HYDR

STUDY

"RELOCATE ELEVON HEATER TEST POINTS FROM THE ELEVON ROOT AREA TO THE MORE  
ACCESSIBLE AFT FUSELAGE."  
(56/5)

\*\*\*\*\*

ID: <2192.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > CONTROLLER  
Reference Data: N/A (54/10.1)  
Description:  
APU/HYDR

REJECT

"REDESIGN THE CONTROLLER TO THE FAIL OPERATE MODE VS. FAIL SAFE."  
(54/10.1)

\*\*\*\*\*  
ID: <2193.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > FUEL ISOLATION VALVE  
Reference Data: N/A (55/1)  
Description:  
APU/HYDR

REJECT

"REDUNDANT FUEL ISOLATION VALVE INSTRUMENTATION REQUIRES DEDICATED TEMP.  
TRANSDUCER TO DETECT OVERHEATING/DETONATION."  
(55/1)

\*\*\*\*\*  
ID: <2194.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PED MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > WSB  
Reference Data: N/A (59/3)  
Description:  
APU/HYDR

REJECT

"ADD MEASUREMENTS TO THE WSB SO THAT INFLIGHT DATA IS MORE USABLE FOR ANOMOLY  
IDENTIFICATION AND INVESTIGATION."  
(59/3)

\*\*\*\*\*

ID: <2195.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<APU > QUICK CONNECT/DISCONNECT  
Reference Data: N/A (60/3)  
Description:  
APU/HYDR

REJECT

"MODIFY EACH ORBITER FOR DYDR, QUICK CONNECT AND DISCONNECT."  
(60/3)

\*\*\*\*\*  
ID: <2196.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > ANTENNA SWITCHES  
Reference Data: N/A (53/4)  
Description:  
COMM/NAVAIDS

PRIORITY #1

"INADVERTENT POSITIONING OF DIRECT STOW SW TO "ON" AND KU ANT. SW. TO "DEPLOY"  
WILL SHORT TWO AC BUS PHASES TOGETHER WITH UNKNOWN CONSEQUENCES FOR SYSTEMS  
BEING POWERED FROM THE AC BUS."  
(53/4)

\*\*\*\*\*  
ID: <2197.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > RADAR ALTIMETER  
Reference Data: N/A (67/8)  
Description:  
COMM/NAVAIDS

PRIORITY #2

"RADAR ALTIMETER CRITICALITY SHOULD BE REEVALUATED FROM A FUNCTION 3 TO A 1R  
DUE TO THE LACK OF TIME FOR CREW RESPONSE IF BOTH ALTIMETERS FAIL AT LOW  
ALTITUDE."  
(67/8) (#1)



\*\*\*\*\*

ID: <2198.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <OV102 >  
Hardware/Software:<AVIONICS > AUDIO SYSTEM  
Reference Data: N/A (52/1.2)  
Description:  
COMM/NAVAIDS

STUDY

"MODIFY OV102 AUDIO SYSTEM TO REFLECT OV103/104."  
(52/1.2)

\*\*\*\*\*  
ID: <2199.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > S-BAND ANTENNA  
Reference Data: N/A (52/2.2)  
Description:  
COMM/NAVAIDS

STUDY

"S-BAND QUAD ANTENNA BEAM SWITCHING CIRCUITS NEED PROPER SEALING."  
(52/2.2)

\*\*\*\*\*

ID: <2200.00>                    Issue(s): DESIGN                    : ACCESSABILITY  
Issue(s) cont.: SAFETY                    : REQUIREMENTS                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation: <GENERIC                    >  
Location: <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >        OAA FIRE & TEMP DETECTORS  
Reference Data:    N/A

Description:  
CATEGORY I (MANDATORY-SAFETY)  
\*PERMANENT INSTALLATION FOR THE OAA TEMP AND FIRE DETECTORS SHOULD BE PROVIDED  
TO BRING BACK DATA THROUGH THE LPS. ESR K12180. (8/15)  
AND PROVIDE REDUNDANT HIM AND/OR SENSORS FOR PAD LEAK AND FIRE DETECTORS.  
(8/15).\*

\*\*\*\*\*  
ID: <2201.00>                    Issue(s): DESIGN                    : RELIABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation: <TEST                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >        HYPERGOLIC VAPOR DETECTION SYSTEM  
Reference Data:    N/A

Description:  
CATEGORY I (MANDATORY-SAFETY)  
REDESIGN ELECTROCHEMICAL CELLS TO ELIMINATE HIGH FAILURE RATE OF HYPERGOLIC  
VAPOR SENSORS. (25/17)

\*\*\*\*\*  
ID: <2202.00>                    Issue(s): DESIGN CRITERIA                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation: <N/A                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A

Description:  
CATEGORY I (MANDATORY-SAFETY)  
REVIEW SENSOR UPGRADES/REPLACEMENT OF EARLY INSTALLED TRANSDUCERS TO  
STATE-OF-THE-ART TECHNOLOGY. (23/2)

\*\*\*\*\*

ID: <2203.00>                    Issue(s): DESIGN                    : ACCESSABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <ASSEMBLY                    >  
Location:    <PAD                    >  
Orb.No/Mission:    <GENERIC                    >  
Hardware/Software: <GSE                    >    ET ACCESS PLATFORM  
Reference Data:    N/A                    SEE DWG 80K50566    (28/8)  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
MODIFY PAD A & B ET ACCESS PLATFORM. (28/8)

\*\*\*\*\*  
ID: <2204.00>                    Issue(s): DESIGN CRITERIA                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <PAD                    >  
Orb.No/Mission:    <GENERIC                    >  
Hardware/Software: <GSE                    >    LH2 SYSTEM  
Reference Data:    N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
\*SINCE OPERATION OF THE LH2 FLARE STACK HAS BEEN INITIATED, A NUMBER OF  
HYDROGEN FIRE DETECTORS RESPOND TO FLARE STACK OPERATION. THESE SENSORS SHOULD  
BE SHIELDED OR RELOCATED AS REQUIRED TO PRECLUDE RESPONSE TO FLARE STACK; IF  
LH2 SYS RQMTS STILL REQUIRE H2 FIRE DETECTION IN THE PRESENTLY DEFINED AREAS.  
(6/8)\*

\*\*\*\*\*  
ID: <2205.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <PROPELLANT                    >  
Location:    <PAD                    >  
Orb.No/Mission:    <GENERIC                    >  
Hardware/Software: <GSE                    >  
Reference Data:    N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
\*REMOVE TEMPERATURE PROBES FROM PUMP SUCTION INLETS WHERE THERE IS NO FILTER OR  
SCREEN BETWEEN PROBE AND PUMP IMPELLER. (38/3.1)\*

\*\*\*\*\*





ID: <2209.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A

Description:

CATEGORY 1 (MANDATORY-SAFETY)

"MODIFY ET 6H2 VENT SYS & PERFORM REQUALIFICATION TEST TO (1) LOWER SYSTEM INTERFACE LOADS TO INCREASE SAFETY FACTOR ON PYRO BOLT. (2) T-0 INITIATED SECONDARY LANYARD ACTIVATION & TAKE-UP TO ASSURE SRB CLEARANCE. (3) THERMAL PROTECTION OF VENTLINE & QD FOR ICE PREVENTION; THERMAL CONTROL OF DECELL SHOCK TO ASSURE PERFORMANCE IN COLD ENVIRONMENT. (4) PROVIDE REDUNDANT LINE RETRACT LATCH TO ASSURE NO HAZARD TO ASCENDING VEHICLE. LETF TEST STAND/SIMULATOR MODS FOR SYSTEM REQUIREMENTS."

\*\*\*\*\*

ID: <2210.00> Issue(s): DESIGN : REQUIREMENTS  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A

Description:

CATEGORY 1 (MANDATORY-SAFETY)

"INSTALL PERMANENT SYSTEM FOR THE TWO LH2 LEAK DETECTORS MONITORING THE 8" LH2 LINE IN HE PURSE BOX AT T-0. ESP K 12156 (6/2)."

\*\*\*\*\*

ID: <2211.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <RSS > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A

Description:

CATEGORY 1 (MANDATORY-SAFETY)

"CHANGEDOUT PAD A RSS TRUCK BEARING. (28/12)"

\*\*\*\*\*



ID: <2215.00>                    Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <LDG                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<GSE           >  
Reference Data:    N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"ESTABLISH A LANDING FACILITY COLOR DTV SYSTEM TO COVER LANDINGS FOR ANALYSIS PURPOSES."

\*\*\*\*\*  
ID: <2216.00>                    Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >                    LETF  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<GSE           >  
Reference Data:    N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"UPGRADE LETF DTV SYSTEM."

\*\*\*\*\*  
ID: <2217.00>                    Issue(s): DESIGN CRITERIA    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<GSE           >  
Reference Data:    N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"UPGRADES TO SLF MET SYSTEM SITE V ONLY."

\*\*\*\*\*

ID: <2218.00> Issue(s): DESIGN : RELIABILITY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE >  
Reference Data: N/A

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Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"COMPLETION OF O2 ANALYZERS, DESIGN, INSTALLATION, AND DOCUMENTATION FOR  
PADS A & B, MLP 1, 2, 3, OPF, VAB, LCC INCLUDING REDESIGNING OF MLP SAMPLE  
SYSTEM TO ELIMINATE INACCURACIES IN O2 ANALYZERS (25/15)"

\*\*\*\*\*

ID: <2219.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > MATE/DEMATE DEVICE  
Reference Data: N/A

Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"MATE/DEMATE DEVICE STRESS ANALYSIS. REVIEW/REDESIGN BREAK"

\*\*\*\*\*

ID: <2220.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <RSS >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE >  
Reference Data: N/A

Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"DEVELOP A PAYLOAD WEIGHTS VERSUS RSS CLEARANCES MATRIX."  
PRESIDENTIAL COMMISSION--PCN 94778

\*\*\*\*\*





ID: <2227.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"REDESIGN SMOOTH HDP COVER KICKER SPRINGS."  
PRESIDENTIAL COMMISSION PCN 94766

\*\*\*\*\*  
ID: <2228.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"FREEZE-PROOF PAD WATER SYSTEMS."  
PRESIDENTIAL COMMISSION--PCN 94777

\*\*\*\*\*  
ID: <2229.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > HAZARDOUS GAS DETECTION SYSTEM  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"ADD MASS FLOW METERS TO B/U HGDS."

\*\*\*\*\*



ID: <2230.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"OTV PAN/TILT WELDS."

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ID: <2231.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"TRANSDUCER IMPROVEMENT PROGRAM"

\*\*\*\*\*  
ID: <2232.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"PORTABLE HYPERGOLIC FUEL VAPOR DETECTORS - HYDRAZINE"

\*\*\*\*\*

\*\*\*\*\*  
ID: <2233.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"DEVELOP A MORE SENSITIVE FIRE DETECTOR FOR THE 17" ORBITER/ET DISCONNECT"  
ESR 93984

\*\*\*\*\*  
ID: <2234.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ET >  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"17" ORBITER ET DISCONNECT FIRE DETECTORS"  
ESR K11825

\*\*\*\*\*  
ID: <2235.00> Issue(s): DESIGN CRITERIA :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 1 (MANDATORY-SAFETY)  
"ELIMINATE PAYLOAD REQ. (SYS) FROM BREATHING AIR SYS 21K (USE TUBE BANK FOR STORAGE)"

\*\*\*\*\*







ID: <2245.00>                    Issue(s): SECURITY                    : PLANNING  
Issue(s) cont.: COST/MANHOOURS                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <GENERIC >  
Location: <LCC >                    FIRING ROOM - 1  
Orb.No/Mission: <DOD >  
Hardware/Software:<LPS >                    CCMS  
Reference Data: N/A  
Description:  
 CATEGORY 2 (MANDATORY)  
 \*IMPLEMENTATION OF DDD SECURITY MODS TO FR-1. (24/3)\*  
 SEE PED NO. 28

\*\*\*\*\*  
 ID: <2246.00>                    Issue(s): DESIGN CRITERIA                    : TECHNOLOGY  
Issue(s) cont.: MAINTAINABILITY                    : LOGISTICS/SPARES                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >                    HVDS (HYPERGOLIC VAPOR DETECTION SYSTEM)  
Reference Data: N/A  
Description:  
 CATEGORY 2 (MANDATORY)  
 \*UPGRADE TDHE HVDS SENSOR TO THE STATE-OF-THE-ART TO LESSEN MAINTENANCE AND  
 LOGISTICS PROBLEMS.  
 ESR 94579  
 ESR 94560  
 ESR 94500

\*\*\*\*\*  
 ID: <2247.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <HAZARDOUS >  
Location: <VAB >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES >                    LOUVERS/VENTS  
Reference Data: N/A  
Description:  
 CATEGORY 2 (MANDATORY)  
 \*PROVIDE LOUVERS/VENT IN THE LC-39 VAB THAT WOULD PRODUCE A "CHIMNEY EFFECT"  
 FLOW OF AIR BY DESIGN IN THE EVENT OF ACCIDENTAL SRM (OR ORBITER RESIDUAL  
 HYPERGOLIC) IGNITION. (13/1)\*

\*\*\*\*\*



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ID: <2251.00>          Issue(s): SAFETY          : DESIGN CRITERIA
Issue(s) cont.:      :
Issue Source: <DE RTN FLT MODS >    16-JUN-86
Operation: <N/A >
Location: <PAD >          PAD A
Orb.No/Mission: <GENERIC >
Hardware/Software:<GSE >          WEATHER PROTECTION
Reference Data: N/A
Description:
CATEGORY 2 (MANDATORY)
"IMPLEMENT PAD A ORBITER WEATHER PROTECTION. (28/11)"

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*****
ID: <2252.00>          Issue(s): SAFETY          :
Issue(s) cont.:      :
Issue Source: <DE RTN FLT MODS >    16-JUN-86
Operation: <N/A >
Location: <RSS >
Orb.No/Mission: <GENERIC >
Hardware/Software:<GSE >          PGHM
Reference Data: N/A
Description:
CATEGORY 2 (MANDATORY)
"PGHM GRATING ON LEVELS 1-5, PADS A & B: THE OPEN GRATING ALLOWS ANY DEBRIS ON
THE BOTTOM OF SHOES OR BOOTIES TO FALL THROUGH ONTO PLATFORMS, GSE, ETC.
(29/14)"

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*****
ID: <2253.00>          Issue(s): DESIGN          :
Issue(s) cont.:      :
Issue Source: <DE RTN FLT MODS >    16-JUN-86
Operation: <N/A >
Location: <RSS >
Orb.No/Mission: <GENERIC >
Hardware/Software:<GSE >          OMS POD HEATED PURGE COVERS
Reference Data: N/A          NE-PED MOD LIST ENTRY # 1844.0
Description:
CATEGORY 2 (MANDATORY)
"OMS POD HEATED PURGE COVERS-PAD A: POD COVERS TO BE REMOVED (NO LONGER REQUIRED
) TO HAVE BETTER ACCESS TO ORBITER DURING RSS OPERATIONS. (30/3)"

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*****
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ID: <2254.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:   <N/A                    >  
Location:    <PCR                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<GSE            >        SIDE SEAL PANEL STRONGBACKS  
Reference Data:   N/A                NE-PEO MOD LIST ENTRY #1845.0

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Description:  
CATEGORY 2 (MANDATORY)  
\*SIDE SEAL STRONGBACKS-PAD A: NEED TO HAVE ADJUSTABLE STRONGBACK TO DECREASE SURFACE AREA OF VERTICAL DOCK SEALS SO HIGH WINDS CAN'T PENETRATE PCR. (30/4)\*

\*\*\*\*\*

ID: <2255.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:   <N/A                    >  
Location:    <PCR                    >        PAD A  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<GSE            >  
Reference Data:   N/A                NE-PEO MOD LIST ENTRY # 1847.0

Description:  
CATEGORY 2 (MANDATORY)  
\*PCR CEILING-PAD A: NEED TO REPLACE PERFORATED PANELS WITH SOLID ONES AND RTV IN PLACE TO KEEP DEBRIS FROM ABOVE CEILING FALLING ONTO PAYLOADS. (30/6)\*

\*\*\*\*\*

ID: <2256.00>                    Issue(s): DESIGN                    : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:   <N/A                    >  
Location:    <PCR                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<GSE            >  
Reference Data:   N/A

Description:  
CATEGORY 2 (MANDATORY)  
\*PCR HARDENING MODS SHOULD BE COMPLETED PRIOR TO RESUMPTION OF LAUNCH OPERATIONS. (32/2)\*

\*\*\*\*\*

ID: <2257.00>                    Issue(s): DRAWING SYSTEM            : DISCIPLINE  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <PAD                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<GSE                    >            ECS  
Reference Data:    N/A

Description:  
CATEGORY 2 (MANDATORY)  
"PADS A & B ENVIRONMENTAL CONTROL SYSTEM ELECTRICAL DRAWING NEEDS UPDATING TO REFLECT ACTUAL INSTALLATION. E.G., THE ADVANCED ELECTRICAL DRAWING SHOWS AN ELECTRICAL DISTRIBUTOR 5048A1 (AT THE COOLING TOWER) THAT DOES NOT EXIST. (44/9)"

\*\*\*\*\*  
ID: <2258.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<FACILITIES >            ELEVATORS  
Reference Data:    N/A

Description:  
CATEGORY 2 (MANDATORY)  
"PENDANT (ELEVATOR CONTROL BOX & CABLE) LENGTH FOR RPSF NOZZLE ELEVATOR IS TOO SHORT. THIS CREATES OPS PROBLEMS/GS RELATED. (44/4)"

\*\*\*\*\*  
ID: <2259.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <RSS                    >            PAD B  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<FACILITIES >  
Reference Data:    N/A

Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE RSS TRIPLE FLIP PLATFORM HOISTS AT PAD B SIMILIAR TO PAD A."

\*\*\*\*\*



ID: <2263.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <PROPELLANT        >  
Location:     <PAD               >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE           >  
Reference Data:    N/A                    (31/2)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE LEAK AND FIRE DETECTION PADS A & B IN SUPPORT OF CENTAUR TANKING.  
(31/2)"

\*\*\*\*\*  
ID: <2264.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                       >  
Location:     <PAD               >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE           >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE RBUS SEPARATION PLATE LEAK CHECK LINES PADS A&B. (ESR K-12212 IN  
SYSTEM). (31/1)"

\*\*\*\*\*  
ID: <2265.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <PROPELLANT        >  
Location:     <PAD               >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software:<GSE           >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"DELETE BACK PRESSURE COMPONENTS FROM PAD A. (38/4)"

\*\*\*\*\*





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ID: <2272.00>                    Issue(s): TECHNOLOGY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <TEST                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A                    (25/13)  
Description:  
CATEGORY 2 (MANDATORY)  
"DEVELOP BETER ION PUMP AND FLOW SWITCHES EQUIP. H6DS (25/13)"

\*\*\*\*\*  
ID: <2273.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <LCC                    >                    FR-3  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"RELOCATE FR-3 PAGING MICROPHONES TO PREVENT INADVERTENT BUMPING OF EMERGENCY  
CAMERA CONTROL START SWITCH. (16/8)"

\*\*\*\*\*  
ID: <2274.00>                    Issue(s): SAFETY                    : ACCESSABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <LCC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A                    (16/9)  
Description:  
CATEGORY 2 (MANDATORY)  
"FR-1,3 & 4 LDBM'S - PROVIDE WITH A KEYBOARD PROTECTION. (NO LDBM IN FR-2)  
(16/9)"

\*\*\*\*\*









ID: <2284.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation: <N/A            >  
Location: <KSC            >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<GSE       >  
Reference Data:    N/A

Description:  
CATEGORY 2 (MANDATORY)  
\*PROVIDE CAPABILITY TO CONFIGURE HOSC AND ENGINEERING SUPPORT AREA (ESA) SYS.  
(2 EACH) IN FOLLOWING MODES: (46/2) ESA 1 & 2, RED, HOSC 1 & 2 RED;  
ESA 1 & 2, BLACK, HOSC 1 & 2, BLACK;  
ESA 1, RED, HOSC 1 RED;  
ESA 2, BLACK, HOSC 2, BLACK.

\*\*\*\*\*  
ID: <2285.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation: <N/A            >  
Location: <PAD            >            PAD A  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<GSE       >  
Reference Data:    N/A

Description:  
CATEGORY 2 (MANDATORY)  
\*RETROFIT PAD B MODS ON PAD A LOX STORAGE AREA. (49/7)\*

\*\*\*\*\*  
ID: <2286.00>            Issue(s): DESIGN            :  
Issue(s) cont.:            :            :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation: <N/A            >  
Location: <KSC            >            SRB STACKING  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<GSE       >  
Reference Data:    N/A            (89/3)

Description:  
CATEGORY 2 (MANDATORY)  
\*PROVIDE LEVELING CAPABILITY FOR THE -384 LIFT/STACK BEAM TO IMPROVE SRB  
STACKING CAPABILITY. (89/3)\*

\*\*\*\*\*

ID: <2287.00>                    Issue(s): DESIGN                    : REQUIREMENTS  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >  
Reference Data:    N/A                    (6/9)  
Description:  
 CATEGORY 2 (MANDATORY)  
 \*LOCAL POWER CONTROL SHOULD BE PROVIDED FOR PRSD LEAK AND FIRE DETECTION SYSTEM  
 , TO PERMIT POWER APPLICATION LOCALLY AS WELL AS FROM THE CONSOLE. THIS WOULD  
 PERMIT SYSTEM TO REMAIN POWERED DURING LOSS OF GSE LINK OR TEMPORARY POWER DOWN  
 OF HIM. ESR K11210 (6/9).

\*\*\*\*\*  
 ID: <2288.00>                    Issue(s): DESIGN                    : REQUIREMENTS  
Issue(s) cont.: REDUNDANCY                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >  
Reference Data:    N/A                    (6/10)  
Description:  
 CATEGORY 2 (MANDATORY)  
 \*PROVIDE CAPABILITY TO SWITCH MODEM FROM PAD TO VAB FOR BACKUP PERKIN ELMER.  
 (6/10).

\*\*\*\*\*  
 ID: <2289.00>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >  
Reference Data:    N/A                    (7/6)  
Description:  
 CATEGORY 2 (MANDATORY)  
 \*REPLACE NICAD BATTERIES FOR GSE GROUND POWER SUPPLIES (MLP & PAD).  
 ESR K12203 (7/6)

\*\*\*\*\*

ID: <2298.00>                    Issue(s): DESIGN CRITERIA                    : SAFETY  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:                    <N/A >  
Location:                    <PCR >  
Orb.No/Mission:                    <GENERIC >  
Hardware/Software: <GSE >  
Reference Data:                    N/A                    (11/19)  
Description:  
CATEGORY 2 (MANDATORY)  
\*PROVIDE PCR WITH A HYPER SPILL SENSING SYSTEM. (11/19)\*

\*\*\*\*\*  
ID: <2291.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:                    <N/A >  
Location:                    <KSC >  
Orb.No/Mission:                    <GENERIC >  
Hardware/Software: <GSE >  
Reference Data:                    N/A                    (12/1)  
Description:  
CATEGORY 2 (MANDATORY)  
\*PROVIDE MAN RATED PERSONNEL NETS. (12/1)\*

\*\*\*\*\*  
ID: <2292.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:                    <N/A >  
Location:                    <PAD >  
Orb.No/Mission:                    <GENERIC >  
Hardware/Software: <GSE >  
Reference Data:                    N/A                    (12/3)  
Description:  
CATEGORY 2 (MANDATORY)  
\*PROVIDE RESCUE CAPABILITIES IN AFT OF ORBITERS (12/3). LOW PROFILE RESPIRATORS  
ARE IN PROCUREMENT CYCLE.\*

\*\*\*\*\*

ID: <2293.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation: <N/A >  
Location: <PCR >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A                    (15/7)  
Description:  
CATEGORY 2 (MANDATORY)  
\*PROVIDE SINGLE-POINT POWER CUTOFF CAPABILITY FOR PCR ELECTRICAL POWER. (15/7)\*

\*\*\*\*\*  
ID: <2294.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >            ECS  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
\*PROVIDE REMOTE CONTROL FOR PADS A & B COOLING TOWERS (ECS).\*

\*\*\*\*\*  
- ID: <2295.00>                    Issue(s): DESIGN                    : ISOLATION  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >            POWER BUSS  
Reference Data: N/A                    (25/16)  
Description:  
CATEGORY 2 (MANDATORY)  
\*PROVIDE IMPROVED ISOLATION IN BUSS MONITORS TO ELIMINATE CROSSTALK AND NOISE ON ORBITER/SRB POWER BUSS MEASUREMENTS. (25/16)\*

\*\*\*\*\*

ID: <2296.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS  
Reference Data: N/A (26/5)

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Description:  
CATEGORY 2 (MANDATORY)  
\*REPLACE PAD A ECS CONTROL SYSTEM WITH SMART HIM AS ACCOMPLISHED ON PAD B.  
(26/5)\*

\*\*\*\*\*  
ID: <2297.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS  
Reference Data: N/A (26/6)

Description:  
CATEGORY 2 (MANDATORY)  
\*REPLACE PAD A ECS PHASE CONTROL TYPE SCR DRIVERS WITH PROPORTIONING (ZERO  
CROSSING TYPE) DRIVERS. (26/6)\*

\*\*\*\*\*  
ID: <2298.00> Issue(s): DESIGN : ISOLATION  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > GCX VENT HOOD  
Reference Data: N/A (26/7)

Description:  
CATEGORY 2 (MANDATORY)  
\*REMOVE PAD A GCX VENT HOOD HEATER CONTROLLERS SCR'S FROM THE ECS AND REPLACE  
WITH CONTROLLERS AND SCR'S IN THE FTOR FOR INDEPENDENT OPS. BY GCX VENT HOOD  
SYSTEM. (26/7)\*

\*\*\*\*\*

ID: <2299.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS.> 16-JUN-86  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ECS  
Reference Data: N/A (26/8)  
Description:  
CATEGORY 2 (MANDATORY)  
\*REPLACE PAD A ECS FOXBORO TRANSDUCERS WITH NEW LPS TYPE. (26/8)\*

\*\*\*\*\*



ID: <2300.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ECS  
Reference Data: N/A (26/9)  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD ET/TPS REPAIR DUCT TO PAD A ECS. (26/9)"

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\*\*\*\*\*  
ID: <2301.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ECS CHILLERS  
Reference Data: N/A (26/10)  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD CHILLER HEALTH MEASUREMENTS FOR PADS A & B ECS. (26/10)"

\*\*\*\*\*  
ID: <2302.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ECS CHILLER PURGE  
Reference Data: N/A (26/12)  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE PADS A & B ECS CHILLER PURGE UNITS. (26/10)"

\*\*\*\*\*

ID: <2303.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:    <N/A                    >  
Location:     <PAD                    >                    PAD A  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    ECS  
Reference Data:    N/A                    (26/13)  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE PADS A & B FLEX DUCTS AND EXPANSION JOINTS. (26/13)"

\*\*\*\*\*  
ID: <2304.00>                    Issue(s): DESIGN                    : RELIABILITY  
Issue(s) cont.: INTERFACE                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:    <GENERIC                    >  
Location:     <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A                    (27/1)  
Description:  
CATEGORY 2 (MANDATORY)  
"REDESIGN 9909 INTERFACE TO UTILIZE ENVIRONMENTAL QUALIFIED CONNECTORS AND  
REDUCE NUMBER OF CONNECTORS. (27/1)"

\*\*\*\*\*  
ID: <2305.00>                    Issue(s): DESIGN                    : INTERFACE  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:    <GENERIC                    >  
Location:     <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A                    (27/2)  
Description:  
CATEGORY 2 (MANDATORY)  
"REDESIGN 9055 BULKHEAD PLATE TO UTILIZE CONNECTORS DEVELOPED FOR 9099  
INTERFACE. (27/2)"

\*\*\*\*\*

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ID: <2306.00>                    Issue(s): DESIGN                    : EFFICIENCY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <GENERIC                    >  
Location:    <PAD                    >                    PAD A, B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A                    (27/3)  
Description:  
CATEGORY 2 (MANDATORY)  
"REDESIGN 9099 PAD CABLE DOLLY TO IMPROVE CABLE HOOKUP EFFICIENCY. (27/3)"

\*\*\*\*\*  
ID: <2307.00>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >                    PAD A,B, MLP'S 1,2,3  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:    N/A                    (27/4)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE ADDITIONAL RUNS OF J-55 AND J-58 CABLES TO PRECLUDE "BREAKOUT BOX"  
TYPE WORKAROUNDS. (27/4) -ADD RUNS J-55, J-58 CABLES, 8/O BOXES"  
PEO NO. 233

\*\*\*\*\*  
ID: <2308.00>                    Issue(s): DESIGN                    : MAINTAINABILITY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <MLP                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    ECS, 0534'S  
Reference Data:    N/A                    (28/7)  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD PERMANENT ECS STATIONS TO REPLACE 534. MLP (28/7)"

\*\*\*\*\*

ID: <2309.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (38/8)  
Description:  
CATEGORY 2 (MANDATORY)  
"PURSUE THE PROCUREMENT OF TWO STAINLESS STEEL VAPORIZER CHECK VALVES TO  
REPLACE THE REMAINING ALUMINUM VALVES WHICH ARE PRONE TO LEAKAGE. (38/8)"

\*\*\*\*\*  
ID: <2310.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (39/16)  
Description:  
CATEGORY 2 (MANDATORY)  
"MODIFY VACUUM PUMPS AT KSC TO PROVIDE ISOLATION FROM OIL MIGRATION FROM PUMP.  
ALSO PROVIDE VACUUM BREAK VALVES PROTECTION FROM LOSS OF POWER. (39/16)"

\*\*\*\*\*  
ID: <2311.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > FCSS  
Reference Data: N/A (39/23)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE H2/FREEZE PROOFING OF FCSS VALVE ACTUATORS. (39/23)"

\*\*\*\*\*

ID: <2312.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (41/7)

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Description:  
CATEGORY 2 (MANDATORY)  
\*PRESENT USE OF PRIMARY & SECONDARY HEATERS IN FORWARD & AFT DUCT SYSTEMS.  
REF. ESR K11147 INCREASE ORBITER DUCT HEATER CAPABILITIES. (41/7)\*

\*\*\*\*\*  
ID: <2313.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <COUNTDOWN >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (43/1)

Description:  
CATEGORY 2 (MANDATORY)  
\*REDUNDANT MEASUREMENTS & COMMANDS FOR SOUND SUPPRESSION SYSTEM.  
(REF. ESR K10157) (43/1)\*

\*\*\*\*\*  
ID: <2314.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (45/12)

Description:  
CATEGORY 2 (MANDATORY)  
\*MODIFY LDB BY-PASS HARDWARE & INDICATORS OR MASTER CONSOLE IN FIRING ROOM 3 TO  
INDICATE WHEN SYSTEM IS ARMED AND WHEN SYSTEM IS ACTIVATED. (45/12)\*

\*\*\*\*\*

ID: <2315.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <N/A >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A                    (45/13)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE BACKUP LAUNCH DATA BUS MONITOR IN FIRING ROOM S. (45/13)"

\*\*\*\*\*  
ID: <2316.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A                    (45/14)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE LAUNCH DATA BUS MONITOR IN FIRING ROOM 2 FOR VEHICLE TESTING AND TROUBLESHOOTING PURPOSES. (45/14)"

\*\*\*\*\*  
ID: <2317.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A                    (45/15)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE CAPABILITY TO RECORD HOSC DATA IN RPS AND TO PLAYBACK THIS DATA THROUGH THE HOSC LINK TO MSFC. (45/15)"

\*\*\*\*\*



ID: <2321.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS >  
Reference Data: N/A (46/3)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE REMOTE CONTROL SWITCHING TO REPLACE PATCH PANELS IN SECURE COMM DATA  
LINKS IN 4R10. (46/3)"

\*\*\*\*\*  
ID: <2322.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS >  
Reference Data: N/A (46/3)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE REMOTE CONTROL SWITCHING TO REPLACE PATCH PANELS FOR THE ESA SLAVE  
MONITOR SYS IN FIRING ROOMS. (46/4)"

\*\*\*\*\*  
ID: <2323.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS >  
Reference Data: N/A (47/21)  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE DISPLAY GENERATORS WITH DISPLAY PROCESSORS IN ALL FIRING ROOMS.  
(47/21)"

\*\*\*\*\*



ID: <2324.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <COUNTDOWN >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS >  
Reference Data: N/A (47/34)  
Description:  
CATEGORY 2 (MANDATORY)  
"INHIBIT ALL HIM'S NOT REQUIRED AFTER T-10 MINUTES DURING LAUNCH COUNTDOWN.  
(47/34)"

\*\*\*\*\*  
ID: <2325.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <COUNTDOWN >  
Location: <RSS >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > HIM'S  
Reference Data: N/A (47/35)  
Description:  
CATEGORY 2 (MANDATORY)  
"INSTALL SOLID FLOOR IN FRONT OF AND BEHIND THE RSS HIM'S (107 FT LEVEL).  
(47/35)"

\*\*\*\*\*  
ID: <2326.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <COUNTDOWN >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > HIM'S  
Reference Data: N/A (47/36)  
Description:  
CATEGORY 2 (MANDATORY)  
"MODIFY HIM BACKPLANES SO THAT I/O CARD PROBLEMS CAN BE ISOLATED WITHOUT  
REMOVING GROUPS OF I/O CARDS. (47/36)"

\*\*\*\*\*

ID: <2327.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <COUNTDOWN >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > CPU'S  
Reference Data: N/A (47/37)  
Description:  
CATEGORY 2 (MANDATORY)  
"MODIFY ALL CPU'S TO INCORPORATE MEMORY TRACE CAPABILITY. (47/37)"

\*\*\*\*\*  
ID: <2328.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <COUNTDOWN >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS >  
Reference Data: N/A (47/39)  
Description:  
CATEGORY 2 (MANDATORY)  
"ENHANCE REMOTE CONTROL VIDEO SWITCHER SOFTWARE FOR BETTER CONFIGURATION  
VISIBILITY AND SYSTEM STATUS. (47/39)"

\*\*\*\*\*  
ID: <2329.00> Issue(s): DESIGN : MAINTAINABILITY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <COUNTDOWN >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS >  
Reference Data: N/A (47/40)  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE THE STRIP CHART RECORDS IN RPS WITH MORE RELIABLE AND LESS MAINTENANCE  
INTENSIVE UNITS. (47/40)"

\*\*\*\*\*





ID: <2333.00> Issue(s): SAFETY :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > OIS  
Reference Data: N/A (4/28)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE OIS LINK WITH LOCAL SAFETY ENGINEER. (4/28)"

\*\*\*\*\*  
ID: <2334.00> Issue(s): SECURITY :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <TEST >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (17/1)  
Description:  
CATEGORY 2 (MANDATORY)  
"SECURITY POSTS - PADS A & B GATES PRESENTLY HAVE A SECURITY POINT-TO-POINT  
TELEPHONE AND RADIO NET 105. (17/1)  
ADD NETS 103/203/102"

\*\*\*\*\*  
ID: <2335.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > OIS  
Reference Data: N/A (18/1)  
Description:  
CATEGORY 2 (MANDATORY)  
"REVIEW AND COMPLETE TOTAL OIS-D OPERATING PLAN, MATCH THE PLAN TO AVAILABLE  
RESOURCES TO DETERMINE NECESSARY ACTION TO ACCOMPLISH REQUIRED SUPPORT. (18/1)"

\*\*\*\*\*

ID: <2336.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <MAINTENANCE >  
Location: <PAD > PTCR 220  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (28/1)  
Description:  
CATEGORY 2 (MANDATORY)  
"ENLARGE PTCR 220 TO ACCOMODATE P/L EMUIPMENT AND TECHNICIANS. (28/1)"

\*\*\*\*\*  
ID: <2337.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (28/9)  
Description:  
CATEGORY 2 (MANDATORY)  
"IMPLEMENT PAD A STORAGE ROOM/ANTE ROOM MODS. (28/9)"

\*\*\*\*\*  
ID: <2338.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (32/4)  
Description:  
CATEGORY 2 (MANDATORY)  
"INCORPORATE THE PLANNED PAD A PCR ENLARGEMENT MODIFICATIONS TO BRING PAD A  
PCR UP TO PAD B STANDARDS. (32/4)"

\*\*\*\*\*



ID: <2342.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:     <PAD                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software: <N/A            >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD THREE HIGH DEFINITION COLOR TV CAMERA SYSTEM TO PAD A & B."

\*\*\*\*\*  
ID: <2343.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:     <KSC                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software: <N/A            >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD THREE HIGH DEFINITION TRACKING COLOR CAMERA SYSTEM REMOTE TRACKING SITES."

\*\*\*\*\*  
ID: <2344.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:     <LCC                    >  
Orb.No/Mission: <GENERIC            >  
Hardware/Software: <N/A            >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD HIGH DEFINITION RECORDING CAPABILITY AT THE LCC."

\*\*\*\*\*



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ID: <2345.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:     <LCC                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<N/A           >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD HIGH DEFINITION MONITORING CAPABILITY IN EACH FIRING ROOM."

\*\*\*\*\*  
ID: <2346.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:     <PAD                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<N/A           >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE CAMERA SITE 2 PAO COLOR CAMERA WITH NEW CCD UNITS."

\*\*\*\*\*  
ID: <2347.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:     <PAD                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<N/A           >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPDATE C-ICE OTV WITH MULTI-SPECTRAL TV FOR BETTER ICE DETECTION."

\*\*\*\*\*





ID: <2354.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD > PAD A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPDADTE PAD A & B CNLIS AND LIVIS SYS TO LATMOS CONFIG."

\*\*\*\*\*  
ID: <2355.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <MLP >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE PERFORATED TOP PLATES ON TD9076, TD9077, TD9049A71 ON MLP 1,2,3 TO  
PRECLUDE CONDUCTIVE DUST FROM ENTERING AND RESULTING IN SHORT CIRCUITS DURING  
LAUNCHES."

\*\*\*\*\*  
ID: <2356.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"REMOTE TO LCC REDUNDANT CPU SELECTION OF ITI MATRIX SWITCHER."

\*\*\*\*\*

ID: <2357.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

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Description:  
CATEGORY 2 (MANDATORY)  
"HARDWARE PMS PCM DATA TO UNUSED MAG TAPE TRACKS IN PARALLEL WITH PCM DATA  
FROM ITI SWITCHER."

\*\*\*\*\*

ID: <2358.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
CATEGORY 2 (MANDATORY)  
"ADD SWITCH GUARDS TO CRITICAL SWITCHES."

\*\*\*\*\*

ID: <2359.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
CATEGORY 2 (MANDATORY)  
"IMPROVE REAL TIME DATA DISPLAY PROCESSING AND DATA RETRANSMISSION TO FIRING  
ROOMS IN LCC."

\*\*\*\*\*

ID: <2360.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"DEVELOP PMS SYSTEM SCHEMATICS AND AN INTEGRATED BLOCK DIAGRAM."

\*\*\*\*\*  
ID: <2361.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <LETF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE OLD INSTRUMENTATION SYSTEM IN LETF CONTROL ROOM."

\*\*\*\*\*  
ID: <2362.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"DE R&D HVDS/TOXIC GAS ANALYTICAL INSTRUMENTATION LAB. DE SUPPORT CONTRACTOR STAFFED AND OPERATED. FOR TEST AND EVALUATION OF INSTRUMENTATION FOR SHUTTLE IMPROVEMENTS."

\*\*\*\*\*

ID: <2363.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <COUNTDOWN        >  
Location:     <KSC               >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software: <N/A         >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"TIMING AND COUNTDOWN MODERNIZATION."

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ID: <2364.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                       >  
Location:     <LETF                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software: <N/A         >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPGRADE LETF PHOTO-OPTICAL SYSTEM."

\*\*\*\*\*  
ID: <2366.00>                    Issue(s): DRAWING SYSTEM            :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                       >  
Location:     <PAD                       >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software: <N/A         >  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPDATE SYSTEM DOCUMENTATION LISTS AND CABLE INTERCONNECT DIAGRAMS - PAD A AND B."

\*\*\*\*\*

ID: <2367.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPGRADE ET NOSE CONE HEATER."

\*\*\*\*\*  
ID: <2368.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PNEU  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"PRIMARY GHE REGULATOR SEAT REPLACEMENT."

\*\*\*\*\*  
ID: <2369.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PNEU  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPGRADE GHE ANTI-ICE PANEL SOLENOID VALVES."

\*\*\*\*\*



ID: <2370.00>                    Issue(s): DESIGN                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >        PNEU  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE LOX AND LH2 PROP. CONSOLES WITH CURRENT TECHNOLOGY."

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ID: <2371.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >        PNEU  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPGRADE CONTROL AND MONITOR FEATURES OF GH2 STORAGE FLARE STACK (PAD A & B)."

\*\*\*\*\*  
ID: <2372.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation:    <N/A                    >  
Location:    <MLP                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >        PNEU  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"BUILD NEW MLP FAC GHE REGULATION PANEL TO FEED LOX, LH2 & PAYLOAD SYSTEMS."

\*\*\*\*\*



ID: <2376.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PNEU  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"HVDS FUNCTIONAL CHECK BOTTLES (REMOTE CONTROL)."

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ID: <2377.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > C.C.PRESS  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE PRESSURE RELIEF DEVICE ON C70-1226-3 TO ELIMINATE CONTROLLED HAZ. HO-1  
FOR CREW CABIN PRESS SYS AT PAD A."

\*\*\*\*\*  
ID: <2378.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD > PAD B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > C.C.PRESS  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE PRESSURE RELIEF DEVICE ON C70-1226-3 TO ELIMINATE CONTROLLED HAZ. HO-1  
FOR CREW CABIN PRESS SYS AT PAD B."

\*\*\*\*\*





ID: <2385.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > HAZ DET  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE HAZARDOUS DETECTION SYSTEM AT PHSF FACILITY."

\*\*\*\*\*  
ID: <2386.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD > PAD A,B, VPF  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > SP TELES  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"HYDROCARBONS CONTAM MOD FOR PAD A/B & VPF."

\*\*\*\*\*  
ID: <2387.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PCR EMS  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"ESR K12571---REL. HUM. PWR."

\*\*\*\*\*



ID: <2391.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD STORAGE AND UPGRADE PAD COMP. AIR SYSTEM."

\*\*\*\*\*  
ID: <2392.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD > PAD B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"PAD B PCR AIR-SHOWER IS NOT WORKING PROPERLY, ALSO MISSING HARDWARE."

\*\*\*\*\*  
ID: <2393.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"PAYLOAD RETENTION FITTINGS IN USE ARE RUSTY - NEED SPARES TO ALLOW ROTATION  
OF FITTINGS FOR MAINTENANCE. FAILURE TO DO MAY RESULT IN HAZARDS TO PERSONNEL  
OPERATING FITTINGS."

\*\*\*\*\*



ID: <2394.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A

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Description:  
CATEGORY 2 (MANDATORY)  
"COMPLETION OF VPF TRUNNION ACCESS STEPS. LIGHTWEIGHT ARE SAFER TO INSTALL AND  
PROVIDE A LARGER WORK PLATFORM."

\*\*\*\*\*

ID: <2395.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A

Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE INDUSTRIAL AREA FIRE AND MEDICAL RADIO NETS ON THE TC CONSOLES IN CITE  
CONTROL RM. IN ORDER TO PROVIDE INSTANT COMM. TO PERSONNEL IN EVENT OF  
EMERGENCY SITUATIONS."

\*\*\*\*\*

ID: <2396.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PCR >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A

Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE PCR CAMERAS ON EVERY LEVEL OF THE PCR VS. THE 2 FOR ENTIRE FAC.  
CAMERAS SHOULD HAVE CAPABILITY TO BE MOUNTED ON END OF PGHM AS WELL AS PCR  
FIXED PLATFORMS.  
THIS WILL REDUCE PCR MANLOADING DURING HAZARDOUS OPERATIONS, SUCH AS PAYLOAD  
TRANSFER AND ORDNANCE OPERATIONS."

\*\*\*\*\*

ID: <2397.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"MOVE GPC/CAS OUT OF VPF HIGHBAY: (A) EQUIPMENT NOT EXPLOSION PROOF;  
(B) REDUCE NO. OF PERSONNEL IN HAZARDOUS AREAS;  
(C) ALLOW SW OPS DURING FAC. CLEARS.  
(ESR 80163.0197 HAS BEEN WRITTEN TO MOVE GPC/CAS TO AN OFFICE IN THE O&C, BUT  
IT HAS NOT BEEN APPROVED AND FUNDED.)"

\*\*\*\*\*  
ID: <2398.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPGRADE THE CANISTER HYPERGOL SENSOR SYSTEM."

\*\*\*\*\*  
ID: <2399.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"FOUR ADDITIONAL 10-INCH FIRE ALARM BELLS FOR VPF ROOMS 104,105,106,AND 120."

\*\*\*\*\*

ID: <2400.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation: <N/A                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<N/A           >        CARGO  
Reference Data:    N/A

Description:  
CATEGORY 2 (MANDATORY)  
"SOUND SUPPRESSION LINING ADDED TO INTERFACE OF MMSE 2ND SET "EPS" UNIT. EG&G HAS DONE SOUND LEVEL MEASUREMENTS IN THE PAST AND DETERMINED THAT NOISE IS ABOVE 85 DBA. THIS MATERIAL COULD BE SIMILIAR TO THE LINING USED INSIDE THE SPACE TELESCOPE I&CS CAB."

\*\*\*\*\*

ID: <2401.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation: <N/A                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<N/A           >        CARGO  
Reference Data:    N/A

Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE MECHANICAL STOPS FOR MMSE TRANSPORTER MOVES INTO TEST CELL."

\*\*\*\*\*

ID: <2402.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >        16-JUN-86  
Operation: <N/A                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC           >  
Hardware/Software:<N/A           >        CARGO  
Reference Data:    N/A

Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE ROTATION CAPABILITY FOR MMSE CANISTER WHICH DOES NOT REQUIRE VAB CRANES."

\*\*\*\*\*

ID: <2403.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO ECS  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"BACK-UP POWER FOR ECS BLOWERS IN PCR."

\*\*\*\*\*  
ID: <2404.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"REMOVE ENVIRONMENTAL CONTROL SYSTEM OF ESA-60,S&A BLDG., DYNAMIC SPIN TEST BUILDING., ESA-60; PAYLOAD SPIN TEST FACILITY."

\*\*\*\*\*  
ID: <2405.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"MOD AND UPGRADE ENVIRONMENTAL SYS AT SAEF-2 AND VERTICAL PROCESSING FACILITY SO THAT SYSTEM CAN MAINTAIN A MINIMUM OF 30% R.A. WHEN HAZARDOUS PAYLOADS ARE BEING PROCESSED IN THE FACILITIES."

\*\*\*\*\*

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ID: <2406.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:   <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    CARGO  
Reference Data:   N/A

Description:

CATEGORY 2 (MANDATORY)

"PROVIDE EMERGENCY "E" STOPS ON PAYLOAD CRANES AT SAEF-2, VPF, ESA-60,  
PSTF HGR. S, HGR. AM, HGR. AE, RTGF, HGR. AO."

\*\*\*\*\*

ID: <2407.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:   <N/A                    >  
Location:    <VPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    CARGO  
Reference Data:   N/A

Description:

CATEGDRY 2 (MANDATORY)

"MODIFY THE PLATFORM HOIST AT THE VPF TO INCLUDE UPPER LIMIT SWITCHES WHICH  
WILL PREVENT DAMAGE TO THE SHEAVES."

\*\*\*\*\*

ID: <2408.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation:   <N/A                    >  
Location:    <VPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    CARGO  
Reference Data:   N/A

Description:

CATEGORY 2 (MANDATORY)

"ADD FIRE ALARM FULL STATION AT THE VPF WORKSTAND NORTH WALL EMERGENCY EXITS AT  
THE 35', 45', 55', & 65' LEVEL."

\*\*\*\*\*



ID: <2412.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"SPACELAB IGLOO ROTATION DEVICE MOD (OPF)"

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\*\*\*\*\*  
ID: <2413.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UNINTERRUPTED POWER SUPPLY SERVICE TO PAYLOAD GES RACKS IN MLP 1/2/3 RM 10A  
AND PADS A&B."

\*\*\*\*\*  
ID: <2414.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <HAZARDOUS >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"PADS A&B PCR EMERGENCY SHUTDOWN CAPABILITY OF NON-EXPLOSIVE/HAZARDOUS PROOF  
EQUIPMENT."

\*\*\*\*\*

ID: <2415.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <REPLACEMENT/LRU >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > HAZ GAS  
Reference Data: N/A ESR K10965  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE EQUIPMENT FOR BENCH CHECKING AND REPAIRING HGDS LRU'S."

\*\*\*\*\*  
ID: <2416.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <HAZARDOUS >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > HAZ GAS  
Reference Data: N/A ESR K11848  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE LOCAL POWER CONTROL FOR FCSS LH2 LEAK AND FIRE DETECTORS AT THE OPF"

\*\*\*\*\*  
ID: <2417.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > HAZ GAS  
Reference Data: N/A ESR K12644  
Description:  
CATEGORY 2 (MANDATORY)  
"ADD FLOW METERS TO LD 24."

\*\*\*\*\*



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ID: <2418.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <N/A                    >  
Location: <PAD                    >                    PAD B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >                    FAC. PWR.  
Reference Data:    N/A                    ESR 12635  
Description:  
CATEGORY 2 (MANDATORY)  
"REPLACE HGDS UPS AT PAD B WITH A 10KVA UNIT."

\*\*\*\*\*  
ID: <2419.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <N/A                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >                    HAZ GAS  
Reference Data:    N/A                    ESR 93942  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE A PERMANENT SYSTEM TO REPLACE THE GAS CHROMATOGRAPH."

\*\*\*\*\*  
ID: <2420.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >                    16-JUN-86  
Operation: <N/A                    >  
Location: <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >                    SLF  
Reference Data:    N/A  
Description:  
CATEGORY 2 (MANDATORY)  
"UPGRADE MMH/N2H4/NH3 FLAMMABLE CONCENTRATION DETECTOR CART TO VLS  
CONFIGURATION & COMPLETE OMD."

\*\*\*\*\*

ID: <2421.00> Issue(s): REQUIREMENTS :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A (4-32)  
Description:  
CATEGORY 2 (MANDATORY)  
"PROVIDE LOW PRESSURE EDUCTORS FOR DECONTAMINATION OF GSE/FLT HARDWARE  
(OPF/HMF) (4-32)"

\*\*\*\*\*  
ID: <2422.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > OAA  
Reference Data: N/A (43/4)  
Description:  
CATEGORY 3 (DESIRABLE)  
"PROVIDE REMOTE OAA GN2 ACCUMULATOR VENT CAPABILITY. REF ESR 88690 (43/4)"

\*\*\*\*\*  
ID: <2423.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > OAA  
Reference Data: N/A (43/4)  
Description:  
CATEGORY 3 (DESIRABLE)  
"PROVIDE REDUNDANT OAA RETRACTED SWITCH TO INDICATE THE GLS OAA PROGRAM POC5.  
REF : ESR 88690 (43/5)"

\*\*\*\*\*

ID: <2424.00> Issue(s): DESIGN  
Issue(s) cont.:  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > OAA  
Reference Data: N/A (43/6)

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Description:  
CATEGORY 3 (DESIRABLE)  
"REVIEW GOX VENT ARM & OAA LCC REQUIREMENTS #3.1-16 & 3.1-17 TO INCREASE BACKUP  
POTENTIOMETER REDLINE TO TBD DEGREES FROM PRESENT 2 DEGREES. (43/6)"

\*\*\*\*\*

ID: <2425.00> Issue(s): DESIGN  
Issue(s) cont.:  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A (9/1)

Description:  
CATEGORY 3 (DESIRABLE)  
"PROVIDE OXIDIZER VENT & DRAIN SYSTEM FOR VPF. (9/1)"

\*\*\*\*\*

ID: <2426.00> Issue(s): DESIGN  
Issue(s) cont.:  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > CARGO  
Reference Data: N/A (9/3)

Description:  
CATEGORY 3 (DESIRABLE)  
"PROVIDE PAGING CAPABILITY FROM O&C CITE CONTROL ROOM TO VPF. (9/3)"

\*\*\*\*\*







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ID: <2436.00>                    Issue(s): DESIGN  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >    CCMS  
Reference Data:    N/A                    (24/4)  
Description:  
CATEGORY 3 (DESIRABLE)  
"IMPLEMENTATION OF STANDALONE OMR/CCMS CHECKOUT CAPABILITY. (24/4)"

\*\*\*\*\*  
ID: <2437.00>                    Issue(s): TECHNOLOGY                    : EXPERT SYSTEM  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >    CCMS  
Reference Data:    N/A                    (24/5)  
Description:  
CATEGORY 3 (DESIRABLE)  
"MODIFICATIONS TO LPS/CCMS CONSOLE DATA PROCESSING DISPLAY UTILIZING AI  
TECHNOLOGY AND EXPERT SYSTEM. (24/5)"

\*\*\*\*\*  
ID: <2438.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >    16-JUN-86  
Operation:    <N/A                    >  
Location:    <ORBTR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >    HGDS (CENTAUR)  
Reference Data:    N/A  
Description:  
CATEGORY 3 (DESIRABLE)  
"ADD ACTIVE HAZARDOUS GAS DETECTION SYSTEM IN THE PAYLOAD BAY FOR POST-LAND  
OPERATIONS. READOUT TO BE AVAILABLE IN CREW COMPARTMENT, IN DOWNLINK DATA  
AND FOR POST-LANDING OPERATIONS AFTER ORBITER POWER-DOWN.  
NOT A KSC RESPONSIBILITY--SHOULD BE DONE BY JSC/RIC--DE TRADE STUDY ALREADY ON  
CONTRACT WITH PERKIN-ELMER."

\*\*\*\*\*

ID: <2439.00> Issue(s): TECHNOLOGY : MAINTAINABILITY  
Issue(s) cont.: LOGISTICS/SPARES :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A (8/7)  
Description:  
CATEGORY 3 (DESIRABLE)  
"UPGRADE THE HVDS SENSOR TO STATE-OF-THE-ART TO LESSEN MAINTENANCE AND LOGISTICS PROBLEMS. ESR 94579, 94560/ (8/7)"

\*\*\*\*\*  
ID: <2440.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A (28/2)  
Description:  
CATEGORY 3 (DESIRABLE)  
"CONSTRUCT A FACILITY TO QUALIFY COMPONENTS FOR USE IN CRYOGENIC AND PNEUMATIC SYSTEMS. (28/2)"

\*\*\*\*\*  
ID: <2441.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PCR >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A (29/9)  
Description:  
CATEGORY 3 (DESIRABLE)  
"PCR HUMIDITY CONTROL PADS A & B : NEED A SYSTEM TO ADD MOISTURE IN THE PCR WHEN THE HUMIDITY GOES LOWER THAN 30 PERCENT. (29/9)"

\*\*\*\*\*









ID: <2451.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > 16-JUN-86  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (31/1)  
Description:  
CATEGORY 3 (DESIRABLE)  
"RBUS SECONDARY RETRACT: RBUS SECONDARY RETRACT CAN CAUSE RECONTACT WITH ORBITER (31/1)"

\*\*\*\*\*  
ID: <2452.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <PCR >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (32/5)  
Description:  
CATEGORY 3 (DESIRABLE)

"PCR STATIC PRESSURE SHOULD BE INCREASED TO ASSURE MINIMUM VALUES OF NOT LESS THAN 0.25 INS. OF WATER. (32/5)"

\*\*\*\*\*  
ID: <2453.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ORBITER PAYLOAD BAY LRU PLATFORM HOIST  
Reference Data: N/A (34/1)  
Description:  
CATEGORY 3 (DESIRABLE)

"REVIEW THE DESIGN OF THE ORBITER PAYLOAD BAY LRU PLATFORM HOIST. (34/1)"

\*\*\*\*\*



ID: <2457.00> Issue(s): ACCESSABILITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > OMS POD ACCESS  
Reference Data: N/A (4/37)  
Description:  
CATEGORY 3 (DESIRABLE)

"IMPROVE OMS POD ACCESS. (4/37)"

\*\*\*\*\*  
ID: <2458.00> Issue(s): DESIGN : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <ASSEMBLY >  
Location: <PCR > PGHM  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PGHM  
Reference Data: N/A (5/5)  
Description:  
CATEGORY 3 (DESIRABLE)

"MODIFY PGHM SO IT IS NOT NECESSARY TO REMOVE PLD BAY CCTV CAMERAS DURING  
PAYLOAD INSTALLATION. (5/5)"

\*\*\*\*\*  
ID: <2459.00> Issue(s): ACCESSABILITY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <ASSEMBLY >  
Location: <VAB > TOWER D/HB-1  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ACCESS PLATFORM  
Reference Data: N/A (10/12)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE ACCESS PLATFORM FOR VAB-MLP 'O' LEVEL EGRESS TO TOWER 'D' IN HB-1.  
(10/12)"

\*\*\*\*\*



ID: <2463.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > LRU HANDLER ARM  
Reference Data: N/A (34/3)  
Description:  
CATEGORY 3 (DESIRABLE)

"MODIFY THE LRU HANDLER ARM. (34/3)"

\*\*\*\*\*  
ID: <2464.00> Issue(s): ACCESSABILITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > GSE HOIST PLATFORM  
Reference Data: N/A (34/4)  
Description:  
CATEGORY 3 (DESIREABLE)

"MODIFY GSE HOIST PLATFORM AT PADS. (35/4)"

\*\*\*\*\*  
ID: <2465.00> Issue(s): DESIGN : ACCESSABILITY  
Issue(s) cont.: SAFETY :  
Issue Source: <DE RTN FLT MODS >  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > RTG HOIST  
Reference Data: N/A (35/5)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE NEW RTG HOIST" (35/5)"

\*\*\*\*\*



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ID: <2466.00> Issue(s): ACCESSABILITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > PLBD CLOSURE MECHANISM  
Reference Data: N/A (35/6)  
Description:  
CATEGORY 3 (DESIRABLE)

"REDESIGN ZERO-G PLBD CLOSURE MECHANISM TO PRECLUDE DOOR STICKING, JERKING, OR HANG-UPS DURING DOOR CLOSURE OPERATIONS. ALSO ELIMINATE DEPENDENCY ON BUCKET BRIDGE CRANES FOR ZERO-G MECHANISM OPERATIONS OR STORAGE OF HEAVY ZERO-G HARDWARE. (35-6)"

\*\*\*\*\*  
ID: <2467.00> Issue(s): ACCESSABILITY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > PLATFORM  
Reference Data: N/A (36/2)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE ADDITIONAL PLATFORM SPACE AT THE LEVEL 6 AND 7, FOR MOST FREQUENTLY USED GSE STORAGE. (36/2)"

\*\*\*\*\*  
ID: <2468.00> Issue(s): ACCESSABILITY : SAFETY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ACCESS PLATFORMS  
Reference Data: N/A (40/2)  
Description:  
CATEGORY 3 (DESIRABLE)

"INSTALL ACCESS PLATFORMS TO PROVIDE SAFE ACCESS TO COMPONENTS.  
(A) VALVES AT BASE OF FLARE STACKS.  
(B) BELLONS AND VACUUM VALVE MID-WAY UP DISCONNECT TOWER.  
(40/2)"

\*\*\*\*\*

ID: <2469.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ENGINE SERVICE PLATFORMS  
Reference Data: N/A (44/3)  
Description:  
CATEGORY 3 (DESIRABLE)

"HANDRAIL LEVEL ON HOLE SIDE OF ESP SRB HOLES FOR TENSIONING. NETTING MUST BE INSTALLED. (44/3)"

\*\*\*\*\*  
ID: <2470.00> Issue(s): DESIGN : ACCESSABILITY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > RPS WORKSTAND ENCLOSURE  
Reference Data: N/A (50A/1)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE ENCLOSURE CAPABILITY AT RPS WORKSTANDS FOR FOAMING OPERATIONS ON SRB AFT ASSEMBLIES. (50A/1)"

\*\*\*\*\*  
ID: <2471.00> Issue(s): ACCESSABILITY : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > RPS F WORKSTAND ENCLOSURE  
Reference Data: N/A (89/1)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE ENCLOSURE CAPABILITY AT RPS F WORKSTANDS FOR FOAMING OPERATIONS ON SRB AFT ASSEMBLIES. (89/1)"

\*\*\*\*\*



ID: <2475.00> Issue(s): SAFETY : MAINTAINABILITY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <PROPELLANT >  
Location: <PAD > OPF  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > CRYOGENIC FLEX HOSES  
Reference Data: N/A (25/10)  
Description:  
CATEGORY 3 (DESIRABLE)

"REPLACE PADS AND OPF CRYOGENIC FLEX HOSES. (25/10):

\*\*\*\*\*  
ID: <2476.00> Issue(s): TECHNOLOGY : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <PROPELLANT >  
Location: <MLP >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > TSM  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)  
"REDESIGN TSM UPPER FLEX HOSE TO SUPPORT LOX FLANGE TO INCORPORATE A  
STATE-OF-THE-ART JOINT WHICH WILL PREVENT LEAKAGE.  
THIS WOULD REQUIRE REDESIGN OF BOTH THE RI AND KSC INTERFACES. ALSO  
APPLIES TO LH2."

\*\*\*\*\*  
ID: <2477.00> Issue(s): DESIGN : REQUIREMENTS  
Issue(s) cont.: SAFETY :  
Issue Source: <DE RTN FLT MODS >  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > SCREENS  
Reference Data: N/A (40/33)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE GSE FOR REMOVAL OF FOREIGN PARTICLES FROM PROPELLANT SYSTEM SCREEN  
(I.E., CLEAN VACUUM SYSTEMS, SPECIAL BORESCOPE EQUIPMENT, ETC.) (40/33)"

\*\*\*\*\*

ID: <2478.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <PROPELLANT                    >  
Location:   <PAD >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    UMBILICALS  
Reference Data:   N/A                    (41/13)  
Description:  
CATEGORY 3 (DESIRABLE)

"RE-ASSESS PREMATURE DISCONNECT OF EITHER THE LO2 OR LH2 T-O UMBILICAL AND DETERMINE POSSIBLE ACTIONS AND/OR DESIGN CHANGES. (41/13)"

\*\*\*\*\*  
ID: <2479.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <PROPELLANT                    >  
Location:   <PAD >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    REPLENISH VALVE  
Reference Data:   N/A                    (3/12)  
Description:  
CATEGORY 3 (DESIRABLE)

"STUDY NON-LEAK REPLENISH VALVE. (3/12)"

\*\*\*\*\*  
ID: <2480.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <PROPELLANT                    >  
Location:   <PAD >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    L02 PUMPS  
Reference Data:   N/A                    (3/13)  
Description:  
CATEGORY 3 (DESIRABLE)

"STUDY NON-LEAK L02 PUMPS. (3/13)"

\*\*\*\*\*



ID: <2484.00>                    Issue(s): RELIABILITY                    : REQUIREMENTS  
Issue(s) cont.: DESIGN                    : REDUNDANCY                    :  
Issue Source: <DE RTN FLT MODS >  
Operation: <TEST                    >  
Location: <PAD                    >                    PCR  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    PCR DOCK-SEAL  
Reference Data: N/A                    (33/8)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE A BACK-UP SYSTEM TO THE PRIMARY PCR DOCK-SEAL. (33/8)"

\*\*\*\*\*  
ID: <2485.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation: <TEST                    >  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >  
Reference Data: N/A                    (39/22)  
Description:  
CATEGORY 3 (DESIRABLE)  
"INSTALL GH2 SENSORS ON OPF PLATFORM 4 WEST (ESR K11382). (39/22)"

\*\*\*\*\*  
ID: <2486.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation: <TEST                    >  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >                    OMBUU SCUPPER PURGE/H2 LEAK DETECTION  
Reference Data: ESR                    ESR K11382, (39/18)  
Description:  
CATEGORY 3 (DESIRABLE)

"REDESIGN OMBUU SCUPPER PURGE/H2 LEAK DETECTION SYSTEM FOR ADEQUATE PURGE FLOWRATES. (39/22)"

\*\*\*\*\*

ID: <2487.00> Issue(s): ACCESSABILITY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > DATA STORAGE  
Reference Data: N/A (16/1)  
Description:  
CATEGORY 3 (DESIRABLE)

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"REVIEW SPA DATA STORAGE PROBLEM - KEEP 30 DAYS THEN DESTROY. (16/1)"

\*\*\*\*\*  
ID: <2488.00> Issue(s): SECURITY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > OIS  
Reference Data: N/A (16/2)  
Description:  
CATEGORY 3 (DESIRABLE)

"REVIEW OIS MCU HEADSET CONNECTION PHILOSOPHY IN DOD CONTROLLED AREAS. (16/2)"

\*\*\*\*\*  
ID: <2489.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <LCC > FR4  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > FR4 AIR HANDLERS  
Reference Data: N/A (16/3)  
Description:  
CATEGORY 3 (DESIRABLE)

"FR-4 AIR HANDLERS - TEMPERATURE CONTROL NOT PROPERLY REGULATED BETWEEN FRONT  
AND BACK SYSTEM. (16/3)"

\*\*\*\*\*

C-7



ID: <2490.00>                    Issue(s): DESIGN                    : ISOLATION  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <N/A                    >  
Location:    <LCC                    >                    FR4  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <FACILITIES                    >                    HALON PANEL TROUBLE ALARM  
Reference Data:    N/A                    (16/4)  
Description:  
CATEGORY 3 (DESIRABLE)

"FR-4 HALON PANEL TROUBLE ALARM TOO LOUD. NOISE OVERRIDES OIS CONVERSATION.  
(16/4)"

\*\*\*\*\*  
ID: <2492.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <GENERIC                    >  
Location:    <LCC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <FACILITIES                    >  
Reference Data:    N/A                    (16/7)  
Description:  
CATEGORY 3 (DESIRABLE)

"ROOM 1R15 (OSF LIBRARY) REQUIRES DOUBLE DOORS FOR EFFICIENT OPERATION. (16/7)"

\*\*\*\*\*  
ID: <2493.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <GENERIC                    >  
Location:    <VAB                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <FACILITIES                    >                    250 & 175 TON CRANES  
Reference Data:    N/A                    (2/7)  
Description:  
CATEGORY 3 (DESIRABLE)

"MODIFY 250 & 175 TON CRANES WITH NEW LOAD INDICATOR LINK AND HOOK ADAPTOR.  
(2/7)"

\*\*\*\*\*

ID: <2495.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <TEST                    >  
Location:   <PAD                    >                    PAD A  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    CRYO FCSS  
Reference Data:   N/A                    (25/7)  
Description:  
CATEGORY 3 (DESIRABLE)

"REPLACE PRESENT CRYO FCSS WITH NEW CRYOGENIC FCSS FOR PAD A. (25/7)"

\*\*\*\*\*  
ID: <2496.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <GENERIC                    >  
Location:   <PAD                    >                    PADS A & B  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    HIM'S  
Reference Data:   N/A                    (1/9)  
Description:  
CATEGORY 3 (DESIRABLE)

"MODIFY WCCS GSE TO HARDLINE THE SYSTEM AS MUCH AS POSSIBLE. THE EXISTING LONG (EXPENSIVE) FLEX HOSES ARE DAMAGED NEARLY EVERY FLOW. (1/9.1)"

\*\*\*\*\*  
ID: <2497.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <TEST                    >  
Location:   <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    WCCS LAMINAR FLOW BENCH  
Reference Data:   N/A                    (1/12)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE LAMINAR FLOW BENCH IN OPF AREA FOR WCCS REFURBISHMENT. (1/12)"

\*\*\*\*\*

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ID: <2498.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <TEST                    >  
Location:     <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >        PAYLOAD BAY DOOR ZERO-G SYSTEM  
Reference Data:    N/A                    (2/18)  
Description:  
CATEGORY 3 (DESIRABLE)

"PAYLOAD BAY DOOR ZERO-G SYSTEM NEEDS WEIGHT MODIFICATIONS. (2/18)"

\*\*\*\*\*  
ID: <2499.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <GENERIC                    >  
Location:     <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >        HYPER SPILL PROTECTION  
Reference Data:    N/A                    (4/30)  
Description:  
CATEGORY 3 (DESIRABLE)

" IMPROVE HYPER SPILL PROTECTION DESIGN. (4/30)"

\*\*\*\*\*



ID: <2503.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > PHOTO SYSTEM  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

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"DETERMINE IMPACT OF NIGHT LAUNCEHES ON PHOTO SYSTEM IN ORDER TO OBTAIN  
ADEQUATE DATA."

\*\*\*\*\*  
ID: <2504.00> Issue(s): LOGISTICS/SPARES :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > NO-GO SIMULATORS  
Reference Data: ESR ESR K11334 (7/8)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE SPARE C72-1128 NO-GO SIMULATORS. ESR K11334. (7/8)"

\*\*\*\*\*  
ID: <2505.00> Issue(s): METHODS :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > WIRE ROPE  
Reference Data: N/A (10/11)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE PERMANENT WIRE ROPE CLIP ATTACHMENTS INSTEAD OF SWAGGED/CRIMPED TYPE  
ON PERMANENT INSTALLATIONS. (10/11)"

\*\*\*\*\*

ID: <2507.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > SCAPE TRAILER LOCATION  
Reference Data: N/A (11/17)  
Description:  
CATEGORY 3 (DESIRABLE)

"SCAPE TRAILERS ARE WITHIN A 700' RADIUS OF THE OPF VENT STACKS. (11/17)  
EXTEND OR RELOCATE VENT STACKS."

\*\*\*\*\*

ID: <2508.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > OPF WARNING LIGHTS  
Reference Data: N/A (11/21)  
Description:  
CATEGORY 3 (DESIRABLE)

"OPF WARNING LIGHTS HAVE NUMEROUS DEFICIENCIES AND NEED REVIEW.(11/21)  
OPF WARNING LIGHT SYSTEM NEEDS TO BE IMPROVED. LIGHTS ARE IN LOCATIONS WHERE  
THEY ARE NOT ABLE TO BE SEEN BY PERSONS ENTERING THE FACILITY."

\*\*\*\*\*

ID: <2509.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > SAFETY RADIO NET  
Reference Data: N/A (12/2)  
Description:  
CATEGORY 3 (DESIRABLE)

" PROVIDE ADDITIONAL SAFETY NET (RADIO) FREQUENCY FOR DEDICATED SAFETY USAGE.  
(12/2)"

\*\*\*\*\*



ID: <2513.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <HAZARDOUS       >  
Location:    <KSC       >                    HMF  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<FACILITIES >        HARD PAVED EGRESS ROUTE  
Reference Data:    N/A                    (13/3)  
Description:  
CATEGORY 3 (DESIRABLE)

"HMF AREA NEEDS ADDITIONAL HARD-PAVED EGRESS ROUTES DUE TO INCREASED  
HAZARDOUS WORK TASKS. (13/3)"

\*\*\*\*\*  
ID: <2514.00>                    Issue(s): SAFETY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <HAZARDOUS       >  
Location:    <KSC       >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<GSE       >        TIRE PRESSURIZATION CAGE  
Reference Data:    N/A                    (14/2.8)  
Description:  
CATEGORY 3 (DESIRABLE)

"UPGRADE ORBITER TIRE PRESSURIZATION CAGE TO MEET SAFETY PROOFLOAD REQUIREMENTS  
(14/2.8)"

\*\*\*\*\*  
ID: <2515.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <HAZARDOUS       >  
Location:    <PAD       >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software:<GSE       >        FIREX DELUGE SYSTEM  
Reference Data:    N/A                    (14/4.A)  
Description:  
CATEGORY 3 (DESIRABLE)

"FIREX DELUGE SYSTEM MODIFICATION TO ALLOW SYSTEM TO BE RESET AND FLOW  
TERMINATED REMOTELY. SOME AREAS NOW REQUIRE ENTERING THE AREA TO RESET SYSTEM  
TO STOP FLOW: PAD PROPELLANT FARMS. (14/4.A)"

\*\*\*\*\*



ID: <2516.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: REDUNDANCY :  
Issue Source: <DE RTN FLT MODS >  
Operation: <TEST >  
Location: <LCC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS >  
Reference Data: N/A (21/1)

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Description:  
CATEGORY 3 (DESIRABLE)  
"MODIFY MASTER, INTEGRATION, & BACKUP CONSOLE SOFTWARE TO PERFORM AUTOMATIC  
FAILURE RECOVERY & HAVE CAPABILITY TO CONTINUE UNINTERRUPTED IN A "2 OF 3"  
CONFIGURATION. (21/1)"

\*\*\*\*\*

ID: <2517.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<FACILITIES > LOCAL AIR SYSTEM  
Reference Data: N/A (25/4)

Description:  
CATEGORY 3 (DESIRABLE)

"UPGRADE PADS A & B LOCAL AIR SYSTEM AND RELATED CONTROLS. (25/3)"

\*\*\*\*\*

ID: <2518.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (25/4)

Description:  
CATEGORY 3 (DESIRABLE)  
"UPGRADE LOCAL AIR SYSTEM AND RELATED CONTROLS AT PADS A & B. (25/4)"

\*\*\*\*\*

ID: <2519.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <OPF > HB 1  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > AMMONIA SERVICING UNIT  
Reference Data: N/A (25/9)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE NEW SIMPLIFIED AMMONIA SERVICING UNIT FOR OPF HB1. (25/9)"

\*\*\*\*\*

ID: <2520.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC > PADS AND OPF  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > COOLANT/COOLANT SERVICING FLEX HOSES  
Reference Data: N/A (25/11)  
Description:  
CATEGORY 3 (DESIRABLE)

"REPLACE COOLANT/COOLANT SERVICING FLEX HOSES AT PADS AND OPF. (25/11)"

\*\*\*\*\*

ID: <2521.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC > PADS AND OPF  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > COOLANT/COOLANT SERVICING COMPONENTS  
Reference Data: N/A (25/12)  
Description:  
CATEGORY 3 (DESIRABLE)

"REPLACE OBSOLETE COMPONENTS FOR COOLANT/COOLANT SERVICING PADS AND OPF.  
(25/12)"

\*\*\*\*\*

ID: <2522.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > H2 INLINE GAS ANALYZER  
Reference Data: N/A (26/2)  
Description:  
CATEGORY 3 (DESIRABLE)

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"INSTALL INLINE GAS ANALYZER TO PRECLUDE BREAKING INTO SYSTEM AFTER A HYDROGEN  
FLOW OPERATION. (26/2)"

\*\*\*\*\*  
ID: <2523.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > ECS  
Reference Data: N/A (26/11)  
Description:  
CATEGORY 3 (DESIRABLE)

"ADD NEW HVAC FOR PADS A & B ECS. (26/11)"

\*\*\*\*\*  
ID: <2524.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <GSE > LPAC SYSTEMS  
Reference Data: N/A (26/14)  
Description:  
CATEGORY 3 (DESIRABLE)

"MODIFY PADS A & B LPAC SYSTEMS. (26/14)"

\*\*\*\*\*

ID: <2525.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > HYPER SPILL SYSTEMS  
Reference Data: N/A (26/15)  
Description:  
CATEGORY 3 (DESIRABLE)

"MODIFY PADS A & B HYPER SPILL SYSTEMS. (26/15)"

\*\*\*\*\*  
ID: <2526.00> Issue(s): LOGISTICS/SPARES : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > LOX PUMP VAPORIZERS  
Reference Data: N/A (27/9)  
Description:  
CATEGORY 3 (DESIRABLE)  
"PROCURE NEW VAPORIZERS FOR PADS A & B LOX PUMPS. (27/9)"

\*\*\*\*\*  
ID: <2527.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > COOLING TOWERS  
Reference Data: N/A (28/4)  
Description:  
CATEGORY 3 (DESIRABLE)  
"ADD NEW COOLING TOWER/CHILLED WATER SYSTEM TO SUPPORT OMRF, ECS STATION, AND  
TPS FACILITY. (28/4)"

\*\*\*\*\*





ID: <2534.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (32/7)  
Description:  
CATEGORY 3 (DESIRABLE)  
"TEMPERATURE AND HUMIDITY CONTROLS NEED TO BE REVIEWED. (32/7)"

\*\*\*\*\*  
ID: <2536.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (33/9)  
Description:  
CATEGORY 3 (DESIRABLE)  
INSTALL OIL SEPARATORS IN SHOP AIR USED IN FACILITIES WHERE PAYLOAD PROCESSING  
IS CONDUCTED & VERIFY OIL CONTENT IS WITHIN ACCEPTABLE LIMITS. (33/9)"

\*\*\*\*\*  
ID: <2537.00> Issue(s): DESIGN : REDUNDANCY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PCR >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (33/11)  
Description:  
CATEGORY 3 (DESIRABLE)  
"STUDY/INSTALL BACK-UP DRIVE SYSTEM FOR PCR MAIN DOORS TO PRECLUDE FAILURE TO  
OPEN AND/OR CLOSE AFTER PAYLOAD TRANSFER. (33/11)"

\*\*\*\*\*

ID: <2538.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PCR >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PCR DEBRIS CURTAIN  
Reference Data: N/A (36/1)  
Description:  
CATEGORY 3 (DESIRABLE)  
"REDESIGN/RELOCATE THE PLB DEBRIS CURTAIN TO PROVIDE SUFFICIENT CLEARANCE  
FOR PLB DOOR CLOSURE OPERATIONS. (36/1)"

\*\*\*\*\*  
ID: <2539.00> Issue(s): SURFACE TRANSP :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <LDG >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (37/4)  
Description:  
CATEGORY 3 (DESIRABLE)  
"PROVIDE A METHOD TO ASSURE PATHWAY USED TO TOW ORBITER OFF DFRF LAKE BED IS  
STABLE. (37/4)"

\*\*\*\*\*  
ID: <2540.00> Issue(s): SAFETY : DESIGN  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (38/3)  
Description:  
CATEGORY 3 (DESIRABLE)  
"MODIFY LH2 FILL MANIFOLD. (38/3)  
(1) INSTALL VENT MANIFOLD W/PURGE SO TANKERS AND RAILCARS COULD BE VENTED TO  
FLARE STACKS.  
(2) EXTEND FILL MANIFOLD SO TWO RAILCARS COULD BE OFF-LOAD SIMULTANEOUSLY."

\*\*\*\*\*



ID: <2541.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (38/5) (38/7)

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Description:  
CATEGORY 3 (DESIRABLE)  
"SIMPLIFY/UPDATE FLARE STACK CONTROL CABINET. PROVIDE A RAIN SHELTER SO DOORS  
CAN BE OPENED IN THE RAIN. (38/5)  
(A) CHANGE CENTAUR REDUNDANT VENT VALVE(S) CONTROL FROM HARDWARE TO LPS  
CONTROL.  
(B) UPGRADE ORBITER PIPE TO FULLY INSULATED TO PREVENT GENERATION OF LIQUID  
NITROGEN SO BULK OF DYNAMIC H/W CAN BE REMOVED FROM GSE. (38/7)

\*\*\*\*\*

ID: <2542.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > FC/PRSD  
Reference Data: ESR ESR K11562, K11561, K10534. (39/14)

Description:  
CATEGORY 3 (DESIRABLE)

"SIMPLIFY OPF FC/PRSD O2 + H2 SYSTEMS (ESR'S APPROVED BUT NOT YET IMPLEMENTED.  
REF.: ESR K11562, K11561, K10534. (39/14)"

\*\*\*\*\*

ID: <2543.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PAD A  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > LO2 DEWAR ANNULAR SPACE  
Reference Data: N/A (39/17)

Description:  
CATEGORY 3 (DESIRABLE)

"CLEAN VACUUM PUMP OIL FROM PAD A LO2 DEWAR ANNULAR SPACE. (39/17)"

\*\*\*\*\*

ID: <2544.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > :  
Operation: <GENERIC > :  
Location: <PAD > :  
Orb.No/Mission: <GENERIC > :  
Hardware/Software:<GSE > BPR ISOLATION VALVES  
Reference Data: N/A (39/19)  
Description:  
CATEGORY 3 (DESIRABLE)

"RELOCATE BPR ISOLATION VALVES FROM OUTLET TO INLET (C70-0834-2 AND S70-0698-3)  
OF BPR PANELS. (39/19)"

\*\*\*\*\*  
ID: <2545.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > :  
Operation: <GENERIC > :  
Location: <MLP > T-0 POD, MLP 1,2,3  
Orb.No/Mission: <GENERIC > :  
Hardware/Software:<GSE > PRESSURE SWITCH  
Reference Data: N/A (39/20)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE PRESSURE SWITCH FOR T-0 POD'S ON MLP 1,2,3. (39/20)"

\*\*\*\*\*  
ID: <2546.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS > :  
Operation: <GENERIC > :  
Location: <PAD > PAD A/B CRYO SKIDS (PRSD)  
Orb.No/Mission: <GENERIC > :  
Hardware/Software:<FACILITIES > ROLLUP CURTAINS  
Reference Data: N/A (39/21)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE ROLLUP CURTAINS AROUND PAD A/B CRYO SKIDS (PRSD). (39/21)"

\*\*\*\*\*



ID: <2550.00>                    Issue(s): DESIGN                    : REDUNDANCY  
Issue(s) cont.: SAFETY                    : RELIABILITY                    :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<POWER >                    ECS POWER  
Reference Data: N/A                    (41/9)  
Description:  
CATEGORY 3 (DESIRABLE)

"CAN ORBITER SYSTEMS SUSTAIN A LOSS OF PAD ECS POWER SHOULD FLORIDA POWER & LIGHT FAIL ON A COLD OR HOT DAY. LOSS OF PAD AC POWER WOULD SHUTDOWN: (41/9)  
A. PUMPS  
B. BLOWERS  
C. HEATERS  
D. CHILLERS

\*\*\*\*\*

ID: <2551.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD >                    PAD 8  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >                    ECS INSTRUMENTATION  
Reference Data: N/A                    (42/5)  
Description:

CATEGORY 3 (DESIRABLE)  
"PAD 8 ECS SYSTEM INSTRUMENTATION DEFICIENCIES. KNOWN DEFICIENCIES ARE: (42/5)  
A. CONDENSER WATER TEMPERATURE GCCT 2070A.  
B. AIR/GN2 TEMPERATURE LEAVING NORTH PRECOOL COIL.  
C. AIR/GN2 TEMPERATURE LEAVING COLD COIL.  
D. AIR TEMPERATURE LEAVING CABIN PRECOOL COIL.  
E. AIR TEMP LEAVING SOUTH PRECOOL COIL.  
F. CABIN DUCT FLOW RATE  
G. PAYLOAD BAY INTERFACE PRESSURE.

\*\*\*\*\*

ID: <2552.00>                    Issue(s): DESIGN                    : SAFETY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >                    BIACH TENSIONER  
Reference Data: N/A                    (44/1)  
Description:  
CATEGORY 3 (DESIRABLE)

"REVIEW HDP BIACH TENSIONER DESIGN TO IMPROVE SAFETY FACTOR. (44/1)"

\*\*\*\*\*

ID: <2553.00> Issue(s): PROCEDURE : LOGISTICS/SPARES  
Issue(s) cont.: METHODS : SURFACE TRANSP :  
Issue Source: <DE RTN FLT MODS >  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > SRB SEGMENT HANDLING  
Reference Data: N/A (44/2)  
Description:  
CATEGORY 3 (DESIRABLE)

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"EMPTY SEGMENT HANDLING. (44/2)"

\*\*\*\*\*  
ID: <2554.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > SRM CIRCUMFERENCE ALIGNMENT TOOL  
Reference Data: N/A (44/5)  
Description:  
CATEGORY 3 (DESIRABLE)

"EXTERNAL SRM CIRCUMFERENCE ALIGNMENT TOOL. (44/5)"

\*\*\*\*\*  
ID: <2555.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > SHOE HANDLING CLAMP  
Reference Data: N/A (44/6)  
Description:  
CATEGORY 3 (DESIRABLE)

"HDP SHOE HANDLING CLAMPS FOR POST LAUNCH. (44/6)"

\*\*\*\*\*

ID: <2556.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > BLAST SHIELD HANDLING SLING  
Reference Data: N/A (44/7)  
Description:  
CATEGORY 3 (DESIRABLE)

"HDP BLAST SHIELD HANDLING SLING NEEDS RE-DESIGN. (44/7)"

\*\*\*\*\*  
ID: <2557.00> Issue(s): LOGISTICS/SPARES : SAFETY  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <ASSEMBLY >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > AFT SKIRT DOLLIES  
Reference Data: N/A (44/9)  
Description:  
CATEGORY 3 (DESIRABLE)

"BPS (USBI) AFT SKIRT DOLLIES IN SHORT SUPPLY. REQUIRE EXTRA HANDLING OF SKIRTS. DOUBLE HANDLING OF THE AFT SKIRTS INCREASES RISK TO FLIGHT HARDWARE. (44/9)"

\*\*\*\*\*  
ID: <2558.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <LCC > FR-3  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > POWERLINE FILTERS  
Reference Data: N/A (45/18)  
Description:  
CATEGORY 3 (DESIRABLE)

"UPGRADE POWERLINE FILTERS IN FIRING ROOM 3. (45/18)"

\*\*\*\*\*



ID: <2562.00> Issue(s): REQUIREMENTS : DESIGN  
Issue(s) cont.: INTERFACE :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC > VLS/KSC COMMUNICATIONS  
Location: <VLS >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > BROAD BAND LINKS  
Reference Data: N/A (46/30)  
Description:  
CATEGORY 3 (DESIRABLE)

"INSTALL BROAD BAND LINKS BETWEEN KSC AND VLS RED AND BLACK SYSTEMS TO FACILITATE DG'S AND DOWN-LINE-LOAD'S ACCESS FROM KSC AND/OR VLS HOST CONCURRENTLY. (46/30)"

\*\*\*\*\*  
ID: <2563.00> Issue(s): DESIGN : SAFETY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <TEST >  
Location: <KSC > PADS/MLP/LCC  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<LPS > HARDWARE I/F MODULES  
Reference Data: N/A (46/23)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE REMOTE CONTROL OF POWER TO ALL HARDWARE INTERFACE MODULES. (46/23)"

\*\*\*\*\*  
ID: <2564.00> Issue(s): DESIGN : INTERFACE  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > S72-0685-3 PANEL  
Reference Data: N/A (48/9)  
Description:  
CATEGORY 3 (DESIRABLE)

"MODIFY S72-0685-3 PANEL TO ADD MANUAL VALVE BYPASS TO HELIUM LEAK CHECK PURGE, TO FREE ET L02 GROUP FROM SUPPORTING MPS GROUP. (48/9)"

\*\*\*\*\*



ID: <2565.00>                    Issue(s): DESIGN                    : TECHNOLOGY  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <GENERIC            >  
Location:     <KSC               >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software: <GSE           >            INSTRUMENTATION SYSTEM  
Reference Data:    N/A                    (49/4)  
Description:  
CATEGORY 3 (DESIRABLE)

"REDESIGN INSTRUMENTATION SYSTEM TO STATE-OF-THE-ART. (49/4)"

\*\*\*\*\*  
ID: <2566.00>                    Issue(s): MAINTAINABILITY                    : DESIGN  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <MAINTENANCE           >  
Location:     <PAD               >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software: <GSE           >            SRB AFT SKIRT SERVICE PORTS  
Reference Data:    N/A                    (50A/2)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE WATER INTRUSION BARRIERS AT SRB AFT SKIRT SERVICE PORTS TO PREVENT  
WETTING THE THERMAL CURTAINS DURING RAIN STORMS AT THE PADS. (50A/2)"

\*\*\*\*\*  
ID: <2567.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <ASSEMBLY               >  
Location:     <VAB               >  
Orb.No/Mission: <GENERIC       >  
Hardware/Software: <GSE           >            -384 SRB LIFT/STACK BEAM  
Reference Data:    N/A                    (50A/3)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE LEVELING CAPABILITY FOR THE -384 SRB LIFT/STACK BEAM TO IMPROVE SRB  
STACKING CAPABILITY. (50A/3)"

\*\*\*\*\*

ID: <2568.00> Issue(s): SURFACE TRANSP :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > OASIS (V771-714903-2 FERRY KIT PANEL  
Reference Data: N/A (85/1)  
Description:  
CATEGORY 3 (DESIRABLE)

"OASIS (V771-714903-2) -- FERRY KIT PANEL. (85/1)"

\*\*\*\*\*  
ID: <2569.00> Issue(s): LOGISTICS/SPARES :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PAYLOAD  
Reference Data: N/A (85/2)  
Description:  
CATEGORY 3 (DESIRABLE)

"FLIGHT KIT (SED 33101201-303) SSP SPARES. (85/2)"

\*\*\*\*\*  
ID: <2573.00> Issue(s): LOGISTICS/SPARES :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <N/A >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PAYLOAD  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"UPDATE CORROSION CONTROL SPEC."

\*\*\*\*\*





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ID: <2580.00> Issue(s): REQUIREMENTS : SAFETY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > OIS/OTV  
Reference Data: N/A (19/2)  
Description:  
CATEGORY 3 (DESIRABLE)

"REVIEW THE REQUIREMENTS TO PROVIDE EMERGENCY PAD HAZARD WARNING TO SELECTED  
AREAS. IMPLEMENT MODERN CONTROL SYSTEM TO PROVIDE THESE NEW REQUIREMENTS AS  
WELL AS ALL EXISTING REQUIREMENTS. (19/2)"

\*\*\*\*\*  
ID: <2582.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PCR  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > RAIN ENTRY PREVENTION (SIDE 1 DOORS)  
Reference Data: N/A (1/7)  
Description:  
CATEGORY 3 (DESIRABLE)

"IMPROVE CONTAMINATION PREVENTION OF PAYLOAD CHANGEDOUT ROOM, E.Q., SIDE 1 DOORS  
, H2O PROOFING (RAIN ENTRY). (1/7)"

\*\*\*\*\*  
ID: <2583.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > PADS A & B  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > DUCT SEAL SYSTEM  
Reference Data: N/A (25/1)  
Description:  
DE RTN FLT MODS

"REPLACE PADS A & B DUCT SEAL SYSTEM. (25/1)"

\*\*\*\*\*



ID: <2587.00> Issue(s): DRAWING SYSTEM :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > PNEUMATIC  
Reference Data: N/A (48/7)  
Description:  
CATEGORY 3 (DESIRABLE)

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"REIDENTIFY GROUND HALF PNEUMATIC OPERATED DISCONNECT REFERENCE DESIGNATIONS.  
REF. LEVEL I CHANGE REQUEST CL 30724. (48/7)"

\*\*\*\*\*  
ID: <2588.00> Issue(s): RELIABILITY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <MAINTENANCE >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > CARGO  
Reference Data: N/A (48/8)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE CABLE STRAIN RELIEF FOR C73-0003 CARGO INTERFACE. REF ESR K12510.  
(48/8)"

\*\*\*\*\*  
ID: <2589.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <TEST >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (41/11)  
Description:  
CATEGORY 3 (DESIRABLE)

"APPROVAL FROM ROCKWELL DOWNEY THAT THE T-0 UMBILICAL COLLET RECEPTABLE  
INSTALLATION IS SATISFACTORY FOR PERMANENT USE. (41/11)"

\*\*\*\*\*

ID: <2590.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <TEST                    >  
Location:     <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >  
Reference Data:    N/A                    (41/12)  
Description:  
CATEGORY 3 (DESIRABLE)

"UPGRADE THE T-O UMBILICALS SET NO. 1, I.E., CORROSION PROTECTION OF UMBILICAL GROUND PLATE, REPLACE WORK DETENTS, ETC. NOTE: WAS SCHEDULED FOR 1986 BUT JSC RENEGED ON DEAL. (41/12)"

\*\*\*\*\*

ID: <2591.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <TEST                    >  
Location:     <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >  
Reference Data:    N/A                    (10/13)  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE RPSF-POL/HAZ WASTE BLDG (K6-445) AS CITED IN FACILITY ORI 7/84. (10/13)"

\*\*\*\*\*

ID: <2592.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:    <TEST                    >  
Location:     <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <GSE                    >  
Reference Data:    N/A                    (14/I.D.)  
Description:  
CATEGORY 3 (DESIRABLE)

"IMPROVE LIGHTING AT REAR OF OPF TO PROVIDE SCRUBBER MONITORING. (14/I.D.)"

\*\*\*\*\*





ID: <2596.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE H2 DETECTION CAMERAS."

\*\*\*\*\*

ID: <2597.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"HIGH DEFINITION TV CAMERA STUDY."

\*\*\*\*\*

ID: <2598.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD > FLAME TRENCH  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"REPLACE FLAME TRENCH FIREBRICK WITH REFRACTORY CONCRETE."

\*\*\*\*\*







ID: <2607.00>                    Issue(s): DESIGN                    : DRAWING SYSTEM  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >                    16 JUN 86  
Operation:   <PROPELLANT                    >  
Location:   <PAD                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >                    HYPERGOL SYSTEM  
Reference Data:   N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"DEVELOP AND IMPLEMENT A SELECTED SET OF SPECIFICATION CONTROL DRAWINGS FOR HYPERGOL SYSTEM COMPONENTS."

\*\*\*\*\*

ID: <2608.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <GENERIC                    >  
Location:   <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data:   N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"IMPLEMENT AN EVALUATION AND QUALIFICATION PROGRAM FOR SELECTED COMPONENTS."

\*\*\*\*\*

ID: <2609.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <GENERIC                    >  
Location:   <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >  
Reference Data:   N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"CHANGE TCU COMPRESSOR START PNEUMATIC TIME DELAY RELAY TO AN ELECTRONIC TYPE - PAD A AND B."

\*\*\*\*\*

ID: <2610.00> Issue(s): DESIGN : MAINTAINABILITY  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

ORIGINAL PAGE IS  
OF POOR QUALITY

"REMOVE DEACTIVATED SYSTEMS FROM O&C TO SUPPORT PAYLOAD OPERATIONS AND  
MINIMIZE MAINTENANCE."

\*\*\*\*\*  
ID: <2611.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PHOTO-OPTICAL  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"STUDY WHAT IS NEEDED FOR A DEEP DRAFT TRACKING SHIP LIKE THE "POINT LOMA" THAT  
WSMC AND VLS/STG ARE NEGOTIATING WITH THE NAVY. COST OF EXISTING SHIP &  
DUPLICATE SHIP FOR ESMC TBD."

\*\*\*\*\*  
ID: <2612.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PHOTO-OPTICAL  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"HIGH ALTITUDE TRACKING AIRCRAFT UPGRADED FROM STARCAST AND CAST-GLANCE A/C  
DEDICATED TO EMSC OPERATIONS."

\*\*\*\*\*







ID: <2619.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > BREATHING AIR  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"CHANGE COMPRESSOR TO A FIX STORAGE SYSTEM AT RPSF."

\*\*\*\*\*  
ID: <2620.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <VAB >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > BREATHING AIR  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"CHANGE COMPRESSOR TO A FIX STORAGE SYSTEM IN VAB LOW BAY."

\*\*\*\*\*  
ID: <2621.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > SCRUBBERS  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"COMPLETE TESTING OF FUEL SCRUBBER."

\*\*\*\*\*

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OF POOR QUALITY

ID: <2623.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PAYLOADS  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE SEPARATE SERVICING AREAS IN SERVICE BAY OF PHSF AND SAEF II OR  
DEDICATE SAEF FOR N2O4 SERVICE ONLY."

\*\*\*\*\*  
ID: <2624.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PAYLOADS  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"PROVIDE SEPARATE SERVICING AREAS IN SERVICE BAY OF PHSF AND SAEF II OR  
DEDICATE SAEF FOR FUEL SERVICE ONLY."

\*\*\*\*\*  
ID: <2625.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <OPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > SCRUBBERS  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"ADD SIGHT GLASSES TO SCRUBBER LIQUID SEPARATORS AT OPF."

\*\*\*\*\*





ID: <2632.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"NEED VPF 12-TON BRIDGE CRANE CERTIFIED FOR FUELED PAYLOADS, FLT. HARDWARE"

\*\*\*\*\*  
ID: <2633.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <VPF >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"REMOVE PVC VENT LINES IN VPF AND REPLACE WITH METAL-(PVC BUILDS STATIC)"

\*\*\*\*\*  
ID: <2634.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PCR >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"IN THE EVENT OF HYPERGOL LEAK FROM PAULOAD AT PCR OR IN THE TRANSCAN REQUIRE A METHOD TO LOWER CANISTER TO TRANSPORTER FROM PCR AND ROTATE CANISTER TO HORIZONTAL TO PERMIT DESERVICING OR PAYLOAD REMOVAL. WOULD ALSO REQUIRE A MODIFIED SCAPE SUIT TO ALLOW TRANSCAN DRIVER TO A SAFE LOCATION."

\*\*\*\*\*



ID: <2638.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"SAFETY STUDY OF SINGLE FAILURE POINTS:(1) PAYLOAD CANISTER TRANSPORTER;  
(2) O&C LEVEL IV FREON AND WATER SYS; (3) 60 HZ POWR ST SY. ECS  
(4) DELUGE SYS. DSTF; (5) DELUGE SYS, ESA-60; (6) ENVIRONMENTAL MONITORS SAEF-2  
(7) 60 HZ POWER, SAEF-2; (8) 10-TON BRIDGE CRANE SAEF-2 TEST CELL/AIRLOCK;  
(9) DELUGE SYS, SAEF-2"

\*\*\*\*\*  
ID: <2639.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"REVIEW ADHESIVES IN SPACELAB PROGRAM-REPLACE ALL CONTAINING CARCINOGENS  
OR ASBESTOS."

\*\*\*\*\*  
ID: <2640.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"HOLES ON LEVEL 13 PLATFORM MAY BE A HAZARD."

\*\*\*\*\*



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ID: <2641.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <GENERIC                    >  
Location:   <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:   N/A                    CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"EMERGENCY LIGHTING SYS FOR PARGER OFFLINE LABS."

\*\*\*\*\*  
ID: <2642.00>                    Issue(s): COMMONALITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <GENERIC                    >  
Location:   <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:   N/A                    CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"MAKE O&C, OPF, AND PAD POWER PHASING SAME - 3 PHASE POWER IN O&C IS NOT SAME AS PAD. POSSIBLE CAUSING H/W DAMAGE WHEN CONNECTED."

\*\*\*\*\*  
ID: <2643.00>                    Issue(s): SAFETY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <DE RTN FLT MODS >  
Operation:   <GENERIC                    >  
Location:   <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<GSE                    >  
Reference Data:   N/A                    CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"EVALUATE BLDG. 505 FOR SAFETY REQUIREMENTS, INCLUDING:  
(A) FIRE RESISTANT WALLS;  
(B) AUTOMATIC EXTINGUISHING SYS."

\*\*\*\*\*







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ID: <2653.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A CARGO  
Description:  
CATEGORY 3 (DESIRABLE)

"UPGRADE FOR CLEANER ENVIRONMENT. (O&C AT&T AREA)"

\*\*\*\*\*  
ID: <2654.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > HYDROGEN TANK  
Reference Data: N/A  
Description:  
CATEGORY 3 (DESIRABLE)

"RECERTIFY HYDROGEN TANK IN LIGHT OF CORROSION DAMAGE SUFFERED DURING DOWN PERIOD, I.E., APOLLO SOYUZ TO STS 51-L."

\*\*\*\*\*  
ID: <2655.00> Issue(s): SAFETY :  
Issue(s) cont.: :  
Issue Source: <DE RTN FLT MODS >  
Operation: <PROPELLANT >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > O2 SYSTEM  
Reference Data: N/A (75/1)  
Description:  
CATEGORY 3 (DESIRABLE)

"REVISE NHB 8060.1 PROCEDURES FOR SELECTION OF MATERIALS USED IN O2 SYSTEM AND COMPONENTS." (75/1)

\*\*\*\*\*

ID: <2656.00> Issue(s): PROCEDURE :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <PROPELLANT >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (75/2)  
Description:  
CATEGORY 3 (DESIRABLE)

"REVISE NHB 8060.1 PROCEDURES FOR HYPERGOLIC MATERIALS SELECTION. (75/2)"

\*\*\*\*\*

ID: <2657.00> Issue(s): PROCEDURE :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <PAD >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE > ECS  
Reference Data: N/A (75/3)  
Description:  
CATEGORY 3 (DESIRABLE)

"IMPLEMENT QUALIFICATION PROGRAM FOR PADS A AND B ECS COMPONENTS. (75/3)"

\*\*\*\*\*

ID: <2658.00> Issue(s): MANAGEMENT :  
Issue(s) cont.: : :  
Issue Source: <DE RTN FLT MODS >  
Operation: <GENERIC >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<GSE >  
Reference Data: N/A (75/5)  
Description:  
CATEGORY 3 (DESIRABLE)

"REVISE RISK MANAGEMENT TRACKING SYSTEM AND SUPPORT. - \$1.9M (75/5)"

\*\*\*\*\*



ID: <2700.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > S-BAND ANTENNA  
Reference Data: N/A (57/9)  
Description:  
COMM/NAVAIDS

STUDY

"UPDATE S-BAND ANTENNAS TO LATEST CONFIGURATION."  
(57/9)

\*\*\*\*\*

ID: <2701.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > COMM. SWITCHES  
Reference Data: N/A (52/4.4)  
Description:  
COMM/NAVAIDS

STUDY

"REDESIGN ORBITER COMM SWITCHES TO ELIMINATE SINGLE POINTD FAILURES."  
(52/4.4) (#1)

\*\*\*\*\*

ID: <2702.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS >  
Reference Data: N/A (66/2)  
Description:  
COMM/NAVAIDS

STUDY

"BASED ON THE RATIONALE OF FMEA #05-2R-5411-1 AND #05-2R-5412-1, SHOULD ALSO  
INCLUDE S-BAND PM MODE SWITCH AS CAT. 1R2."  
(66/2) (#1)

\*\*\*\*\*



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ID: <2703.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <AVIONICS >                    PM ANTENNA SELECT SWITCH  
Reference Data: N/A                    (66/3)  
Description:  
COMM/NAVAIDS

STUDY

"RECOMMEND PM ANTENNA SELECT SWITCH ON PNL C3 BE INCLUDED AS A CAT. 2R3.  
INABILITY TO SELECT ANTENNA MANUALLY AFTER MULTIPLE FAILURES (ANT. MANAGEMENT,  
KU-BAND) COULD CAUSE LOSS OF MISSION OBJECTIVES DUE TO POOR ANTENNA COVERAGE  
WITH GROUND STATIONS OR TDRS."  
(66/3) (#1)

\*\*\*\*\*  
ID: <2704.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <AVIONICS >                    UHF SWITCHES  
Reference Data: N/A                    (66/4)  
Description:  
COMM/NAVAIDS                    STUDY

"RATIONALE FOR RATING UHF SWITCHES AS CATEGORY 1R IS VERY FAR FETCHED AND  
UNLIKELY. IT WOULD REQUIRE MULTIPLE FAILURES OF SEVERAL SYSTEMS (BOTH S-BAND  
AND KU-BAND). REF.FMEA #'S    05-2A-21948-2  
                                  05-2A-21949-2                    05-2A-23400-1  
                                  05-2A-22100-2  
                                  05-2A-22101-1  
                                  05-2A-22104-1  
                                  05-2A-22104-1                    (66/4) (#1)

\*\*\*\*\*  
ID: <2705.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <AVIONICS >                    KUBAND EA-1  
Reference Data: N/A                    (67/9)  
Description:  
COMM/NAVAIDS

STUDY

"A RECENT WIRING MOD NOW MAKES THE KUBAND EA-1 (CRIT. 1R OR 2 DEPENDING ON  
SPECIFIC FAILURE MODES) MUCH MORE SUSCEPTIBLE TO FAILURE. IT CAN NOW BE  
DISABLED BY A FAILURE OF EITHER ONE OF TWO MAIN BUSES, A FUSE OR AN RPC."  
(67/9) (#1)

\*\*\*\*\*

ID: <2706.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > KUBAND EA-1  
Reference Data: N/A (67/10)  
Description:  
COMM/NAVAIDS

STUDY

"FMEA 0-2R-5100-1 (KUBAND EA-1) SHOULD BE RECLASSIFIED AS CRIT.2 FROM THE CURRENT 1R AS THE 1R RATIONALE APPEARS TO BE RATHER FAR FETCHED. ALSO 05-2R-5104-2, 05-2R-5107-3, 05-2R-5108-3, 05-2R-5112-1, 05-2R-5112-2, 05-2R-5113-1, 05-2R-5113-2 AND 05-2R-5200-1."  
(67/10) (#1)

\*\*\*\*\*

ID: <2707.00> Issue(s): REDUNDANCY :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > TACAN  
Reference Data: N/A (67/11)  
Description:  
COMM/NAVAIDS

STUDY

"CRITICALITY 1R DOES NOT ADEQUATELY INDICATE THE NUMBER OF REDUNDANCIES AVAILABLE. FOR EXAMPLE, A SINGLE TACAN FAILURE (BLANKING PULSE FAILED ON) CAN DISABLE ALL THREE TACANS WITH ONLY S-BAND UPLINK AS A REDUNDANT SOURCE OF STATE VECTOR UPDATE. BUT THE 1R FMEA FOR MSBLS (LOSS OF OUTPUT) STILL LEAVES TWO OTHER MSBLS'S PLUS THE S-BAND UPLINK."  
(67/11)

\*\*\*\*\*

ID: <2708.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > TACAN  
Reference Data: N/A (53/1)  
Description:  
COMM/NAVAIDS

REJECT

"TACAN - POSSIBLE TACAN SUSCEPTIBILITY TO EXTERNAL RF SOURCES (ORLANDO VOR-7AC) DURING KSC LANDINGS. TACAN CRIT. 1R"  
(53/1)

\*\*\*\*\*



ID: <2712.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > DPS  
Reference Data: N/A (60/1.1)  
Description:  
DPS

STUDY

"MODIFY EACH ORBITER TO DOWNLIST A UNIQUE HARDWARE I.D. TO ENSURE PROPER ORBITER IS UNDER TEST."  
(60/1.1) (#2)

\*\*\*\*\*  
ID: <2713.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ECLSS > FLASH EVAPORATOR  
Reference Data: N/A (52/2)  
Description:  
ECLSS

CATEGORY #2

"PROVIDE A FLIGHT HARD COVER FOR FLASH EVAPORATOR UNIT TO PROTECT THE UNIT FROM TURNAROUND DAMAGE."  
PCIN 60099 (52/2)

\*\*\*\*\*  
ID: <2714.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ECLSS > GN2 WATER TEST TANK PORT  
Reference Data: N/A (52/3)  
Description:  
ECLSS

CATEGORY #2

"ELIMINATE A GN2 WATER TANK TEST PORT AT MID-BODY DOOR 44. MOVE A TEST PORT INSIDE THE CREW MODULE. (LOSS OF PRESSURE FOR FLASH EVAPORATOR OPERATION).  
(52/3)

\*\*\*\*\*

ID: <2715.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <ECLSS >                    RTG COOLANT FLUID  
Reference Data: N/A                    (52/4)  
Description:  
ECLSS

CATEGORY #2

"TO PREVENT POSSIBLE DAMAGE TO THE ORBITER GSE HEAT EXCHANGER, CHANGE RTG  
COOLANT FLUID FROM WATER TO WATER GLYCOL OR WATER/ALCOHOL MIXTURE."  
(52/4)

\*\*\*\*\*  
ID: <2716.00>                    Issue(s): REDUNDANCY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <ECLSS >                    FIRE SUPPRESSION  
Reference Data: N/A                    (52/1)  
Description:  
ECLSS

CATEGORY #2

"PROVIDE REDUNDANT FIRE SUPPRESSION SUBSYSTEMS IN EACH AVIONICS BAY IN THE  
CREW CABIN."  
(52/1) PCIN 60082

\*\*\*\*\*  
ID: <2717.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software: <ECLSS >                    TEMPERATURE SENSORS  
Reference Data: N/A                    (52/5)  
Description:  
ECLSS

STUDY

"ADD ADDITIONAL TEMPERATURE SENSORS TO THE FREON LOOPS TO ALLOW FOR ADDITIONAL  
TIME THE ORBITER CAN BE POWERED UP IF GROUND COOLANT UNIT IS LOST. EXISTING  
CAPABILITY PROVIDES TIME TO RECOVER."  
(52/5) (#2)

\*\*\*\*\*

ID: <2718.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ECLSS > PRESSURE TRANSDUCERS  
Reference Data: N/A (52/6)  
Description:  
ECLSS

STUDY

"ADD PRESSURE TRANSDUCER(S) TO THE LCG LOOPS. (NO INSTRUMENTATION AT PRESENT).  
(52/6) (#2)

\*\*\*\*\*

ID: <2719.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ECLSS > WATER COOLING, WINDOWS  
Reference Data: N/A (52/26)  
Description:  
ECLSS

STUDY

"MODIFY THE WATER-COOLING SYSTEM AROUND WINDOWS TO ALLOW FOR QUICK DISCONNECT  
AND REMOVAL OF WINDOWS WITHOUT REQUIRING SYSTEM DESERVICING.  
(56/26) (#2)

\*\*\*\*\*

ID: <2720.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ECLSS > POTABLE AND ARS WATER SERVICING QDS  
Reference Data: N/A (68/9)  
Description:  
ECLSS

STUDY

"MOVE POTABLE AND ARS WATER SERVICING QDS FROM 0-13 INTERFACE TO INSIDE THE  
CREW MODULE (ACCESS AT THE PAD)."  
(68/9) (REJECT)

\*\*\*\*\*

ID: <2721.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ECLSS > RTG COOLANT LOOP  
Reference Data: N/A (52/10)  
Description:  
ECLSS

REJECT

"MODIFY RTG COOLANT LOOP TO USE H2O/ALCOHOL OR H2O/GLYCOL TO PREVENT FREEZING.  
(52/10)

\*\*\*\*\*  
ID: <2722.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <OV102 >  
Hardware/Software:<ECLSS > PPO2 MOD  
Reference Data: N/A (52/7)  
Description:  
ECLSS

REJECT

"PERFORM PPO2 MOD ON OV102 AND OV103 (OV104 IS COMPLETE). REJECT DUE TO BEING  
ON CURRENT MOD SCHEDULE."  
(52/7)

\*\*\*\*\*  
ID: <2723.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ECLSS > ARPCS G02 TANK  
Reference Data: N/A (52/8)  
Description:  
ECLSS

REJECT

"REMOVE ARPCS G02 TANK FROM OV102 (MOD KIT RELEASED). PCIN 60076 - REVIEW PCIN  
AND SUPPORT IDEA OF REDUNDANT AIR BREATHING SYSTEM)  
(52/8) (STUDY)

\*\*\*\*\*

ID: <2724.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <OV102 >  
Hardware/Software:<ECLSS > O2 TANK  
Reference Data: N/A (52/9)  
Description:  
ECLSS

REJECT

"REMOVE O2 TANK FROM OV102.  
(52/9) (DUPLICATE - STUDY)

\*\*\*\*\*

ID: <2725.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<POWER > WIRING  
Reference Data: N/A (64/1)  
Description:  
EPDC

CATEGORY #1

"AFT FUSELAGE WIRING PROTECTION - PCIN 3357."  
(64/1)

\*\*\*\*\*

ID: <2726.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<POWER > WIRING  
Reference Data: N/A (64/3)  
Description:  
EPDC

PRIORITY #2

"EACH SYSTEM (A & B) FOR SRB HOLDDOWN POSTS AND T-O UMBILICAL COMMANDS  
(ARM & FIRE) DEPEND UPON A SINGLE WIRE THROUGH THE T-O UMBILICAL). CRIT. IR."  
(64/3) (#1)

\*\*\*\*\*



ORIGINAL PAGE IS  
OF POOR QUALITY

ID: <2727.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <POWER                    >                    WIRING  
Reference Data: N/A                    (51/16)  
Description:  
EPDC

STUDY

"MODIFY FWD PCA #1 WIRING TO PREVENT K6 AND K7 FAILURES DURING LANDING OPERATIONS."  
(51/16) (#1)

\*\*\*\*\*  
ID: <2728.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <POWER                    >                    CONNECTOR  
Reference Data: N/A                    (56/6)  
Description:  
EPDC

REJECT

"DESIGN AN ELECTRICAL CONNECTOR THAT HAS BUILT-IN PROVISIONS FOR TESTING COPPER PATH INTEGRITY."  
(56/6)

\*\*\*\*\*  
ID: <2729.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <POWER                    >                    WIRING  
Reference Data: N/A                    (64/17)  
Description:  
EPDC

REJECT

"COMPLETE ALL WIRING MODS PRIOR TO POWER UP OR LAUNCH."  
(64/17)

\*\*\*\*\*

ID: <2730.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <POWER                    >                    ACCESS PANEL  
Reference Data:    N/A                    (64/11)  
Description:  
EPDC

REJECT

"PROVIDE ACCESS PANELS IN WINGS FOR ELEVON ACTUATOR R&R."  
(64/11)

\*\*\*\*\*

ID: <2731.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <POWER                    >                    CIRCUIT BREAKER SWITCH GUARD  
Reference Data:    N/A                    (51/5)  
Description:  
EPDC

REJECT

"FABRICATE CIRCUIT BREAKER SWITCH GUARD FOR RMS PYRO SYSTEM AND PRSD."  
(51/5) (#2)

\*\*\*\*\*

ID: <2732.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <N/A                    >                    PEAP BREATHING AIR  
Reference Data:    N/A                    (51/7)  
Description:  
FLIGHT CREW SYSTEMS

STUDY

"EXTEND ASTRONAUT PEAP BREATHING AIR TIME SO THE GROUND RESCUE PERSONNEL DON'T  
HAVE TO CHANGE OUT THE PEAP'S DURING RESCUE. MOST ASPECTS OF RESCUE REQUIRE  
LONGER THAN 5-6 MINUTES OF AIR TIME CURRENTLY AVAILABLE IN THE PEAP'S FOR THE  
ASTRONAUTS TO BREATHE."  
(51/7)

\*\*\*\*\*

ID: <2733.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > LIQUID AIR PACK  
Reference Data: N/A (51/8)  
Description:  
FLIGHT CREW SYSTEMS

REJECT

"DEVELOP A LONG DURATION LIQUID AIR ASTRONAUT RESCUE AIR PACK (ARAP)."  
(51/8) (#2)

\*\*\*\*\*  
ID: <2734.00> Issue(s): LOGISTICS/SPARES : CANNIBALIZATION  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > SPARES  
Reference Data: N/A (65/6)  
Description:  
GENERAL

STUDY

"LOOK INTO OBTAINING ENOUGH LRU'S TO FILL ALL THE VEHICLES SO AS TO DIMINISH  
THE NEED FOR CANNIBALIZATION."  
(65/6)

\*\*\*\*\*  
ID: <2735.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<AVIONICS > SRB RATE GYRO  
Reference Data: N/A (55/1.1)  
Description:  
GNC

CATEGORY #1

"SRB RATE GYRO RECHANNELIZATION - MCR 11769."  
(55/1.1) (STUDY) PCIN S60027 AND S40018

\*\*\*\*\*

ID: <2736.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <FLIGHT                    >  
Location:                    <ORBTR>  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <AVIONICS                    >                    ROTATION HAND CONTROL  
Reference Data:                    N/A                    (55/2.1)  
Description:  
GNC

CATEGORY #1

"ROTATION HAND CONTROL RECHANNELIZATION - MCR 11770."  
(55/2.1) PCIN S60027

\*\*\*\*\*

ID: <2737.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <FLIGHT                    >  
Location:                    <ORBTR>  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <AVIONICS                    >                    ACTUATION SYSTEM  
Reference Data:                    N/A                    (58/6)  
Description:  
GNC

CATEGORY #2

"HYDRAULIC CONTAMINATION HAS BEEN A CONTINUING PROBLEM. CLEAN ALL ACTUATORS;  
STUDY AND FIX THE SOURCE OR HAVE METHOD OF FILTERING THE CONTAMINATION;  
OR RE-DESIGN THE ACTUATION SYSTEM."  
(58/6) (TRANSFERRED FROM APU/HYDR - #2)

\*\*\*\*\*

ID: <2738.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:                    <FLIGHT                    >  
Location:                    <ORBTR>  
Orb.No/Mission:                    <GENERIC                    >  
Hardware/Software: <N/A                    >                    NOSEWHEEL STEERING  
Reference Data:                    N/A                    (55/3.1)  
Description:  
GNC

CATEGORY #2

"LONG TERM NOSEWHEEL STEERING MODIFICATION TO PROVIDE REDUNDANCY."  
(55/3.1) PCIN S60035

\*\*\*\*\*

ID: <2739.00>                    Issue(s): RELIABILITY                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    OMS CONTROLLERS  
Reference Data:    N/A                    (51/6.1)  
Description:  
GNC

STUDY

"OMS CONTROLLERS RELIABILITY COMPONENT UPDATE TO REMOVE UNRELIABLE COMPONENTS."  
(51/6.1)

\*\*\*\*\*  
ID: <2740.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    SERVO/VALVE CONTROL  
Reference Data:    N/A                    (56/7)  
Description:  
GNC

REJECT

"SERVO/VALVE CONTROL CONTAMINATION CANNOT BE QUALIFIED OR CLEANED WITHOUT  
SYSTEM DISASSEMBLY. PROVIDE BYPASS DESIGN FOR FLUSH/CLEANING/REMOVAL OF  
EXISTING SCREENS UP/DOWN STREAM OF CONTAMINATION SENSITIVE COMPONENTS."  
(56/7) (TRANSFERRED FROM APU/HYDR - REJECT)

\*\*\*\*\*  
ID: <2741.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<N/A                    >                    HAZ GAS DETECTION SYSTEM  
Reference Data:    N/A                    (51/4)  
Description:  
HAZ GAS

STUDY

"ADD "ON-BOARD" HAZ GAS DETECTION SYSTEM TO ORBITERS WITH COCKPIT AND REMOTE  
READOUTS. SYSTEM SHOULD NOT REQUIRE ORBITER POWER TO OPERATE."  
(51/4) (#2)

\*\*\*\*\*

ID: <2742.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > ET ULLAGE TRANSDUCERS  
Reference Data: N/A (52/1.1)  
Description:  
INSTRUMENTATION

STUDY

"ET ULLAGE TRANSDUCERS NEED REDESIGN. PCIN 60006"  
(52/1.1)

\*\*\*\*\*

ID: <2743.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A > PCMMU'S  
Reference Data: N/A  
Description:  
INSTRUMENTATION

STUDY

"MODIFY THE PCMMU'S TO ALLOW FOR THE PROPER OPERATION OF BITE BIT 15, NO  
RESPONSE MDM OR PDI."  
(NEW)

\*\*\*\*\*

ID: <2744.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > 17" & 4" DISCONNECTS  
Reference Data: N/A (62/18)  
Description:  
MPS/SSME

CATEGORY #2

"QUALIFY SECONDARY SEALS ON 17" AND 4" DISCONNECTS.  
(62/18) PCIN S60053

\*\*\*\*\*

ID: <2745.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    GH2 FCV  
Reference Data:                    N/A                    (60/12)  
Description:  
MPS/SSME

CATEGORY #2

"EVALUATE CHANGE TO GH2 FCV DESIGN TO ELIMINATE BUNA-N O-RING; REPLACE WITH  
K-SEAL. (RI-LSS)  
(60/12) PCIN S60002R2

\*\*\*\*\*  
ID: <2746.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    GH2 LINE  
Reference Data:                    N/A                    (53/20)  
Description:  
MPS/SSME

CATEGORY #2

"ANALYZE/REDESIGN SSME #2 GH2 LINE BETWEEN SSME I/F AND FCV TO ELIMINATE  
VIBRATION."  
(53/20) S60057

\*\*\*\*\*  
ID: <2747.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    LOX PREVALVE SCREEN  
Reference Data:                    N/A  
Description:  
MPS/SSME

CATEGORY #2

"REDESIGN LOX PREVALVE SCREEN."

\*\*\*\*\*

ID: <2748.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > HAZ GAS MONITOR  
Reference Data: N/A (62/15)  
Description:  
MPS/SSME

CATEGORY #2

"INSTALL HAZ GAS MONITOR LINE TO DETECT H2 LEAKAGE OF 17" LH2 ORBITER/ET  
UMNICAL."  
(62/15) PCIN S60053

\*\*\*\*\*  
ID: <2749.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > ORIFICE FLOW CONTROL SYSTEM  
Reference Data: N/A (58/22)  
Description:  
MPS/SSME

CATEGORY #2

"REPLACE THE LO2/LH2 ET TANK PRESSURIZATION SYSTEM CURRENT DESIGN WITH AN  
ORIFICE FLOW CONTROL SYSTEM."  
(58/22) PCIN S60002R2

\*\*\*\*\*  
ID: <2750.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > PREVALVE DETENT MECHANISM  
Reference Data: N/A (61/39)  
Description:  
MPS/SSME

CATEGORY #2

"PERFORM TESTING AT LIQUID PROPELLANT TEMPERATURES AND SSME FLOWRATES AND  
VIBRATION LEVELS TO VERIFY THAT PREVALVES WILL STAY OPEN WITH VENTED ACTUATORS  
(NO PNEUMATICS UP) - REF: FLT 2 OF DV104."  
(61/39) PCIN S60055

\*\*\*\*\*



ID: <2751.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    GOX FLOW CONTROL VALVES  
Reference Data: N/A                    (62/2)  
Description:  
MPS/SSME

CATEGORY #2

"GOX FLOW CONTROL VALVES SHOULD PROVIDE THE GH2 90 DEGREE CONFIGURATION."  
PCIN R66364/UCN 11199  
(62/2)

\*\*\*\*\*  
ID: <2752.00>                    Issue(s): PROCEDURE                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    LEAK CHECK 2" ET/ORB I/F  
Reference Data: N/A                    (53/22)  
Description:  
MPS/SSME

STUDY

"LEAK CHECK 2" ET/ORB I/F AT 400 PSI INSTEAD OF 6 PSI."  
(53/22)

\*\*\*\*\*  
ID: <2753.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    2-WAY SOLENOID VALVES  
Reference Data: N/A                    (61/29)  
Description:  
MPS/SSME

STUDY

"COMPLETE MODIFICATION OF OV102 WITH LATEST DESIGN 2-WAY SOLENOID VALVES."  
(61/29)

\*\*\*\*\*

ID: <2754.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > SOLENOID VALVE FILTERS  
Reference Data: N/A (61/30)  
Description:  
MPS/SSME

STUDY

"COMPLETE MODIFICATION OF OV102 AND OV104 WITH LOX PREVALVE SOLENOID VALVE FILTERS."  
(61/30)

\*\*\*\*\*

ID: <2755.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > TEMPERATURE TRANSDUCER  
Reference Data: N/A (61/31)  
Description:  
MPS/SSME

STUDY

"ADD A LH2 HI-POINT BLEED TEMPERATURE TRANSDUCER SINCE GSE MEASUREMENT IS SO UNRELIABLE (DFI PORT AVAILABLE).  
(61/31)

\*\*\*\*\*

ID: <2756.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > CENTAUR IN-FLIGHT VENT  
Reference Data: N/A (62/13)  
Description:  
MPS/SSME

STUDY

"DESIGN A PURGE TO THE CENTAUR IN-FLIGHT VENT TO PRECLUDE MOISTURE BUILDUP IN FLAME ARRESTOR.  
(62/13) (#1)

\*\*\*\*\*

ID: <2757.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <OV102 >  
Hardware/Software: <MPS > DFI INSTRUMENTATION  
Reference Data: N/A (61/36)  
Description:  
MPS/SSME

STUDY

"REMOVE DFI INSTRUMENTATION FROM OV102."  
(61/36)

\*\*\*\*\*  
ID: <2758.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <MPS > L02/LH2 17" DISCONNECT  
Reference Data: N/A (62/1)  
Description:  
MPS/SSME

STUDY

"L02/LH2 17" DISCONNECT REDESIGN TO PROVIDE POSITIVE LATCHING IN THE OPEN  
POSITION."  
CCB R56843 (62/1)

\*\*\*\*\*  
ID: <2759.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <MPS > RTLS H2 VENTING  
Reference Data: N/A (62/8)  
Description:  
MPS/SSME

STUDY

"MPS AND CENTAUR RTLS H2 VENTING REDESIGN AND PLUME STUDY."  
MCR 11789, PCIN R66534, PCIN 66511. (62/8)

\*\*\*\*\*

ID: <2760.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    MPS BALL VALVE  
Reference Data: N/A                    (62/16)  
Description:  
MPS/SSME

STUDY

"COMPLETE MPS BALL VALVE MODIFICATION TO -005X CONFIGURATION."  
(62/16)

\*\*\*\*\*

ID: <2761.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    LPFT DISCHARGE DUCT  
Reference Data: N/A                    (62/9)  
Description:  
MPS/SSME

STUDY

"SSME LPFT DISCHARGE DUCT OVALITY CONCERN."  
(62/9) (#2)

\*\*\*\*\*

ID: <2762.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    LOX/LH2 PREVALVE  
Reference Data: N/A  
Description:  
MPS/SSME

STUDY

"LOX AND LH2 PREVALVE DETENT CONTAMINATION STUDY."  
(NEW)

\*\*\*\*\*

ID: <2763.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    17" DISCONNECT  
Reference Data:    N/A                    (61/32)  
Description:  
MPS/SSME                    STUDY

"THE FOLLOWING AREAS ASSOCIATED WITH THE 17" DISC. NEED REDESIGN OR CHANGE.  
.    BODY CLIPS FOR SEAL RETAINERS NEED REDESIGN TO ELIMINATE BENDING  
.    AND MR CONDITION.  
.     
.    A MASTER GSE 3-DIMENSIONAL TOOL IS NEEDED TO VERIFY CORRECT ALIGNMENT  
.    OF DISC. MICROSWITCH CAM CLEVIS, FLOWLINER, AND ACTUATOR ROLLER  
.     
.    NEW TORSION BAR DESIGN."                    (61/32)

\*\*\*\*\*

ID: <2764.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    TANK MONITORING  
Reference Data:    N/A                    (52/2.1)  
Description:  
MPS/SSME

REJECT

"TANK PRESSURE MONITORING RESPONSIBILITY CLARIFICATION (MPS, CLOX, CLNY, INST)  
(TO BE WORKED BY C. FLOYD)."  
(52/2.1)

\*\*\*\*\*

ID: <2765.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    TRANSDUCER  
Reference Data:    N/A                    (52/3.1)  
Description:  
MPS/SSME

REJECT

"PROVIDE PROTECTIVE COVERING FOR VLUNERABLE TRANSDUCERS."  
(52/3.1) (DUPLICATE OF EPDC)

\*\*\*\*\*

ID: <2766.00>                    Issue(s): RELIABILITY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    FASCOS  
Reference Data:    N/A                    (58/8)  
Description:  
MPS/SSME

REJECT

"IMPLEMENT A RELIABLE FASCOS SHUTDOWN CAPABILITY ON THE SSME'S."  
(58/8)

\*\*\*\*\*

ID: <2767.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    MPS/SSME PNEUMATICS  
Reference Data:    N/A                    (61/26)  
Description:  
MPS/SSME

REJECT

"REDESIGN MPS/SSME PNEU: PANELS WITH 8-NUTS AT INLET/OUTLET SO THEY CAN BE  
REMOVED AS A UNIT AND CHECKED OUT ON THE BENCH."  
(61/26)

\*\*\*\*\*

ID: <2768.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    17" ALUMINUM FEEDLINE  
Reference Data:    N/A                    (64/4)  
Description:  
MPS/SSME

REJECT

"REPLACE L02 ALUMINUM 17" FEEDLINE WITH ALL WELDED LINE.  
(64/4)

\*\*\*\*\*

ID: <2769.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > HE FILL LINE FILTER  
Reference Data: N/A (53/21)  
Description:  
MPS/SSME

REJECT

"INSTALL INLET FILTER ON HELIUM FILL LINE PROTECT CVI-4 FROM CONTAMINATION.  
(53/21)

\*\*\*\*\*  
ID: <2770.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > PNEUMATIC/REPRESS SYSTEM  
Reference Data: N/A (61/25)  
Description:  
MPS/SSME

REJECT

"REDESIGN PNEUMATIC/REPRESS SYSTEMS IN DISCONNECT AREAS (ROUTING OF TUBING/FLEX  
HOSES TO MINIMIZE DAMAGE DUE TO TRAFFIC IN AREA).  
(61/25) (#2)

\*\*\*\*\*  
ID: <2771.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > WELD JOINTS  
Reference Data: N/A (61/37)  
Description:  
MPS/SSME

REJECT

"PERFORM TESTING AND/OR REDESIGN THE GOX PRESSURIZATION SYSTEM WELD JOINTS  
WHICH HAVE EXHIBITED SMALL CRACKS."  
(61/37) (REJECT WITHDRAWN BY ORIG.) (#2)

\*\*\*\*\*

ID: <2772.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    LH2 8" FILL & DRAIN  
Reference Data: N/A                    (62/4)  
Description:  
MPS/SSME

REJECT

"LH2 8" FILL AND DRAIN VALVE TEARDOWN INSPECTION CLARIFICATION.  
PCIN R56906A. (62/4) (#2)

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ID: <2773.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    LH2 8" UMBILICAL PURGE  
Reference Data: N/A                    (62/14)  
Description:  
MPS/SSME

REJECT

"IMPLEMENT HIGH FLOW LH2 UMBILICAL (8") PURGE TO DILUTE H2 LEAKAGE.  
(62/14) (#2)

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ID: <2774.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<MPS                    >                    MECHANICAL JOINTS  
Reference Data: N/A                    (64/2.1)  
Description:  
MPS/SSME

REJECT

"MINIMIZE MECHANICAL JOINTS ON G02 AND GH2 PRESSURIZATION LINES."  
(64/2.1) (#2)

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ID: <2775.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    LO2 TANK TUMBLE VALVE  
Reference Data: N/A                    (64/3.1)  
Description:  
MPS/SSME

REJECT

"DELETE LO2 TANK TUMBLE VALVE. UTILIZE TANK VENT/RELIEF FOR TUMBLE FUNCTION."  
(64/3.1) (#2)

\*\*\*\*\*  
ID: <2776.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    SSME HPOTP TURBINE SEALS  
Reference Data: N/A                    (58/21)  
Description:  
MPS/SSME

REJECT

"REDUCE COMPLEXITY AND WEIGHT OF ORBITER BY REDESIGN OF SSME HPTOP TURBINE SEAL  
PACKAGE TO MINIMIZE MPS HELIUM SYSTEM WEIGHT IMPACT."  
MCR 4879 (58/21) (STUDY)

\*\*\*\*\*  
ID: <2777.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <MPS                    >                    8" FILL & DRAIN VALVES  
Reference Data: N/A                    (62/3)  
Description:  
MPS/SSME

REJECT

"LO2/LH2 8" OUTBOARD AND INBOARD FILL AND DRAIN VALVES (PV9, 10,11,12). NEED  
ACTUATOR SWITCH REDESIGN. UCN 108049. "  
(62/3) (ACTION IN WORK. - STUDY)

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ID: <2778.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > LH2 TOPPING VALVE  
Reference Data: N/A (62/5)  
Description:  
MPS/SSME

REJECT

"LH2 TOPPING VALVE (PV-13) NEEDS COMPLETION. MCR 10108R5."  
(62/5) (DUPLICATE OF ITEM #9, STUDY)

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ID: <2779.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > LH2 RTLS DUMP VALVE  
Reference Data: N/A (62/6)  
Description:  
MPS/SSME

REJECT

"LH2 RTLS DUMP (PV17 & 18) NEEDS COMPLETION. MCR 10108R5"  
(62/6) (DUPLICATE OF ITEM #9, STUDY)

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ID: <2780.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<MPS > MPS LOX PREVALVE SOLENOID FILTERS  
Reference Data: N/A (62/7)  
Description:  
MPS/SSME

REJECT

"MPS LOX PREVALVE SOLENOID FILTERS INSTALLATION. UCN 10860, PCIN 56970."  
(62/7) (DUPLICATE OF ITEM #2, STUDY)

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ID: <2781.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    RCS THRUST CHAMBERS  
Reference Data:    N/A                    (54/1)  
Description:  
OMS/RCS

CATEGORY #1

"RCS THRUST CHAMBERS CAN HAVE LEAKAGE, RECOMMEND ADDING THRUSTER INSTABILITY  
DESELECTION KIT."  
(54/1) PCIN S60069

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ID: <2782.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    BI-PROPELLANT VALVE FLANGE SEALS  
Reference Data:    N/A                    (54/6)  
Description:  
OMS/RCS

CATEGORY #2

"BI-PROPELLANT VALVE FLANGE SEALS HAVE EXTERNAL LEAKS. RECOMMEND IMPROVING  
SEALS."  
(54/6) (#1)

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ID: <2783.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    OMS/RCS REGULATORS  
Reference Data:    N/A                    (54/4)  
Description:  
OMS/RCS

CATEGORY #2

"OMS/RCS REGULATORS NEED REEDESIGN TO PROVIDE CAPABILITY TO TRICKLE PURGE  
REGULATORS."  
(54/4) PCIN S60069

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ID: <2784.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > OMS/RCS CROSSFEED AC MOTOR VALVES  
Reference Data: N/A (54/5)  
Description:  
OMS/RCS

CATEGORY #2

"OMS/RCS/CROSSFEED AC MOTOR VALVES NEED PIND TESTED SWITCHES, AND REDESIGN TO ELIMINATE BELLOWS LEAKAGE."  
(54/5) PCIN S60066 AND S60020

\*\*\*\*\*  
ID: <2785.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > RCS THRUSTER VALVES  
Reference Data: N/A (54/7)  
Description:  
OMS/RCS

STUDY

"RCS THRUSTER VALVES HAVE EXTERNAL LEAKS. DESENSITIZE VALVE TO LOW TEMPERATURE."  
(54/7)

\*\*\*\*\*  
ID: <2786.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > RCS PROPELLANT TANK HEATER  
Reference Data: N/A (54/9)  
Description:  
OMS/RCS

STUDY

"RCS PROPELLANT TANK HEATER MOD. THERMAL SWITCHES DO NOT MAINTAIN PROPELLANT ABOVE MINIMUM ENTRY TEMPERATURE (70 F) TO PRECLUDE THRUSTER ZOTS. MCR 11659."  
(54/9)

\*\*\*\*\*

ID: <2787.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBITR>  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<ORBITER           >        OMS HARDWARE GAGING SYSTEM  
Reference Data:    N/A                    (54/10)  
Description:  
OMS/RCS

STUDY

"OMS HARDWARE GAGING SYSTEM SUFFERS AN ESTIMATED 30 PERCENT MAJOR FAILURE RATE FOR FLIGHT. CR 79194, MCR 11290."  
(54/10)

\*\*\*\*\*  
ID: <2788.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBITR>  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<ORBITER           >        +X THRUSTER  
Reference Data:    N/A                    (54/11)  
Description:  
OMS/RCS

STUDY

"PROVIDE PROTECTION TO +X THRUSTER TO PREVENT DAMAGE FROM WATER INTRUSION."  
(54/11)

\*\*\*\*\*  
ID: <2789.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBITR>  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<ORBITER           >        QUANTITY GAUGING PROBE  
Reference Data:    N/A                    (55/18)  
Description:  
OMS/RCS

STUDY

"DELETE OMS QUANTITY GAUGING PROBE AND PROVIDE POINT SENSORS AT 60, 70, 80, 90, AND 100 PERCENT."  
(55/18)

\*\*\*\*\*

ID: <2790.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > OME NOZZLE CHAMBER FLANGE  
Reference Data: N/A (54/3)  
Description:  
OMS/RCS

STUDY

"OME NOZZLE CHAMBER FLANGE NEED REDESIGN TO REDUCE WAVINESS OF NOZZLE/CHAMBER FLANGE."  
(54/3) (#1)

\*\*\*\*\*  
ID: <2791.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > OMS CROSSFEED LINE HEATER  
Reference Data: N/A (55/12)  
Description:  
OMS/RCS

STUDY

"OMS CROSSFEED LINE HEATER SWITCH INSULATION CHANGE WILL PREVENT DAMAGE TO SWITCHES DURING CIG RETEST."  
(55/12) (#2)

\*\*\*\*\*  
ID: <2792.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > TVC CONTROLLERS, DSC'S  
Reference Data: N/A (55/13)  
Description:  
OMS/RCS

STUDY

"PROVIDE NEW POD PENETRATIONS FOR ACCESS TO TVC CONTROLLERS AND DSC'S."  
(55/13) (#2)

\*\*\*\*\*

ID: <2793.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    GAGE LOCKOUT INHIBIT SWITCH  
Reference Data:                    N/A                    (55/14)  
Description:  
OMS/RCS

STUDY

"PROVIDE OMS GAGE LOCKOUT INHIBIT SWITCH IN COCKPIT TO INSURE PROPER GAGE READINGS. FLIGHT HARDWARE CONCERN FOR RTLS BFS TO START ENGINES."  
(55/14) (#2)

\*\*\*\*\*  
ID: <2794.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <OPF                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    BI-PROPELLANT VALVE PURGE  
Reference Data:                    N/A                    (55/17)  
Description:  
OMS/RCS

STUDY

"PROVIDE "ON BOARD" SYSTEM FOR PURGING OMS ENGINE BI-PROPELLANT VALVE CAVITIES TO ELIMINATE THE NEED FOR AN OPF HIGH BAY CLEAR TO DRAIN AND PURGE THE BI PROP CAVITIES."  
(55/17) (#2) CR SUBMITTED

\*\*\*\*\*  
ID: <2795.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    PURGE CIRCUITS  
Reference Data:                    N/A                    (55/19)  
Description:  
OMS/RCS

STUDY

"PROVIDE SEPARATE PURGE CIRCUITS FOR FRCS/AFT PODS."  
(55/19) (#2)

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ID: <2796.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<ORBITER                    >                    DELTA PRESSURE TRANSDUCERS  
Reference Data:    N/A                    (60/38)  
Description:  
OMS/RCS

STUDY

"IMPROVE OPERATION OF DELTA PRESSURE TRANSDUCERS."  
(60/38) (#2)

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ID: <2797.00>                    Issue(s): REDUNDANCY                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<ORBITER                    >                    RCS FERRY PLUGS  
Reference Data:    N/A                    (60/24)  
Description:  
OMS/RCS

STUDY

"PROVIDE SECOND SET OF RCS FERRY PLUGS."  
(60/24) (#2)

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ID: <2798.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<ORBITER                    >                    FIRING THRUSTERS  
Reference Data:    N/A                    (65/41)  
Description:  
OMS/RCS

STUDY

"CANT ARCS DOWN FIRING THRUSTERS TO REDUCE BODY FLAP IMPINGEMENT."  
(65/41) (#2)

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OF POOR QUALITY

ID: <2799.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    RCS HIGH PRESSURE HELIUM VALVE  
Reference Data:    N/A                    (65/42)  
Description:  
OMS/RCS

STUDY

"DEVELOP SLOWER OPENING RCS HIGH PRESSURE HELIUM VALVE."  
(65/42) (#2)

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ID: <2800.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > RCS THROAT PLUGS  
Reference Data: N/A (60/23)  
Description:  
OMS/RCS

STUDY

"PROVIDE LIGHT-WEIGHT RCS THROAT PLUGS FOR PC CHECKS AND FWD LEAK TESTS."  
(60/23) (#2)

\*\*\*\*\*  
ID: <2801.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > PRESSURE TRANSDUCERS  
Reference Data: N/A (54/8)  
Description:  
OMS/RCS

STUDY

"ADD PRESSURE TRANSDUCER FOR VISIBILITY TO THE CROSSFEED TRANSDUCER MOD.  
MCR 11 110.  
(54/8)

\*\*\*\*\*  
ID: <2802.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > FRCS VERNIER THRUSTERS  
Reference Data: N/A (65/40)  
Description:  
OMS/RCS

REJECT

"ADD REDUNDANT FRCS VERNIER THRUSTERS AND ELIMINATE FRS/ARCS VERNIER SINGLE  
POINT FAILURES."  
(65/40)

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ID: <2803.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    TEST PORTS  
Reference Data:    N/A                    (55/15)  
Description:  
OMS/RCS

REJECT

"PROVIDE TEST PORTS IN MOLDLINE TO PROVIDE ACCESS FOR OMS TRICKLE PURGE  
REGULATORS."  
(55/15) (#2)

\*\*\*\*\*  
ID: <2804.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    PRESSURE TRANSDUCER  
Reference Data:    N/A                    (55/16)  
Description:  
OMS/RCS

REJECT

"PROVIDE PRESSURE TRANSDUCER DOWN-STREAM OF REGULATORS TO ENHANCE CAPABILITY  
TO MONITOR REGULATOR PERFORMANCE."  
(55/16) (#2)

\*\*\*\*\*  
ID: <2805.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >                    AFT POD ELECTRICAL I/F  
Reference Data:    N/A                    (55/20)  
Description:  
OMS/RCS

REJECT

"RELOCATE AFT POD ELECTRICAL I/F (CROSS FEED DISCONNECT SPILL POTENTIAL)."  
(55/20) (#2)

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ID: <2806.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > OME NOZZLE  
Reference Data: N/A (54/2)  
Description:  
OMS/RCS

REJECT

"OME NOZZLE HAVE HAD STRUCTURAL DEFORMATION, RECOMMEND COMPLETE HEAVY WEIGHT NOZZLE EXCHANGE."  
(54/2) (STUDY)

\*\*\*\*\*  
ID: <2807.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > PRSD/FC TANK SETS  
Reference Data: N/A (58/1)  
Description:  
PRSD/FC

CATEGORY #2

"INSTALL A JUMPER TUBE BETWEEN DEMATE SUPPLY AND VENT LINES OF TANK SETS NOT INSTALLED."  
(58/1)

\*\*\*\*\*  
ID: <2808.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > FUEL CELLS  
Reference Data: N/A (58/5)  
Description:  
PRSD/FC

STUDY

"FUEL CELL IMPROVEMENT MODIFICATION. DELETE END CELL HEATERS AND MODIFIES START-UP HEATER."  
(58/5) (#2)

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ID: <2809.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:    <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >        INSTRUMENTATION FOR CELL VOLTAGES  
Reference Data:    N/A                    (58/4)  
Description:  
PRSD/FC

STUDY

"PROVIDE SUFFICIENT INSTRUMENTATION CHANNELS SO THAT FUEL CELL SINGLE CELL  
VOLTAGES ARE AVAILABLE."  
(58/4) (#2)

\*\*\*\*\*

ID: <2810.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:    <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >        PRESSURE TRANSDUCERS FOR REACTANT REGS  
Reference Data:    N/A                    (65/9)  
Description:  
PRSD/FC

STUDY

"INSTALL PRESSURE TRANSDUCERS AT OUTLET OF REACTANT REGULATORS."  
(65/9) (#2)

\*\*\*\*\*

ID: <2811.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:    <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software: <ORBITER                    >        COOLANT ACCUMULATOR INSTRUMENTATION  
Reference Data:    N/A                    (65/10)  
Description:  
PRSD/FC

STUDY

"PROVIDE COOLANT ACCUMULATOR WITH QUANTITY READDUT INSTRUMENTATION."  
(65/10) (#2)

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ID: <2812.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > PURGE VALVE POSITION INDICATORS  
Reference Data: N/A (65/11)  
Description:  
PRSD/FC

STUDY

"PROVIDE INDIVIDUAL POSITION INDICATORS AND COMMENTS TO H2 AND O2 PURGE VALVES"  
(65/11) (#2)

\*\*\*\*\*  
ID: <2813.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > FUEL CELL PH SENSOR  
Reference Data: N/A (58/2)  
Description:  
PRSD/FC

STUDY

"PROVIDE A "SELF CHECK" CIRCUIT IN FUEL CELL PH SENSOR."  
(58/2)

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ID: <2814.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > PYRO SEPARATION SYSTEM  
Reference Data: N/A (60/2)  
Description:  
PYRO

PRIORITY #2

"REDESIGN ORBITER/ET UMBILICAL PYRO SEPARATION SYSTEM TO ELIMINATE POST  
SEPARATION DEBRIS."  
(60/2) (#1)

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ID: <2815.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<ORBITER        >        ORBITER/ET SEPARATION SYSTEM  
Reference Data: N/A  
Description:  
PYRO

PRIORITY #2

"REDESIGN ORBITER/ET UMBILICAL SEPARATION SYSTEM BLAST CONTAINER TO PREVENT  
CABLE HARNESS PREFLIGHT DAMAGE."  
(NEW)

\*\*\*\*\*  
ID: <2816.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<ORBITER        >        RANGE SAFETY SYSTEM  
Reference Data: N/A                    (60/5)  
Description:  
PYRO

PRIORITY #2

"DELETE ET RANGE SAFETY SYSTEM."  
(60/5) (STUDY) PCIN S60042

\*\*\*\*\*  
ID: <2817.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC            >  
Hardware/Software:<ORBITER        >        ORBITER/ET SEPARATION SYSTEM  
Reference Data: N/A  
Description:  
PYRO

PRIORITY #2

"REDESIGN ORBITER/ET AFT STRUCTURAL ATTACH PYRO SEPARATION SYSTEM TO ELIMINATE  
POST SEPARATION DEBRIS."  
(NEW)

\*\*\*\*\*

ID: <2818.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > SRB/HDP SEPARATION SYSTEM  
Reference Data: N/A  
Description:  
PYRO

PRIORITY #2

"REDESIGN SRB/HDP PYRO SEPARATION SYSTEM TO ELIMINATE POST SEPARATION DEBRIS."  
(NEW)

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ID: <2819.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > BLAST CONTAINERS  
Reference Data: N/A (60/1)  
Description:  
PYRO

STUDY

"REDESIGN ET UMBILICAL BLAST CONTAINERS/BASES."  
(60/1) (#2)

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ID: <2820.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > THERMAL BLANKETS  
Reference Data: N/A (60/3)  
Description:  
PYRO

STUDY

"REDESIGN FWD ET ATTACH ASSY THERMAL BLANKET FOR EASE OF INSTALLATION."  
(60/3) (#2)

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ID: <2821.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<ORBITER > LINEAR SHAPE CHARGE  
Reference Data: N/A (60/4)  
Description:  
PYRO

STUDY

"RELOCATE LINEAR SHAPE CHARGE (LSC) FROM CABLE TRAY TO UNDER FOAM INSULATION (SOFI), I.E., SMOOTH TANK CONCEPT. (60/4) (STUDY)

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ID: <2822.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<PV&D > DUCT PROTECTIVE COVERS  
Reference Data: N/A (65/7)  
Description:  
PV&D

STUDY

"PROVIDE FULL SET OF PVD DUCT PROTECTIVE COVERS."  
(65/7) (#2)

\*\*\*\*\*  
ID: <2823.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<PV&D > JUMPER DUCTS  
Reference Data: N/A (65/8)  
Description:  
PV&D

STUDY

"DESIGN A FULL SET OF TEMPORARY PVD JUMPER DUCTS."  
(65/8) (#2)

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ID: <2824.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<PV&D                    >                    DUCT V070-385182-004  
Reference Data:                    N/A                    (65/14)  
Description:  
PV&D

STUDY

"REDESIGN OF DUCT V070-385182-004, LEFT HAND SIDE OF ORBITER. DUE TO HYDRAULIC  
LINE INTERFERENCE, THIS DUCT CANNOT BE REMOVED OR INSTALLED ON OV104 WITHOUT  
CAUSING DAMAGE TO IT."  
(65/14) (#2)

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ID: <2825.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<PV&D                    >                    WCCS DESICCANTS  
Reference Data:                    N/A                    (65/11)  
Description:  
PV&D

STUDY

"PROVIDE AN EXTRA SET OF WCCS DESICCANTS SO THAT THE DESICCANTS CAN BE  
REFURBISHED OFF-LINE TO REDUCE V1076 CRITICAL PATH TIME."  
(65/11) (#2)

\*\*\*\*\*  
ID: <2826.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT                    >  
Location: <ORBTR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<STRUCTURE                    >                    CCTV CAMERAS  
Reference Data:                    N/A                    (57/8)  
Description:  
TPS/STR/MEQ

CATEGORY #1

"BOLT CCTV CAMERAS TO 576 BULKHEAD."  
(57/8)

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ID: <2827.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<TPS > ABLATOR ADHESION  
Reference Data: N/A (68/7)  
Description:  
TPS/STR/MEQ

CATEGORY #1

"REVIEW SRB FORWARD ASSEMBLY ABLATOR ADHESION PERFORMANCE. PAST RECOVERED SRB'S EXHIBITED LOSS OF ABLATOR IN-FLIGHT. THIS LOSS OF SRB ABLATOR IS A POTENTIAL RISK TO THE ORBITER."  
(68/7)

\*\*\*\*\*  
ID: <2828.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <OV102 >  
Hardware/Software:<TPS > BODY FLAP TILES  
Reference Data: N/A (57/1.1)  
Description:  
TPS/STR/MEQ

CATEGORY #2

"UPGRADE OV102 BODY FLAP LOWER OUTBOARD TILES TO OV103/OV104 CONFIGURATION."  
(57/1.1)

\*\*\*\*\*  
ID: <2829.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > ET FERRY DOORS  
Reference Data: N/A (57/6)  
Description:  
TPS/STR/MEQ

CATEGORY #2

"MODIFY ET FERRY DOORS TO ELIMINATE DAMAGE DURING FERRY."  
(57/6)

\*\*\*\*\*

ID: <2830.00>                    Issue(s): DESIGN                    :  
 Issue(s) cont.:                    :                    :  
 Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
 Operation: <FLIGHT                    >  
 Location: <ORBITR>  
 Orb.No/Mission: <GENERIC            >  
 Hardware/Software:<STRUCTURE       >    NLG DOOR  
 Reference Data:    N/A                    (59/12)  
 Description:  
 TPS/STR/MEQ

CATEGORY #2

"NLG DOOR BOOSTER BUNGEE COCKED INDICATION, REDESIGN INDICATOR SWITCH/RIGGING  
 FOR INCREASED RELIABILITY."  
 (59/12)

\*\*\*\*\*  
 ID: <2831.00>                    Issue(s): DESIGN                    :  
 Issue(s) cont.:                    :                    :  
 Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
 Operation: <FLIGHT                    >  
 Location: <ORBITR>  
 Orb.No/Mission: <GENERIC            >  
 Hardware/Software:<TPS               >    THERMAL BARRIER BOND  
 Reference Data:    N/A  
 Description:  
 TPS/STR/MEQ

CATEGORY #2

"ET DOOR THERMAL BARRIER BOND VERIFICATION."  
 (NEW)

\*\*\*\*\*  
 ID: <2832.00>                    Issue(s): DESIGN                    :  
 Issue(s) cont.:                    :                    :  
 Issue Source: <NE-PEO MOD LIST >    (POST 51-L PRELIM. MOD LISTING)  
 Operation: <FLIGHT                    >  
 Location: <ORBITR>  
 Orb.No/Mission: <GENERIC            >  
 Hardware/Software:<STRUCTURE       >    BRAKES  
 Reference Data:    N/A                    (51/5A&B)  
 Description:  
 TPS/STR/MEQ                    CATEGORY #2

BRAKES:

- . A. INCORPORATE PLANNED HARDWARE UPDATES TO ALLEVIATE BRAKE DAMAGE AND RESOLVE BRAKE ISSUES.
- . B. INSTALL BRAKE INSTRUMENTATION ON OTHER VEHICLES. (OV-099 ORBITER WAS ONLY VEHICLE INSTRUMENTED TO OBTAIN BRAKE DATA FOR RESOLVING BRAKE ISSUES AND EVALUATE BRAKES)."

(51/5A&B) PCIN S60035, S60100, & S60103

\*\*\*\*\*



ID: <2836.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > BORON TANK STRUTS  
Reference Data: N/A (58/7)  
Description:  
TPS/STR/MEQ

STUDY

"REPLACE ALL BORON TANK STRUTS WITH TITANIUM STRUTS."  
(58/7) (STUDY)

\*\*\*\*\*  
ID: <2837.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > BORON MIDBODY STRUTS  
Reference Data: N/A (56/23)  
Description:  
TPS/STR/MEQ

STUDY

"SUBSTITUTE MACHINED ALUMINUM STRUTS FOR THE BORON ALUMINUM STRUTS IN MIDBODY ON  
A PERMANENT MOD BASIS AS THE BORON/ALUMINUM STRUTS GET DAMAGED."  
(56/23) (REJECT)

\*\*\*\*\*  
ID: <2838.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > BORON STRUTS  
Reference Data: N/A (56/23)  
Description:  
TPS/STR/MEQ

STUDY

"DEVISE A SYSTEM TO PERFORM FIELD-SITE REPAIRS AND TESTING OF BORON/ALUMINUM  
STRUTS."  
(56/23) (REJECT)

\*\*\*\*\*



ID: <2842.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<TPS > ET DOOR THERMAL BARRIER  
Reference Data: N/A (57/4.1)  
Description:  
TPS/STR/MEQ

STUDY

"DOUBLE COVER ON ET DOOR THERMAL BARRIER."  
(57/4.1) (#2)

\*\*\*\*\*  
ID: <2843.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<TPS > HONEYCOMB  
Reference Data: N/A (57/1)  
Description:  
TPS/STR/MEQ

STUDY

"OMS POD LEADING EDGE - REPLACE GRAPHITE/EPOXY HONEYCOMB CONSTRUCTION TO  
ELIMINATE HEAT INDUCED (STEAM) FAILURES."  
(57/1) (#2)

\*\*\*\*\*  
ID: <2844.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > FORWARD ACCESS  
Reference Data: N/A (57/3)  
Description:  
TPS/STR/MEQ

STUDY

"FORWARD FUSELAGE TOROIDAL ACCESS - PROVIDE ADDITIONAL ACCESS PANELS SUCH THAT  
ADEQUATE ACCESS EXISTS TO INSPECT FOR DAMAGE/CORROSION AT FORWARD FUSELAGE  
INTERIOR SURFACES/CREW MODULE EXTERIOR SURFACES."  
(57/3) (#2)

\*\*\*\*\*





ID: <2848.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > CAPTIVE NUTPLATES  
Reference Data: N/A (59/14)  
Description:  
TPS/STR/MEQ

STUDY

"INACCESSIBLE CAPTIVE NUTPLATES, DEVISE AN UNRESTRICTED REPAIR METHOD TO REPLACE DAMAGED NUTPLATE WITHOUT HAVING TO REMOVE OMS POD OR FRCS."  
(59/14) (#2)

\*\*\*\*\*  
ID: <2849.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > DOOR FRAMES  
Reference Data: N/A (59/16)  
Description:  
TPS/STR/MEQ

STUDY

"50-1/-2 GSE DOOR FRAMES, BEEF-UP SO THAT GSE DOOR PANELS NEED NOT BE INSTALLED DURING HANDLING AND STACKING OPERATIONS."  
(59/16) (#2)

\*\*\*\*\*  
ID: <2850.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > SIDE HATCH MICROSWITCHES  
Reference Data: N/A (59/17)  
Description:  
TPS/STR/MEQ

STUDY

"SIDE HATCH LATCHED MICROSWITCHES, PROVIDE A REDUNDANT MICROSWITCH TO PROVIDE HATCH "LATCHED" INDICATION SHOULD PRIMARY SWITCH FAIL DURING HATCH CLOSURE IN TERMINAL COUNT."  
(59/17) (#2;

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ID: <2851.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBTR>  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<STRUCTURE       >        DOME HEAT SHIELD BLANKETS  
Reference Data:    N/A                    (61/24)  
Description:  
TPS/STR/MEQ

STUDY

"REDESIGN V070-852611 DOME HEAT SHIELD BLANKETS. PRESENT DESIGN REQUIRES REPLACEMENT AFTER 1 OR 2 FLIGHTS."  
(61/24) (#2)

\*\*\*\*\*  
ID: <2852.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBTR>  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<STRUCTURE       >        FERRY KIT  
Reference Data:    N/A                    (63/2)  
Description:  
TPS/STR/MEQ

STUDY

"PROVIDE A REDUNDANT ORBITER FERRY KIT."  
(63/2) (#2)

\*\*\*\*\*  
ID: <2853.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBTR>  
Orb.No/Mission: <GENERIC               >  
Hardware/Software:<STRUCTURE       >        RMS BLANKETS  
Reference Data:    N/A                    (65/1.1)  
Description:  
TPS/STR/MEQ

STUDY

"MODS TO RMS BLANKETS, WHICH WOULD ALLOW THE RING CLAMPS THAT ATTACH THE ARM TO THE STRONGBACK TO BE INSTALLED OR REMOVED WITHOUT REMOVING THE BLANKETS."  
(65/1.1) (#2)

\*\*\*\*\*

ID: <2854.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<STRUCTURE                    >        VENT DOORS  
Reference Data:    N/A                    (65/10.1)  
Description:  
TPS/STR/MEQ

STUDY

"ELIMINATE OR REDESIGN THE ORBITER ASCENT/DESCENT WING RELIEF VENT DOORS TO PREVENT EXCESSIVE WEAR AND TEAR."  
(65/10.1) (#2)

\*\*\*\*\*  
ID: <2855.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<STRUCTURE                    >        CREW MODULE FEED-THRU  
Reference Data:    N/A                    (68/10)  
Description:  
TPS/STR/MEQ

STUDY

"DEDICATE A FEED-THRU PANEL (CREW MODULE) FOR PAYLOADS. (AS PAYLOAD REQUIREMENTS CHANGE ORBITER SYSTEMS NEED TO BE DISTURBED)."  
(68/10) (#2)

\*\*\*\*\*  
ID: <2856.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PED MOD LIST >        (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBITR>  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<STRUCTURE                    >        RESCUE ACCESS AREA  
Reference Data:    N/A                    (51/6)  
Description:  
TPS/STR/MEQ

STUDY

"PROVIDE A QUICK ACCESS CUT-IN-AREA TO ALLOW RESCUE OF ASTRONAUTS FROM THE CREW MODULE. THE CURRENT LOCATION REQUIRES CUTTING THROUGH THE FLIGHT LOCKERS."  
(51/6) (REJECT)

\*\*\*\*\*



ID: <2860.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > SCA  
Reference Data: N/A (63/4)  
Description:  
TPS/STR/MEQ

REJECT

"PROVIDE A SECOND SCA."  
(63/4)

\*\*\*\*\*  
ID: <2861.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > SCA  
Reference Data: N/A (63/5)  
Description:  
TPS/STR/MEQ

REJECT

"PROVIDE SCA IN-FLIGHT REFUELING."  
(63/5)

\*\*\*\*\*  
ID: <2862.00> Issue(s): DESIGN :  
Issue(s) cont.: : :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > MACU  
Reference Data: N/A (65/3)  
Description:  
TPS/STR/MEQ

REJECT

MOD TO THE MACU WHICH WOULD ALLOW THE RECORDING OF JOINT MOTION (TACH, ENCODER,  
FLAGS, ETC.) SO AS TO ESTABLISH A GOOD PASS FAIL CRITERIA AND ALLOW THE  
EXPRACTION OF TREND DATA (GEAR BOX WEAR, CLUTCH BREAKDOWN, BRAKE WEAR, ETC.).  
(MACU IS PART OF RMS TEST GSE AT THE OFF-SITE TEST AREA.)  
(65/3)

\*\*\*\*\*

ORIGINAL PAGE IS  
OF POOR QUALITY

ID: <2863.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software:<STRUCTURE >                    SWITCH GUARDS  
Reference Data: N/A                    (68/1)  
Description:  
TPS/STR/MEQ

REJECT

"ADD ORBITER COCKPIT PANEL SWITCH GUARDS. REF. ESR K11112.  
(68/1) (#2)

\*\*\*\*\*  
ID: <2864.00>                    Issue(s): LOGISTICS/SPARES                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <GENERIC >                    :  
Hardware/Software:<STRUCTURE >                    WINDOW SPARES  
Reference Data: N/A                    (56/27)  
Description:  
TPS/STR/MEQ

REJECT

"PROVIDE WINDOW SPARES."  
(56/27) (#3)

\*\*\*\*\*  
ID: <2865.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >                    :  
Location: <ORBITR>                    :  
Orb.No/Mission: <OV102 >                    :  
Hardware/Software:<STRUCTURE >                    WING SPAR  
Reference Data: N/A                    (57/4)  
Description:  
TPS/STR/MEQ

REJECT

"WING SPAR BEEF-UP (OV102 ONLY) - IMPLEMENT X1191 SPAR BEEF-UP TO SATISFY 6.0  
LOADS ASSESSMENT."  
(57/4) (STUDY)

ID: <2866.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <OV103 >  
Hardware/Software:<STRUCTURE > AFT FUSELAGE BULKHEAD  
Reference Data: N/A (57/5)  
Description:  
TPS/STR/MEQ

REJECT

"AFT FUSELAGE BULKHEAD BEEF-UP (OV103 ONLY) - IMPLEMENT X1307 BULKHEAD MOD TO SATISFY DELTA-P PRESSURE SPIKE."  
(57/5) (STUDY)

\*\*\*\*\*  
ID: <2867.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ORBITR>  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > WING ACCESS  
Reference Data: N/A (59/9)  
Description:  
TPS/STR/MEQ

REJECT

"WING ELEVON ACTUATOR ACCESS, PROVIDE ACCESS PANEL THROUGH WING UPPER SURFACE THAT WOULD PERMIT ACTUATOR REPLACEMENT IN THE VERTICAL WITHOUT HAVING TO DESTACK."  
(59/9) (STUDY)

\*\*\*\*\*  
ID: <2868.00> Issue(s): DESIGN :  
Issue(s) cont.: :  
Issue Source: <NE-PEO MOD LIST > (POST 51-L PRELIM. MOD LISTING)  
Operation: <FLIGHT >  
Location: <ALL > KSC AND VLS  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<STRUCTURE > EXCURSION DATA  
Reference Data: N/A (68/10.1)  
Description:  
TPS/STR/MEQ

REJECT

"DIRECT RIC-DOWNEY TO UPDATE SHUTTLE EXCURSION DATA AFTER SRB JOINT PROBLEM IS CORRECTED TO CONFIRM THAT KSC PAD A & B AND VLS FACILITIES/GSE ARE COMPATIBLE."  
(68/10.1) (STUDY)

\*\*\*\*\*



ID: <2869.00>                    Issue(s): DESIGN                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <NE-PEO MOD LIST >                    (POST 51-L PRELIM. MOD LISTING)  
Operation:    <FLIGHT                    >  
Location:     <ORBITR>  
Orb.No/Mission:   <GENERIC                    >  
Hardware/Software: <STRUCTURE                    >                    ELEVON COVE  
Reference Data:    N/A                    (57/2.1)  
Description:  
TPS/STR/MEQ

APPROVED

"ELEVON COVE FLOW PROBLEMS."  
(57/2.1) (#2) APPROVED PCIN S60090

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ID: <3000.00> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: : :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-39 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

MAINTAINABILITY CHECKLIST (ACCESSIBILITY) 1 OF 3 OK CHG NA  
 1. ACCESSES LOCATED TO FACILITATE MAINTENANCE. -- -- --  
 2. ORBITAL ACCESS CONSIDERS ZERO-G ENVIRONMENT. -- -- --  
 3. ACCESS IS NOT HINDERED BY INSTALLATION. -- -- --  
 4. ACCESSES ALLOW CREW MEMBERS TO SEE WHAT THEY ARE DOING. -- -- --  
 5. VISUAL ACCESS IS PROVIDED WHERE NEEDED. -- -- --  
 6. UNCOVERED ACCESSES EMPLOYED WHEREVER PRACTICAL. -- -- --  
 7. ACCESS SIZE AND SHAPE APPROPRIATE FOR WORK TO BE PERFORMED. -- -- --  
 8. ACCESSES ALLOW FOR VARIOUS TASKS, CLOTHING, ACCESSORIES, TOOLS. -- -- --  
 9. EVA ACCESSES ALLOW FOR OPERATIONS AND ANTHROPOMETRY. -- -- --

\*\*\*\*\*  
 ID: <3000.01> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: : :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-39 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

MAINTAINABILITY CHECKLIST (ACCESSIBILITY) 2 OF 3 OK CHG NA  
 10. FREQUENTLY ACCESSED UNIT ARE ON SLIDES, HINGES, ROLL-OUTS. -- -- --  
 11. DIRECT, QUICK ACCESS IS PROVIDED TO ALL TEST & SERVICE POINTS. -- -- --  
 12. SMALL ACCESSES USE HINGED, SLIDING, QUICK-OPEN PLATES OR CAPS. -- -- --  
 13. MASSIVE ITEMS CAN BE SLID OUT RATHER THAN LIFTED OUT. -- -- --  
 14. ACCESS WILL NOT CUT PERSONNEL, CLOTHING, ETC. -- -- --  
 15. GUARDS AND SHIELDS PROTECT PERSONNEL FROM HIGH VOLTAGES. ETC. -- -- --  
 16. SAFETY INTERLOCKS ARE PROVIDED ON ACCESSES TO ALL HAZARDS. -- -- --  
 17. SWITCHES CAN OVERRIDE INTERLOCKS IF MAINT. REQUIRES UNIT ON. -- -- --  
 18. EACH ACCESS LOCATION UNIQUELY IDENTIFIED FOR INSTRUCTION REF. -- -- --

\*\*\*\*\*  
 ID: <3000.02> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: : :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-40 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

MAINTAINABILITY CHECKLIST (ACCESSIBILITY) 3 OF 3 OK CHG NA  
 19. LABELS IDENTIFY HAZARDS, TEST OR SERVICE POINTS BEHIND  
 . ACCESSES. -- -- --  
 20. LABELS IN FULL VIEW AND APPROPRIATELY PLACED. -- -- --  
 21. LABELS IDENTIFY EQUIPMENT/MATERIAL BEHIND OR USED AT ACCESS. -- -- --  
 22. LABELS ON SMALL ACCESSES SHOW PROPER INSERTION OF TOOLS/SPARES. -- -- --  
 23. ACCESS COVERS AND FASTENERS CONFORM TO PREFERRED TYPES  
 . PRACTICES. -- -- --  
 24. ORU REMOVAL INVOLVES MINIMUM COVERS, FASTENERS, MOUNTS, ETC. -- -- --

\*\*\*\*\*



ID: <3002.00> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: : :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-43 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

- MAINTAINABILITY CHECKLIST (SUPPORT EQUIPMENT) 1 OF 3 OK CHG NA
1. WORK STATIONS AND ACCESSORIES DESIGNED FOR ZERO-G ARE PROVIDED  
 . AS NEEDED. -- --- --
  2. WORK STATIONS INCLUDE STORAGE FOR PATCH CORDS, TESTERS, TOOLS,  
 . MANUALS, SPARES, AND MISCELLANEOUS ITEMS. -- --- --
  3. WORK STATIONS CONTAIN NECESSARY COMMUNICATIONS, VIDED, AND  
 . LIGHTING. -- --- --
  4. EQUIPMENT RESTRAINTS, RACKS AND DRAWERS ARE PROVIDED WHERE  
 . NEEDED. -- --- --
  5. RESTRAINTS ARE COMPATIBLE WITH ACCESSES, SLIDE RAILS, ETC. -- --- --

\*\*\*\*\*

ID: <3002.01> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: : :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-43 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

- MAINTAINABILITY CHECKLIST (SUPPORT EQUIPMENT) 2 OF 3 OK CHG NA
6. WHERE POSSIBLE, RESTRAINTS ARE PART OF BASIC RACK/CONSOLE. -- --- --
  7. RESTRAINTS, HOLDERS, REELS, ETC. ARE BUILT-IN WHEREVER  
 . PRACTICAL. -- --- --
  8. CREW RESTRAINT EYES, HOOKS, PULLEYS, ETC. ARE PROVIDED WHERE  
 . NEEDED. -- --- --
  9. CREW RESTRAINTS, BELTS, CLOTHING, GOGGLES ARE PROVIDED/STORED  
 . WHERE NEEDED. -- --- --
  10. SUPPORT EQUIPMENT IS BUILT-IN OR PORTABLE (IN THAT ORDER). -- --- --

\*\*\*\*\*

ID: <3002.02> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: : :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-43 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

- MAINTAINABILITY CHECKLIST (SUPPORT EQUIPMENT) 3 OF 3 OK CHG NA
11. PORTABLE ITEMS ARE HUMAN ENGINEERED FOR ZERO-G POSTURE AND  
 . ARE EASY TO USE, CARRY, AND STORE. -- --- --
  12. HANDLES, RETAINERS, BUMPERS ARE PROVIDED TO REDUCE HAZARD OF  
 . ACCIDENTAL CONTACT. -- --- --

\*\*\*\*\*

ID: <3003.00> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-44 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software: <N/A >  
 Reference Data: N/A  
 Description:

- MAINTAINABILITY CHECKLIST (TEST EQUIPMENT [TE]) 1 OF 3 OK CHG NA
1. ADEQUATE/STANDARD TE IS PLANNED FOR EACH REQUIRED MEASUREMENT. -- --- --
  2. TE IS DESIGNED AND SHIELDED FOR CONSTANT, ROUGH USE. -- --- --
  3. TE IS SELECTED/PLANNED FOR OPERATIONS; WORKSPACE AND ENVIROMH'T. -- --- --
  4. TE IS BUILT-IN WHERE USE IS HEAVY, ACCESS AND DISPLAYS LIMITED. -- --- --
  5. TE IS FAIL-SAFE; FAILURE IS NOT DANGEROUS TO MAN OR EQUIPMENT. -- --- --
  6. GROUNDS, BREAKERS, AND FUSES PROTECT AGAINST USER ERROR/MISUSE. -- --- --
  7. TE ALLOWS ONE-MAN TROUBLESHOOTING IN FEWEST AND QUICKEST STEPS. -- --- --
  8. TE ALLOWS ACCESS TO INPUTS/OUTPUTS OF EACH RU, MODULE, ETC. -- --- --
  9. SELECTOR SWITCHES ARE PREFERRED TO MANY SEPARATE CONNECTORS. -- --- --
- \*\*\*\*\*

ID: <3003.01> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-44 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software: <N/A >  
 Reference Data: N/A  
 Description:

- MAINTAINABILITY CHECKLIST (TEST EQUIPMENT [TE]) 2 OF 3 OK CHG NA
10. PROBES CAN BE COMFORTABLY HELD; TIPS ENSURE ADEQUATE CONTACT. -- --- --
  11. MAJOR LEADS ARE PERMANENTLY ATTACHED, AND ADEQUATE IN LENGTH. -- --- --
  12. REMOVABLE ADAPTORS ARE PROVIDED AS NEEDED FOR FLEXIBILITY. -- --- --
  13. SIMPLE CHECKS SHOW WHEN TE IS OUT OF CALIBRATION OR IN ERROR. -- --- --
  14. DISPLAYS ARE DIRECT READING; ANY CONVERSION TABLES ARE ON TE. -- --- --
  15. TE IS PLANNED TO SATISFY AS MANY RELATED USES AS POSSIBLE. -- --- --
  16. INSTRUCTIONS ARE PERMANENTLY INSCRIBED IN STEP-BY-STEP FORMAT. -- --- --
  17. INSTRUCTION LANGUAGE IS SIMPLE, IN EASY VIEW AND EASILY READ. -- --- --
  18. INSTRUCTIONS INCLUDE CALIBRATION REQUIREMENTS AND PROCEDURES. -- --- --
- \*\*\*\*\*

ID: <3003.02> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-45 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software: <N/A >  
 Reference Data: N/A  
 Description:

- MAINTAINABILITY CHECKLIST (TEST EQUIPMENT [TE]) 3 OF 3 OK CHG NA
19. THERE IS A LABEL ON EVERY ITEM PERSONNEL MUST USE. -- --- --
  20. LABELS PROVIDE NAME, PURPOSE, LIMITATIONS AND CAUTIONS FOR FOR USER. -- --- --
  21. COLOR CODES RELATE CONTROLS-DISPLAYS AND ALTERNATE SCALES-USES. -- --- --
  22. STORAGE IS ADEQUATE FOR LEADS, PROBES, SPARES, DATA REFERENCES, ETC. -- --- --
  23. STORAGE HOLDERS/FASTENERS ARE PROVIDED, PROPER USE INDICATED. -- --- --
  24. PORTABLE TE IS SELF-POWERED AND BEST SIZE/SHAPE WEIGHT FOR USE. -- --- --
  25. ALL TE IS DESIGNED FOR CONVENIENT STORAGE, TRANSPORT AND REPAIR. -- --- --
- \*\*\*\*\*

ID: <3004.00>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :  
Issue Source: <BOE SS MT PLNG >                    BOEING SPACE STAT MAINT PLNG & ANALYSIS  
Operation: <GENERIC >                    PAGE 1-46 OF D483-50106-1  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <N/A >  
Reference Data: N/A

Description:  
MAINTAINABILITY CHECKLIST (SUBASSEMBLIES) 1 OF 4 OK CHG NA  
1. SUBASSEMBLIES CAN BE R&R WITHOUT DISCONNECTING OR REMOVING  
. OTHER EQUIPMENT AND WITHOUT INTRODUCING A HAZARDOUS CONDITION. -- --- --  
2. SUBASSEMBLIES ARE PACKED WITH THE GREATEST PRACTICAL DENSITY. -- --- --  
3. SUBASSEMBLY DESIGN COMPATIBLE WITH PLANNED DIAGNOSTIC  
. CAPABILITIES. -- --- --  
4. SUBASSEMBLIES ARE TESTED AS UNITS ON GO/NO-GO BASIS FOR  
. MINIMUM ERROR AS PRACTICAL. -- --- --  
5. SUBASSEMBLIES ARE SEALED ONLY IF ASSEMBLY REQUIRES SPECIAL  
. CONDITIONS. -- --- --

\*\*\*\*\*  
ID: <3004.01>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :  
Issue Source: <BOE SS MT PLNG >                    BOEING SPACE STAT MAINT PLNG & ANALYSIS  
Operation: <GENERIC >                    PAGE 1-46 OF D483-50106-1  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <N/A >  
Reference Data: N/A

Description:  
MAINTAINABILITY CHECKLIST (SUBASSEMBLIES) 2 OF 4 OK CHG NA  
6. "IDENTICAL SUBASSEMBLIES" ARE INTERCHANGEABLE WITHOUT  
. REALIGNMENT. -- --- --  
7. LIKE SUBASSEMBLIES WITH DIFFERENT FUNCTIONS ARE NOT  
. INTERCHANGEABLE. -- --- --  
8. PIECE PARTS ARE MOUNTED ON, OR INTEGRAL TO SUBASSEMBLIES. -- --- --  
9. PARTS ARE MOUNTED IN AN ORDERLY ARRAY AND ARE NOT STACKED. -- --- --  
10. ALL PARTS IN A SUBASSEMBLY CONTRIBUTE TO A SINGLE , COMMON  
. FUNCTION. -- --- --  
11. CRITICAL ITEMS OR PARTS SUBJECT TO R&R ARE NOT ENCAPSULATED. -- --- --

\*\*\*\*\*  
ID: <3004.02>                    Issue(s): MAINTAINABILITY                    :  
Issue(s) cont.:                    :  
Issue Source: <BOE SS MT PLNG >                    BOEING SPACE STAT MAINT PLNG & ANALYSIS  
Operation: <GENERIC >                    PAGE 1-46 OF D483-50106-1  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <N/A >  
Reference Data: N/A

Description:  
MAINTAINABILITY CHECKLIST (SUBASSEMBLIES) 3 OF 4 OK CHG NA  
12. IRREGULAR HOSES, WAVEGUIDES, ETC., ARE REMOVABLE BEFORE  
. HANDLING. -- --- --  
13. ALL CONNECTIONS ARE FAILSAFE, AND WILL TOLERATE JUMPER CABLES. -- --- --  
14. A SYSTEM-CONSISTENT COLOR-CODE DISCRIMINATES SIMILAR MODULES. -- --- --  
15. CODES AND LABELS IDENTIFY AND OUTLINE FUNCTIONAL GROUPS OF  
. ITEMS. -- --- --  
16. TEST AND SERVICE POINTS, THEIR VALUES AND LIMITS, ARE LABELED,  
. WHERE PRACTICAL. -- --- --

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ORIGINAL PAGE IS  
OF POOR QUALITY

ID: <3004.03> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
Operation: <GENERIC > PAGE 1-47 OF D483-50106-1  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
MAINTAINABILITY CHECKLIST (SUBASSEMBLIES) 4 OF 4 OK CHG NA  
17. LIFT POINTS ARE INDICATED; CIRCUITS ARE SHOWN ON SEALED NETWORKS. -- --- --  
18. STANDARDIZED, PREFERRED CIRCUITS ARE USED FOR ROUTINE FUNCTIONS. -- --- --

\*\*\*\*\*

ID: <3005.00> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
Operation: <GENERIC > PAGE 1-48 OF D483-50106-1  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
MAINTAINABILITY CHECKLIST (FASTENERS) 1 OF 4 OK CHG NA  
1. A MINIMUM NUMBER AND VARIETY OF STANDARD FASTENERS ARE USED. -- --- --  
2. FASTENERS ARE LARGE, STRONG, DURABLE, AND "FREEZE" PROOF. -- --- --  
3. FASTENERS CAN BE REACHED AND REMOVED WITHOUT OTHER DISASSEMBLY -- --- --  
4. DIFFERENT THREAD TYPES ARE DISCRIMINATELY DIFFERENT IN DIAMETER. -- --- --  
5. STANDARDIZED 7/16" HEX-HEADS ARE USED WHEREVER PRACTICAL TO MINIMIZE TOOLS. -- --- --  
6. LIKE FASTENERS IN DIFFERENT LENGTHS ARE NEVER USED TOGETHER. -- --- --  
7. THE NUMBER OF TURNS TO REMOVE FASTENERS IS MINIMAL (4 OR LESS). -- --- --  
8. ADEQUATE WORKING AND TOOL CLEARANCES SURROUND EACH FASTENER. -- --- --

\*\*\*\*\*  
ID: <3005.01> Issue(s): MAINTAINABILITY :  
Issue(s) cont.: :  
Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
Operation: <GENERIC > PAGE 1-48 OF D483-50106-1  
Location: <ALL >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
MAINTAINABILITY CHECKLIST (FASTENERS) 2 OF 4 OK CHG NA  
9. SPECIAL FASTENERS IN DIFFERENT LENGTHS ARE NEVER USED TOGETHER. -- --- --  
10. STANDARD SIZE, TYPE, TORQUE VALUE CODES ARE ETCHED OR EMBOSSED. -- --- --  
11. FREQUENTLY USED FASTENERS CONTRAST IN COLOR WITH THE SURFACE. -- --- --  
12. REPLACEMENT OF STRIPPED, WORN, DAMAGED FASTENERS IS EASILY ACCOMPLISHED BY HAND AND EMV GLOVE USING COMMON HAND TOOLS -- --- --  
13. COMBINATION HEADS (DEEP SLOT AND HEX) ALLOW ALTERNATE TOOL USE. -- --- --  
14. WINGED NUTS ARE PREFERRED TO KNURLED NUTS; AVOID TAPPED HOLES. -- --- --  
15. CAPTIVE FASTENERS ARE USED WHERE LOOSE ITEMS COULD CREATE PROBLEMS. -- --- --

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ID: <3005.02> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-48 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:  
 MAINTAINABILITY CHECKLIST (FASTENERS) 3 OF 4 OK CHG NA  
 16. WASHERS/SEALS FIT TIGHTLY; ARE DURABLE; USED ONLY IN A FEW  
 . STANDARD SIZES. -- --- --  
 17. RIVETS ARE NOT USED ON ANY PART THAT MAY REQUIRE REMOVAL. -- --- --  
 18. SAFETY WIRING/COTTER KEYS ARE AVOIDED; CAN BE REPLACED IF USED. -- --- --  
 19. CLOSE TOLERANCE FASTENERS ARE AVOIDED. -- --- --  
 20. NUT PLATES ARE EASILY ALIGNED; EACH GANGED NUT IS REPLACEABLE. -- --- --  
 21. RETAINER CHAINS/RINGS PREVENT LOSS OF SMALL ITEMS, HOLD COVERS. -- --- --  
 22. CHAINS ARE LOCATED EXTERNALLY; CAN NOT ENGAGE MOVING GEAR,ETC. -- --- --  
 23. CHAINS ARE NO LONGER THAN NECESSARY; BEAD-LINK CHAIN AVOIDED. -- --- --  
 \*\*\*\*\*

ID: <3005.03> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-49 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:  
 MAINTAINABILITY CHECKLIST (FASTENERS) 4 OF 4 OK CHG NA  
 24. PLUG-INS, HINGES, CATCHES, ETC. REDUCE NUMBER OF FASTENERS  
 . USED. -- --- --  
 25. ZERO-FORCE FASTENERS USED WHERE APPROPRIATE. -- --- --  
 26. PHILLIPS, COMMON & ALLEN HEAD SCREW HEADS ARE AVOIDED. -- --- --

\*\*\*\*\*

ID: <3006.00> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-50 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:  
 MAINTAINABILITY CHECKLIST (CONNECTORS) 1 OF 3 OK CHG NA  
 1. CONNECTORS ARE PROVIDED WHEREVER EQUIPMENT SEPARATION IS LIKELY. -- --- --  
 2. QUICK-DISCONNECT OR PLUG-IN CONNECTORS ARE USED WHERE FEASIBLE. -- --- --  
 3. CONNECTORS ARE VISIBLE, REACHABLE, OPERABLE WITHOUT DISASSEMBLY. -- --- --  
 4. CONNECTORS ARE OPERABLE BY HAND AND EMU GLOVE, REPLACEABLE  
 . WITH COMMON TOOLS. -- --- --  
 5. ADEQUATE WORKSPACE AND TOOL CLEARANCE SURROUNDS EACH CONNECTOR. -- --- --  
 6. CONNECTING AUXILIARY AND MAINTENANCE EQUIPMENT REQUIRES NO  
 . TOOLS. -- --- --  
 7. EACH CONNECTOR CAN BE REMOVED WITHOUT DISTURBING OTHERS. -- --- --  
 \*\*\*\*\*





ID: <3007.01> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-52 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

MAINTAINABILITY CHECKLIST (TEST POINTS (TP'S)) 2 OF 3 OK CHG NA  
 9. SPECIAL TP'S ARE USED ONLY FOR DEPOT MAINTENANCE FUNCTIONS. -- --- --  
 10. TP'S ARE GROUPED ON THE MOST ACCESSIBLE FACE OF EACH UNIT. -- --- --  
 11. TP'S ARE GROUPED WITHIN LIMITS OF NORMAL TEST LEAD LENGTHS. -- --- --  
 12. TP'S ARE ARRANGED IN A LINE/MATRIX REFLECTING TEST SEQUENCE. -- --- --  
 13. TP LOCATION PRECLUDES PROBE DAMAGE TO LINES AND OTHER ITEMS. -- --- --  
 14. FREQUENTLY USED TP'S ARE MOST ACCESSIBLE; ALL ARE VISIBLE. -- --- --  
 15. TROUBLE CAN BE DIAGNOSED WITHOUT REMOVING UNITS OR SUBASSEMB'S. -- --- --  
 16. ADEQUATE WORKSPACE IS PROVIDED ABOUT TP'S FOR PROBES, HANDS. -- --- --  
 17. TP'S WILL SUPPORT PROBES, WHICH NEED NOT BE HELD BY HAND. -- --- --

\*\*\*\*\*

ID: <3007.02> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-53 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

MAINTAINABILITY CHECKLIST (TEST POINTS (TP'S)) 3 OF 3 OK CHG NA  
 18. PROBES, LEADS REQUIRE ONLY FRACTION TURNS FOR ATTACHMENT. -- --- --  
 19. TP'S ARE LABELED WITH WAVE FORM, VOLTAGE, AND TOLERANCES. -- --- --  
 20. TP'S ARE LABELED SEQUENTIALLY AND COLOR CODED TO AID IN . LOCATION. -- --- --  
 21. LUMINESCENT MARKINGS AID TP LOCATION IN LOW ILLUMINATION. -- --- --  
 22. TP ATTACHMENT AND CONSTRUCTION WILL WITHSTAND LONG USE. -- --- --  
 23. TP INSULATION AND CLEARANCES PREVENT SHORTING WITH PROBES. -- --- --

\*\*\*\*\*

ID: <3008.00> Issue(s): MAINTAINABILITY :  
 Issue(s) cont.: :  
 Issue Source: <BOE SS MT PLNG > BOEING SPACE STAT MAINT PLNG & ANALYSIS  
 Operation: <GENERIC > PAGE 1-54 OF D483-50106-1  
 Location: <ALL >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software:<N/A >  
 Reference Data: N/A  
 Description:

MAINTAINABILITY CHECKLIST (BREAKERS & FUSES) 1 OF 2 OK CHG NA  
 1. FUSES OR CIRCUIT BREAKERS PROTECT BOTH SIDES OF THE LINE. -- --- --  
 2. FUSES/CIRCUIT BREAKERS ARE LOCATED/GROUPED FOR EASY INSPECTION. -- --- --  
 3. FUSES/CIRCUIT BREAKERS POSITIVELY INDICATE WHEN BLOWN/TRIPPED. -- --- --  
 4. EASILY RESET CIRCUIT BREAKERS ARE PREFERRED, USUALLY, TO FUSES. -- --- --  
 5. TRIPPED BREAKERS ARE EASILY DETECTED AND RESET FROM FRONT PANELS. -- --- --  
 6. BREAKERS SERVING SAME FUNCTIONS ARE THE SAME SIZE, TYPE, SHAPE. -- --- --  
 7. INSTRUCTIONS FOR CLOSING TRIPPED BREAKERS ARE CLEAR AND STANDARD. -- --- --  
 8. BREAKERS ARE LABELED WITH FUNCTION AND KEY CHARACTERISTICS. -- --- --  
 9. FUSES ARE ON FRONT PANELS AND ARE REPLACEABLE WITHOUT TOOLS. -- --- --

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OF POOR QUALITY

ID: <3100.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <SSME GSE REVIEW >        7/86 TEAM A4 PRES TO STS GSE REV 8D  
Operation:    <GENERIC                    >  
Location:     <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<SSME                    >  
Reference Data:    N/A  
Description:  
DOCUMENTATION SUMMARY

\* BASELINES (B/L)

- . - DO NOT LOGICALLY GROUP GSE PMN'S BY FUNCTION IN MOST CASES
- . - SERVES NO USEFUL PURPOSE FOR ELEMENT CONTRACTOR EQUIPMENT

\*\*\*\*\*

ID: <3101.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <SSME GSE REVIEW >        7/86 TEAM A4 PRES TO STS GSE REV 8D  
Operation:    <GENERIC                    >  
Location:     <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<SSME                    >  
Reference Data:    N/A  
Description:  
DOCUMENTATION SUMMARY

\* PROGRAM MODEL NUMBERS (PMN)

- . - USED FOR CONTROLLING WORK AUTHORIZING DOCUMENTS (WAD'S)
- . - INCONSISTENTLY ASSIGNED BUT GENERALLY ACCURATE.

\*\*\*\*\*

ID: <3102.00>                    Issue(s): REQUIREMENTS                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <SSME GSE REVIEW >        7/86 TEAM A4 PRES TO STS GSE REV 8D  
Operation:    <GENERIC                    >  
Location:     <KSC                    >  
Orb.No/Mission: <GENERIC                    >  
Hardware/Software:<SSME                    >  
Reference Data:    N/A  
Description:  
DOCUMENTATION SUMMARY

\* KENNEDY MODEL NUMBERS (KMN)

- . - REMARKS APPLY TO 7 KMN'S REVIEWED
- . - DO NOT REPRESENT "REAL" HARDWARE
- . - NOT DEFINED BY DRAWING
- . - FICTITIOUS DESIGNATION WHICH IS APPARENTLY USELESS
- . - COULD BE USEFUL FOR SYSTEM ANALYSIS (INSTEAD OF B/L) WHEN MULTIPLE PMN  
MAKE UP AN OVERALL SYSTEM (E.G.: VAB GN2 SYSTEM, PAD LH2 SYSTEM, ETC.)



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OF POOR QUALITY

\*\*\*\*\*  
ID: <3106.00>                    Issue(s): LOGISTICS/SPARES    :  
Issue(s) cont.:                    :  
Issue Source: <SSME GSE REVIEW >    7/86 TEAM A4 PRES TO STS GSE REV BD  
Operation:   <GENERIC            >  
Location:    <KSC                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software: <SSME        >  
Reference Data:    N/A

Description:  
HARDWARE REVIEW SUMMARY  
\* NO NEW CRITICAL SINGLE POINT FAILURES WERE FOUND  
\* STRUCTURAL ITEMS RELY ON PROOF LOAD VERIFICATION FOR HAZARD ELIMINATION  
  . - OMI'S NEED UPDATE  
\* PNEUMATIC SYSTEM GSE DEPENDS ON INTERFACE FILTER AND RELIEF VALVE/GAUGE  
  . CALIBRATION TO CONTROL CONTAMINATION/OVERPRESSURIZATION  
  . - OMI'S NEED UPDATE  
  . - NEW FILTER REQUIRED FOR C70-0908 FLOWMETER USE

(CONTINUED ON 3106.01)

\*\*\*\*\*  
ID: <3106.01>                    Issue(s): LOGISTICS/SPARES    :  
Issue(s) cont.:                    :  
Issue Source: <SSME GSE REVIEW >    7/86 TEAM A4 PRES TO STS GSE REV BD  
Operation:   <GENERIC            >  
Location:    <KSC                >  
Orb.No/Mission: <GENERIC        >  
Hardware/Software: <SSME        >  
Reference Data:    N/A

Description:  
HARDWARE REVIEW SUMMARY  
\* FLIGHT HARDWARE DAMAGE IS LIKELY DUE TO INADEQUATE ACCESS DURING  
  . LRU OPERATIONS  
  . - A70-0663 ENGINE SERVICE PLATFORM  
  . - A70-0885 OPF SWING PLATFORMS  
\* SSME NOZZLE THERMAL PROTECTION INSULATION (TPS) IS DAMAGED BY H70-0568  
  . HORIZONTAL INSTALLER

(CONTINUED FROM 3106.00)

ID: <3901.00> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <102/STS-1 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
STS-1: COLUMBIA  
CREW: JOHN YOUNG AND ROBERT CRIPPEN.  
LAUNCH: APRIL 12, 1981 AT 7 AM  
LANDING: APRIL 14 AT EDWARDS AIR FORCE BASE, CALIF.  
OF NOTE: FIRST SHUTTLE FLIGHT  
FIRST MANNED U.S. FLIGHT IN SIX YEARS

\*\*\*\*\*

ID: <3902.00> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <102/STS-2 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
STS-2: COLUMBIA  
CREW: JOSEPH ENGLE AND RICHARD TRULY  
LAUNCH: NOVEMBER 12, 1981 AT 10:10 AM  
LANDING: NOVEMBER 14 AT EDWARDS AIR FORCE BASE, CALIF. AFTER 36 ORBITS  
OF NOTE: FLIGHT CUT SHORT AFTER FAILURE OF A FUEL CELL

\*\*\*\*\*

ID: <3903.00> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <102/STS-3 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
STS-3: COLUMBIA  
CREW: JACK LOUSMA AND GORDON FULLERTON  
LAUNCH: MARCH 22, 1982 AT 11 AM  
LANDING: MARCH 30 AT WHITE SANDS, N.M., AFTER 129 ORBITS  
OF NOTE: FIRST AND ONLY LANDING AT WHITE SANDS BECAUSE OF WET CONDITIONS  
AT EDWARDS.



ID: <3904.00>                    Issue(s): MISSION                    :

Issue(s) cont.:                    :                    :

Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986

Operation:    <FLIGHT                    >

Location:     <KSC                    >

Orb.No/Mission: <102/STS-4                    >

Hardware/Software:<N/A                    >

Reference Data:    N/A

Description:

STS-4: COLUMBIA

CREW: THOMAS MATTINGLY AND HENRY HARTSFIELD

LAUNCH: JUNE 27, 1982 AT 11 AM

LANDING: JULY 4 AT EDWARDS AFTER 112 ORBITS.

OF NOTE: FIRST LAUNCH WITHOUT A BACKUP TEAM OF ASTRONAUTS.

          FIRST LAUNCH WITHOUT ANY DELAYS IN SCHEDULE.

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ID: <3905.00>                    Issue(s): MISSION                    :

Issue(s) cont.:                    :                    :

Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986

Operation:    <FLIGHT                    >

Location:     <KSC                    >

Orb.No/Mission: <102/STS-5                    >

Hardware/Software:<N/A                    >

Reference Data:    N/A

Description:

STS-5: COLUMBIA

CREW: VANCE BRAND, ROBERT OVERMYER, JOE ALLEN AND WILLIAM LENOIR

LAUNCH: NOVEMBER 11, 1982 AT 7:19 AM.

LANDING: NOVEMBER 16 AT EDWARDS AFTER 81 ORBITS

OF NOTE: FIRST OPERATIONAL MISSION OF THE SHUTTLE TRANSPORTATION SYSTEM.

          FIRST COMMERCIAL SATELLITES LAUNCHED.

          LARGEST CREW TO FLY ABOARD ANY AMERICAN SPACECRAFT TO DATE.

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ID: <3906.00>                    Issue(s): MISSION                    :

Issue(s) cont.:                    :                    :

Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986

Operation:    <FLIGHT                    >

Location:     <KSC                    >

Orb.No/Mission: <099/STS-6                    >

Hardware/Software:<N/A                    >

Reference Data:    N/A

Description:

STS-6: CHALLENGER

CREW: PAUL WEITZ, KAROL BOBKO, DONALD PETERSON AND STORY MUSGRAVE

LAUNCH: APRIL 4, 1983 AT 1:30 PM

LANDING: APRIL 9 AT EDWARDS AFTER 80 ORBITS.

OF NOTE: FIRST CHALLENGER FLIGHT. ENGINE PROBLEMS FORCED LAUNCH TO BE PUSHED

          BACK FROM JANUARY 20.

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ID: <3907.00> Issue(s): MISSION :  
Issue(s) cont.: : :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/STS-7 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
STS-7: CHALLENGER  
CREW: ROBERT CRIPPEN, FRED HAUCK, JOHN FABIAN, SALLY RIDE AND NORMAN THAGARD  
LAUNCH: JUNE 18,1983 AT 7:33 AM  
LANDING: JUNE 24 AT EDWARDS AFTER 97 ORBITS.  
OF NOTE: FIRST AMERICAN WOMAN IN SPACE;  
. LARGEST CREW TO DATE (5);  
. FIRST REFLIGHT OF A SHUTTLE ASTRONAUT (CRIPPEN);  
. FIRST LANDING AT KSC WAVED OFF BECAUSE OF WEATHER.

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ID: <3908.00> Issue(s): MISSION :  
Issue(s) cont.: : :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/STS-8 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
STS-8: CHALLENGER  
CREW: RICHARD TRULY, DANIEL BRANDENSTEIN, DALE GARDNER, GUION BLUFORD  
. AND WILLIAM THORNTON  
LAUNCH: AUGUST 30, 1983 AT 2:30 AM  
LANDING: SEPT. 5 AT EDWARDS AFTER 97 ORBITS  
OF NOTE: FIRST AMERICAN BLACK IN SPACE;  
. FIRST NIGHT LAUNCH AND LANDING

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ID: <3909.00> Issue(s): MISSION :  
Issue(s) cont.: : :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <102/STS-9 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
STS-9: COLUMBIA  
CREW: JOHN YOUNG, BREWSTER SHAW, OWEN GARRIOTT, ROBERT PARKER,  
. BYRON LICHTENBERG AND ULF MERBOLD.  
LAUNCH: NOVEMBER 28, 1983 AT 11 AM.  
LANDING: DEC. 8 AT EDWARDS AFTER 167 ORBITS.  
OF NOTE: FIRST FLIGHT OF NON-ASTRONAUT SCIENTISTS ABOARD THE SHUTTLE  
. (LICHTENBERG AND MERBOLD); FIRST FOREIGNER TO FLY ON THE ORBITER  
. (MERBOLD, REPRESENTING THE EUROPEAN SPACE AGENCY); FIRST SPACELAB  
. MISSION; FIRST SIX-MEMBER CREW; LAUNCH DELAYED A MONTH BECAUSE OF A  
. SUSPECT NOZZLE ON THE RIGHT SOLID ROCKET BOOSTER.

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OF POOR QUALITY

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ID: <3910.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/41-8 >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
41-B: CHALLENGER (STS-11)  
CREW: VANCE BRAND, ROBERT GIBSON, BRUCE MCCANDLESS, ROBERT MCNAIR AND  
. ROBERT STEWART  
LAUNCH: FEB. 3, 1984 AT 8 AM.  
LANDING: FEB. 11 AT KSC AFTER 127 ORBITS.  
OF NOTE: FIRST LANDING OF A SPACECRAFT AT ITS LAUNCH SITE;  
. FIRST UNTETHERED SPACE WALKS;  
. FIRST USE OF "BUCK ROGERS-STYLE" JETPACK;  
. FIRST FLIGHT TO USE NEW MISSION DESIGNATION

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ID: <3911.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/41-C >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
41-C: CHALLENGER (STS-13)  
CREW: ROBERT CRIPPEN, DOCK SCOBEE, GEORGE NELSON, JAMES VAN HOFTEN AND  
. TERRY HART  
LAUNCH: APRIL 6, 1984 AT 8:58 AM.  
LANDING: APRIL 13 AT EDWARDS AFTER 108 ORBITS.  
OF NOTE: FIRST CAPTURE AND IN-FLIGHT REPAIR OF AN AILING SATELLITE (SOLAR MAX);  
. CRIPPENS THIRD SHUTTLE FLIGHT.

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ID: <3912.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <103/41-D >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:  
41-D: DISCOVERY (STS-14)  
CREW: HENRY HARTSFIELD, MICHAEL COATS, JUDY RESNIK, RICHARD MULLANE,  
. STEVEN HAWLEY AND CHARLES WALKER.  
LAUNCH: AUGUST 30, 1984 AT 8:41 AM. LANDING: SEPT. 5 AT EAFB AFTER 97 ORBITS  
OF NOTE: MAIDEN FLIGHT OF DISCOVERY WAS PUSHED BACK FROM JUNE 25 LAUNCH BECAUSE  
. OF COMPUTER PROBLEM AND, ONE DAY LATER, AN ON-PAD ABORT AT T-4 SECONDS  
. BEFORE LIFTOFF BECAUSE OF A FAULTY ENGINE VALVE; FIRST ORBITER TO BE  
. ROLLED OFF THE PAD BACK TO THE VAB FOR REPAIRS; FIRST COMBINATION OF  
. FLIGHTS (41-D & 41-F); FIRST LAUNCH OF 3 SATELLITES FROM CARGO BAY;  
. FIRST FLIGHT OF COMMERCIAL PAYLOAD SCIENTIST (WALKER-MCDONNELL DOUGLAS)

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ID: <3913.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/41-G >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
41-G: CHALLENGER (STS-17)  
CREW: ROBERT CRIPPEN, JON MCBRIDE, DAVID LEESTMA, SALLY RIDE,  
KATHRYN SULLIVAN, PAUL SCULLY-POWER AND MARC GARNEAU  
LAUNCH: OCT. 5, 1984 AT 7:03 AM.  
LANDING: OCT. 13 AT KSC AFTER 133 ORBITS  
OF NOTE: LARGEST CREW TO DATE (7); CRIPPEN'S FOURTH FLIGHT; FIRST FLIGHT WITH  
TWO WOMEN; FIRST WOMAN TO WALK IN SPACE (SULLIVAN); FIRST CANADIAN  
TO FLY (GARNEAU); FIRST IN-ORBIT REFUELING OF A SATELLITE.

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ID: <3914.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <103/51-A >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
51-A: DISCOVERY (STS-19)  
CREW: FRED HAUCK, DAVID WALKER, ANNA FISHER, DALE GARDNER, AND  
JOE ALLEN  
LAUNCH: NOV. 8, 1984 AT 7:15 AM.  
LANDING: NOV. 16 AT KSC AFTER 127 ORBITS  
OF NOTE: FIRST MISSION TO RETRIEVE TWO MALFUNCTIONING SATELLITES AND BRING  
THEM BACK TO EARTH.

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ID: <3915.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :                    :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <103/51-C >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
51-C: DISCOVERY (STS-20)  
CREW: THOMAS MATTINGLY, LOREN SHRIVER, JAMES BUCHLI, ELLISON ONIZUKA AND  
GARY PAYTON.  
LAUNCH: JAN. 24, 1985, AT 2:40 PM.  
LANDING: JAN. 27 AT KSC (CLASSIFIED MISSION- ORBITS UNAVAILABLE  
OF NOTE: LAUNCH DELAYED A DAY BECAUSE OF FREEZING CONDITIONS ON THE PAD; FIRST  
MISSION TOTALLY DEDICATED TO THE DEPARTMENT OF DEFENSE;  
CHALLENGER ORIGINALLY WAS SCHEDULED FOR THIS FLIGHT BUT THERMAL TILE  
PROBLEMS FORCED THE SUBSTITUTION OF DISCOVERY.

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OF POOR QUALITY

ID: <3916.00>            Issue(s): MISSION            :  
Issue(s) cont.:            :            :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <103/51-D >  
Hardware/Software:<N/A >  
Reference Data:        N/A

Description:  
51-D:    DISCOVERY            (STS-23)  
CREW:    KAROL BOBKO, DONALD WILLIAMS, RHEA SEDDON, DAVID GRIGGS,  
         JEFFREY HOFFMAN, CHARLES WALKER, AND US SEN. JAKE GARN, R-UTAH.  
LAUNCH:  APRIL 12, 1985, AT 8:59 AM. (FOURTH ANNIVERSARY FIRST SHUTTLE FLIGHT)  
LANDING: APRIL 19 AT KSC AFTER 110 ORBITS.  
OF NOTE: FIRST FLIGHT OF A CONGRESSIONAL OBSERVER;  
         MISSION EXTENDED TWO DAYS SO ASTRONAUTS COULD USE "FLYSWATTER"  
         ATTACHMENT TO FIX A SATELLITE THAT FAILED TO ACTIVATE AFTER DEPLOYMENT  
         A TIRE BLEW ON LANDING.

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ID: <3917.00>            Issue(s): MISSION            :  
Issue(s) cont.:            :            :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/51-8 >  
Hardware/Software:<N/A >  
Reference Data:        N/A

Description:  
51-B:    CHALLENGER            (STS-24)  
CREW:    ROBERT OVERMYER, FREDRICK GREGORY, DON LIND, NORMAN THAGARD,  
         WILLIAM THORTON, LODEWIJK VAN DEN BERG AND TAYLOR WANG.  
LAUNCH:  APRIL 29, 1985, AT 12:02 PM.  
LANDING: MAY 6 AT EDWARDS AFTER 111 ORBITS.  
OF NOTE: FIRST OPERATIONAL USE OF ESA'S SPACELAB;  
         FIRST MISSION WHERE ANIMALS WERE FLOWN;  
         QUICKEST BACK-TO-BACK LAUNCHES (17 DAYS);  
         FIRST LAUNCH IN THE SAME MONTH AND YEAR AS ANOTHER

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ID: <3918.00>            Issue(s): MISSION            :  
Issue(s) cont.:            :            :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <103/51-G >  
Hardware/Software:<N/A >  
Reference Data:        N/A

Description:  
51-G:    DISCOVERY            (STS-25)  
CREW:    DANIEL BRANDENSTEIN, JOHN CREIGHTON, SHANNON LUCID, STEVEN NAGEL,  
         JOHN FABIAN, PATRICK BAUDRY AND SULTAN AL-SAUD.  
LAUNCH:  JUNE 17, 1985 AT 7:33 AM.  
LANDING: JUNE 24 AT EDWARDS AFTER 112 ORBITS.  
OF NOTE: FIRST ARABIAN NATIONAL TO FLY (AL-SAUD);  
         DEPLOYMENT OF THREE SATELLITES.

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ID: <3919.00> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/51-F >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
51-F: CHALLENGER (STS-26)  
CREW: GORDON FULLERTON, ROY BRIDGES, STORY MUSGRAVE, ANTHONY ENGLAND,  
KARL HENIZE, LOREN ACTON AND JOHN-DAVID BARTOE.  
LAUNCH: JULY 29, 1985 AT 5 PM.  
LANDING: AUG. 6 AT EDWARDS AFTER 126 ORBITS.  
OF NOTE: FIRST ABORT TO ORBIT DECLARED WHEN NO. 1 ENGINE SHUT DOWN PREMATURELY  
BECAUSE OF FAILED SENSORS;  
LAUNCH ABORTED ON JULY 12 AT T-3 SECONDS BECAUSE OF FAILURE OF NO. 2  
ENGINE COOLANT VALVE;  
SPACELAB 2 ABOARD

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ID: <3920.00> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <103/51-I >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
51-I: DISCOVERY (STS-27)  
CREW: JOE ENGLE, RICHARD COVEY, JAMES VAN HOFTEN, JOHN LOUNGE AND  
WILLIAM FISHER.  
LAUNCH: AUGUST 27, 1985 AT 6:58 AM.  
LANDING: SEPT. 3 AT EDWARDS AFTER 112 ORBITS.  
OF NOTE: TWO LAUNCH SCRUBS - FIRST BECAUSE OF WEATHER AT T-5 MIN., SECOND AT  
T-9 MIN. BECAUSE OF FAULTY ONBOARD COMPUTER  
THREE SATELLITES DEPLOYED.

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ID: <3921.00> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <104/51-J >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
51-J: ATLANTIS (STS-28)  
CREW: KAROL BOBKO, RONALD GRABE, ROBERT STEWART, DAVID HILMERS AND  
WILLIAM PAILES.  
LAUNCH: OCT. 3, 1985 AT 11:15 AM.  
LANDING: OCT. 7 AT EDWARDS (MISSION CLASSIFIED - ORBITS UNAVAILABLE).  
OF NOTE: FIRST LAUNCH OF ATLANTIS;  
FIRST TIME ORBITER LAUNCHED ON MAIDEN FLIGHT WITHOUT DELAYS;  
DEPARTMENT OF DEFENSE MISSION.

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ID: <3922.00> Issue(s): MISSION :  
Issue(s) cont.: : :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/61-A >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
61-A: CHALLENGER (STS-30)  
CREW: HENRY HARTSFIELD, STEVEN MAGEL, JAMES BUCHLI, GUYON BLUFORD,  
. BONNIE DUNBAR, WUBBO OCKELS, RIENHARD FURRER AND ERNST MESSERSCHMID.  
LAUNCH: OCT. 30, 1985 AT NOON.  
LANDING: NOV. 6 AT EDWARDS AFTER 112 ORBITS.  
OF NOTE: FIRST MISSION TO HAVE SCIENTIFIC ANGLE HANDLED BY ANOTHER COUNTRY  
. (GERMANY'S SPACELAB);  
. LARGEST CREW TO DATE (8).

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ID: <3923.00> Issue(s): MISSION :  
Issue(s) cont.: : :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <104/61-8 >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
61-8: ATLANTIS (STS-31)  
CREW: BREWSTER SHAW, BRYAN O'CONNOR, MARY CLEAVE, SHERWOOD SPRING,  
. JERRY ROSS, RODOLFO NERI VELA AND CHARLES WALKER.  
LAUNCH: NOV. 26, 1985 AT 7:29 PM.  
LANDING: DEC. 3 AT EDWARDS AFTER 108 ORBITS.  
OF NOTE: FIRST MEXICAN NATIONAL IN SPACE (NERI VELA);  
. FIRST SPACE CONSTRUCTION CREW;  
. SECOND NIGHT LAUNCH.

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ID: <3924.00> Issue(s): MISSION :  
Issue(s) cont.: : :  
Issue Source: <FLORIDA TODAY > NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <102/61-C >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
61-C: COLUMBIA (STS-32)  
CREW: ROBERT GIBSON, CHARLES BOLDEN, FRANKLIN CHANG-DIAZ, STEVEN HAWLEY,  
. GEORGE NELSON, ROBERT CENKER AND US REP. BILL NELSON OF MELBOURNE,FLA.  
LAUNCH: JAN. 12, 1986, AT 6:55 AM.  
LANDING: JAN. 18 AT EDWARDS.  
OF NOTE: FIRST LAUNCH OF COLUMBIA AFTER REFURBISHMENT IN CALIFORNIA;  
. LAUNCH DELAYED A RECORD SEVEN TIMES BECAUSE OF A COMBINATION OF  
. WEATHER AND ENGINE PROBLEMS;  
. DELAYED LANDING TWO DAYS IN AN ATTEMPT TO LAND AT KSC TO TEST NEW  
. NOSEGEAR STEERING SYSTEM.

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ID: <3925.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :  
Issue Source: <FLORIDA TODAY >        NEWSPAPER ARTICLE DATED APRIL 12, 1986  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <099/51-L >  
Hardware/Software:<N/A >  
Reference Data:    N/A

Description:  
51-L:    CHALLENGER                (STS-33)  
CREW:    DICK SCOBEE, MIKE SMITH, JUDY RESNIK, RONALD MCNAIR, ELLISON ONIZUKA,  
          GREGORY JARVIS AND "TEACHERNAUT" CHRISTA MCAULIFFE.  
LAUNCH:  JAN. 28, 1986 AT 11:38 AM. THE SHUTTLE EXPLODED 74 SECONDS INTO  
          FLIGHT, KILLING ALL SEVEN MEMBERS OF THE CREW.

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ID: <3926.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :  
Issue Source: <NASA HQ >            NATIONAL SPACE TRANSPORTATION MANIFEST  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <ALL >  
Hardware/Software:<N/A >  
Reference Data:    N/A

Description:                    1988 SHUTTLE MANIFEST

FLIGHT DATE	ORBITER	PAYLOAD
26 FEB 18	DISCOVERY	TDRS-C
27 MAY 26	ATLANTIS	DOD
28 JULY 28	COLUMBIA	DOD
29 SEPT. 22	DISCOVERY	TDRS-D
30 NOV. 17	ATLANTIS	SPACE TELESCOPE

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ID: <3927.00>                    Issue(s): MISSION                    :  
Issue(s) cont.:                    :  
Issue Source: <NASA HQ >            NATIONAL SPACE TRANSPORTATION MANIFEST  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <ALL >  
Hardware/Software:<N/A >  
Reference Data:    N/A

Description:                    1989 SHUTTLE MANIFEST

FLIGHT DATE	ORBITER	PAYLOAD
31 JAN. 19	COLUMBIA	ASTRO-1
32 MAR. 2	DISCOVERY	DOD
33 APR. 25	ATLANTIS	MAGELLAN
34 JUN. 2	DISCOVERY	DOD SPACELAB
35 JUN. 21	COLUMBIA	GPS-1, GPS-2, MSL-3
36 JUL. 20	ATLANTIS	DOD
37 SEPT. 1	DISCOVERY	DOD

----(CONTINUED ON 3927.01)----

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ID: <3927.01> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <NASA HQ > NATIONAL SPACE TRANSPORTATION MANIFEST  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <ALL >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:

1989 SHUTTLE MANIFEST ----(CONT. FROM 3927)----  
FLIGHT DATE ORBITER PAYLOAD  
38 SEPT. 21 COLUMBIA GPS-3, GPS-4, MSL-4  
39 NOV. 1 ATLANTIS PLANETARY OPPORTUNITY  
40 DEC. 7 DISCOVERY SPACE LIFE SCIENCES LAB-1

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ID: <3928.00> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <NASA HQ > NATIONAL SPACE TRANSPORTATION MANIFEST  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <ALL >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:

1990 SHUTTLE MANIFEST ----(CONTINUED ON 3928.01)----  
FLIGHT DATE ORBITER PAYLOAD  
41 JAN. 18 COLUMBIA GAMMA RAY OBSERVATORY  
42 FEB. 15 ATLANTIS DOD  
43 APR. 20 DISCOVERY INTERNATIONAL MICROGRAVITY LAB-1  
44 MAY 4 COLUMBIA GPS-5, PATHFINDER, EOS-1, SHARE  
45 MAY 31 ATLANTIS DOD  
46 JULY 12 DISCOVERY DOD  
47 JUL. 26 COMUMBIA GPS-6, SKYNET-4, MSL-5

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ID: <3928.01> Issue(s): MISSION :  
Issue(s) cont.: :  
Issue Source: <NASA HQ > NATIONAL SPACE TRANSPORTATION MANIFEST  
Operation: <FLIGHT >  
Location: <KSC >  
Orb.No/Mission: <ALL >  
Hardware/Software:<N/A >  
Reference Data: N/A  
Description:

1990 SHUTTLE MANIFEST ----(CONT. FROM 3928)----  
FLIGHT DATE ORBITER PAYLOAD  
48 AUG. 31 ATLANTIS DOD  
49 OCT. 5 DISCOVERY PLANETARY OPPORTUNITY  
50 OCT. 25 COLUMBIA GPS-7, INSAT-1D, TETHERED SATELLITE  
SYSTEM-1  
51 NOV. 15 ATLANTIS LDEF RETRIEVAL, CONTROL OF FLEXIBLE  
STRUCTURES-1

\*\*\*\*\*

ID: <4100.00> Issue(s): PLANNING :  
 Issue(s) cont.: :  
 Issue Source: <KSC GO-MPO > NOX WILEY OCT '85  
 Operation: <SCHEDULING > FACTORS AFFECTING LAUNCH RATE  
 Location: <KSC >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software: <N/A >  
 Reference Data: N/A

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 OF POOR QUALITY

Description:  
 -----FACTORS WHICH AFFECT LAUNCH RATE INCLUDE-----  
 \* GROUND TURNAROUND TIME \* WEATHER EFFECTS  
 \* GND PROCESSING ANOMALIES(SERIAL HITS) \* NON-KSC LANDINGS  
 \* MISSION DURATION \* VAFB/KSC ORBITER TRANSFERS  
 \* GND PROCESSING M/P & SHIFTING \* MAJOR FLT OR GND HDWRE/SOFTW PROBLEMS  
 \* ORBITER MODIFICATIONS \* LOGISTICS/SPARES AVAILABILITY  
 \* ORBITER "OUT OF SERVICE" TIME \* ORBITER FLEET SIZE  
 \* LAUNCH WINDOWS \* FACILITIES AVAILABILITY

\*\*\*\*\*

ID: <4101.00> Issue(s): PLANNING : EFFICIENCY  
 Issue(s) cont.: COST/MANHOURS : TIME/CYCLE : MAINTAINABILITY  
 Issue Source: <KSC GO-MPO > NOX WILEY OCT '85  
 Operation: <SCHEDULING >  
 Location: <KSC >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software: <N/A >  
 Reference Data: N/A

Description:  
 -----FACTORS AFFECTING ABILITY TO REDUCE TURNAROUND TIME-----  
 \* ADDITIONAL STANDARD WORK REQUIREMENTS  
 \* NON STANDARD WORK REQUIREMENTS (DEFERRED WORK, UNPLANNED WORK, NON-STD TASKS)  
 \* ORBITER MODIFICATION REQUIREMENTS  
 \* LOGISTICS SPARES AVAILABILITY/CANNIBALIZATION  
 \* TIME CYCLE MAINTENANCE REQ. (STRUCT INSP, SSME/PUMP R/R, 5/10/15TH FLT REQ)  
 \* WORK REQ DUE TO MISSION PERFORM. LIMITATIONS (R/R RMS, TANK SETS, GALLEY,ETC)  
 \* GROUND PROCESSING MANPOWER AND SHIFTING  
 \* GSE/FACILITY DOWN-TIME FOR PERIODIC MAINTENANCE

\*\*\*\*\*

ID: <4102.00> Issue(s): EFFICIENCY : PLANNING  
 Issue(s) cont.: CANNIBALIZATION : PAPERWORK : REQUIREMENTS  
 Issue Source: <KSC GO-MPO > NOX WILEY -- OCT '85  
 Operation: <SCHEDULING >  
 Location: <KSC >  
 Orb.No/Mission: <GENERIC >  
 Hardware/Software: <N/A >  
 Reference Data: N/A

Description:  
 -----NEAR TERM TURNAROUND REDUCTION PLANS-----  
 \*\* TARGET -- REDUCE TURNAROUND TO 35 DAYS  
 \*\* PROCESS -- PROCESSING REQUIREMENTS REDUCTION  
 \* ELIMINATE ALL BUT MANDATORY TESTING (INCLUDING CONFIDENCE TYPE TESTING)  
 \* REDUCE TEST REQUIREMENTS (OMRSD) \* REDUCE NUMBER OF LRU REPLACEMENTS  
 \* REDUCE NUMBER OF LRU REPLACEMENTS \* REDUCE CANNIBALIZATION  
 \* REDUCE MODIFICATIONS  
 \* REDUCE/ELIMINATE ELECTRICAL CONNECTOR RETEST  
 -- PRODUCTIVITY IMPROVEMENTS: \* STREAMLINE WORK CONTROL SYS \* AUTOMATE/REDUCE  
 PAPERWORK TRANSACTIONS \*OPTIMIZE 2ND/3RD SHIFT WORK \*SPARES AVAILABILITY

ID: <4103.00>                    Issue(s): PLANNING                    : DESIGN  
 Issue(s) cont.: EFFICIENCY                    :                    :  
 Issue Source: <KSC GO-MPD                    >                    NOX WILEY -- OCT '85  
 Operation: <SCHEDULING                    >  
 Location: <KSC                    >  
 Orb.No/Mission: <GENERIC                    >  
 Hardware/Software:<N/A                    >  
 Reference Data:    N/A  
 Description:

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-----LONGER TERM TURNAROUND REDUCTION PLANS-----  
 \*\* GOAL -- REDUCE TURNAROUND TO 28 DAYS  
 \*\*PROCESS -- \* HARDWARE MATURITY LEADING TO LESS PROBLEMS AND MORE CONFIDENCE  
   . IN FLIGHT SYSTEM INTEGRITY IS KEY.  
   . \* HARDWARE IMPROVEMENTS: \* UPGRADE SSME DESIGN & MATERIALS TO REDUCE MT/  
   . INSPECTION/TESTING \* IMPROVE CARGO BAY RECONFIGURATION HARDWARE (MECH &  
   . ELECT) \* TPS IMPROVEMENTS \* LRU RELIABILITY IMPROVEMENTS  
   . \* PRIORITIZE TURNAROUND ENHANCEMENT PROGRAM EFFORTS  
   . \* FURTHER IMPROVE PRODUCTIVITY  
   . \* FURTHER REDUCE PROCESSING REQUIREMENTS  
 \*\*\*\*\*

ID: <4104.00>                    Issue(s): PLANNING                    :  
 Issue(s) cont.:                    :                    :  
 Issue Source: <KSC GO-MPD                    >                    NOX WILEY -- OCT '85  
 Operation: <SCHEDULING                    >  
 Location: <KSC                    >  
 Orb.No/Mission: <GENERIC                    >  
 Hardware/Software:<N/A                    >  
 Reference Data:    N/A  
 Description:

-----SHUTTLE TURNAROUND CONCLUSIONS-----  
 1. ORBITER IS THE MAJOR PACING ELEMENT IN ESTABLISHING KSC LAUNCH RATE.  
   . SSME'S ARE MAJOR PACING SUBSYSTEM IN THE ORBITER  
 2. REDUCTION OF ORBITER PROCESSING TIME IN THE OPF IS THE DRIVER TO ACHIEVING  
   . HIGHER FLIGHT RATES  
 3. CURRENT CAPABILITY (LONGER FLOWS) MAY BE ABLE TO ACCOMODATE INCREMENTALLY  
   . PERFORMED STRUCTURAL INSPECTIONS WHEREAS SHORTER PROCESSING TIME WILL RE-  
   . QUIRE BLOCK MOD CONCEPT  
 4. PERIODIC USE OF THE 4TH ORB AT KSC, WHILE ONE ORB IS IN POWER-DOWN MOD/MT  
   . PERIOD(OMRF) PROVIDES SAME CAP AS SUCCESS ORIENT CAP WITH 3 ORB-----  
 \*\*\*\*\*

ID: <4105.00>                    Issue(s): PLANNING                    :  
 Issue(s) cont.:                    :                    :  
 Issue Source: <KSC GO-MPD                    >                    NOX WILEY -- OCT '85  
 Operation: <SCHEDULING                    >  
 Location: <KSC                    >  
 Orb.No/Mission: <GENERIC                    >  
 Hardware/Software:<N/A                    >  
 Reference Data:    N/A  
 Description:

-----SHUTTLE TURNAROUND -- SUMMARY-----  
 \* KSC CURRENT CAPABILITY CAN SUPPORT 15 TO 18 LAUNCHES PER YEAR USING 6/3 AND  
   . 7/3 SHIFTING RESPECTIVELY -- WITH CONTINGENCY  
 \* KSC CAN SUPPORT 20 LAUNCHES PER YEAR BASED ON PROJECTED TURNAROUND IMPROVE-  
   . MENTS & ENHANCEMENTS  
 \* 20 KSC LAUNCHES PER YEAR CAPABILITY IS NOT REQUIRED UNTIL FY'89 PER POP 85-2  
   . GUIDELINES    \* ACHIEVEMENT OF REDUCED OPF PROCESSING TIME REQUIRES CONTIN-  
   . UING TURNAROUND ENHANCEMENT EFFORTS PROGRAM-WIDE    \* POTENTIAL TIME/CYCLE  
   . (PERIODIC) MAINTENANCE REQ (ESPECIALLY STRUCTURAL INSPECTIONS) COULD BE THE  
   . MAJOR OBSTACLE TO REDUCING ORBITER/OPF PROCESSING TIME  
 .....

\*\*\*\*\*

ID: <4106.00> Issue(s): CONSTRAINTS : DESIGN CRITERIA  
Issue(s) cont.: :  
Issue Source: <KSC GO-MPO > NOX WILEY -- OCT '85  
Operation: <SCHEDULING >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <N/A >  
Reference Data: N/A

Description:  
-----GROUND TESTING AND CHECKOUT PHILOSOPHIES-----  
\* VEHICLE ASSEMBLY AND CHECKOUT, MOVEMENT WITHIN THE LAUNCH SITE, LAUNCH,  
. LANDING AND/OR RECOVERY SHALL NOT BE CONSTRAINED BY WEATHER/ELEMENTS.  
  
\* MINIMIZE ALL EXTERNAL INTERFACES (PURGES, COOLING, POWER, GSE, AGE, ETC)  
  
\* MINIMIZE STORAGE REQUIREMENTS (ENVIRONMENTAL CONTROL, CLEANLINESS,  
. EXTERNAL INTERFACES.)

\*\*\*\*\*

ID: <4107.00> Issue(s): DESIGN CRITERIA : CONSTRAINTS  
Issue(s) cont.: :  
Issue Source: <KSC GO-MPO > NOX WILEY -- OCT '85  
Operation: <SCHEDULING >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <N/A >  
Reference Data: N/A

Description:  
-----GROUND TESTING AND CHECKOUT PHILOSOPHIES-----  
  
\* DESIGN HARDWARE SO THAT SINGLE SYSTEMS/SUBSYSTEMS/COMPONENTS THAT FAIL SHALL  
. NOT RESULT IN TESTING OR LAUNCH DELAYS.  
. + USE COMMERCIAL AIRCRAFT PHILOSOPHY WHICH ALLOWS FLIGHT BASED ON FUNCT-  
. IONAL REDUNDANT SYSTEMS.  
. + DEVELOP LAUNCH COMMIT CRITERIA PARALLEL WITH SYSTEM DESIGN WHICH WILL  
. ALLOW MINIMAL TESTING OR LAUNCH DELAYS.  
. + DEVELOP COMMON SENSE MISSION RULES BASED ON REDUNDANT HARDWARE DESIGN.

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ID: <4108.00> Issue(s): CONSTRAINTS : DESIGN CRITERIA  
Issue(s) cont.: :  
Issue Source: <KSC GO-MPO > NOX WILEY -- OCT '85  
Operation: <SCHEDULING >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software: <N/A >  
Reference Data: N/A

Description:  
-----GROUND TESTING AND CHECKOUT PHILOSOPHIES-----  
\* VEHICLE ELEMENTS SHALL BE EASILY TRANSPORTABLE BETWEEN LAUNCH SITE FACILITIES  
. + USE CONVENTIONAL METHODS (ROAD, RAIL, WATER, AIR).  
. + MINIMIZE GSE, EXTERNAL INTERFACES, SUPPORT, ETC.  
\* IF THE VEHICLE IS RECOVERABLE, DO NOT CONSTRAIN RECOVERY LOCATIONS BY VEHICLE  
. DESIGN.  
. + DO NOT CONSTRAIN CONTINGENCY LANDING/RECOVERY SITE LOCATIONS. + MINIMIZE  
. ALL EXTERNAL SUPPORT REQUIRED AT SITES. + MINIMIZE PERSONNEL/RESOURCES AT  
. SITES. + DESIGN RECOVERABLE HWRE/VEHICLES TO BE SELF SUPPORTING. + RECOVER  
. AS MUCH OF THE VEHICLE ELEMENTS AS POSSIBLE AT OR NEAR THE LAUNCH SITES.

\*\*\*\*\*

ID: <4109.00> Issue(s): DESIGN CRITERIA : STANDARDS  
Issue(s) cont.: :  
Issue Source: <KSC GO-MPO > NOX WILEY -- OCT '85  
Operation: <SCHEDULING >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

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Description:  
-----GROUND TESTING AND CHECKOUT PHILOSOPHIES-----  
\* DESIGN FOR MAINTAINABILITY AND TURNAROUND EFFICIENCY WITH RESPECT TO:  
. + LRU REPLACEMENT + SYSTEM RETEST  
. + SYSTEM RESERVICING/REFUELING  
\* STANDARDIZE ALL GSE/AGE AT ALL LOCATIONS.  
. + SINGLE DESIGN  
. + COMPATIBLE STANDARDS/SPECIFICATIONS  
. + ACHIEVE NASA/DOD COMPATIBILITY/COMPROMISE  
. + PROCURE INDIVIDUAL ITEMS FROM COMMON SOURCE  
. + DEVELOP COMMON PROCEDURES  
\*\*\*\*\*

ID: <4110.00> Issue(s): STANDARDS : INTERFACE  
Issue(s) cont.: DESIGN CRITERIA :  
Issue Source: <KSC GO-MPO > NOX WILEY -- OCT '85  
Operation: <SCHEDULING >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
-----GROUND TESTING AND CHECKOUT PHILOSOPHIES-----  
\* AVOID DESIGNING TO THE STATE-OF-THE-ART.  
. + DRIVES COST UP + COMPLICATES CHECKOUT & LAUNCH OPERATIONS  
. + UTILIZE PROVEN DESIGN/HARDWARE  
. + STRESS RELIABILITY/MAINTAINABILITY  
. + DO NOT COMPROMISE VEH SYSTEM DESIGN TO EFFECT MAX PAYLOAD ENHANCEMENT  
\* STANDARDIZE VEHICLE/SYSTEM PROPELLANTS, FLUIDS, AND CONSUMABLES.  
\* MINIMIZE INTERFACES BETWEEN LAUNCH VEHICLES AND GROUND SUPPORT SYSTEMS.  
\* DESIGN FOR SERVICING PRIOR TO MOVING VEHICLES TO LAUNCH PAD WHERE POSSIBLE.  
\*\*\*\*\*

ID: <4111.00> Issue(s): DESIGN CRITERIA : INTERFACE  
Issue(s) cont.: STANDARDS :  
Issue Source: <KSC GO-MPO > NOX WILEY -- OCT '85  
Operation: <SCHEDULING >  
Location: <KSC >  
Orb.No/Mission: <GENERIC >  
Hardware/Software:<N/A >  
Reference Data: N/A

Description:  
-----GROUND TESTING AND CHECKOUT PHILOSOPHIES-----  
\* DESIGN FOR NO DESERVICING DURING TURNAROUND.  
\* ACCOMODATIONS FOR PAYLOADS/CARGOS SHALL BE DESIGNED FOR EASE OF INSTALLATION  
. ,REMOVAL, AND INTERFACE VERIFICATION.  
\* SIMPLIFY, MINIMIZE, AND STANDARDIZE INTERFACE REQUIREMENTS BETWEEN PAYLOADS/  
. CARGOS AND LAUNCH VEHICLES.  
\* SIMPLIFY MISSION TO MISSION CARGO BAY RECONFIGURATION REQUIREMENTS.  
. + PROVIDE VARIOUS ATTACHMENT LOCATIONS. + PROVIDE MULTIPLE INTERFACE  
. + FLY SCAR WT IN PANELS/CABLES/FLUID PANELS/CONNECTION LOCATIONS.  
. CONNECTIONS & ATTACH FITTINGS TO REDUCE TURNAROUND RECONFIGURATION REQ.

\*\*\*\*\*

ID: <4112.00> Issue(s): DESIGN CRITERIA : REQUIREMENTS

Issue(s) cont.: : :  
( Issue Source: <KSC GO-MPO > NOX WILEY -- OCT '85

Operation: <SCHEDULING >

Location: <KSC >

Orb.No/Mission: <GENERIC >

Hardware/Software:<N/A >

Reference Data: N/A

Description:

-----GROUND TESTING AND CHECKOUT PHILOSOPHIES-----

- \* MINIMIZE REQUIREMENT FOR REDUNDANT TESTING.
- \* MAXIMIZE ON-BOARD CHECKOUT/FAULT ISOLATION CAPABILITY.
- \* VEHICLE DESIGN VERIFICATION TESTING SHOULD NOT BE IMPOSED ON THE LAUNCH SITE.
- \* MINIMIZE REQ FOR VEHICLE ROUTINE MAINTENANCE, REFURBISHMENT, & INSPECTION.
- \* MINIMIZE MISSION-TO-MISSION RETEST. SUCCESSFUL SYSTEM OPERATION ON LAST FLT . SUFFICIENT TEST TO VERIFY FLIGHT READINESS FOR NEXT FLIGHT FOR THAT SYSTEM . IF THE SYSTEM HAS NOT BEEN DISTURBED DURING GROUND TURNAROUND.
- \* THERMAL PROTECTION SYSTEM SHALL BE DURABLE AND REUSABLE AND EASILY INSTALLED, . INSPECTED, REPAIRED, AND REPLACED.

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