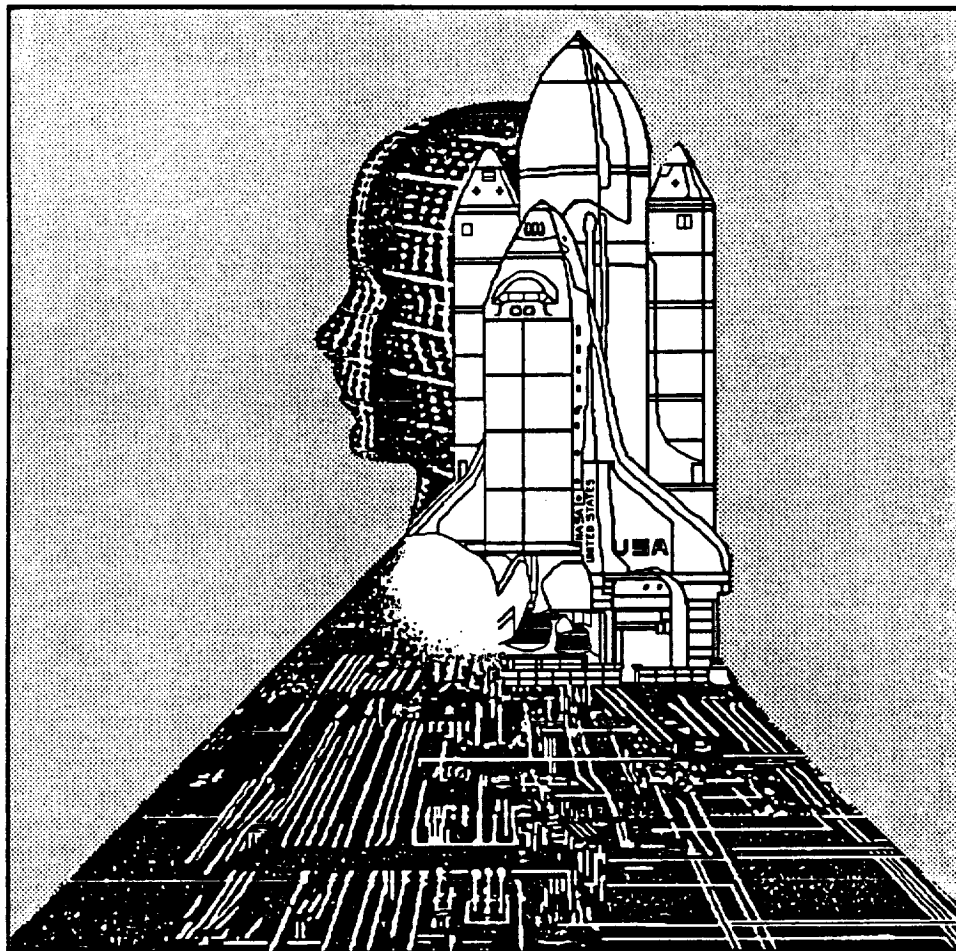


Shuttle Ground Operations Efficiencies/Technologies Study

BOEING

AEROSPACE OPERATIONS



TECHNICAL INFORMATION SHEETS (TIS)
VOLUME 5 of 5

FINAL REPORT - Phase 1

KENNEDY SPACE CENTER

NAS10-11344

May 4, 1987

(NASA-CR-180585) SHUTTLE GROUND OPERATIONS
EFFICIENCIES/TECHNOLOGIES STUDY (SGOE/T).
VOLUME 5: TECHNICAL INFORMATION SHEETS (TIS)
Final Report, Jun. 1986 - May 1987 (Boeing)

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SHUTTLE GROUND OPERATIONS
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STUDY

TECHNICAL INFORMATION SHEETS

FINAL REPORT - VOL 5
- PHASE 1 -
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KENNEDY SPACE CENTER
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BOEING

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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.

TECHNOLOGY IDENTIFICATION SHEETS

The Technology Identification Sheet (TIS) is an expanded version of the Resource Identification Sheet (RIS) that was in the original Study Plan. The TIS contains a description of the activity, location, facility and equipment requirements, hazard level, subtask procedures and manpower requirements. In addition, it now contains vehicle power requirement, LCC Support requirement, associated issues, technology needs, and technology candidates. Each task has been assigned a task sequence number to provide for downstream manipulation.

The manhour and headcount data on the TIS Sheets are incomplete because the data was not obtainable from the SPC or NASA. Technician data for the OPF was the only data made available and is incorporated.

The "Technology Need" and "Technology Candidates" descriptions have been completed only for the seven technology tentpoles identified in the study.

The TIS sequence task number was used to group the OMI's by usage location, i.e.,

1	-	88	are the top level OMI's performed in the OPF
100	-	111	are the top level OMI's performed in the VAB
200	-	213	are the top level OMI's performed at the PAD
300	-	305	are examples of spacecraft support OMI's at the PAD
401	-	423	are the top level OMI's performed in the ET checkout cell.

The Technology Identification Sheet Database consists of up to four entry screens. The printed sheets combine the most significant information into one sheet per task number. All of the information on the first screen is printed. The second screen contains the GSE equipment required. The equipment nomenclature is omitted from the GSE equipment entries on the second screen, but the part number is printed. The third and fourth screens contain space for the technology need description and the technology candidates identified and is printed in its entirety.

A sample of the printout appears on the next page with an explanation of all the fields.

Technology Identification Sheet

Seq. Task No.: ..[1].... Facility:[2]..... OMI Page Count: [3].
OMI No:[4]..... OMI Title: ..[ACTUAL TITLE PRINTED ON OMI].....

Subtask OMI(s):[5].....

Prerequisite Task OMI:[6].....
Hazard: . Level: ...[7].. Vehicle Power Required: . LCC Support Required: .
GSE:[8].....

Activity Description: ..[BRIEF DESCRIPTION OF OMI OPERATION].....

Table with 4 columns: Personnel, Head Count, Man Hours, Remarks. Rows include Mech. Tech, Elec. Tech, Quality, LCC Ops, Support, Engineering, and Total. Time: .[12]

Issues[13].....

Technology Need Description:
[THIS AREA TO BE USED FOR ANY NEEDS FOR IMPROVEMENT]
[IDENTIFIED FROM A REVIEW OF THE PROCEDURE]

Technology Candidates Identified:
[THIS AREA TO BE USED FOR A BRIEF DESCRIPTION]
[OF TECHNOLOGY IMPROVEMENT POSSIBILITIES]

[] NOTES

- [1] AN INTERNALLY ASSIGNED NUMBER USED BY STUDY TEAM.
[2] USAGE LOCATION SUCH AS OFF, VAB OR THE PAD.
[3] NUMBER OF PAGES IN THE OMI REVISION REVIEWED.
[4] OMI NUMBER AS IT APPEARS ON DOCUMENT.
[5] 14 MOST SIGNIFICANT SUBTASK OMIS LISTED IN OMI UNDER REVIEW.
[6] OMI THAT MUST HAVE BEEN PERFORMED BEFORE THIS ONE CAN BE RUN.
[7] HAZARDOUS - YES OR NO, LEVEL OF HAZARD , VEHICLE POWER NECESSARY TO PERFORM THIS OMI - YES OR NO, AND LCC INVOLVEMENT REQUIRED - YES OR NO.
[8] 8 MOST SIGNIFICANT GSE EQUIPMENT SETS REQUIRED FOR PERFORMANCE OF THIS OMI
[9] MAXIMUM NUMBER OF PERSONS REQUIRED TO PERFORM OMI.
[10] HOURS REQUIRED BY THIS CATEGORY.
[11] N/A WILL APPEAR IF NO INFORMATION WAS AVAILABLE FOR THIS TASK.
[12] LENGTH OF TIME REQUIRED TO PERFORM THIS OMI
[13] PRELIMINARY ISSUES DATA BASE ISSUES IDENTIFIED DURING REVIEW OF THIS OMI.

Technology Identification Sheet

Seq. Task No: 1.000 Facility: OPF OMI Page Count: 735
OMI No: VI002 OMI Title: SHUTTLE LANDING--POST LANDING CONVOY
OPERATIONS --KSC (LPS)
Subtask OMI(s): I2004 , I3012 , Q3053 , Q3230
Q6051 , Y3109 , V3528 , V3537 , V1091
V3521 , , , ,
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
OSE: 170-0991 , C70-1115 , H70-0508 , S70-1218
S70-1226 , S70-0508 , S70-0534 , P72-1001

Activity Description: TO PROVIDE OVERALL CONTROL OF ALL RELATED ACTIVITIES DURING ANY LANDING OPERATIONS AND DETAILED PREPLANNED APPROVED ACTIONS AUTHORIZED IN THE EVENT OF ANY EMERGENCY OR CONTINGENCY.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	27	162.0	
<u>Elec. Tech:</u>	4	24.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	31	186.0	<u>Time:</u> 6.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

**ORIGINAL PAGE IS
OF POOR QUALITY**

Technology Identification Sheet

Seq. Task No: 2.000 Facility: OPF OMI Page Count: 82
OMI No: V5099 OMI Title: ORBITER SPOTTING, LIFTING AND
LEVELING

Subtask OMI(s): V3508

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: H70-0570 , H70-0758 , A70-0600 , H70-0508
P72-1001

Activity Description: PREPARE ORBITER FOR NORMAL MAINTENANCE BY LIFTING AND LEVELING ORBITER TO 400 AT 253 INCHES OFF FLOOR, USING ORBITER PLATFORM LIFT SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	14	56.0			
<u>Elec. Tech:</u>	0	0.0	N/A		
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	14	56.0		<u>Time:</u>	4.0

Issues:

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 3.000 Facility: OPF OMI Page Count: 1167
OMI No: V1158 OMI Title: OMS/RCS DESERVICING(LFS)

Subtask OMI(s): V3511 , 03415 , W3103 ,
, , , ,
, , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: S70-0784-XX , S70-0865-XX , A70-0671-04 , A70-0672-XX ,
A70-1084 , F70-0031-02 , S70-0679-XX , S70-0695-XX

Activity Description: PERFORM OPF ORBITER DESERVICING OF FRCS AND OMS POD/XFD SYSTEM FOLLOWING FLIGHT. DESERVICING WILL OFF LOAD EXCESS PROPELLANT FROM TANKS, AND DRAIN AND PURGE PROPELLANT DISTRIBUTION SYSTEM TO PREPARE OMS/XFD SYSTEM AND FRCS FOR PRE-FLIGHT SERVICING OR REMOVAL FROM ORBITER.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	3	168.0	
<u>Elec. Tech:</u>	3	168.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	6	336.0	<u>Time:</u> 56.0

Issues: DESIGN CRITERIA : AUTOMATION : COST/MANHOURS : ACCESSABILITY

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 4.000 Facility: OPF OMI Page Count: 150
OMI No: V9021 OMI Title: OME TRICKLE PURGE ACTIVATION/
DEACTIVATION

Subtask OMI(s):
: : : :
: : : :
: : : :

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
SEE: F70-0031-001(2), S70-0570-3(6LS), S70-0704-11(12), S70-0065-XX ,
S70-0066-XX , S70-1229-1(2) , S70-0700-XX ,

Activity Description: TO PERFORM NECESSARY OPERATIONS TO SUPPORT THE OME TRICKLE
PURGE HOOKUP, ACTIVATION, DEACTIVATION.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	2	24.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	3	0.0	N/A
<u>Engineers:</u>	0	0.0	N/A
<u>Total:</u>	2	24.0	<u>Time:</u> 12.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: S.000 Facility: OFF OPI Page Count: 407
OPI No: V1091 OPI Title: ORBITER PRSD CRYO BRAIN (LFE)

Subtask OPI(s): V3543 , V3502 , V3507 , V3511
V3512 , V3315 , V5033 , V5034 , V9031/2/1
V7016 , I3117 , M2063 , 03415

Prerequisite Task OPI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
OSE: C70-0688 , C70-0689 , C70-0743-2 , C70-0897
070-0590 , 070-0706-2 , 070-1220 , 072-1106-1

Activity Description: TO PROVIDE INSTRUCTIONS TO DETANK AND INERT ORBITER
PRSD LO2 AND LH2 TANKS AT OFF USING LFS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	192.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	192.0	<u>Time:</u> 48.0

Issues: DESIGN CRITERIA : COST/MANHOURS :

Technology Need Description: DEVELOP NEW, HIGH POWER-DENSITY FUEL CELLS OR
BATTERIES THAT REQUIRE SIGNICANTLY LESS ON-LINEMAITENANCE THAN THE CURRENT
FUEL CELL SYSTEM. REPLACE THE CURRENT FUEL CELLS.

Technology Candidates Identified:

EARLY CANDIDATES APPEAR TO BE:

1. ALKALINE/ALKALINE REGENERATIVE FUEL CELL SYSTEM (RFCS)
2. INDIVIDUAL PRESSURE VESSEL (IPV) NI-H2 HATTERY
3. NAS BATTERIES (LONG TERM)
4. LI/SOCL2 BATTERIES (LONG TERM)

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Technology Identification Sheet

Seq. Task No: 7.000
OMI No: V5057

Facility: OPF
OMI Title: TVC/SSME GSE INSTALLATION/REMOVAL

OMI Page Count: 20:

Subtask OMI(s): V2270 , V3508 , V3512
, , ,
, , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE: A70-0501 , A70-0983 , A70-1056 , H70-0629
M70-0021 , M70-0024 , S70-0902 , S72-1107-1

Activity Description: TO PROVIDE OPERATIONAL INSTRUCTIONS FOR INSTALLATION, USE AND REMOVAL OF LISTED GSE TO SUPPORT SSME, HYDRAULIC OR GN&C SUBSYSTEM TESTING.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	4	32.0			
<u>Elec. Tech:</u>	0	0.0	N/A		
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	4	32.0		<u>Time:</u>	12.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 2.000 Facility: OPF QMI Page Count: 25
QMI No: V5003 QMI Title: ORBITER FERRY KIT REMOVAL AND
PREPARATIONS FOR ORBITER ACCESS
Subtask QMI(s):

, , , ,
, , , ,
, , , ,

Prerequisite Task QMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
SSE: A70-0603 , A70-0657 , A70-0672-XX , A70-0702 ,
A70-0796 , A70-0797 , A70-0971 , A70-1011

Activity Description: TO REMOVE ORBITER FERRY KIT AND PREPARE ORBITER FOR ACCESS

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 0.0

Issues: ACCESSABILITY : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 9.000
QMI No: V5017

Facility: OPF
QMI Title: CREW SYSTEMS DESTOWAGE

QMI Page Count: 446

Subtask QMI(s): V6024

, V5067

Prerequisite Task QMI:

Hazard: Y Level:

Vehicle Power Required: N

LCC Support Required: N

QSE: A70-0541

, P70-0805

, P70-0806

, H70-0857

A70-0712

, A70-0796

Activity Description: REMOVE CREW SYSTEMS EQUIPMENT FROM ORBITER AFTER THE COMPLETION OF A MISSION.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	6	48.0			
<u>Elec. Tech:</u>	2	16.0			
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	8	64.0		<u>Time:</u>	8.0

Issues:

:

:

:

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 10.000
OMI No: V9001VL1-VL4

Facility: OPF
OMI Title: ORBITER POWER UP/DOWN-OPF(OPF)

OMI Page Count: 1367

Subtask OMI(s): V3500
V1184 , C2008

, V3502 , V3507
, ,
, ,

, V3512
,
,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C70-0807 , C72-1079 , C72-1250 , S70-0890-1 ,
S70-0500-2 , C70-0532 , C70-0910 , E70-0012

Activity Description: PROVIDE STANDARD INSTRUCTIONS FOR ORBITER POWER UP AND DOWN INCLUDING THE GSE REQUIRED FOR THE BASIC SUPPORT SYSTEMS, I.E. EPD&C, INSTRUMENTATION, ECLSS AND OPS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	4	0.0	N/A
<u>Quality:</u>	3	0.0	N/A
<u>LCC Ops:</u>	6	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	13	0.0	<u>Time:</u> 0.0

Issues: DESIGN CRITERIA : COST/MANPOWER : REQUIREMENTS : EXPERT SYSTEM

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 11.000 Facility: OFF OMI Page Count: 250
OMI No: V5012 OMI Title: ORDNANCE INSTALLATION AND CHECKOUT
(LPS)
Subtask OMI(s): S3500 , S6005 , V1086 , V3502
V9001 , V9002.07 , V9024 ,
, , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: H72-1003 , C72-1127-2 , C72-1128 , A72-1014
H72-1005 , E70-0011 , H72-0565-02 , H72-1006

Activity Description: INSTALL AND ELECTRICALLY CONNECT ORBITER ORDNANCE IN THE OFF.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	5	148.0	
<u>Elec. Tech:</u>	6	164.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	11	312.0	<u>Time:</u> 44.0

Issues: SAFETY :

Technology Need Description: REPLACE ORDNANCE DEVICES WITH NON-EXPLOSIVE DEVICES.

Technology Candidates Identified: NITINOL APPLICATION (NITINOL - A NICKEL-TITANIUM "MEMORY" ALLOY, CAN BE MECHANICALLY DEFORMED AND THEN RETURNED TO ORIGINAL SHAPE BY HEAT WHILE EXERTING UP TO 300K PSI).

Technology Identification Sheet

Seq. Task No: 12.000 Facility: OPF OMI Page Count: 149
OMI No: V1184 OMI Title: ORBITER S/W GPC AND MMU READ/WRITE
PROCEDURES (LFS)
Subtask OMI(s): , , ,
, , ,
, , ,
Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: Y LCC Support Required: :
DSE: , , , , ,

Activity Description: TO LOAD, PATCH, DUMP, AND COMPARE SOFTWARE FROM THE MASS MEMORY UNITS OR GPC'S.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	3	36.0	
<u>Elec. Tech:</u>	3	40.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	6	76.0	<u>Time:</u> 16.0

Issues: TIME/ON-LINE : REQUIREMENTS :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 14.000 Facility: OPF OMI Page Count: 139
OMI No: V1054.01-1.03 OMI Title: CAUTION AND WARNING TURNAROUND
VERIFICATION (LPS)
Subtask OMI(s): S9001 , V9001 , V9036

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE:

Activity Description: PERFORM ANNUNCIATOR AND TONE CHECKS BETWEEN EACH FLIGHT.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	1	4.0	
<u>Elec. Tech:</u>	3	12.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	16.0	<u>Time:</u> 4.0

Issues: DESIGN : FAULT DETECTION : RELIABILITY

Technology Need Description:
SEE TIS 57 (V1003)

Technology Candidates Identified:
SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 15.000

Facility: OPF

ONI Page Count: 1749

ONI No: V5043VL1-VL3

ONI Title: SSME HEAT SHIELD INSTALLATION AND

REMOVAL

Subtask ONI(s): V3508

, V3512

, V3511

, V2270

V5057 , V1007

,

,

,

Prerequisite Task ONI:

Hazard: Y Level:

Vehicle Power Required: N

LCC Support Required: N

BSE: M70-0020-1

, H70-0855-1

, H70-1352

, H70-0541-02

A72-1323

, H70-0588

,

,

Activity Description: PROVIDE INSTRUCTIONS FOR INSTALLATION AND/OR REMOVAL OF SSME MOUNTED AND ORBITER MOUNTED HEAT SHIELD SEGMENTS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
Mech. Tech:	15	1440.0	
Elec. Tech:	2	192.0	
Quality:	0	0.0	N/A
LCC Ops:	0	0.0	N/A
Support:	0	0.0	N/A
Engineering:	0	0.0	N/A
Total:	17	1632.0	<u>Time:</u> 96.0

Issues: DESIGN : TIME/ON-LINE : COST/MANHOURS : ACCESSABILITY

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 17.000
Chl No: V1011.01-.07

Facility: OPF
OMI Title: SSME ENGINE LEAK AND FUNCTIONAL (LPS)

OMI Page Count: 1090

Subtask OMI(s): V1171 , V9001VL4 , V9002VL1 ,
, , , ,
, , , ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
BSE: S72-1106-2 , C72-1227 , S70-0670-XX , C70-0907 ,
C70-0743-XX , S70-0695-XX , Z70-0018-04 , A34-0329030

Activity Description: ACCOMPLISH THE FOLLOWING: HPFTP & MCC DRYING, TURBOPUMP INT. CHECKS; INT/EXT INSPECTION OF MAJOR COMP'S; INTEGRITY OF HE FLUID SYS; VERIFY INTEGRITY OF SSME HGM, LOX, & LH2 FLUID SYS'S; PNEUMATIC CHECKOUT & LEAK CHECKS & ROUTINE MODULE CHECKOUT OF SSME'S; AND OPERATIONAL INTEGRITY OF ALL SSME/ORBITER FLUID & ELECTRICAL INTERFACES FOLLOWING 10 ENGINE STARTS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	9	1320.0	
<u>Elec. Tech:</u>	3	744.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	12	2064.0	<u>Time:</u> 252.0

Issues: DESIGN CRITERIA : REQUIREMENTS : COST/MANPOWER : RELIABILITY

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 18.000
OMI No: V1113

Facility: OPF
OMI Title: ORBITER ATTITUDE REFERENCE

OMI Page Count: 36

Subtask OMI(s): , , , ,
, , , ,
, , , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE: , , , ,

Activity Description: TO DETERMINE ORBITER ROLL, PITCH AND YAW ANGLES

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 4.0

Issues: TIME/ON-LINE : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 19.000 Facility: OPF OMI Page Count: 648
OMI No: V5006.01-.03 OMI Title: PAYLOAD BAY DOOR OPENING TO 145 OR
160 DEGREE MAINTENANCE POSITION (LFS)
Subtask OMI(s): 03110 , V3508 , V9001VL1 , 03500
V6034 , , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
OSE: A70-0568 , A70-0893 , C70-0807 , C70-0870
H70-0529 , H70-0728 , H70-0829 , H72-0828-5

Activity Description: POSITION PAYLOAD DOORS TO THE 145 OR 160 DEGREE MAINTENANCE POSITION TO ALLOW ACCESS TO THE PAYLOAD BAY, RADIATOR MECHANISMS, ETC.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	8	96.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	8	96.0	<u>Time:</u> 12.0

Issues: ACCESSABILTY : DESIGN : REQUIREMENTS : TIME/ON-LINE

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 21.000
OMI No: V1009.01-.05

Facility: OPF
OMI Title: MPS LEAK AND FUNCTIONAL TEST (LPS)

OMI Page Count: 1858

Subtask OMI(s): V1171 , S3500 , V3502 , V9001
; ; ; ;
; ; ; ;

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C70-0903 , C72-1227 , C70-0796 , E70-0036
A70-0702 , C70-0807 , A70-0640-3 , S70-0695-2,-8

Activity Description: TO INSPECT THE 1000 MICRON SCREENS IN THE MAIN ENGINE FEED LINES AT THE OUTLET SIDE OF THE PREVALVES; PERFORM TIP LOAD AND FLAPPER ANGLE MEASUREMENTS ON THE 17 IN. OD'S AND VERIFY MPS COPPER PATHS, COMPONENT AND ELECTRICAL CHECKS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	5	1320.0	
<u>Elec. Tech:</u>	3	792.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	8	2112.0	<u>Time:</u> 264.0

Issues: DESIGN : MAINTAINABILITY : TIME/ON-LINE : COST/MANPOWER

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 22.000 Facility: OPF OMI Page Count: 163
OMI No: V6018 OMI Title: CABIN AIR RECIRULATION INSPECTION
AND MAINTENANCE
Subtask OMI(s): , , , ,

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE: , , , ,

Activity Description: TO PERFORM ROUTINE MAINTENANCE ON THE CABIN FAN, IMU, AND AVIONICS BAY 1,2,3 DEBRIS SCREENS. THE CONDENSING HEAT EXCHANGER WILL BE INSPECTED FOR CORROSION AND BIOLOGICAL GROWTH, WATER SAMPLES WILL BE OBTAINED FROM THE CONDENSING HEAT EXCHANGER AND ANALYZED FOR BIOLOGICAL GROWTH. TOTAL SYSTEM WILL BE INSPECTED AND VACUUMED.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	368.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	368.0	<u>Time:</u> 92.0

Issues: ACCESSABILITY :DESIGN :MAINTAINABILITY :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 23.000 Facility: OPF OMI Page Count: 1031
OMI No: V5E02 OMI Title: SPACE SHUTTLE MAIN ENGINE LRU
COMPONENT REMOVAL/INSTALLATION-HIGH PRESSURE OXIDIZER TURBOPUMP (LPS)
Subtask OMI(s): V3512 , V5043 , V3508 , V5057
V9002 , V3553 , , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
OSE: H70-0565 , H70-0774 , H70-0773 , A70-1265
H70-1208 , A70-0885 , H70-0528 ,

Activity Description: TO PROVIDE PROCEDURES TO REMOVE SSME HIGH PRESSURE OXIDIZER TURBOPUMP (LRU) IN THE OPF (HOR).

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	6	216.0	
<u>Elec. Tech:</u>	0	0.0	
<u>Quality:</u>	2	72.0	
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	1	72.0	
<u>Total:</u>	9	360.0	<u>Time:</u> 36.0

Issues: ACCESSABILITY :MAINTAINABILITY :RELIABILITY :DESIGN

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 24.000 Facility: OPF OMI Page Count: 265
OMI No: V5E04 OMI Title: SPACE SHUTTLE MAIN ENGINE LRU
COMPONENT REMOVAL/INSTALLATION HIGH PRESSURE FUEL TURBOPUMP
Subtask OMI(s): V3512 , V3553 , V5043 , V3508
V5057 , V9002 , V9001VL1 , 03119 , 13205

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
BSE: H70-1208 , H70-0528 , H70-0774 , A70-0501
S70-0902 , S70-0695-2 , A70-0983 , H70-0565

Activity Description: TO PROVIDE PROCEDURES TO REMOVE SOME HIGH PRESSURE FUEL TURBOPUMP (LRU) IN THE OPF (HOR).

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	6	216.0	
<u>Elec. Tech:</u>	0	0.0	
<u>Quality:</u>	2	72.0	
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	1	36.0	
<u>Total:</u>	9	324.0	<u>Time:</u> 36.0

Issues: ACCESSABILITY : MAINTAINABILITY : RELIABILITY : DESIGN

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 26.000 Facility: OPF OMI Page Count: 132
OMI No: V6003 OMI Title: ORBITER SHAKEDOWN INSPECTION INTERNAL

Subtask OMI(s):
, , ,
, , ,
, , ,

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE: S70-0902 , S70-0903 , , ,

Activity Description: TO PERFORM AN INTERNAL VISUAL AND PHYSICAL INSPECTION OF ORBITER VEHICLE.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	96.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	96.0	<u>Time:</u> 24.0

Issues: MAINTAINABILITY : DESIGN CRITERIA : REQUIREMENTS :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 28.000 Facility: OPF OMI Page Count: 656
OMI No: V9024VL1-VL6 OMI Title: THERMAL PROTECTION SYSTEM RSI

MAINTENANCE

Subtask OMI(s):

, , ,
, , ,
, , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N

BSE:

, , , , ,

Activity Description: TO PROVIDE GUIDELINES FOR EVALUATION AND REWORK OF TPS SYSTEM CONDITIONS. OUTLINES PROCESSING STEPS AND INDICATES REQUIRED INSPECTION BUY-OFF TO SUPPORT PLANNING AND PROCESS CONTROL.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 60.0

Issues:

, , ,

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seg. Task No: 31.000
OMI No: V1022

Facility: OPF
OMI Title: FUEL CELL AND PRSD SYSTEM TEST --(LPS)

OMI Page Count: 810

Subtask OMI(s): V3500 , V3502 , V3507 , B3511
V3512 , V3515 , V3527 , V5033 , V5034
V7001VLI , V9014 , V9016 ,

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
SSE: C70-0807 , C70-0743-2 , C70-0834-1,-2 , C72-1227
S70-0531-1,-2 , S70-0698-1,2,3 , S72-1106-1 , A70-0884

Activity Description: TO PROVIDE PROCEDURE FOR VERIFICATION OF FUEL CELL/PRSD INSTRUMENTATION AND CONTROLS INCLUDING FUNCTIONAL OPERATIONS OF SYSTEM RELIEF VALVES AND CONTROLS CIRCUITS ON ORBITER VEHICLE.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	2	144.0		
<u>Elec. Tech:</u>	1	72.0		
<u>Quality:</u>	1	72.0		
<u>LCC Ops:</u>	2	144.0		
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	6	432.0		<u>Time:</u> 72.0

Issues: FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)
SEE TIS 5 (V1091)

Technology Candidates Identified:

SEE TIS 57 (V1003)
SEE TIS 5 (V1091)

Technology Identification Sheet

Seq. Task No: 32.000 Facility: OPF OMI Page Count: 352
OMI No: V1026 OMI Title: WASTE MANAGEMENT SYSTEM LEAK AND
FUNCTIONAL TEST (LPS)
Subtask OMI(s): V3500 , V3511 , V3512 , V5067
V9001 , V9014 , , ,
Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
SEE: C70-0907 , C70-0743-001 , H70-0561-005 , A70-0658-002 ,
M70-0022 , S70-0791-2 , S70-0656 , P70-1013

Activity Description: TO PROVIDE PROCEDURES TO INSTALL WASTE COLLECTOR, TO TEST WASTE SUBSYSTEM AND WASTE WATER MANAGEMENT SYSTEM, AND PERFORM WASTE MANAGEMENT SYSTEM TURNAROUND OPERATIONS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	5	320.0	
<u>Elec. Tech:</u>	3	192.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	8	512.0	<u>Time:</u> 64.0

Issues: TECHNOLOGY : TIME/OFF-LINE : TIME/ON-LINE :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 33.000 Facility: OPF OMI Page Count: 66
OMI No: V6012 OMI Title: HYDRAULIC SYSTEM INSPECTION

Subtask OMI(s): V3511 , V5057 , V5064 , V9002.00

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE:

Activity Description: TO INSPECT THE HYDRAULIC SYSTEM PREFLIGHT AND POSTFLIGHT TO DETECT SYSTEM DEGRADATION.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	3	204.0	
<u>Elec. Tech:</u>	4	272.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	7	476.0	<u>Time:</u> 60.0

Issues: TECHNOLOGY : COST/MANHOURS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 34.000 Facility: OPF OMI Page Count: 904
OMI No: V9002.01-.10 OMI Title: OPF-VEHICLE HYDRAULIC POWER UP/DOWN

Subtask OMI(s): S3500 , V1133 , V9001 ,
 , , ,
 , , ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
QSE: A70-0696 , C70-0894 , S72-0841 , S70-0843 ,
S70-0952 , S70-0861-1 , S72-0844-3 , S72-0844-4

Activity Description:APPLY HYDRAULIC GROUND POWER TO THE ORBITER TO SUPPORT HYDRAULIC OR ANY ASSOCIATED SUBSYSTEM TESTING.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	3	140.0	
<u>Elec. Tech:</u>	3	72.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	6	212.0	<u>Time:</u> 48.0

Issues: TECHNOLOGY : COST/MANHOURS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 36.000 Facility: OPF OMI Page Count: 52
OMI No: V9022 OMI Title: ET UMBILICAL DOOR POSITIONING

Subtask OMI(s): V9001VL1

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: A70-0603 , A70-1031

Activity Description: PROVIDE PROCEDURES FOR POSITIONING THE ET UMBILICAL DOORS, DOOR LATCHES AND CENTERLINE LATCHES TO SUPPORT OPERATIONAL AND MANUFACTURING REQUIREMENTS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
Mech. Tech:	3	324.0	
Elec. Tech:	3	324.0	
Quality:	0	0.0	N/A
LCC Ops:	0	0.0	N/A
Support:	0	0.0	N/A
Engineering:	0	0.0	N/A
<u>Total:</u>	6	648.0	<u>Time:</u> 108.0

Issues: COST/MANHOURS :REQUIREMENTS :DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 37.000
OMI No: V1123

Facility: OPF
OMI Title: ECLSS ARS FUNCTIONAL TEST (LPS)

OMI Page Count: 209

Subtask OMI(s): V3501 , V9001VL1 , V3511 , V3512
, , ,
, , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
SEE: C70-0548-01 , S70-0679-03 , C70-0796 , ,

Activity Description: TO PERFORM OPERATIONS NECESSARY TO FUNCTIONALLY TEST THE ARS WATER COOLANT LOOPS, CABIN TEMPERATURE CONTROL AND HUMIDITY SEPARATOR SYSTEMS, AND AVIONICS BAYS AND IMU AIR CIRCULATION CONDITIONING SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	1	4.0			
<u>Elec. Tech:</u>	3	12.0			
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	4	16.0		<u>Time:</u>	4.0

Issues: FAULT DETECTION : TIME/ON-LINE : :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 38.000 Facility: OPF DMI Page Count: 57

DMI No: VI134 DMI Title: WATER DRAIN AND HAZARDOUS GAS

DETECTION LINE VERIFICATION AND DRAIN/VENT FILTER REPLACEMENT

Subtask DMI(s):
,
,
,

Prerequisite Task DMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N

GSE: S70-0965 , S70-0679 , S70-0772 , Z70-0018-05

S70-0657 , A70-0702 , S34-0160-01

Activity Description: TO REMOVE RESIDUAL WATER ACCUMULATION FROM ORBITER FROGS AND NOSE WHEEL DRAIN LINES AND TO VERIFY NO LEAKS IN THE FROGS AND NOSE WHEEL DRAIN LINES AND THE HGDS SENSOR LINES UNDER VACUUM CONDITIONS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	4	32.0			
<u>Elec. Tech:</u>	2	16.0			
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	6	48.0		<u>Time:</u>	8.0

Issued: DESIGN : MAINTAINABILITY : :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 39.000
OMI No: V1079

Facility: OPF
OMI Title: APU LUBE OIL SERVICING-LPS

OMI Page Count: 716

Subtask OMI(s): S3500 , V9014 , V3504 , V9001VL0
, , , ,
, , ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
OSE: C70-0743-002 , S70-0679-11 , S70-0770-3 , S70-0679-2 ,
S70-0700-11A , S72-0694-5 , S70-0613 , S70-0752

Activity Description: PERFORM POST FLIGHT CONTINGENCY SAMPLING & ULLAGE CHECK, MAGNETIC CHIP INSPECTION, GEARBOX REPRESSURIZATION, OFFLOAD OIL AND PURGE WITH O₂. REMOVE FLIGHT FILTER, INSTALL FLUSH FILTER & FLUSH, REPLACE FLIGHT FILTER AND LEAK TEST. MONITOR DELTA PRESSURES BETWEEN ALL APU GEARBOXES AND RESPECTIVE DRAIN CAVITIES.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	192.0	
<u>Elec. Tech:</u>	2	96.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	6	288.0	<u>Time:</u> 48.0

Issues: TECHNOLOGY : REQUIREMENTS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Req. Task No: 40.000 Facility: OPF OIM Page Count: 168
OIM No: V6005 OIM Title: STAR TRACKER INSPECTION AND CLEANING

Subtask OMI(s): V3508 , V3509 , V3511
, , ,
, , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
OSE: A70-0887 , A70-1019 , H70-0789 ,

Activity Description: TO PROVIDE A PROCEDURE FOR INSPECTION, CLEANING, REMOVAL AND INSTALLATION OF THE STAR TRACKER, PROTECTIVE WINDOW AND LIGHT SHADE.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	1	8.0	
<u>Elec. Tech:</u>	1	8.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	2	16.0	<u>Time:</u> 0.0

Issues: TECHNOLOGY : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 41.000 Facility: OPF OMI Page Count: 175
OMI No: V1153 OMI Title: APU WATER SERVICING (LPS)

Subtask OMI(s): V3500 , S9001 , V3511 , V3512
V7223 , V9014 , V2350 , V3508 , V3502

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C70-0743-002 , S70-0679-11 , S70-0986 , S70-1232
Z70-0018-006 , , ,

Activity Description: TO PERFORM THE FOLLOWING OPERATION ON THE PRIMARY AND SECONDARY PUMP/VLV COOLING WATER TANKS AND THE INJECTOR COOLING TANK, OFFLOAD, DIAPHRAGM LEAK TEST AND SERVICING.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	32.0	
<u>Elec. Tech:</u>	3	24.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	7	56.0	<u>Time:</u> 0.0

Issues: TECHNOLOGY : COST/MANHOURS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 48.000 Facility: OPF DMI Page Count: 361
DMI No: V1055 DMI Title: POTABLE WATER SERVICING - WET SYSTEMS
KSC LANDING (LPS)
Subtask DMI(s): S9001VL1 , V3502 , V3504 , V9001VL1
V9014 , , ,
Prerequisite Task DMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
OSE: C70--743-1 , C70-1153 , S70-0742 , S70-0787-2
S70-0974 , , ,

Activity Description: TO SERVICE THE POTABLE WATER SYSTEM WITH 3-5 PPM IODINE/
WATER FOR FLIGHT CREW CONSUMPTION AND FLASH EVAPORATOR USE.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	5	120.0	
<u>Elec. Tech:</u>	2	48.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	7	168.0	<u>Time:</u> 24.0

Issues: DESIGN : REQUIREMENTS : TECHNOLOGY : INTERFACE

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 49.000 Facility: OPF OMI Page Count: 590
OMI No: V1178 OMI Title: KU-BAND COMM/RADAR SYSTEMS TEST (LPS)

Subtask OMI(s): S3500 , V1114 , V1184 , V3508
V3528 , V3546 , V5006.01 , V9001VL1 , V9001VL2

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C70-0625 , C70-0725 , C70-0727 , C70-0727-B
C70-1188 , , ,

Activity Description: TO VERIFY THAT THE ORBITER KU-BAND COMMUNICATIONS/RADAR SYSTEM OPERATES WITHIN SPECIFIED LIMITS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	2	16.0	
<u>Elec. Tech:</u>	5	40.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	7	56.0	<u>Time:</u> 8.0

Issues: FAULT DETECTION : COST/MNHOURS : TIME/ON-LINE :

Technology Need Description:
SEE TIS 57 (V1003)

Technology Candidates Identified:
SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 51.000 Facility: OPF OMI Page Count: 216
OMI No: V1093 OMI Title: FUEL CELL SINGLE CELL VOLTAGE TEST
(LPS)

Subtask OMI(s): S3500 , V1050 , V1091 , V1120
V3502 , V3507 , V3511 , V3512 , V3515
V9001 , V9014 , V9016 ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C70-0807 , C70-0854 , S70-0590 , S70-0679-1 ,
S70-0695-1 , S70-0698-1,2,3 , S70-0815-2,3 , S70-0825-1,2

Activity Description: TO PROVIDE PROCEDURES TO CONDUCT A SINGLE CELL VOLTAGE TEST (BOTH THE TAFEL TEST AND GN2 DIAGNOSTIC TEST) OF THE ORBITER FUEL CELLS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	3	0.0	N/A
<u>Elec. Tech:</u>	2	0.0	N/A
<u>Quality:</u>	2	0.0	N/A
<u>LCC Ops:</u>	2	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	9	0.0	<u>Time:</u> 0.0

Issues: TECHNOLOGY : TIME/ON-LINE :

Technology Need Description:

SEE TIS 5 (V1091)

Technology Candidates Identified:

SEE TIS 5 (V1091)

Technology Identification Sheet

Seq. Task No: 54.000 Facility: OPF OMI Page Count: 509
OMI No: V1196 OMI Title: APU POST FLIGHT FUEL SYSTEM

OPERATIONS (LPS)

Subtask OMI(s):
, , ,
, , ,
, , ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C70-0743-002 , C70-0743-004 , F70-0013-006 , S70-0679-02 ,
S70-0679-11 , S70-0757 , S70-0758 ,

Activity Description: TO VENT APU FUEL TANKS AND FUEL MANIFOLDS TO PAD PRESSURE, DRAIN APU CAVITY DRAIN SYSTEM CATCH BOTTLES, AND PERFORM FUNCTIONAL TEST OF CATCH BOTTLE RELIEF VALVES AND ALCOHOL-FLUSH CAVITY DRAIN SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	5	120.0	
<u>Elec. Tech:</u>	2	48.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	7	168.0	<u>Time:</u> 24.0

Issues: TECHNOLOGY : COST/MANHOURS : DESIGN :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 55.000 Facility: OPF OMI Page Count: 558
OMI No: V1086 OMI Title: MASTER EVENT CONTROLLER/PYROTECHNIC
INITIATOR CONTROLLER VERIFICATION (LPS)
Subtask OMI(s): V1003 , V3502 , V3507 , V9001
53500 , , ,

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C77-0202 , C72-1128 , E70-0011 , C72-1280-1
C72-1127-2 , , ,

Activity Description: TO FUNCTIONALLY VERIFY OPERATIONS OF EACH MASTER EVENT CONTROLLER. TEST AND VALIDATE ALL ORBITER MEC/PIC FUNCTIONS AND VALIDATE ALL ORBITER, ET, SRB, AND GROUND INTERFACES. VERIFY MANUAL PIC/LCA FUNCTIONS, FIRE EXTINGUISHERS AND LANDING GEARS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	2	48.0		
<u>Elec. Tech:</u>	3	72.0		
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	5	120.0		<u>Time:</u> 24.0

Issues: FAULT DETECTION : COST/MANHOURS :

Technology Need Description:
SEE TIS 57 (V1003)

Technology Candidates Identified:
SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 56.000 Facility: OFF OMI Page Count: 355
OMI No: V1165 OMI Title: LANDING GEAR MAINTENANCE

Subtask OMI(s):
, , ,
, , ,
, , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: , , , , , , , , , ,

Activity Description: TO PERFORM NORMAL MAINTENANCE AND INSPECTION OF MAIN AND NOSE LANDING GEAR.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	288.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	288.0	<u>Time:</u> 72.0

Issues: DESIGN : REQUIREMENTS : TECHNOLOGY :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 59.000 Facility: OPF OMI Page Count: 70
OMI No: V9019 OMI Title: ORBITER MPS VACUUM JACKETED LINE
CHECKS AND SERVICING
Subtask OMI(s): V3527

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE: C70-1227 , A70-1004

Activity Description: OBTAIN VACUUM READINGS ON THE MPS VACUUM-JACKETED PROPELLANT LINES PER ML0510-0030

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	0	0.0	N/A	
<u>Elec. Tech:</u>	0	0.0	N/A	
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	0	0.0		<u>Time:</u> 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 60.000 Facility: OFF OMI Page Count: 0
OMI No: N/A OMI Title: TPS WATERPROOFING

Subtask OMI(s):
, , ,
, , ,
, , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE: , , , , , , , , , ,

Activity Description: APPLY WATERPROOFING TO THE TPS TILE.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 108.0

Issues: TECHNOLOGY : COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 61.000 Facility: OFF DMI Page Count: 1214
DMI No: V1190 DMI Title: RIGHT AND LEFT APS POD FUNCTIONAL
CHECKOUT (LPS):
Subtask OMI(s): I2003 , I2022 , I3053 , M2061
M2063 , M3095 , M3096 , M3141 , Q3415
V2119 , W3103 , , ,
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: C72-1227 , S70-0865-XX , S70-1119-X , C70-0743
C70-0886-1 , S70-0784 , S70-0547 , S70-0548

Activity Description: TO DEMONSTRATE APS OMS/RCS GHE REGULATOR, CHECK VALVE AND RELIEF VALVE/BURST DISC FUNCTIONAL OPERATION AFTER EXTENDED NON-TEST PERIODS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	7	504.0		
<u>Elec. Tech:</u>	3	216.0		
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	10	720.0		<u>Time:</u> 72.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 63.000 Facility: OPF OMI Page Count: 310
OMI No: V1065 OMI Title: BRAKE/ANTI-SKID CONTROL SYSTEM TEST
(LPS)
Subtask OMI(s): V3500 , V9001VL1 , V9001VL3 , V9002.01
, , , ,
, , , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: A70-0771 , A70-0787 , , ,

Activity Description: TO VERIFY THE SIGNALS, INTERFACES AND VOTING LOGIC OF THE BRAKE AND SKID CONTROL SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	16.0	
<u>Elec. Tech:</u>	3	12.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	7	28.0	<u>Time:</u> 4.0

Issues: FAULT DETECTION : COST/MANPOWER : MAINTAINABILITY :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 64.000 Facility: OPF OMI Page Count: 385
OMI No: V1060 OMI Title: FLIGHT CONTROL AEROSURFACE CHECKOUT
(LPS)
Subtask OMI(s): V3500 , S9001 , V1123 , V9002.01
V9002.02 , V9002.05 , ,
, , , ,
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
BSE: C70-0561 , , , ,

Activity Description: TO FUNCTIONALLY CHECK THE PROPER OPERATION AND ACCURACY OF THE ORBITER'S AEROSURFACE FLIGHT CONTROL SYSTEMS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	7	28.0	
<u>Elec. Tech:</u>	3	12.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	10	40.0	<u>Time:</u> 4.0

Issues: FAULT DETECTION :DESIGN

Technology Need Description:
SEE TIS 57 (V1003)

Technology Candidates Identified:
SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 45.000 Facility: OPF OMI Page Count: 409
OMI No: V1043 OMI Title: FLIGHT CONTROL MPS TVC CHECKOUT AND
SRB SIMULATED INTERFACE VERIFICATION (LPS)
Subtask OMI(s): S3500 , S9001 , V1123 , V3502
V3503 , V3504 , V5057 , V9001VL1 , V9002
, , , ,
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
BSE: C70-0796 , M70-0021 , , ,

Activity Description: TO VERIFY THE COMMAND, FEEDBACK AND FAILURE DETECTION AND FUNCTIONAL OPERATION OF THE ORBITER ASCENT THRUST VECTOR CONTROL.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	16.0	
<u>Elec. Tech:</u>	3	12.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	7	28.0	<u>Time:</u> 4.0

Issues: FAULT DETECTION :MAINTAINABILITY :COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 66.000 Facility: OFF OMI Page Count: 436
OMI No: V1151 OMI Title: ORBITER VEHICLE BUS REDUNDANCY TEST

(LPS)
Subtask OMI(s): V9001VL1 , V9001VL2 , V9001VL4 , V1123
S3500 , V1171 , , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: , , , ,

Activity Description: TO PROVIDE AN INTEGRATED BUS REDUNDANCY TEST WHICH INCLUDES ALL ORBITER VEHICLE SYSTEMS CONTAINING BUS REDUNDANT DESIGN.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	1	8.0	
<u>Elec. Tech:</u>	3	24.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	32.0	<u>Time:</u> 8.0

Issues: FAULT DETECTION : TIME/ON-LINE : COST/MANHOURS :

Technology Need Description:
SEE TIS 57 (V1003)

Technology Candidates Identified:
SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 67.000 Facility: OPF OMI Page Count: 45
OMI No: V1001 OMI Title: SSME ELECTRICAL INTERFACE

VERIFICATION (LPS)

Subtask OMI(s): V9001VL4 , , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: , , , , ,

Activity Description: PROVIDE STANDARD INSTRUCTION TO TEST ALL EIU AND SSME CONTROLLER COPPER PATHS AFTER ENGINE INSTALLATION, AFTER ELECTRICAL LRU REPLACEMENT AND AFTER ENGINE HOT FIRING.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	1	4.0	
<u>Elec. Tech:</u>	3	12.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	16.0	<u>Time:</u> 4.0

Issues: : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 70.000 Facility: OPF OMI Page Count: 225
OMI No: V1201 OMI Title: MPS/SSME HELIUM SIGNATURE TEST

Subtask OMI(s): V1111 , V1171 , V3535
,
,
,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: A70-0702 , S70-0534 , S70-0695-2 , S70-0695-8
Z70-0023 , , ,

Activity Description: PERFORM LEAK CHECK OF ISOLATED MPS/SSME SYSTEMS USING VARIAN MASS SPECTROMETER AND PURGE AIR FLOW IN AFT SECTION.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	4	192.0		
<u>Elec. Tech:</u>	3	144.0		
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	7	336.0		<u>Time:</u> 48.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 71.000 Facility: OPF OMI Page Count: 52
OMI No: V1032 OMI Title: ORBITER CLOSEOUT PRIOR TO MOVE TO VAB

Subtask OMI(s): , , ,
 , , ,
 , , ,

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
OSE: , , , ,

Activity Description: PREPARE ORBITER FOR WEIGHT AND BALANCE AND MOVE TO VAB.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	10	1440.0	
<u>Elec. Tech:</u>	6	864.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	16	2304.0	<u>Time:</u> 144.0

Issues: COST/MANHOURS : REQUIREMENTS : TIME/ON-LINE : QA

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 72.000
OMI No: V1174

Facility: OPF
OMI Title: PAYLOAD BAY CLOSEOUT CLEANING-OPF

OMI Page Count: 146

Subtask OMI(s): V3508

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: N LCC Support Required: N

OOE:

Activity Description: TO CLEAN ACCESSIBLE PAYLOAD BAY SURFACES TO ONE OF THREE CLEANLINESS LEVEL OPTIONS AND TO QUALITATIVELY ASSESS THE TYPES AND LEVELS OF VARIOUS CONTAMINANTS WITH THE INTENT OF IMPROVING CONTAMINATION CONTROLS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	144.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	144.0	

Time: 36.0

Issues: COST/MANHOURS : REQUIREMENTS : DESIGN : TIME/ON-LINE

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 73.000
OMI No: V1059

Facility: OPF OMI Page Count: 18
OMI Title: DPS COMPUTER COMPLEX CHECKOUT (LPS)

Subtask OMI(s): S3500 , S9001 , V9001VL1 ,
, , , ,
, , , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
OSE: , , , ,

Activity Description: PROVIDES INSTRUCTIONS FOR APPLYING ELECTRICAL POWER TO THE DATA PROCESSING SUBSYSTEM (DPS) AND PERFORMING DPS SUBSYSTEM LEVEL TESTS TO VERIFY SYSTEM READINESS TO SUPPORT ORBITER CHECKOUT AND PROCESSING.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	1	4.0		
<u>Elec. Tech:</u>	3	12.0		
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	4	16.0		<u>Time:</u> 4.0

Issues: FAULT DETECTION : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 74.000 Facility: OFF OMI Page Count: 738
OMI No: V1037 OMI Title: AMMONIA BOILER SERVICING, OPERATIONS
AND DESERVICING (LPS)
Subtask OMI(s): I2003 , M2063 , M3011 , M3022
M3039 , W3103 , S9001VL1 , V9014
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: S70-0654 , S70-0776 , S70-1201-1 , S70-1201-2
S70-1201 , S70-1211 , S70-0695-3

Activity Description: TO PERFORM OPERATIONS NECESSARY TO SERVICE, DE-TANK AND SAFE THE NH3 STORAGE TANKS AND TO CONNECT THE NH3 VENT, OPERATE NH3 BOILER AND DE-TANK.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	7	168.0	
<u>Elec. Tech:</u>	3	72.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	10	240.0	<u>Time:</u> 24.0

Issues: COST/MANHOURS : DESIGN CRITERIA : REQUIREMENTS :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 75.000 Facility: OPF OMI Page Count: 147
OMI No: V1177 OMI Title: HEADS UP DISPLAY SYSTEM (HUDE, PDU)

CHECKOUT (LPS)

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: Y LCC Support Required: Y

GSE:

Activity Description: TO FUNCTIONALLY VERIFY PROPER OPERATION OF HEADS UP DISPLAY ELECTRONICS UNIT (HUDE) AND PROPER OPERATION OF PILOT DISPLAY UNIT 2 (PDU).

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	1	4.0	
<u>Elec. Tech:</u>	3	12.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	16.0	<u>Time:</u> 4.0

Issues: FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 78.000

Facility: OFF

OMI Page Count: 597

OMI No: V1171
(LPS)

OMI Title: MPS/SSME PRESSURIZATION OPERATION

Subtask OMI(s): G6105
V1201 , V5057

, G6150

, G6205

, G625V1201

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: Y

LCC Support Required: Y

ESR:

Activity Description: REPETITIVE TASK OMI TO ALLOW MPS/SSME SYSTEMS TO BE PRESSURIZED TO SUPPORT VEHICLE FLOW.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 79.000 Facility: OPF OMI Page Count: 591
 OMI No: V1007 OMI Title: PVD STRUCTURAL LEAKAGE/POSITIVE
 PRESSURE TESTING AND FILTER MAINTENANCE (LPS)
 Subtask OMI(s): V1111 , V3511 , V3512 , V3555
 V5067 , , ,
 , , ,
 Prerequisite Task OMI:
 Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
 SSE: A70-0769 , C70-1197-2 , F70-0033-1 , S70-0534
 S70-0958 , S70-1310 , ,

Activity Description: TO DETERMINE THE LEAKAGE ACROSS THE ORBITER'S FUSelage AND STRUCTURAL BULKHEADS AND FOR COMPARTMENTS TO MAINTAIN A POSITIVE PRESSURE UNDER NORMAL PURGE FLOWRATES AND INSTRUCTIONS TO REMOVE AND REPLACE PVD VENT FILTERS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
Mech. Tech:	2	48.0	
Elec. Tech:	2	48.0	
Quality:	0	0.0	N/A
LCC Ops:	0	0.0	N/A
Support:	0	0.0	N/A
Engineering:	0	0.0	N/A
<u>Total:</u>	4	96.0	<u>Time:</u> 24.2

Issues: MAINTAINABILITY : DESIGN CRITERIA : TIME/ONLINE :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Prog. Task No: 88.000 Facility: OPF OMI Page Count: 196
OMI No: V5018 OMI Title: PAYLOAD BAY DOOR CLOSING-HORIZONTAL
(LPD)

Subtask OMI(s): 03119 , V3500 , V3508 , V9001VL1
: : : :
: : : :

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required:
OSE: A70-0566 , A70-0883 , C70-0827 , C70-0870
H70-0529 , H70-0728 , H70-0829 , H72-0825-a

Activity Description: CLOSING OF PAYLOAD BAY DOORS PRIOR TO ROLLOUT FROM OPT.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Asst. Tech:</u>	8	96.0	
<u>Exec. Tech:</u>	1	12.0	
<u>Quality:</u>	0	0.0	N/A
<u>LCC Eng:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	9	108.0	<u>Time:</u> 12.0

Issues: TIME/ON-LINE : DESIGN CRITERIA : REQUIREMENTS :

Technology Need Description:

Technology Candidates Identified:

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OF POOR QUALITY**

Technology Identification Sheet

Seq. Task No: 81.000 Facility: OPF OMI Page Count: 246
OMI No: V1034 OMI Title: ORBITER FLIGHT CONTROL FREQUENCY
RESPONSE TEST (LPS)
Subtask OMI(s): S3500 , V9002.08 , V5057 , V9022
V7023 , , ,
Frerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: A70-0999 , 572-0841 , H70-0570 ,

Activity Description: DEMONSTRATE THE DYNAMIC PERFORMANCE OF THE FLIGHT CONTROL SYSTEM BY CONDUCTING A FREQUENCY RESPONSE TEST (FRT) AND/OR A STEP RESPONSE TEST ON THE FOLLOWING: AEROSURFACES, MPS-TVC SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	0	0.0	N/A		
<u>Elec. Tech:</u>	0	0.0	N/A		
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	0	0.0		<u>Time:</u>	0.0

Issues: FAULT DETECTION :DESIGN :MAINTAINABILITY :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 92.000 Facility: OFF OMI Page Count: 122
OMI No: VS101 OMI Title: ORBITER WEIGHT AND CENTER OF GRAVITY
DETERMINATION USING PLATFORM SCALES AND OFF PLATFORM LIFTING SYSTEM

Subtask OMI(s):
, , ,
, , ,
, , ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: A70-0544 , A70-0600 , C70-0894 , H70-0508
H70-0570 , H70-0768 , P72-1001 ,

Activity Description: TO CONFIGURE FOR AND PERFORM A THREE POINT ORBITER WEIGHING

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	16	192.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	16	192.0	<u>Time:</u> 12.0

Issues: DESIGN(GSE) : REQUIREMENTS : TIME/ON-LINE : COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 94.000 Facility: OPF OMI Page Count: 0
OMI No: V3512 OMI Title: INSTALL PAYLOAD BAY ACCESS

Subtask OMI(s):
, , ,
, , ,
, , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
BSE: , , , , ,

Activity Description: INSTALL PAYLOAD ACCESS PLATFORMS IN THE ORBITER PAYLOAD BAY TO PROVIDE ACCESS TO CARGO AND AIRBORNE SUPPORT EQUIPMENT.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	4	32.0	
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	4	32.0	<u>Time:</u> 8.0

Issues: TIME/ON-LINE : DESIGN : REQUIREMENTS : COST/MANHOURS

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 36.000 Facility: OFF OMI Page Count: 0
 OMI No: N/A OMI Title: PAYLOAD BAY RECONFIGURATION (MECH &
 ELECT)
 Subtask OMI(s): , , , ,
 , , , ,
 , , , ,
 Prerequisite Task OMI:
 Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
 GSE: , , , ,

Activity Description: RECONFIGURE THE PAYLOAD BAY BRIDGES (KEEL & LONGERON) AND
 SMCH CABLES TO SUPPORT NEXT MISSION.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
Mech. Tech:	4	768.0	
Elec. Tech:	3	576.0	
Quality:	0	0.0	N/A
LCC Ops:	0	0.0	N/A
Support:	2	0.0	N/A
Engineering:	0	0.0	N/A
Total:	7	1344.0	Time: 192.0

Issues: TIME/ON-LINE : COST/MANHOURL : REQUIREMENTS : DESIGN CRITERIA

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 07.002 Facility: 0PF OMI Page Count: 0
OMI No: N/A OMI Title: PAYLOAD BAY RADIATOR FUNCTIONAL/KU/
RMS/TANK SET OPPORTUNITY
Subtask OMI(s): , , , , , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: , , , , ,

Activity Description: SCHEDULE OPPORTUNITY TO PERFORM RADIATOR FUNCTIONAL TEST, KU BAND TEST, RMS INSTALLATION AND TEST, AND FUEL CELL TANK SET INSTALLATION/REMOVAL.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
Mech. Tech:	4	480.0	
Elec. Tech:	3	360.0	
Quality:	0	0.0	N/A
LCC Ops:	0	0.0	N/A
Support:	0	0.0	N/A
Engineering:	0	0.0	N/A
Total:	7	840.0	Time: 120.0

Issues: TIME/ON-LINE : COST/MANHOURS : DESIGN CRITERIA : REQUIREMENTS

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 100.000 Facility: VAB OMI Page Count: 526
OMI No: S0004 OMI Title: ORBITER/ET MATE

Subtask OMI(s): S3001 , S3002 , T1203 , T1248
V1111 , V2084 , V2093 * , V2094 * , V3508
V3509 , V3511 , V5029 , V6030 , V9005

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: Y
GSE: A70-0562 , A70-1268 , H70-0597 , H70-0768
P72-1001 , H70-0508 , S70-0805 , S70-0958

Activity Description: HOISTING AND MATING ORBITER TO EXTERNAL TANK AND UMBILICAL HOOK-UPS. 1) TO MATE ORBITER/ET UMBILICALS. 2) CONFIGURE GSE TO MONITOR ET TANK PRESSURE. 3) INSTALL ORB/ET UMBILICAL PURGE CURTAINS. 4) TO INSTALL ORB ORD AT VAB PER OMI V5029. 5) TO MATE T-0 UMBILICALS PER OMI V2093 AND V2094.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 88.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 102.000 Facility: VAB OMI Page Count: 108
OMI No: T5048 OMI Title: INSTALL AND REMOVE INTERTANK ACCESS

KIT

Subtask OMI(s): T6447

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: A72-0853 , A78-3604 , A78-3605

Activity Description: INSTALL INTERTANK ACCESS KIT AND RELATED EQUIPMENT. REMOVE INTERTANK ACCESS KIT AND RELATED EQUIPMENT.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 4.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 103.002
OMI No: B5304

Facility: VAB
OMI Title: SRB SYSTEMS MATE AND CLOSEOUT

OMI Page Count: 452

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: TO PROVIDE INSTRUCTIONS FOR THE SRB CLOSEOUT TASKS TO BE PERFORMED IN VAB HB-1/-3 FROM PREPARATIONS FOR ET MATE THROUGH PREPARATIONS FOR ROLLOUT.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	0	0.0	N/A	
<u>Elec. Tech:</u>	0	0.0	N/A	
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	0	0.0		<u>Time:</u> 17.0

Issues:

Technology Need Description:

SEE TIS 11 (V5012)

Technology Candidates Identified:

SEE TIS 11 (V5012)

Technology Identification Sheet

Seq. Task No: 106.000 Facility: VAB OMI Page Count: 440
OMI No: S0008 OMI Title: SHUTTLE INTERFACE TEST (LPS)

Subtask OMI(s): B1061 , B5003 , S0020 , S3500
S9001 , S9022 , T1249 , V1149 , V3503
V3505 , V3509 , V5027 , V5029 , V9002

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: E78-0006 , C70-1181 , C72-1128 , C70-0903 ,
C77-0202 , C72-0831 , C72-1127-2 , C78-5007

- Activity Description: 1) VERIFY ORBITER/MLP INTERFACES.
2) VERIFY ORBITER/ET ELECTRICAL AND FLUID INTERFACES.
3) VERIFY ORBITER/SAB INTERFADES.
4) VERIFY FUNCTIONAL OPERATION OF SRI SYSTEMS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	2	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	2	0.0	<u>Time:</u> 37.0

Issues: : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 167.002 Facility: VAB OMI Page Count: 246
OMI No: 00025 OMI Title: SHUTTLE FLIGHT CONTROL INTEGRATED
TESTS (LPO):
Subtask OMI(s): B1005 , B1009 , B1026 , B5024
B3101 , B1020 , S9001 , S9002 , V1103
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: A77-0179 , S72-8750-1

Activity Description: TO VERIFY COMMAND, FEEDBACK AND FAILURE DETECTION INTERFACES AND FUNCTIONAL OPERATION OF THE SHUTTLE SRB FLIGHT CONTROL SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Comm. Tech:</u>	0	0.0	N/A
<u>Elect. Tech:</u>	0	0.0	N/A
<u>Mech. Tech:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 6.0

Issues:

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 100.000 Facility: VAB OMI Page Count: 38
OMI No: T6248 OMI Title: EXTERNAL TANK (ET) PRE-MOVE
INSPECTION
Subtask OMI(s): T5048
Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
GSE:

Activity Description: TO PROVIDE DETAILED INSTRUCTIONS FOR PERFORMING INSPECTION OF EACH EXTERNAL TANK (ET), ET/ORBITER (ORB) INTERFACE AND ET/SOLID ROCKET BOOSTER (SRB) INTERFACE PRIOR TO MOVE OPERATIONS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 10.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Sec. Task No: 109.000 Facility: VAB OMI Page Count: 78
OMI No: A5214 OMI Title: SHUTTLE TRANSFER AND MATE TO PAD

Subtask OMI(s): B5306 , C9002 , C9010 , M3051
M3139 , 03006 , 03016 , 05001 , 06014
S3001 , S3002 , T6248 , V1111 , V3509

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: Y
GSE: , , , , , , , , ,

Activity Description: TO PROVIDE SEQUENTIAL INSTRUCTIONS FOR KSC OPERATIONS TO EFFECTIVELY TRANSFER THE SSV/MLP FROM VAB TO PAD. DOCUMENT IS WRITTEN FOR THE CT TO MOVE UNDER THE MLP ON THE FIRST DAY AND THE MOVE AND MATE TO PAD ON SECOND DAY OPERATION.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 10.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 110.002 Facility: VAB OMI Page Count: 62
OMI No: T1205 OMI Title: INSTALLATION/ REMOVAL OF G02 PRESS
LINE BLANK-OFF PLATE - INTEGRATION CELL
Subtask OMI(s): T1001 , T1201 , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: Y
GSE: A79-3623-01 , A79-3623-02 , C78-1229 , P78-3137-1-102 ,

Activity Description: TO INSTALL G02 PRESS LINE BLANK-OFF PLATE TO SUPPORT ORBITER ENGINE/PROPULSION SYSTEM TESTING.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 5.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 111.000 Facility: VAB OMI Page Count: 78
OMI No: T1204 OMI Title: INSTALLATION/REMOVAL OF GH2 PRESS
LINE BLANK-OFF PLATE, INTEGRATION CELL
Subtask OMI(s): 69201 , 89001 , T1001 , T1050
T1201 , , ,
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: Y
GSE: A78-3623-01 , A78-3623-02 , C78-1229 , P78-3137-1-101 ,

Activity Description: TO INSTALL GH2 PRESS LINE BLANK-OFF PLATE, TO SUPPORT ENGINE/PROPULSION SYSTEM TESTING IN VAB INTEGRATION CELL. THE BLANK-OFF PLATE MAY BE REMOVED, IF REQUIRED, AT PAD A PER OMI T1401, OR IN THE INTEGRATION CELL PER THIS OMI.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	0	0.0	N/A		
<u>Elec. Tech:</u>	0	0.0	N/A		
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	0	0.0		<u>Time:</u>	5.0

Issues: :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 201.000 Facility: PAD OMI Page Count: 466
OMI No: S0009 OMI title: SHUTTLE LAUNCH PAD VALIDATION WITH
CONTINGENCY APU CONFIDENCE RUN (LPS)
Subtask OMI(s): SEE PAGE 15 , THRU 24 FOR , 179 SEPARATE , TASK CALLOUTS
,
,
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: H70-0865 , A70-0643-2 , , ,

Activity Description: PERFORM/VERIFY STS/MLP/PAD ELECTRICAL/PNEUMATIC/MECH.
INTERFACES. PERFORM/VERIFY LOX PAD/MLP MATE AND FUNCT CHECKS.
PERFORM/VERIFY LH2 PAD/MLP MATE AND FUNCT CHECKS. PERFORM/VERIFY GOX VENT
ARM/ET ALIGNMENT. VERIFY BSV RF/INSTRUMENTATION INTERFACES WITH THE PAD.
PERFORM/VERIFY PERFORMANCE OF APUS VIA APU CONFIDENCE RUN PERFORMANCE TEST.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 34.0

Issues: :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 203.000
OMI No: V1202

Facility: FAD
OMI Title: MPS/SSME HELIUM SIGNATURE TEST

OMI Page Count: 120

Subtask OMI(s): V1171 , V1122 , G6250 , G6205 ,
G6105 , , , , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: U72-1186-2 , S72-0685-X , A70-0668 , A70-0698 ,
C70-0743-7-060 , C70-1187-001 , F70-0033-1 , S70-0534

Activity Description: PERFORM LEAK CHECK OF ISOLATED MPS/SSME SYSTEMS WITH HELIUM USING HAZ GAS DETECTION SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 44.0

Issues: TIME/ON-LINE : COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No.: 205.000 Facility: PAD OMI Page Count: 266
OMI No: S5009 OMI Title: FINAL ORDNANCE
INSTALLATION/CONNECTION AND AFT CLOSEOUT (LPS)
Subtask OMI(s): SEE PARA 1.1.3, FOR LIST OF , 42 SEPARATE , SUBTASK OMI'S ,

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: Y LCC Support Required: Y

OSE: C72-1127-2

Activity Description: 1) INSTALL SRSS FLIGHT CODE. 2) PERFORM SRSS OPEN/CLOSED LOOP TESTS. 3) PERFORM POWER OFF STRAY VOLTAGE CHECKS, SHIELD TO GROUND RES. CHECKS & ELECT CONNECT ALL PYRO DEVICES. 4) CONNECT ET & SRB SRSS CDF ASSY'S TO S&A DEVICES 5) ET I/T CLOSEOUT. 6) CONNECT SRB IGN S&A CABLES & PULL PINS. 7) PIC RES & ROTATION. 8) SRB MECH CLOSEOUT 9) CARGO STRAY VOLTS 10) FINAL CONF

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
Mech. Tech:	0	0.0	N/A	
Elec. Tech:	0	0.0	N/A	
Quality:	0	0.0	N/A	
LCC Ops:	2	0.0	N/A	
Support:	0	0.0	N/A	
Engineering:	0	0.0	N/A	
<u>Total:</u>	0	0.0		<u>Time:</u> 100.0

Issues: SAFETY

: TIME/ON-LINE :

Technology Need Description:

SEE TIS 57 (V1003)

SEE TIS 11 (V5012)

Technology Candidates Identified:

SEE TIS 57 (V1003)

SEE TIS 11 (V5012)

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Technology Identification Sheet

Seq. Task No: 206.000 Facility: PAD OMI Page Count: 904
OMI No: V9002.01-10 OMI Title: HYDRAULIC POWER UP/DOWN

Subtask OMI(s): S3500 , V1133 , V9001 ,
, , , ,
, , , ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: A70-0696 , C70-0894 , S72-0841 , S70-0843 ,
S70-0952 , S70-0841-1 , S72-0844-3 , S72-0844-4

Activity Description: APPLY HYDRAULIC GROUND POWER TO ORBITER TO SUPPORT
HYDRAULIC OR ANY ASSOCIATED SUBSYSTEMS TESTING.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 28.0

Issues: DESIGN CRITERIA : REQUIREMENTS : COST/MANHOURS :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 207.000 Facility: PAD DMI Page Count: 539
DMI No: V1046 DMI Title: SSME LEAK AND FUNCTIONAL (VERTICAL)
(LFS) (CONTINGENCY)
Subtask DMI(s): , , , , ,

Prerequisite Task DMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: A70-0668 , A70-0698-1 , C70-0902 , C70-0907 ,
S70-0902 , S70-0905 , , ,

Activity Description: 1) PERFORM CONTINGENCY LEAK AND FUNCTIONAL C/O IN VERTICAL
2) VERIFY SSME SYSTEM INTEGRITY FOLLOWING A PAD ABORT AFTER MAIN ENGINE
IGNITION.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 30.0

Issues: , ,

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 202.000 Facility: PAD OMI Page Count: 112
OMI No: S1005 OMI Title: LO2 TOTAL SYSTEM DEW POINT AND ET

CONDITIONING

Subtask OMI(s): G6150 , G9101 , L02-9006 , M3011
M3020 , M3500 , S9001 , V1171 , V5057

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: S72-1106-2

Activity Description: TO PURGE THE EXTERNAL TANK, TSM VENT, ORBITER AND ENGINES, AND ENGINE BLEEDLINE WITH GN2 FROM THE S72-0685-3 PANEL FOR A DEWPOINT OF 113 PPM H2O MAXIMUM. TO VERIFY REPLENISH FILL SYSTEM AND VAPORIZER FOR A DEW POINT OF 22 PPM H2O MAX PER G2124. TO PURGE MAIN FILL AND DRAIN INCLUDING CROSS COUNTRY LINE THRU THE TSK DRAIN LINE WITH GN2..FOR A DEW POINT OF 113 PPM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 12.0

Issues: :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 209.000 Facility: PAD OMI Page Count: 0
OMI No: S1006 OMI Title: ET/FACILITY LH2 SYSTEM CONDITIONING

Subtask OMI(s): 66250 , 69201 , T1050 , V9001
V3500 , V5057 , SOTP-LH2-9006 ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y

GSE:

Activity Description: TO PURGE AND SAMPLE THE ET LH2 TANK AT LC39A. TO PURGE AND SAMPLE THE LH2 STORAGE AND TRANSFER SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	0	0.0	N/A	
<u>Elec. Tech:</u>	0	0.0	N/A	
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	0	0.0		<u>Time:</u> 12.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 210.000 Facility: PAD OMI Page Count: 510

OMI No: V1103.01-03 OMI Title: EXTRAVEHICULAR MOBILITY

UNIT/FUNCTIONAL CHECKOUT (LPS)

Subtask OMI(s): M3095 , M6020 , S3500 , V3502
V3512 , V3528 , V5057 , V5067 , V6003
V9001, VL1 , , ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y

GSE: A70-0962 , C70-0743-001 , S70-0698-1 , S70-0698-3 ,
S70-0834-1 , S70-0834-2 , S70-0787-2 , S72-1106-1

Activity Description: PROVIDE EMU INTERFACE VALIDATION TESTS AT OPF.
PROVIDE EMU FUNCTIONAL CHECKOUT AT PAD. (TWO UNITS)
PROVIDE EMU FUNCTIONAL CHECKOUT AT PAD. (2 EMU'S AND 1 SPARE)

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	0	0.0	N/A	
<u>Elec. Tech:</u>	0	0.0	N/A	
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	0	0.0		<u>Time:</u> 12.0

Issues: FAULT DETECTION : TIME/ON-LINE : DESIGN CRITERIA :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Technology Identification Sheet

Seq. Task No: 211.000 Facility: PAD QMI Page Count: 240
QMI No: V1149 QMI Title: T-0 UMBILICALS INTERFACE LEAK CHECKS
(LPS)
Subtask QMI(s): G6105 , G6150 , G6205 , S9001
S3500 , T1101 , T1201 , V9017 , V5057
V1171
Prerequisite Task QMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: F70-0027 , S70-0517 , S70-0529 , S70-0823-1
S72-0685-1 , S72-0686-1 , S72-1107-1 , S72-1107-13

Activity Description: 1) LEAK CHECK THE INTERFACES BETWEEN THE ORBITER AND THE T-0 UMBILICALS AND THE ORB/ET DISCONNECTS.
2) TIMING OF ORB/ET DISCONNECT VALVES.
3) VERIFICATION OF L02/LH2 ORBITER/ET DISCONNECT CAVITY PURGES.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 9.0

Issues: MAINTAINABILITY : DESIGN :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 212.000 Facility: PAD QMI Page Count: 192
QMI No: V2303 QMI Title: FCSS/PRSD DEWAR SERVICING LO2 AND LH2
(COMBINED LOADINGS) (LPS)
Subtask QMI(s): SEE PARA 1.1.3, FOR LIST OF , 35 SEPARATE , SUBTASK QMI'S ,

Prerequisite Task QMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: Y
GSE: C72-0811 , S70-0817 , S70-0830-2 , S70-1220 ,
S70-1222 , S72-0694-6 , S72-0697-3 , S72-0699-2

Activity Description: PROVIDE THE NECESSARY STEPS TO SERVICE THE LO2 AND LH2 FCSS/PRSD DEWARS FOR SUBSEQUENT ORBITER PRSD CRYO LOADING OPERATION. THIS NEW QMI WILL BE USED FOR INITIAL SYSTEM VALIDATION OF THE S70-0817 SYSTEM (PAD B) AND SUBSEQUENT OPERATIONAL SERVICINGS OF THE ORBITER PRSD SYSTEM (PAD A AND PAD B).

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	0	0.0	N/A	
<u>Elec. Tech:</u>	0	0.0	N/A	
<u>Quality:</u>	0	0.0	N/A	
<u>LCC Ops:</u>	0	0.0	N/A	
<u>Support:</u>	0	0.0	N/A	
<u>Engineering:</u>	0	0.0	N/A	
<u>Total:</u>	0	0.0		<u>Time:</u> 7.0

Issues:

Technology Need Description:

Technology Candidates Identified:

ORBITER OMI IS
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Technology Identification Sheet

Seq. Task No: 300.000 Facility: PAD OMI Page Count: 84
OMI No: N0133 OMI Title: SHUTTLE - CARGO INSTALLATION CONTROL
(LPS)
Subtask OMI(s): A2203 , E1519 , E1933 , E5506
E6600 , M3160 , N5033 , N5433 , V1173
V1176 , V3510 , V3545 , V5045 , V9023
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE: , , , , , , , ,

Activity Description: PROVIDE THE INTEGRATION CONTROL OF THE TRANSFER OF PAYLOADS TO THE PAD, PAYLOAD INSTALLATION IN THE PCR AND PAYLOAD INSTALLATION IN THE ORBITER.

(IUS EXAMPLE)

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 80.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 301.000 Facility: PAD OMI Page Count: 104
OMI No: N0433 OMI Title: CARGO/ORBITER INTERFACE TEST (LPS)
(IUS EXAMPLE)
Subtask OMI(s): A2700 , S3500 , S9001 , V3528
V1117 , V1184 , E0233 , E0433
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y
GSE:

Activity Description: SUPPORT MDAC PAYLOAD AS REQUIRED DURING P/L CHECKOUT.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	0	0.0	N/A		
<u>Elec. Tech:</u>	0	0.0	N/A		
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	0	0.0		<u>Time:</u>	26.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seg. Task No: 305.000

Facility: PAD

OMI Page Count: 0

OMI No: N0430
(SPACELAB EXAMPLE)

OMI Title: -CARGO/ORBITER INTERFACE TEST (LPS)

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: SPACELAB

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	0	0.0	N/A		
<u>Elec. Tech:</u>	0	0.0	N/A		
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	0	0.0		<u>Time:</u>	0.0

Issues:

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 401.000 Facility: ET C/O CELL OMI Page Count: 371
OMI No: T5149 OMI Title: ET OFF-LOAD MOVE AND SECURE IN
 CHECKOUT/STORAGE CELL
Subtask OMI(s): 03016 , I2003 , I2045 , I2047
 03008 , 03011 , 03208 , 03235 , T1102
 T1103 , T5128 , T5148 , T6048
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: H78-0839-2 , H78-0847 , H78-3004 , H78-3006
 H78-3028 , H78-3040 , M78-0063

Activity Description: ET BARGE OFF-LOAD, MOVE TO VAB, REMOVE FROM TRANSPORTER, TRANSLATE TO VERTICAL AND INSTALL IN THE ET CHECKOUT/STORAGE CELL.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 24.0

Issues: :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 402.000

Facility: ET C/O CELL

OMI Page Count: 206

OMI No: T5128

OMI Title: PREP ET CHECKOUT CELL/STORAGE CELL-

HB-2

Subtask OMI(s):

, , ,
, , ,
, , ,

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: PLACE CHECKOUT/STORAGE CELL IN CONFIGURATION NECESSARY FOR RECEIPT AND INSTALLATION OF AN ET.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 8.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 404.000

Facility: ET C/O CELL

OMI Page Count: 102

OMI No: T1103

OMI Title: LH2 TANK PREPS, PURGE, PRESS AND

SAMPLING

Subtask OMI(s): T1101

, T2001

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: TO REMOVE SHIPPING AND STANDBY PRESSURIZATION GSE AND REPRESSURIZE THE LH2 TANK, IF REQUIRED, TO LEAK TEST AND STANDBY PRESSURE LEVELS. TO INSPECT 2 IN. AND 4 IN. DISCONNECTS. TO PURGE THE LH2 TANK WITH GHE, REPRESSURIZE AND SAMPLE FOR PERCENT HELIUM AND DEW POINT.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 20.0

Issues:

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 405.000 Facility: ET C/O CELL OMI Page Count: 84
OMI No: T6149 OMI Title: ET RECEIVING INSPECTION

Subtask OMI(s):
, , ,
, , ,
, , ,

Prerequisite Task OMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
SEE: A72-0853 , A78-0856 , A78-3604 , , ,

Activity Description: TO PROVIDE NECESSARY DETAILED INSTRUCTIONS TO PERFORM RECEIVING INSPECTION ON EACH EXTERNAL TANK (ET), ITS ASSOCIATED SHIP-LOOSE HARDWARE AND ENGINEERING CONFIGURATION VERIFICATION AFTER ARRIVAL AT KSC.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
Mech. Tech:	0	0.0	N/A
Elec. Tech:	0	0.0	N/A
Quality:	0	0.0	N/A
LCC Ops:	0	0.0	N/A
Support:	0	0.0	N/A
Engineering:	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 42.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Spec. Task No: 404.002 Facility: ET C/O CELL QMI Page Count: 109
QMI No: T5048 QMI Title: INSTALL AND REMOVE INTERTANK ACCESS
KIT

Subtask QMI(s): T6447

Prerequisite Task QMI:

Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
CSE: A72-0853 , A78-3604 , A78-3605

Activity Description: INSTALL INTERTANK ACCESS KIT AND RELATED EQUIPMENT. REMOVE INTERTANK ACCESS KIT AND RELATED EQUIPMENT.

<u>Personnel:</u>	<u>Base Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	2	0.0	N/A
<u>Elec. Tech:</u>	2	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 32.0

Issues: ; ; ;

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seg. Task No: 409.000 Facility: ET C/O CELL OMI Page Count: 156
OMI No: T6148 OMI Title: GUCP AND GUCP QUICK DISCONNECT POST
 LAUNCH REFURBISHMENT
Subtask OMI(s):

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
BSE: A78-3621 , F78-0048

Activity Description: TO REFURBISH/LEAK TEST GROUND HALF OF GUCP QUICK DISCONNECT, ONE 7 IN. GH2 VENT AND SIX 3/8 IN. PRESSURIZATION QUICK DISCONNECTS AFTER LAUNCH.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 96.0

Issues: :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 410.000 Facility: ET C/O CELL OMI Page Count: 108
 OMI No: T1147 OMI Title: INSTALL GRQUND UMBILICAL CARRIER
 PLATE (GUCP)
 Subtask OMI(s):

Prerequisite Task OMI:
 Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
 GSE:

Activity Description: INSTALL AND MECHANICALLY CONNECT THE INTERTANK (I/T) GUCP TO THE ET AND TO THE CHECKOUT CELL FACILITY SERVICES.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
Mech. Tech:	0	0.0	N/A
Elec. Tech:	0	0.0	N/A
Quality:	0	0.0	N/A
LCC Ops:	0	0.0	N/A
Support:	0	0.0	N/A
Engineering:	0	0.0	N/A
Total:	0	0.0	Time: 48.0

Issues: :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 411.000 Facility: ET C/O CELL OMI Page Count: 136
OMI No: T1107 OMI Title: ET ANCILLARY LEAK AND FLOW TEST
(HB-2)

Subtask OMI(s): T1101 , T1102 , T1103 ,
, , , ,
, , , ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
GSE: C78-1229 , C78-5202 , , , , ,

Activity Description: PROVIDE THE PROCEDURES FOR LEAK TESTING THOSE ET LINES AND COMPONENTS WITHIN THE INTERTANK NOT DIRECTLY EXPOSED TO LO2 AND LH2 TANK INTERNAL PRESSURE AND FOR VERIFYING FLOW IN INTERTANK PURGE, AND NOSE FAIRING PURGE SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 56.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 412.000

Facility: ET C/O CELL

OMI Page Count: 17

OMI No: T5143

OMI Title: INSTALL ET RANGE SAFETY SYSTEM

COMPONENTS

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: TO INSTALL ET RANGE SAFETY SYSTEM FLIGHT COMPONENTS PRIOR TO SRSS FUNCTIONAL TESTING.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 0.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 415.000

Facility: ET C/O CELL

OMI Page Count: 92

OMI No: T5141

OMI Title: TPS CLOSEOUT, AFT HARDPOINT

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: PERFORM NECESSARY TASKS TO PREPARE LH2 TANK SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT AFT HARDPOINT CLOSEOUT AND APPLY POLYURETHANE FOAM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	

Time: 24.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 416.000 Facility: ET C/O CELL OMI Page Count: 64
OMI No: TS136 OMI Title: TPS CLOSEOUT, HELIUM INJECT LEAK
CHECK PORTS
Subtask OMI(s): , , ,
, , ,
, , ,

Prerequisite Task OMI:
Hazard: N Level: Vehicle Power Required: N LCC Support Required: N
BSE: , , , , ,

Activity Description: PERFORM NECESSARY TASKS TO PREPARE LO2 FEEDLINE SUBSTRATE, AND EXISTING THERMAL PROTECTION SYSTEM FOR APPLICATION OF POLYURETHANE FOAM L744A.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 16.0

Issues: , ,

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 417.000
OMI No: T5238

Facility: ET C/O CELL OMI Page Count: 66
OMI Title: TPS CLOSEOUT, HELIUM INJECT BOX

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:
GSE:

Vehicle Power Required: N LCC Support Required: N

Activity Description: PERFORM NECESSARY TASKS TO PREPARE SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT HELIUM INJECT BOX CLOSEOUT AND APPLY L744A POLYURETHANE FOAM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 16.0

Issues:

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 418.000 Facility: ET C/O CELL OMI Page Count: 147
OMI No. Title: T1101 OMI Title: GH2/GO2 VENT VALVE FUNCTIONAL TEST-
6633
Subtask OMI(s): , , , , , ,

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: Y
GSE: C78-1229 , C78-1273 , C78-1273-32 , , ,

Activity Description: TO VERIFY THAT THE GH2/GO2 VENT VALVES OPEN AND CLOSE WITHIN THE SPECIFIED TIMES, AND THAT THE VALVES CRACK AND RESEAT WITHIN THE SPECIFIED PRESSURES. TO LEAK CHECK THE GH2/GO2 VENT VALVE PILOT SENSE PORTS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	0	0.0	N/A		
<u>Elec. Tech:</u>	0	0.0	N/A		
<u>Quality:</u>	0	0.0	N/A		
<u>LCC Ops:</u>	0	0.0	N/A		
<u>Support:</u>	0	0.0	N/A		
<u>Engineering:</u>	0	0.0	N/A		
<u>Total:</u>	0	0.0		<u>Time:</u>	00.0

Issues: : : :

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 420.000 Facility: ET C/O CELL OMI Page Count: 146
 OMI No: T1108 OMI Title: L02/LH2 DISCONNECT 17-IN. FLAPPER
 VALVE MEASUREMENT, VERIFICATION AND INSPECTION-HB-2/-4 CHECKOUT CELL
 Subtask OMI(s): , , ,

Prerequisite Task OMI:
 Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
 GSE:

Activity Description: MEASURE AND VERIFY THE ANGLE AND TIP LOAD OF THE L02/LH2 17-IN. DISCONNECT FLAPPER VALVES. VERIFY THE FLAPPER VALVE FAIRING CONFIGURATION ON THE L02/LH2 DISCONNECT VALVES. VERIFY THE PROPER TORQUE ON THE L02/LH2 17-IN. DISCONNECT FLAPPER VALVE STOPS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
Mech. Tech:	0	0.0	N/A
Elec. Tech:	0	0.0	N/A
Quality:	0	0.0	N/A
LCC Ops:	0	0.0	N/A
Support:	0	0.0	N/A
Engineering:	0	0.0	N/A
Total:	0	0.0	<u>Time:</u> 48.0

Issues: : :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 421.000
OMI No: T6248

Facility: ET C/O CELL OMI Page Count: 38
OMI Title: EXTERNAL TANK (ET) REMOVE INSPECTION

Subtask OMI(s): T5048

Prerequisite Task OMI:

Hazard: N Level:

GSE:

Vehicle Power Required: N LCC Support Required: N

Activity Description: TO PROVIDE DETAILED INSTRUCTIONS FOR PERFORMING INSPECTION OF EACH EXTERNAL TANK (ET), ET/ORBITER (ORB) INTERFACE AND ET/SOLID ROCKET BOOSTER (SRB) INTERFACE PRIOR TO MOVE OPERATIONS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	

Time: 16.0

Issues:

Technology Need Description:

Technology Candidates Identified:

Technology Identification Sheet

Seq. Task No: 422.000
OMI No: TS149

Facility: ET C/O CELL OMI Page Count: 246
OMI Title: PREP ET CHECKOUT CELL/STORAGE CELL

Subtask OMI(s): , , , , ,

Prerequisite Task OMI:

Hazard: Y Level:

SSE:

Vehicle Power Required: N LCC Support Required: N

Activity Description: PLACE CHECKOUT/STORAGE CELL (VAB HB-2/-4) IN CONFIGURATION NECESSARY FOR RECEIPT AND INSTALLATION OF AN ET.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	0	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 6.0

Issues: :

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Seq. Task No: 423.000 Facility: ET C/O CELL OMI Page Count: 176
OMI No: T5147 OMI Title: ET MOVE FROM STORAGE CELL TO CHECKOUT
CELL/FROM CHECKOUT CELL TO STORAGE CELL
Subtask OMI(s): I2003 , I2026 , Q3008 , Q6003
Q3022 , Q3016 , Q3235 , S0003 , T5128
T5148 , T6248
Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N
OSE: H78-0839-2 , H78-0847 , H78-3006 , H78-3008
H78-3028 , H78-3040 , M78-0063

Activity Description: MOVE ET FROM STORAGE CELL AND SECURE IN CHECKOUT CELL OR
FROM CHECKOUT CELL AND SECURE IN STORAGE CELL.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>
<u>Mech. Tech:</u>	0	0.0	N/A
<u>Elec. Tech:</u>	0	0.0	N/A
<u>Quality:</u>	0	0.0	N/A
<u>LCC Ops:</u>	0	0.0	N/A
<u>Support:</u>	2	0.0	N/A
<u>Engineering:</u>	0	0.0	N/A
<u>Total:</u>	0	0.0	<u>Time:</u> 8.0

Issues: :

Technology Need Description:

Technology Candidates Identified:

