INDEPENDENT ORBITER ASSESSMENT

ASSESSMENT
OF THE
DATA PROCESSING SYSTEM
FMEA/CIL

28 NOVEMBER 1986

MCDONNELL DOUGLAS ASTRONAUTICS COMPANY
HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

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28 November 1986

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1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986.

The IOA effort first completed an analysis of the Data Processing System (DPS) hardware, generating draft failure modes and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. The IOA results were then compared to the NASA FMEA/CIL baseline with proposed Post 51-L updates included. A resolution of each discrepancy from the comparison is provided through additional analysis as required. This report documents the results of that comparison for the Orbiter DPS hardware.

The IOA product for the DPS analysis consisted of one hundred twenty-two failure mode "worksheets" that resulted in twenty-three potential critical items being identified. Comparison was made to the NASA baseline (as of 19 November 1986) which consisted of seventy-eight FMEAs and twenty-five CIL items. The comparison determined if there were any results which had been found by the IOA but were not in the NASA baseline. This comparison produced agreement on all but four FMEAs which caused differences in two CIL items. Figure 1 presents a comparison of the proposed Post 51-L NASA baseline, with the IOA recommended baseline, and any issues.

The issues arose due to differences between the NASA and IOA FMEA/CIL preparation instructions. NASA had used an older ground rules document which has since been superseded by the NSTS 22206 used by the IOA. After comparison, there were no discrepancies found that were not already identified by NASA, and the remaining issues may be attributed to differences in ground rules.

DPS FMEA/CIL ASSESSMENT OVERVIEW

DPS ASSESSMENT SUMMARY

	IOA	NASA	ISSUES
FMEA	78	78	4
CIL	23	25	2

MULTIPLEXER/ DEMULTIPLEXER

	IOA	NASA	ISSUES
FMEA	14	14	2
CIL	8	10	2

ENGINE INTERFACE UNIT

	IOA	NASA	ISSUES
FMEA	4	4	0
CIL	4	4	0

MASS MEMORY UNIT

	IOA	NASA	ISSUES
FMEA	9	9	0
CIL	1	1	0

DATA BUS ISOLATION AMPLIFIERS

	IOA	NASA	ISSUES
FMEA	2	2	0
CIL	0	0	0

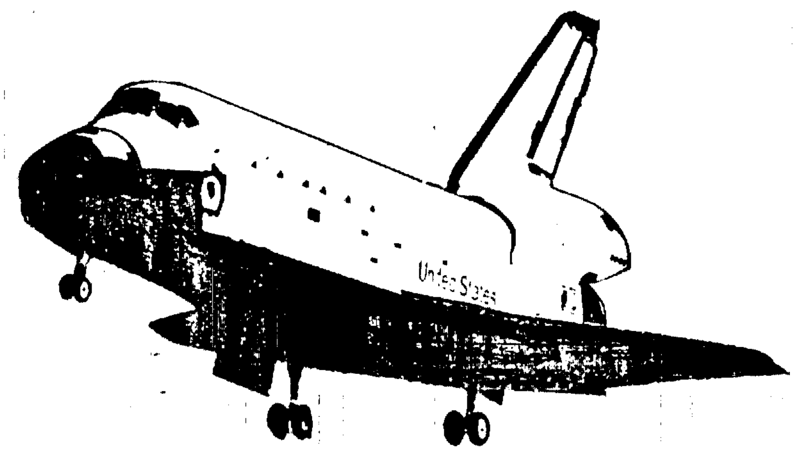
GENERAL PURPOSE COMPUTER

CENTRAL PROCESSING UNIT

	IOA	NASA	ISSUES
FMEA	19	19	1
CIL	4	4	0

INPUT/OUTPUT PROCESSOR

	IOA	NASA	ISSUES
FMEA	6	6	1
CIL	2	2	0



DATA BUS COUPLER

	IOA	NASA	ISSUES
FMEA	1	1	0
CIL	1	1	0

MULTIFUNCTION CRT DISPLAY SYSTEM

	IOA	NASA	ISSUES
FMEA	23	23	0
CIL	3	3	0

COUNT CORRECT AS OF 11/19/86

Figure 1 - DPS FMEA/CIL ASSESSMENT

2.0 INTRODUCTION

2.1 Purpose

The 51-L Challenger accident prompted the NASA to readdress safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of reevaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the proposed Post 51-L Orbiter FMEA/CIL for completeness and technical accuracy.

2.2 Scope

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

2.3 Analysis Approach

The independent analysis approach is a top-down analysis utilizing as-built drawings to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the proposed Post 51-L NASA and Prime Contractor FMEA/CIL. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEA/CIL which is documented in this report.

Step 1.0 Subsystem Familiarization
- 1.1 Define subsystem functions
- 1.2 Define subsystem components
- 1.3 Define subsystem specific ground rules and assumptions

Step 2.0 Define subsystem analysis diagram
- 2.1 Define subsystem
- 2.2 Define major assemblies
- 2.3 Develop detailed subsystem representations

Step 3.0 Failure events definition
- 3.1 Construct matrix of failure modes
- 3.2 Document IOA analysis results

Step 4.0 Compare IOA analysis data to NASA FMEA/CIL
- 4.1 Resolve differences
- 4.2 Review in-house
- 4.3 Document assessment issues
- 4.4 Forward findings to Project Manager

2.4 Ground Rules and Assumptions

The ground rules and assumptions used in the IOA are defined in Appendix B. The subsystem specific ground rules were defined to limit the analysis to single-failed-parts for each failure mode. A subset of the failure mode keywords were identified for the DPS team. This allowed for commonality in the analysis results.

3.0 SUBSYSTEM DESCRIPTION

3.1 Design and Function

The DPS consists of that hardware required for data acquisition, data manipulation, data display, and data transfer on the Orbiter, and includes the five onboard computers and their interfaces. Reference Figure 2. More specifically, the DPS consists of the following components:

1. Twelve MDM units which convert and format data at the remote locations. Each MDM has internal redundancy and consists of a Multiplexer Interface Adapter (MIA), Sequential Control Unit (SCU), Input/Output Module, Analog To Digital Converter, and Power Supply. They convert and format serial digital GPC commands into parallel discrete, digital, and analog data for transfer to vehicle subsystem hardware. They also convert and format parallel discrete, digital, and analog data from vehicle subsystems into serial digital data for transmission to the GPCs. Reference Figure 3.

2. Five GPCs each consisting of a Central Processing Unit (CPU) and Input/Output Processor (IOP). The CPU functionally consists of an Arithmetic Logic Unit, Local Store, Master Bus Control Unit, Data Flow Multiplexer, Micro-code control unit, CPU Timer, Interrupt Logic, Main Memory Timing Page, Timers, Address Bus Control, Main Memory, and Power Supply. The IOP contains Control Monitor, IOP Main Memory, Channel Control, Direct Memory Access Queue, Arithmetic Logic Units, Local Store, Micro-code store and Decode, MIAs, and Time-slice and Multiplexing. One of the functions of the GPCs is to support guidance, navigation, and control requirements of the vehicle. They provide for the monitoring and control of vehicle subsystems. They also check for data transmission errors and crew input error. Vehicle system failures and out-of-tolerance conditions are annunciated by the GPCs. Reference Figure 4 and Figure 5.

3. The MCDS consists of three Keyboard Units (KU), four Display Units (DU) and four Display Electronics Units (DEU). Each KU has Keys, Switches and Lights. The DU consists of X/Y Deflection Amplifiers, Video Amplifiers, Cathode-Ray Tube, BITE and Power Supplies. The DEU has an Oscillator, Memory, Key-board Adapter, Symbol Generator, MIA, Control Logic, BITE, Load Switch, and Power Supplies. The subsystem provides for crew/vehicle interface via a keyboard and CRT display. The crew can interact with the subsystems with keyboard entries and executions. Reference Figure 6 and Figure 7.

4. Thirty serial digital data buses are connected to the Bus Terminal Units (BTUs) via 227 DBCs. The DBCs are shown in Figure 8.

5. Two DBIAs provide the amplification necessary to drive the stubs and provide isolation when the stubs are opened or shorted at the umbilicals.

6. Two MMUs contain MIAs, Read Electronics, Write Electronics, Mass Memory Control Logic, Power Supply with Switch, Tape Transport Mechanism with motor, tape and heads. The mass memory unit stores programs for loading into the GPCs and the MCDS. Reference Figure 9.

7. Three EIUs provide status and command capability of the main engines. Each EIU contains a MIA, BITE, Status Buffer, Controller Interface Adapter, Operational Interface Element, Data Status and Power Supply. The EIU transfers main engine control commands from the GPC and main engine status for use by the GPC, the GSE launch processing system, and the operational instrumentation system. Reference Figure 10.

The DPS interfaces with many onboard Orbiter systems including the Main Propulsion System, Solid Rocket Boosters, Reaction Control System (RCS), Orbital Maneuvering System (OMS), Air Surface Controls used for guidance and control, Nose-wheel Steering, and the Master Timing Unit.

3.2 Interfaces and Locations

The DPS hardware is located throughout the Orbiter. The composite data bus network provides the hardware interfaces between the GPCs and all other avionics subsystems that communicate via a digital data format. Reference Figure 11. GPCs 1 and 4 are located in Avionics Bay 1 while GPCs 2 and 5 are located in Avionics Bay 2, to provide separation of redundancy. GPC 3 is located in Avionics Bay 3. Each GPC interfaces to all Flight Critical MDMs, however only one GPC normally communicates to only one FF and one FA MDM during ascent and entry dynamic flight.

3.3 Hierarchy

Figure 2 illustrates the hierarchy of the DPS hardware and the corresponding subcomponents. Figures 3 through 10 comprise the detailed system representations.

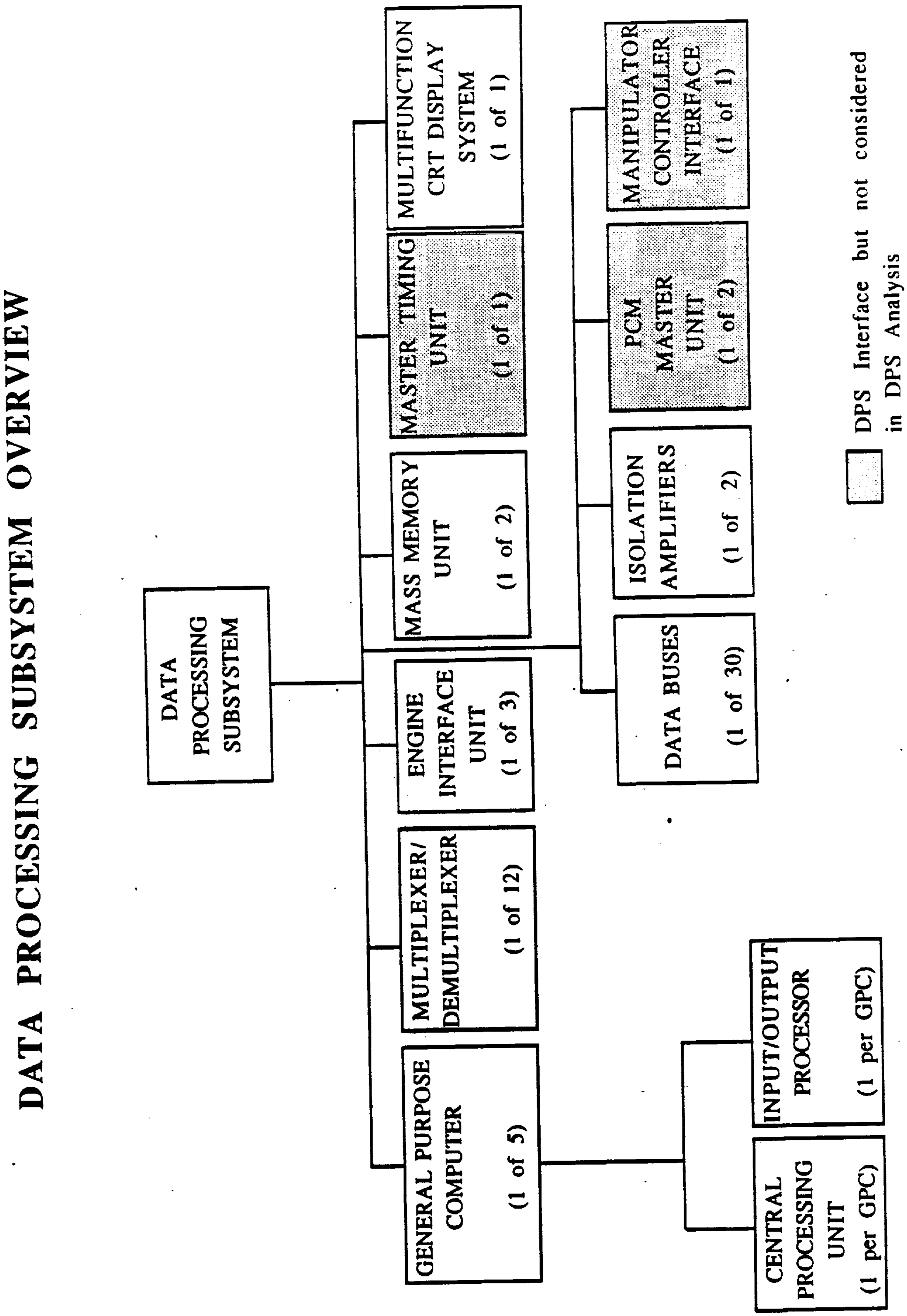


Figure 2 - DPS SUBSYSTEM OVERVIEW

DPS MULTIPLEXER/DEMULTIPLEXER

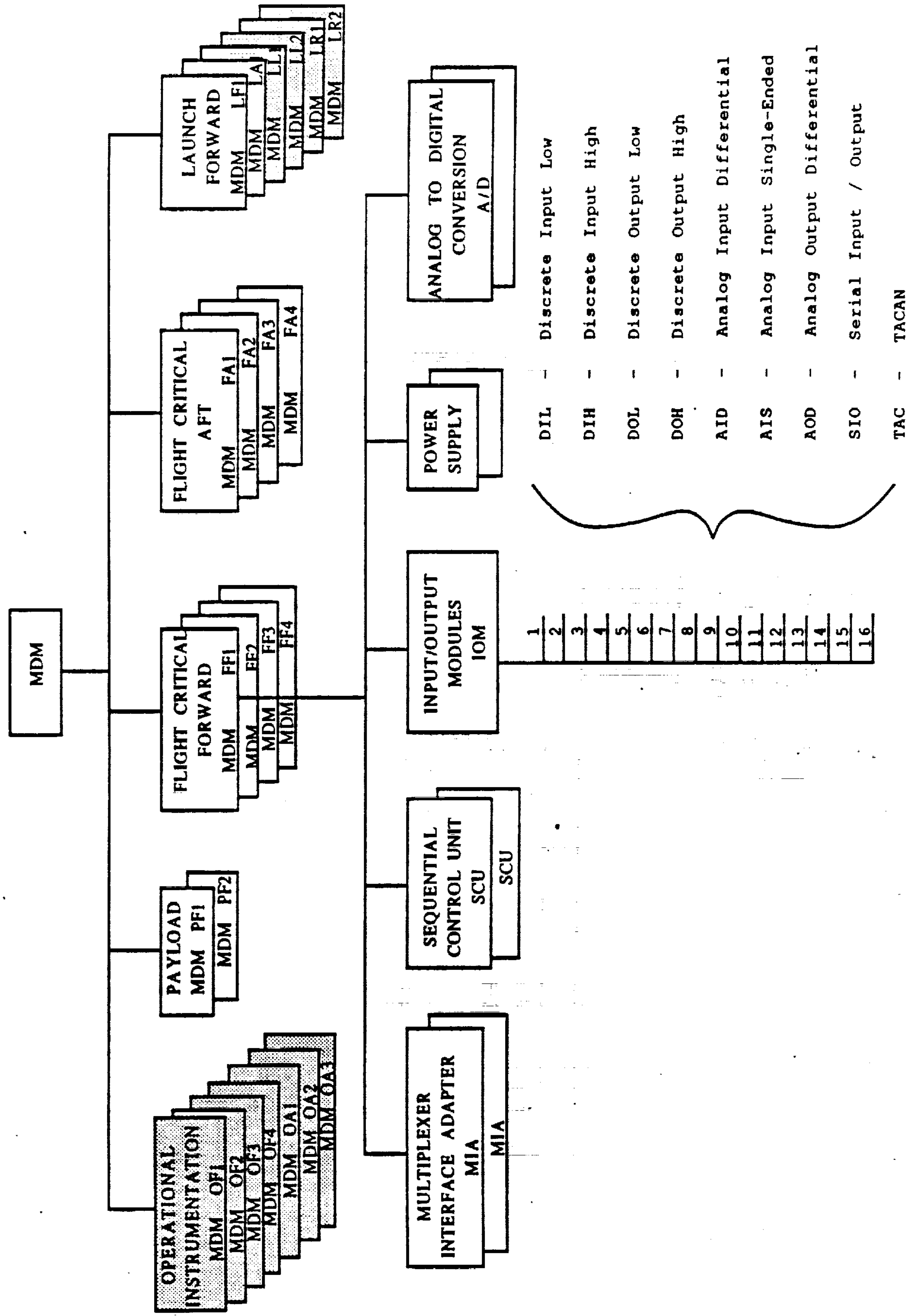


Figure 3 - DPS MULTIPLEXER/DEMULTIPLEXER (MDM)

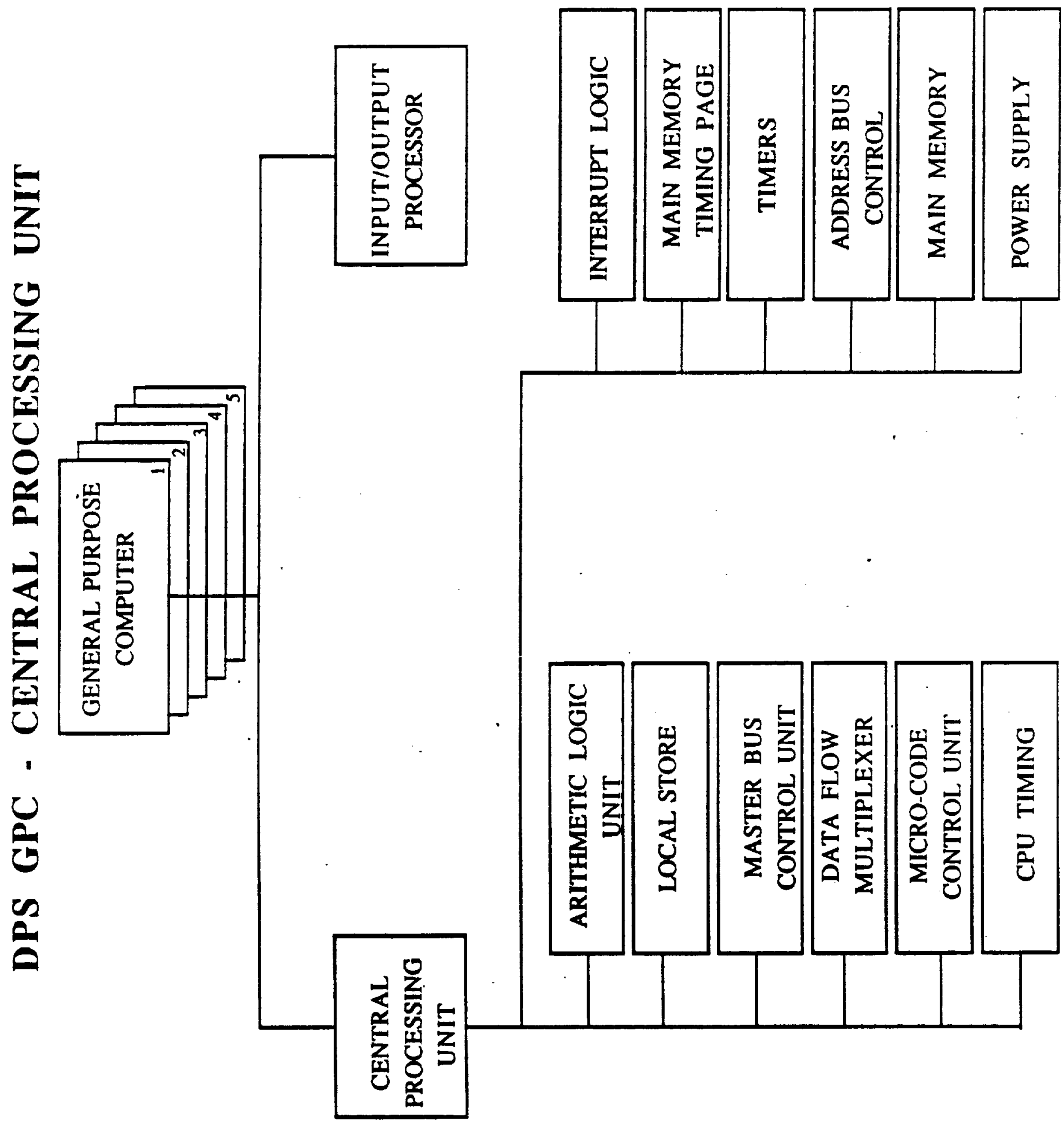


Figure 4 - DPS GPC CENTRAL PROCESSING UNIT (CPU)

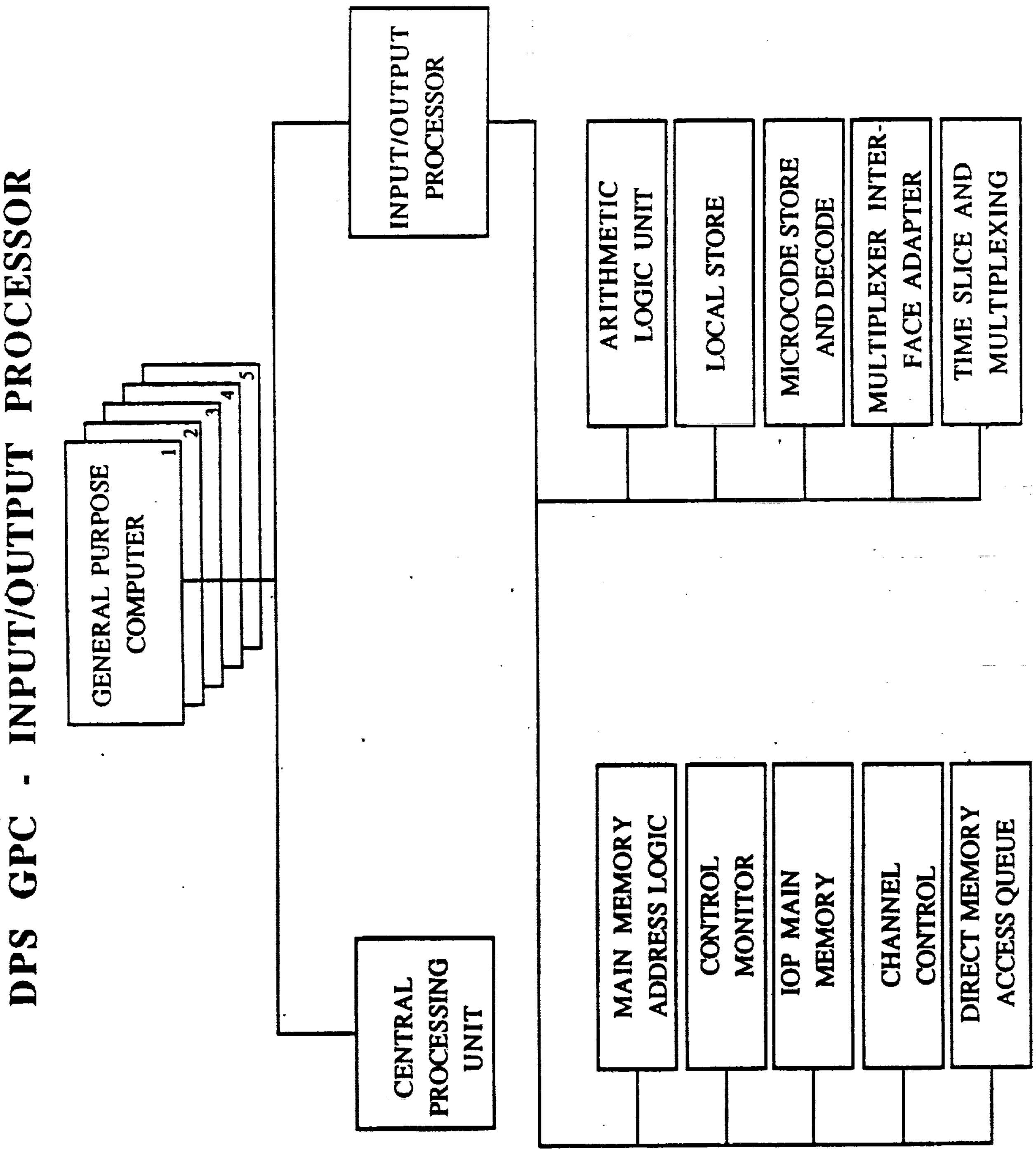


Figure 5 - DPS GPC INPUT/OUTPUT PROCESSOR (IOP)

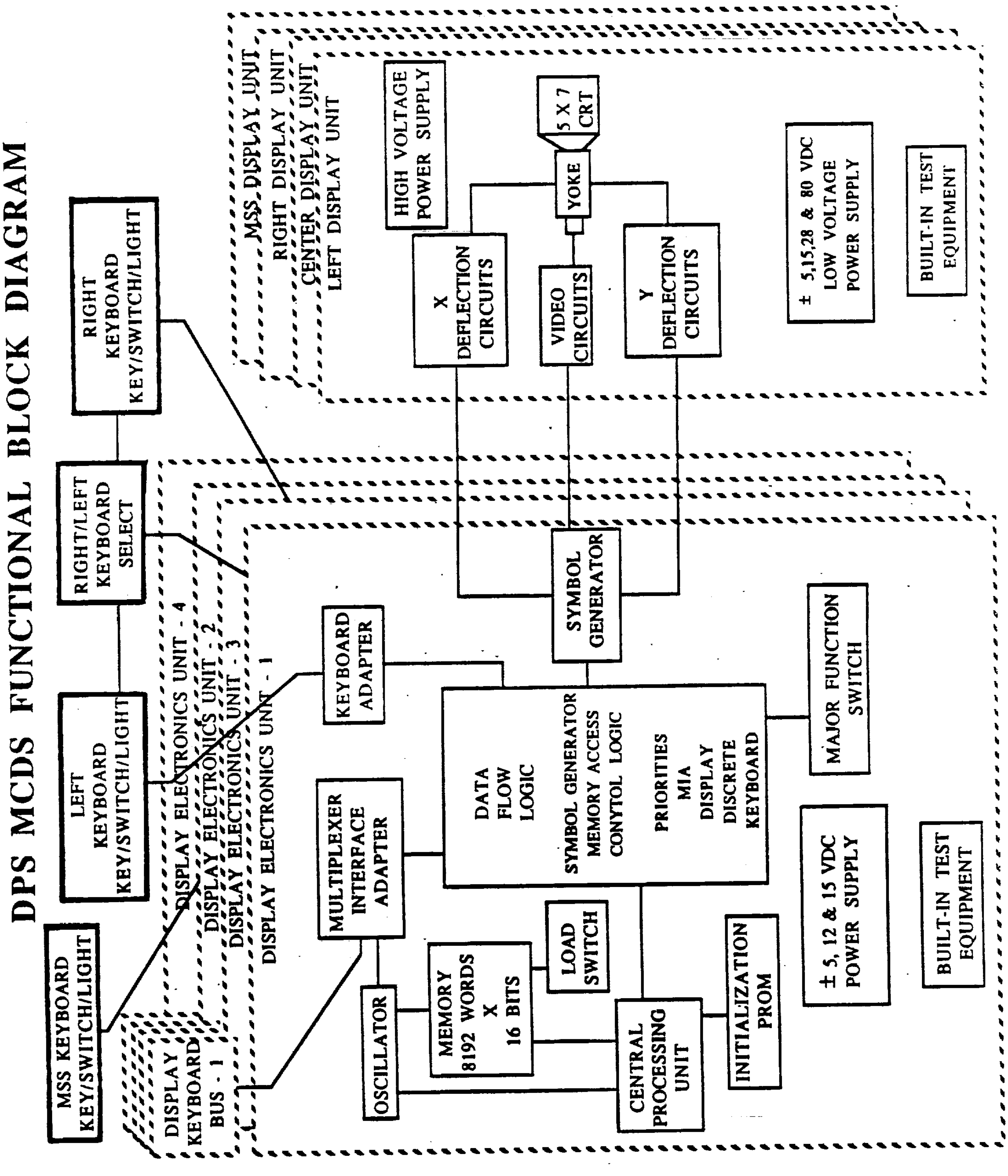


Figure 6 - DPS MCDS FUNCTIONAL BLOCK DIAGRAM

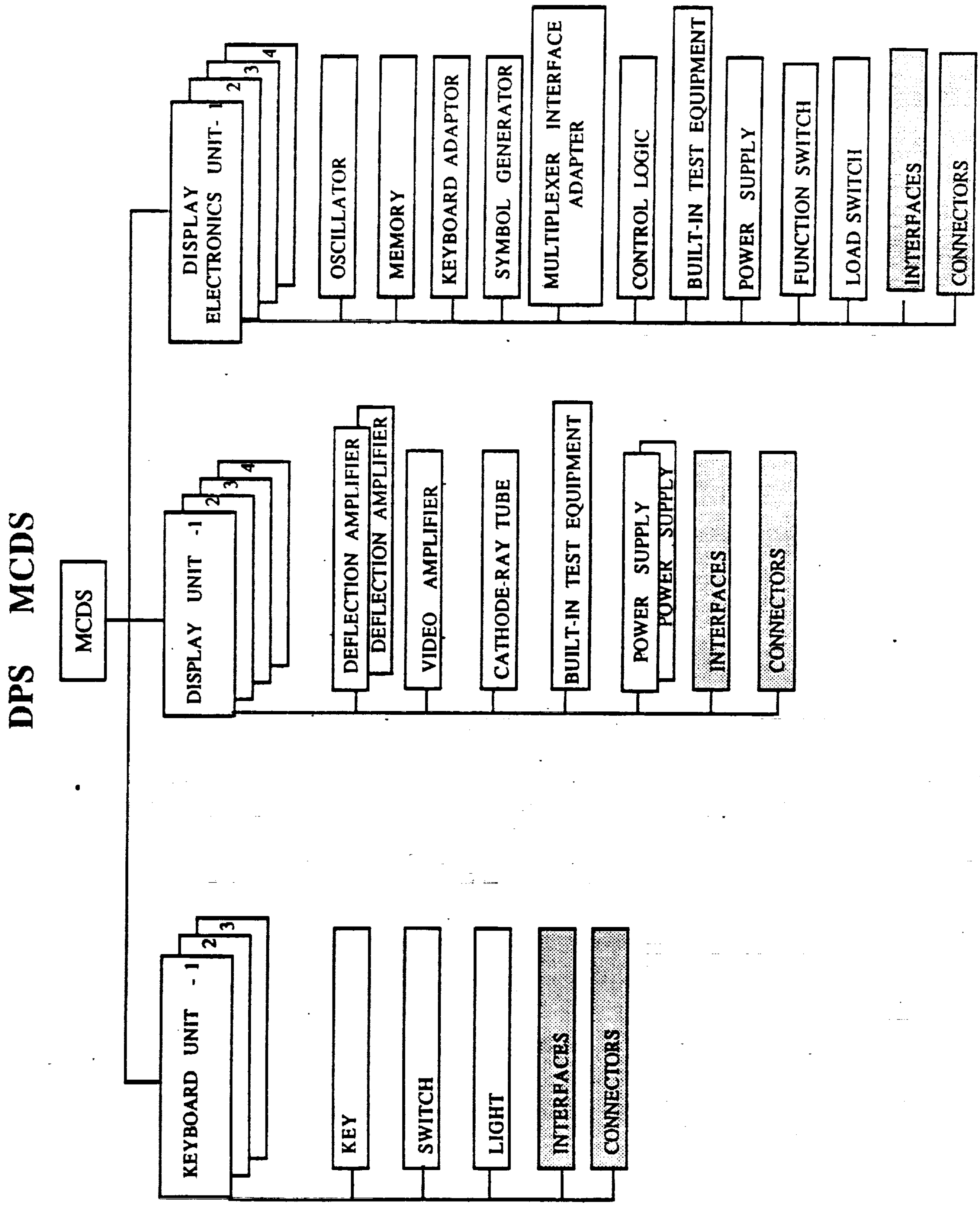
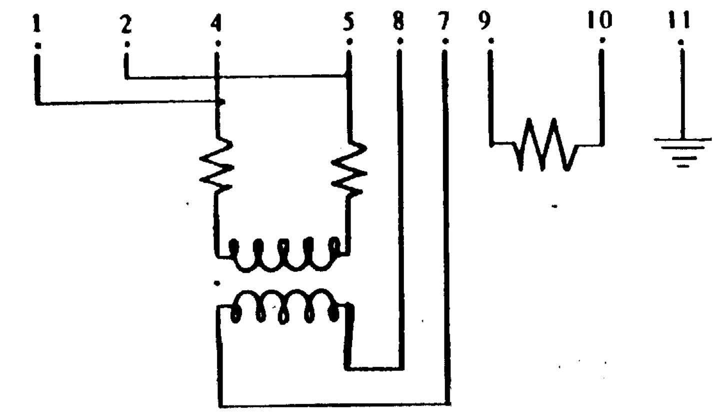


Figure 7 - DPS MCDS

DPS DATA BUS COUPLERS



QUANTITY	DATA BUS	QUANTITY	DATA BUS
6	DISPLAY/KEYBOARD-1	5	INTER-COMPUTER-4
7	DISPLAY/KEYBOARD-2	5	INTER-COMPUTER-5
6	DISPLAY/KEYBOARD-3	3	INSTRUMENTATION/PCMMU-1
7	DISPLAY/KEYBOARD-4	3	INSTRUMENTATION/PCMMU-2
11	FLIGHT CRITICAL-1	3	INSTRUMENTATION/PCMMU-3
11	FLIGHT CRITICAL-2	3	INSTRUMENTATION/PCMMU-4
11	FLIGHT CRITICAL-3	3	INSTRUMENTATION/PCMMU-5
11	FLIGHT CRITICAL-4	16	LAUNCH/BOOST-1
12	FLIGHT CRITICAL-5	16	LAUNCH/BOOST-2
12	FLIGHT CRITICAL-6	6	MASS MEMORY-1
12	FLIGHT CRITICAL-7	6	MASS MEMORY-2
12	FLIGHT CRITICAL-8	4	PAYLOAD INTERFACE-1
5	INTER-COMPUTER-1	4	PAYLOAD INTERFACE-2
5	INTER-COMPUTER-2	9	PAYLOAD-1
5	INTER-COMPUTER-3	8	PAYLOAD-2

Figure 8 - DPS DATA BUS COUPLERS (DBC)

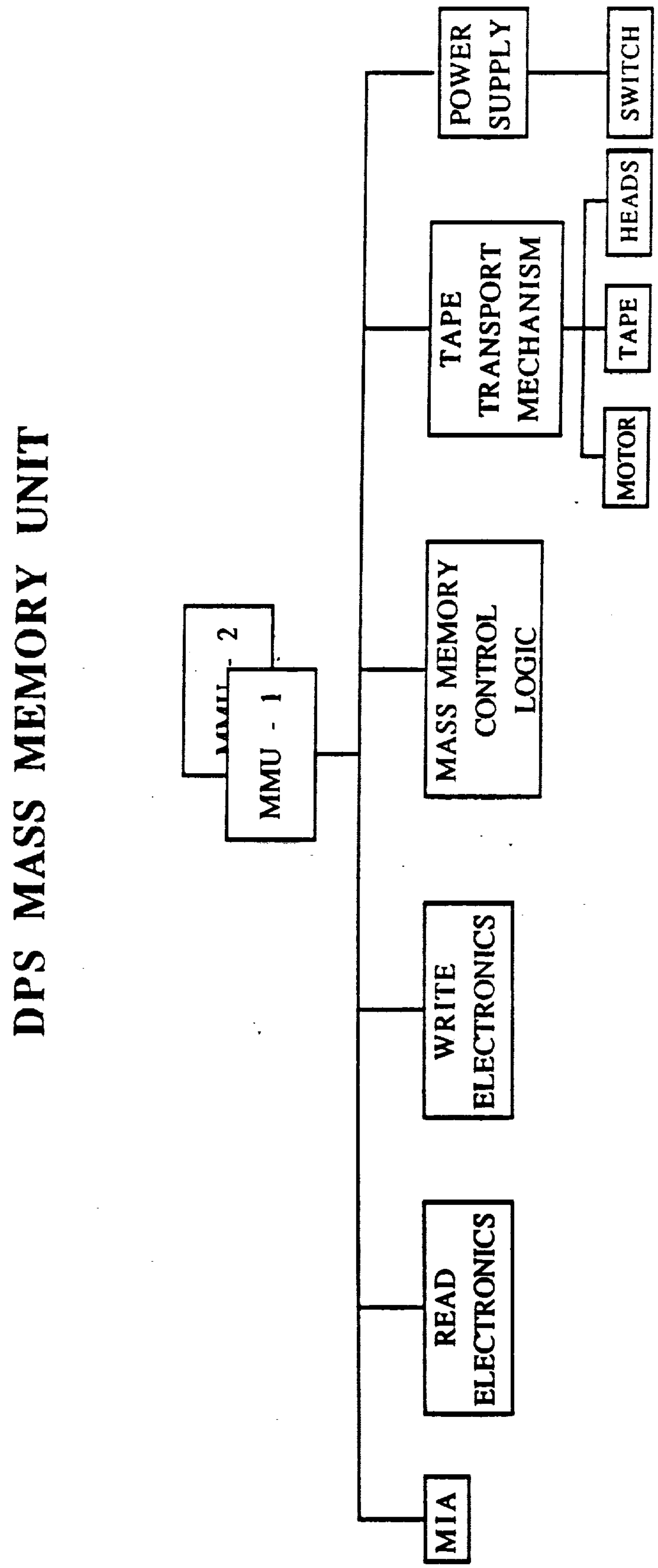


Figure 9 - DPS MASS MEMORY UNIT (MMU)

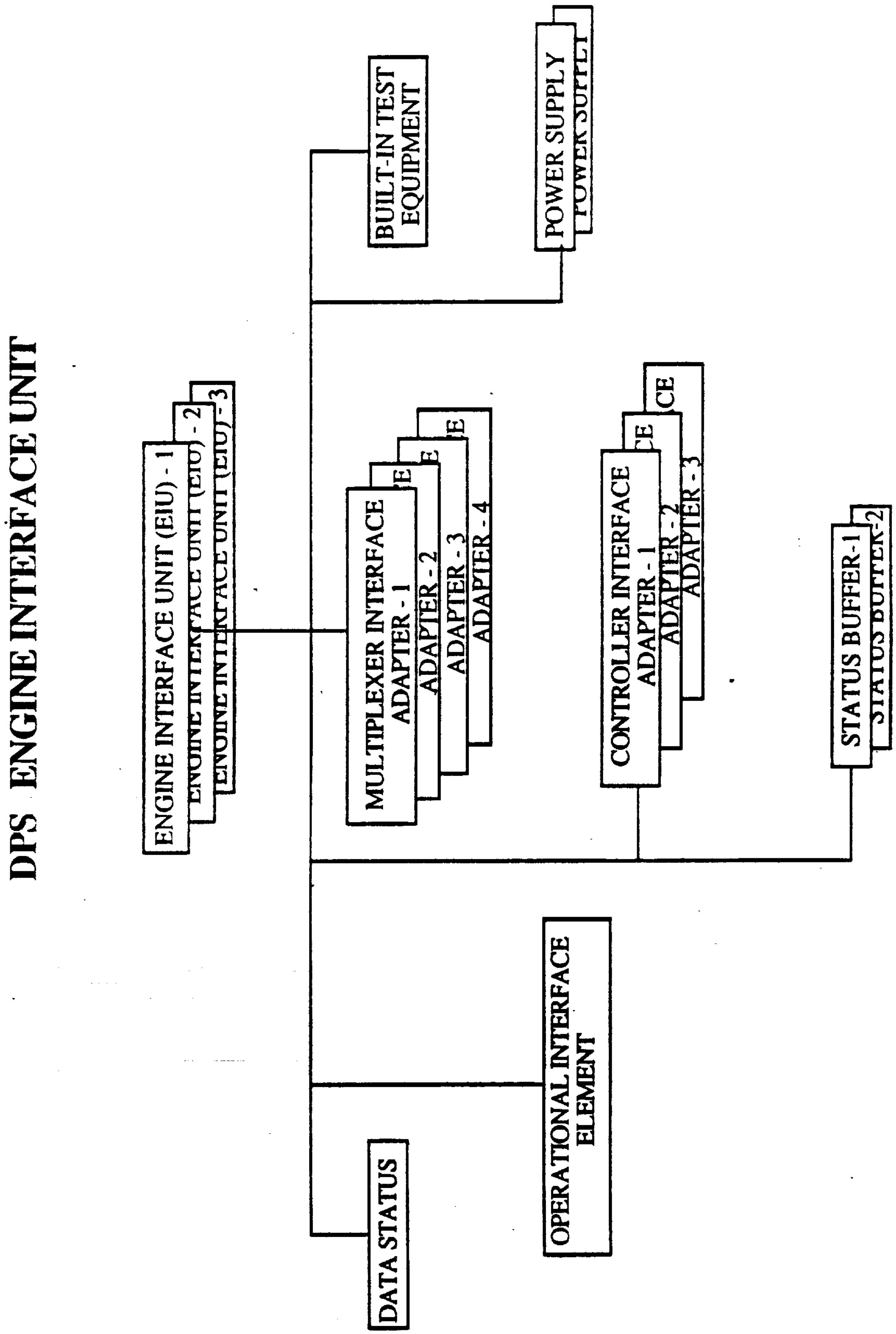


Figure 10 - DPS ENGINE INTERFACE UNIT (EIU)

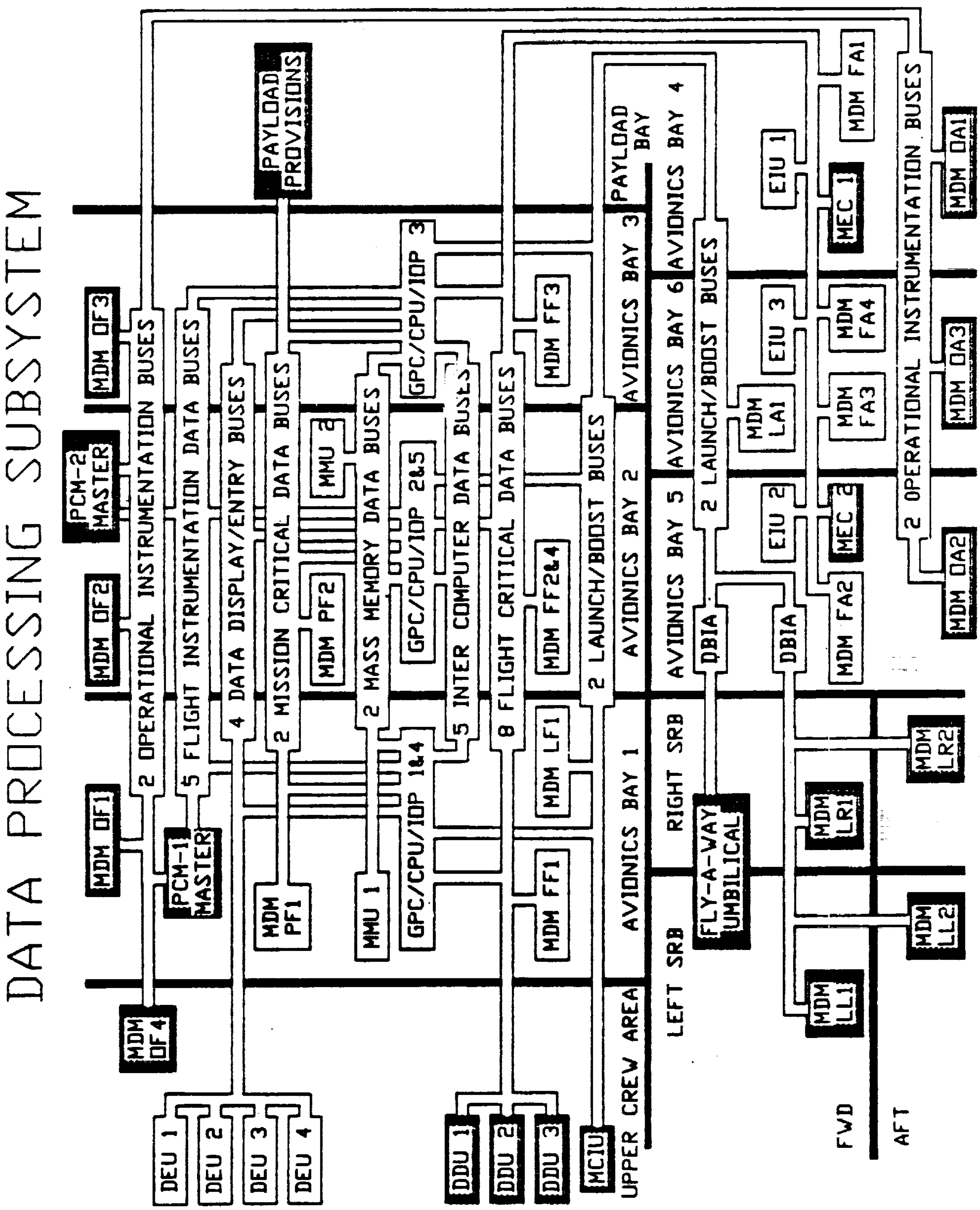


Figure 11 - DPS FUNCTIONAL INTERFACES AND LOCATIONS

4.0 ASSESSMENT RESULTS

The IOA analysis of the DPS hardware initially generated eighty-five failure mode worksheets and identified two Potential Critical Items (PCIs) before starting the assessment process. In order to facilitate comparison, thirty-seven additional failure mode analysis worksheets were generated. These analysis results were compared to the proposed NASA Post 51-L baseline of seventy-eight FMEAs and twenty-five CIL items, which was generated using the Rockwell 100-2G FMEA/CIL instructions. Upon completion of the assessment, sixty of the seventy-eight FMEAs were in agreement. Of the eighteen that remained, fourteen had minor discrepancies that did not affect criticality. Of the remaining four, two issues were with FMEAs (05-5-B03-1-1 and 05-5-B03-2-1) that had considered failure modes outside the DPS subsystem, and caused inflated criticalities. These criticalities mistakenly placed both FMEAs on the CIL. The other two issues were with FMEAs (05-5-B01-1-1 and 05-5-B02-1-1) that also considered failure modes outside the DPS subsystem. However, when the correct failure mode is included, the current criticalities will remain unchanged. In summary, all issues may be attributed to differences between ground rules in Rockwell 100-2G and NSTS 22206 instructions. The IOA recommends correcting the failure modes considered in the four FMEAs, which lowers criticality assignments in two of the FMEAs, and removes them from the CIL.

A summary of the quantity of NASA FMEAs assessed, versus the recommended IOA baseline, and any issues identified is presented in Table I.

Table I Summary of IOA FMEA Assessment

Component	NASA	IOA	Issues
MDM	14	14	2
GPC	25	25	2
MCDS	23	23	-
DBC	1	1	-
DBIA	2	2	-
MMU	9	9	-
EIU	4	4	-
TOTAL	78	78	4

A summary of the quantity of NASA CIL items assessed, versus the recommended IOA baseline, and any issues identified is presented in Table II.

Table II Summary of IOA CIL Assessment			
Component	NASA	IOA	Issues
MDM	10	8	2
GPC	6	6	-
MCDS	3	3	-
DBC	1	1	-
DBIA	-	-	-
MMU	1	1	-
EIU	4	4	-
TOTAL	25	23	2

Appendix C presents the detailed assessment worksheets for each failure mode identified and assessed. Appendix D highlights the NASA Critical Items and corresponding IOA worksheet ID. Appendix E contains the IOA analysis worksheets that were used to assess the NASA FMEA/CIL. Appendix F provides a cross reference between the NASA FMEA and corresponding IOA worksheet(s). IOA recommendations are also summarized.

Table III presents a summary of the IOA recommended failure criticalities for the Post 51-L FMEA baseline. Further discussion of each of these subdivisions and the applicable failure modes is provided in subsequent paragraphs.

TABLE III Summary of IOA Recommended Failure Criticalities							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
MDM	-	4	-	6	2	2	14
GPC	-	5	-	9	1	10	25
MCDS	-	3	-	14	1	5	23
DBC	-	1	-	-	-	-	1
DBIA	-	-	-	-	1	1	2
MMU	-	-	1	-	6	2	9
EIU	2	2	-	-	-	-	4
TOTAL	2	15	1	29	11	20	78

Of the failure modes analyzed, twenty-three were determined to be critical items. A summary of the IOA recommended critical items is presented in Table IV.

TABLE IV Summary of IOA Recommended Critical Items							
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
MDM	-	4	-	4	-	-	8
GPC	-	5	-	1	-	-	6
MCDS	-	3	-	-	-	-	3
DBC	-	1	-	-	-	-	1
DBIA	-	-	-	-	-	-	-
MMU	-	-	1	-	-	-	1
EIU	2	2	-	-	-	-	4
TOTAL	2	15	1	5	-	-	23

The scheme for assigning IOA assessment (Appendix C) and analysis (Appendix E) worksheet numbers is shown in Table V.

Table V IOA Worksheet Numbers	
Component	IOA ID Number
MDM	DPS-100 to DPS-195
GPC	DPS-201 to DPS-232
MCDS	DPS-300 to DPS-321 (includes DBC and DBIA)
MMU	DPS-400 to DPS-417
EIU	DPS-501 to DPS-509

4.1 Assessment Results MDM

The IOA has a total of forty-two assessment worksheets associated with the fourteen NASA MDM FMEAs; excluding the OF, OA, LL, and LR MDM groups, as shown in Figure 3. The IOA worksheets correspond to nine different failure modes for each of the four groups of MDMs, plus six worksheets that are power related. The numbering scheme is shown in the table below.

IOA ID Range	Item Group
DPS-100 to 108	FF - Flight Forward
DPS-120 to 128	FA - Flight Aft
DPS-140 to 148	PF - Payload Forward
DPS-180 to 188	LF,LA - Launch Forward and Aft
DPS-190 to 195	Power related: RPCs, switches, and resistors

Three basic failure modes were found: Loss of Output, Erroneous Output, and Premature Operation. A failure mode may have a different effect, and thus a different criticality, if applied separately to both output sides of a MDM; that is, a MDM's outputs to GPCs and LRUs (such as sensors and effectors). Thus it was decided to treat each output side separately for each basic failure mode, resulting in six failure modes; such as "Loss of Output to GPC" and "Loss of Output to LRU". As it turned out, the effects were somewhat different but the criticalities remained the same.

Three other failure modes were added which were considered applicable to only one output. These are "Selected All Channels Wrong to LRU" (worksheets DPS-106, 126, 146, and 186), "Stuck on a Constant Output to LRU" (DPS-107, 127, 147, and 187), and "Falsely Stuck on Busy Mode" to GPC (DPS-108, 128, 148, and 188). The first two specific failure modes could be considered special cases of "Erroneous Output to LRU", and the third failure mode could be considered a special case of "Loss of Output to GPC". They were considered on the possibility that the specific cases would differ in effects and criticality from the general cases. Again, the result was that these specific cases differed in their effects but not in their criticalities from the general cases.

The NASA FMEAs considered general failure modes, consequently each output and specific cases were not covered uniquely. This resulted in one (NASA FMEA) to many (IOA worksheets) relationships, as shown in the following table. This table shows how the NASA FMEAs and IOA worksheets associated with MDMs map onto each other.

Failure Mode	Item	NASA FMEAs	IOA Assessment Worksheets (Appendix. C)
Loss of Output	FF	05-5-B03-2-1	100, 101, 108
	FA	05-5-B03-1-1	120, 121, 128
	PF	05-5-B03-5-1	140, 141, 148
	LF,LA	05-5-B03-4-1	180, 181, 188
Erroneous Output	FF	05-5-B03-2-2	102, 103, 106, 107
	FA	05-5-B03-1-2	122, 123, 126, 127
	PF	05-5-B03-5-2	142, 143, 146, 147
	LF,LA	05-5-B03-4-2	182, 183, 186, 187
Premature Output	FF	no map	104, 105
	FA	no map	124, 125
	PF	no map	144, 145
	LF,LA	no map	184, 185
Miscell-aneous	Resistor	05-6S-BRES3-1	190
	RPC	05-6S-BRPC3-1	191
	RPC	05-6S-BRPC3-2	192
	Switch	05-6S-BSW3 -1	193
	Switch	05-6S-BSW3 -2	194
	Switch	05-6S-BSW5 -3	195

The number of FMEAs and CILs by criticality are summarized in the following table. The Unmapped IOA column is the raw number of IOA analysis worksheets. The Mapped IOA column is the number of IOA analysis worksheets after they have been mapped onto the NASA FMEAs.

Criticality	Unmapped IOA	Mapped IOA	NASA	IOA CILs	Issues
2/1R	15	4	6	4	2
2/2	0	0	0	0	0
3/1R	16	6	4	4	0
3/2R	9	2	2	0	0
3/3	2	2	2	0	0
Total	42	14	14	8	2

The NASA FMEAs also covered power related items associated with the MDMs, including Remote Power Controllers (RPCs), Power Switches, and Current Limiting Resistors. IOA did not cover these items in the original analysis due to time constraints, but did cover them later, concurring with NASA's reevaluation of these six. IOA's DPS subsystem team did not cover the Operational Instrumentation Forward and Aft (OA and OF) MDMs, since they were considered to be in the domain of IOA's Instrumentation subsystem team. IOA and NASA also did not cover the Launch Left and Launch Right (LL and LR) MDMs since they are within the SRBs.

The difference in the number of FMEAs is due to the fact that IOA considered more specific failure modes than NASA. Another difference is that NASA did not consider the "Premature Operation to GPC" and "Premature Operation to LRU" failure modes for MDMs. This however is not an issue since the criticality of the function of the hardware item (2/1R) was not increased by these failure modes. Also, after further analysis these failure modes are considered to be non-credible.

The criticalities for the LF and LA MDMs (3/2R) were the same for IOA and NASA. For the FF, FA, and PF MDMs however, IOA's criticalities (3/1R) were lower than NASA's criticalities (2/1R). Part of this difference is due to whether the effects of multiple unrelated failures were taken into account. The NASA, using the Rockwell 100-2G hardware criticality 2 ground rules, considered in FMEAs 05-5-B03-1-1 and 05-5-B03-2-1, a MDM failure and then considered an Aero Surface Amplifier (ASA) next related failure outside the DPS subsystem. Whereas, the IOA, using NSTS 22206, considered in assessment worksheets DPS-100, DPS-101, DPS-108, DPS-120, DPS-121, and DPS-128, a MDM failure and then considered the next redundant item failure to be another MDM. The IOA does not concur with these two NASA reevaluations. The IOA believes the hardware criticality should be downgraded to three, thereby removing these two FMEAs from the CIL. The IOA concurred with the remaining twelve FMEAs.

4.2 Assessment Results GPC

The GPC analysis was subdivided into IOP and CPU failures. Generic black box failures were analyzed with causes stemming from failures of the subcomponents such as the MIA, as shown in Figure 4 and Figure 5. IOA has analyzed twenty-five failure modes (FMEAs) related to the General Purpose Computers (GPCs). Four of these FMEAs are attributable to the Input/Output Processors (IOP), eleven are related to the Central Processing Units (CPU), and the remaining ten affect various EPD&C switch functions associated with the GPC. NASA wrote twenty-five GPC related FMEAs: two CPU related, two IOP related, five switch related, four GPC status related, and two GPC power related. The following table is a summary of the GPC related FMEA criticalities including the results of the DPS Pre-board:

Criticality	IOA	NASA	IOA CILs	Issues
2/1R	5	5	5	2
3/1R	9	9	1	0
3/2R	1	1	0	0
3/3	10	10	0	0
Total	25	25	6	2

The seven NASA proposed individual power component failures (FMEA 05-6S-BDIOx-1, 05-6S-BDMC1-1, 05-6S-BDMC1-2, 05-6S-BFUS1-1, 05-6S-BRES1-1, 05-6S-BRPC1-1, and 05-6S-BRPC1-2) were analyzed, along with the four failures of the GPC status indicators. These failure modes are covered in Appendix E.

Of the five switch related failures analyzed by NASA, the CPU Output Switch FMEAs (05-5-B15-1-1 and 05-5-B15-1-3) agree with the IOA assessment (DPS-211) as does the Mode Switch FMEA (05-5-B17-1-1, DPS-210). One GPC Power Switch FMEA (05-6S-BSW1-2) written by NASA is confirmed by a similar IOA FMEA (DPS-216) as criticality 3/1R; the newly-proposed GPC Power Switch FMEA (05-6S-BSW1-3) is consistent with the IOA analysis DPS-217. IOA agrees with the assessment that inadvertent power switch opening has the same effects as CPU Loss of Output (05-5-B01-1-1).

The NASA and IOA analyses of the CPU and IOP erroneous output FMEAs (05-5-B01-1-2, 05-5-B02-1-2, DPS-206 and DPS-202, respectively) are identical in criticality 3/1R, as are the analyses of the inadvertent command outputs from the IOP with criticality 2/1R (05-5-B02-1-3, DPS-225). An IOA analysis of erroneous data inputs to the IOP (DPS-204) brought similar effects with 3/1R criticality.

The IOA analyzed a failure mode (DPS-208) on the CPU which was not considered by NASA. This 2/1R failure is similar in effect to the IOP inadvertent command output failure (05-5-B02-1-3): CPU attempts to output data on incorrect bus due to errors in memory locations containing configuration or bus-stringing parameters (e.g. the Nominal Bus Assignment Table). In this case two output data channels would be lost simultaneously and the actuators would not be able to select the correct data paths. IOA determined this to be a non-credible failure mode during the assessment process.

The NASA analysis of the CPU "Loss Of Output" (05-5-B01-1-1) has a criticality of 2/1R. IOA analysis 205, using the NSTS 22206 does not take into account the effects of multiple unlike failures outside the DPS subsystem. IOA does not agree with the effects assigned by NASA. The IOA recommends changing the effects to delete the sentence "During ascent/entry, this...". The IOA does concur with the rest of NASA's reevaluation and rationale.

The NASA analysis of the IOP "Loss of Output" (05-5-B02-1-1) has a criticality of 2/1R. Initially, the IOA analysis 201 assigned a hardware criticality of 3 for this failure mode. The IOA does not believe a single IOP failure would cause loss of mission. The second failure of an IOP would not result in loss of crew/vehicle. However, NASA's failure effects coupled this failure with an undetected ASA failure (outside the DPS subsystem). This could result in two healthy paths being voted out. This could possibly cause loss of vehicle. Simultaneous dissimilar failures were excluded from the IOA. Multiple failures are inconsistent with the NSTS 22206. The IOA recommends changing the effects to delete the sentence "During ascent/entry, this...". The IOA does concur with the rest of NASA's reevaluation and rationale.

4.3 Assessment Results MCDS

The MCDS consists of the KU, DU, and DEU. Functional failures of components were analyzed. These components are shown functionally in Figure 6 and Figure 7. Nine failure modes were identified, thirty IOA assessment worksheets and twenty-one IOA analysis worksheets were generated. These were then compared to the twenty-three NASA FMEAs. The difference in the total number of FMEAs may be attributed predominantly to the fact that NASA has one FMEA per failure mode whereas IOA has multiple failure modes per worksheet. The additional seven IOA assessment worksheets yielded no additional unique FMEAs and are not included in the comparison FMEA count. They are included in the Appendices for completeness. No issues were identified.

Number of FMEAs by criticality

Criticality	IOA	NASA	IOA CIL	Issues
2/1R	3	3	3	0
3/1R	15	15	0	0
3/3	5	5	0	0
Total	23	23	3	0

4.4 Assessment Results DBC

Thirty serial digital data buses connect the GPC IOPs to the BTUs via 227 DBCs. The DBCs' functional components are shown in Figure 8. Two failure modes were identified and one worksheet was generated. No issues were identified.

Number of FMEAs by criticality

Criticality	IOA	NASA	IOA CIL	Issues
2/1R	1	1	1	0

4.5 Assessment Results DBIA

The DBIAs consists of components required to provide isolation between the Orbiter Launch/Boost Data Buses and the SRBs and associated GSE. Four failure modes were identified and two worksheets were generated. No issues or CILs were identified.

Number of FMEAs by criticality

Criticality	IOA	NASA	IOA CIL	Issues
3/2R	1	1	0	0
3/3	1	1	0	0

4.6 Assessment Results MMU

The MMU analysis investigated failures in the individual components of power supply, read and write electronics, tape transport mechanism, MIA and control logic. These are shown functionally in Figure 9. The power switch and RPC were also investigated. Most of the failures were criticality 3/2R. One critical item was identified.

Number of MMU related FMEAs by criticality

Criticality	IOA	NASA	IOA CIL	Issues
2/2	1	1	1	0
3/2R	6	6	0	0
3/3	2	2	0	0
Total	9	9	1	0

The IOA 400 through 407, 411 and 412 correspond to NASA FMEAs 05-5-B04-2-1 and 05-5-B04-2-2. These FMEAs are concerned with malfunctions of the MMU unit itself. The difference in number of FMEAs is due to the fact that the IOA analysis considered failures of individual components of the MMU, such as the tape transport mechanism. There was no significant difference in the results. Both IOA and NASA found the criticality to be 3/2R.

Four NASA FMEAs (05-6S-BRPC2-1, 05-6S-BSW2-1, 05-6S-BSW2-2, and an as yet unnumbered new item) correspond to IOA FMEAs 408, 409, and 410. These FMEAs deal with failures of the MMU power switches and RPCs. The only difference in the results in this group is that IOA found the switch failure mode which causes the MMU to remain permanently on to be criticality 3/3 rather than 3/2R. The NASA agreed with this criticality in their reevaluation report.

The IOA FMEA 415 corresponds to NASA FMEA 05-5-B20-1-1. This FMEA deals with failure of the GPC IPL source switch. Both IOA and NASA found the criticality to be 2/2. This is the only CIL item associated with the MMUs.

The NASA FMEAs 05-5-B16-1-1 (GPC IPL switch, criticality 3/2R), 05-5-B18-1-1 (GPC IPL indicator, criticality 3/3), and 05-6S-BRES2-1 (current limit resistor, criticality 3/2R) were analyzed by IOA and are contained in Appendix E. No issues were identified.

4.7 Assessment Results EIU

There were no differences between the hardware and functional criticalities assigned by IOA and NASA on the baseline FMEAs of the Engine Interface Unit (EIU).

Number of EIU related FMEAs by Criticality.

Criticality	IOA	NASA	IOA CILs	Issues
1/1	0	2	2	0
2/1R	0	2	2	0
3/1R	5	0	0	0
Totals	5	4	4	0

The NASA presented at the Level III Pre Board (12th and 15th of September, 1986) requests to upgrade the two existing FMEAs from 3/1R to 2/1R. The rationale presented was for a heavy payload. The loss of one engine can cause loss of mission. The IOA can accept this upgrade of criticality based upon a combined payload and vehicle weight requiring three main engines to achieve mission orbit goals.

The second upgrade was requested against the power circuit. The loss of the second circuit causes loss of the EIU. The worst case failure would occur during the last 10 seconds prior to MECO when the crew may not have enough time to respond to manual engine shutdown. This could cause an engine to have fuel or oxidizer depletion with engine running. Previous tests have indicated that pumps fail due to cavitation. In fact, the engine turbine pumps have exploded from cavitations. The IOA agrees with this upgrade and rationale.

There were two new FMEAs proposed by NASA at the pre-board with criticalities of 1/1. The first was for a failure mode of erroneous output to the GPC. The GPC would then command the pre-valves to close with the engine running. That would cause the high pressure turbine pumps to throw turbine blades which have caused uncontained engine failures. The engine explodes and the crew and vehicle are lost.

The second proposed FMEA deals with the failure of the power switch. The failure mode was both contacts shorted to ground. The loss of power to the EIU causes loss of control of engine throttling and shutdown. If failure occurs in the last six to ten seconds before MECO, the crew would have to manually shutdown the engines. The engines would ingest gas causing pump cavitation and disintegration. This results in loss of crew and vehicle.

Four additional failure modes were analyzed by IOA, but following the pre-board these modes were found to be covered by one of the original baseline FMEAs.

5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used included the following:

1. ICD 13M15000, Vehicle/Main Engine Interface Control Document, Rev. U, 6-18-85.
2. JSC-18819, DPS Console Handbook, 8-1-84.
3. JSC-19041, Booster-Systems Briefs, 10-1-84.
4. JSC-18820, DPS System Briefs, 4-20-85.
5. VS70-971102, Integrated System Schematic Rev. D, 9-28-85.
6. JSC-17239, Booster Console Handbook, 10-17-85.
7. JSC-12770, Shuttle Flight Operations Manual, Volume 5, Data Processing System, 3-24-84.
8. JSC-12820, STS Operational Flight Rules, Final PCN-3, 6-28-85.
9. JSC-11174, Space Shuttle Systems Handbook, Rev. C, DCN-5, 9-13-85.
10. V72 Vol III, Operations and Maintenance Requirements and Specification Document - Orbiter OMRSD - DPS, 6-13-86.
11. STS82-0032 Orbiter Vehicle Operational Configuration FMEA for DPS Subsystem, Revised 1-28-83.
12. VS70-973099 Integrated System Schematic, Rev A10, 10-17-85.
13. JSC-18730 Orbiter Operational Configuration Critical Items List, 12-17-82.
14. NSTS 22206, Instructions for Preparation of Failure Modes and Effects Analysis (FMEA) and Critical Items List(CIL), 10-10-86.
15. MDAC IOA DPS Working Paper No. 1.0-WP-VA86001-02, 10-24-86.
16. NASA-JSC FMEA & CIL Review Comments,
    A. DPS - GPC's and MCDS and EPD&C - DPS Items, 9-11-86.
    B. Engine Interface Unit (EIU), 9-19-86.
    C. Mass Memory Unit (MMU), 9-19-86.
    D. MDM, DBC, & DBIA, 8-22-86.

APPENDIX A
ACRONYMS

A/D - Analog to Digital
AID - Analog Input Differential
AIS - Analog Input Single-ended
ALU - Arithmetic Logic Unit
AOA - Abort Once Around
AOD - Analog Output Differential
ASA - Aero Surface Amplifier
ATO - Abort To Orbit
BFC - Backup Flight Controller
BFS - Backup Flight System
BITE - Built-In Test Equipment
BSS - Backup System Services
BTU - Bus Terminal Unit
CI - Critical Item
CIA - Controller Interface Adapter
CICU - Computer Interface Conditioning Unit
CIL - Critical Items List
CPU - Central Processing Unit
CRIT - Criticality
CRT - Cathode Ray Tube
C&W - Caution and Warning System
DBC - Data Bus Coupler
DBIA - Data Bus Isolation Amplifier
DDU - Display Driver Unit
DEU - Display Electronics Unit
DIH - Discrete Input High
DIL - Discrete Input Low
DMA - Direct Memory Access
DOH - Discrete Output High
DOL - Discrete Output Low
DPS - Data Processing System
DU - Display Unit
EIU - Engine Interface Unit
EVA - Extravehicular Activity
FA - Flight Aft
FCOS - Flight Control Operating System
FF - Flight Forward
FM - Failure Mode
FMEA - Failure Mode and Effects Analysis
GPC - General Purpose Computer
GSE - Ground Support Equipment
IMU - Inertial Measurement Unit
IOA - Independent Orbiter Assessment
IOM - Input/Output Module
IOP - Input/Output Processor
IPL - Initial Program Load
KU - Keyboard Unit

LA   - Launch Aft
LF   - Launch Forward
LL   - Launch Left
LPS   - Launch Processing System
LR   - Launch Right
LRU   - Line Replaceable Unit
MC   - Memory Configuration
MCDS - Multifunction CRT Display System
MCIU - Manipulator Controller Interface Unit
MDAC - McDonnell Douglas Astronautics Company
MDM   - Multiplexer/Demultiplexer
MEC   - Main Engine Controller
MIA   - Multiplexer Interface Adapter
MM   - Major Mode
MMU   - Mass Memory Unit
MTU   - Master Timing Unit
NA   - Not Applicable
NASA - National Aeronautics and Space Administration
NSTS - National Space Transportation System
OA   - Operational Aft
OF   - Operational Forward
OIE   - Operational Interface Element
OMRSD - Operational Maintenance Requirements and Specifications Document
OMS   - Orbital Maneuvering System
OPS   - Operational Sequence
PCI   - Potential Critical Item
PCM   - Pulse Code Modulation
PF   - Payload Forward
RCS   - Reaction Control System
RHC   - Rotational Hand Controller
RI   - Rockwell International
RM   - Redundancy Management
RMS   - Remote Manipulator System
RPC   - Remote Power Controller
RS   - Redundant Set
RTLS - Return To Landing Site
SCU   - Sequential Control Unit
SIO   - Serial Input/Output
SM   - Systems Management
SRB   - Solid Rocket Booster
SSME - Space Shuttle Main Engine
STS   - Space Transportation System
SW   - Software
TAC   - Tacan
TAL   - Transatlantic Abort Landing
TD   - Touch Down
THC   - Translational Hand Controller
VDC   - Volts Direct Current

APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

APPENDIX B
DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, were used with the following amplifications and additions.

INTACT ABORT DEFINITIONS:

RTLS - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

TAL - begins at declaration of the abort and ends at transition to OPS 9, post-flight

AOA - begins at declaration of the abort and ends at transition to OPS 9, post-flight

ATO - begins at declaration of the abort and ends at transition to OPS 9, post-flight

CREDIBLE (CAUSE) - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

CONTINGENCY CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

EARLY MISSION TERMINATION - termination of onorbit phase prior to planned end of mission

EFFECTS/RATIONALE - description of the case which generated the highest criticality

HIGHEST CRITICALITY - the highest functional criticality determined in the phase-by-phase analysis

MAJOR MODE (MM) - major sub-mode of software operational sequence (OPS)

MC - Memory Configuration of Primary Avionics Software System (PASS)

MISSION - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)

MULTIPLE ORDER FAILURE - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter power-up and ends at moding to OPS Major Mode 102 (liftoff)

LIFTOFF MISSION PHASE - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

DEORBIT PHASE - begins at transition to OPS Major Mode 301 and ends at first main landing gear touchdown

LANDING/SAFING PHASE - begins at first main gear touchdown and ends with the completion of post-landing safing operations

APPENDIX B
DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in NSTS 22206, Instructions for Preparation of FMEA/CIL, 10 October 1986, was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

   RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

   RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

   RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

   RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

   RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

B.3 DPS-Specific Ground Rules and Assumptions

The IOA analysis was performed to the component or assembly level of the DPS subsystem. The analysis considered the worst case effects of the hardware or functional failure on the subsystem, mission, and crew and vehicle safety.

1. Crew procedures that take the two good FCS channels to override following two GPC or two MDM failures are considered in assigning criticality.

   RATIONALE: Clarifies standard cockpit procedures that can be considered in assigning criticality.

APPENDIX C
DETAILED ASSESSMENT

This section contains the IOA assessment worksheets generated during the assessment of this subsystem. The information on these worksheets facilitates the comparison of the NASA FMEA/CIL (Pre and Post 51-L) to the IOA detailed analysis worksheets included in Appendix E. Each of these worksheets identifies the NASA FMEA being assessed, corresponding MDAC Analysis Worksheet ID (Appendix E), hardware item, criticality, redundancy screens, and recommendations. For each failure mode, the highest assessed hardware and functional criticality is compared and discrepancies noted as "N" in the compare row under the column where the discrepancy occurred.

LEGEND FOR IOA ASSESSMENT WORKSHEETS

Hardware Criticalities:
- 1 = Loss of life or vehicle
- 2 = Loss of mission or next failure of any redundant item (like or unlike) could cause loss of life/vehicle
- 3 = All others

Functional Criticalities:
- 1R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of life or vehicle
- 2R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of mission

Redundancy Screens A, B and C:
- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

NASA Data :
- Baseline = NASA FMEA/CIL
- New = Baseline with Proposed Post 51-L Changes

CIL Item :
- X = Included in CIL

Compare Row :
- N = Non compare for that column (deviation)

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-100
NASA FMEA #: 05-5-B03-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 100
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA, MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206.
IOA RECOMMENDS REPLACING THIS PHRASE IN THIS NASA/RI FMEA'S EFFECTS FIELD "COUPLED WITH AND UNDETECTED FCS FAILURE (IN THE NULL POSITION)," WITH "COUPLED WITH A LIKE FAILURE IN ANOTHER MDM". IOA DID NOT CONSIDER DEGRADED STATE VECTORS.
IOA DOES NOT BELIEVE THE LOSS OF TWO STATE VECTORS WILL CAUSE LOSS OF CREW OR VEHICLE. IN THE WORST CASE ON ENTRY, THE LOSS OF THE SECOND STATE VECTOR WILL PERMIT THE ORBITER TO FLY WITH ONE REMAINING STATE VECTOR.
IOA DOES NOT CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
IOA RECOMMENDS DOWNGRADING HARDWARE CRITICALITY TO 3, THEREBY REMOVING THE FMEA FROM THE CIL.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-101
NASA FMEA #: 05-5-B03-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 101
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "LOSS OF OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "NO OUTPUT: FAILED MDM PORT - SCU, MIA, A/D, POWER SUPPLIES, OR I/O CARD/CHANNEL FAILURE".
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA. MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206.
IOA RECOMMENDS REPLACING THIS PHRASE IN THIS NASA/RI FMEA'S EFFECTS FIELD, "COUPLED WITH AND UNDETECTED FCS FAILURE (IN THE NULL POSITION)", WITH "COUPLED WITH A LIKE FAILURE IN ANOTHER MDM". IOA DID NOT CONSIDER DEGRADED STATE VECTORS.
IOA DOES NOT BELIEVE THE LOSS OF TWO STATE VECTORS WILL CAUSE LOSS OF CREW OR VEHICLE. IN THE WORST CASE ON ENTRY, THE LOSS OF THE SECOND STATE VECTOR WILL PERMIT THE ORBITER TO FLY WITH ONE REMAINING STATE VECTOR.
IOA DOES NOT CONCUR WITH NASA'S REEVALUATION AND RATIONALE. IOA RECOMMENDS DOWNGRADING HARDWARE CRITICALITY TO 3, THEREBY REMOVING THE FMEA FROM THE CIL.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-102
NASA FMEA #: 05-5-B03-2-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 102
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOD DID NOT INITIALLY CONSIDER DEGRADED STATE VECTORS.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-103
NASA FMEA #: 05-5-B03-2-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 103
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "ERRONEOUS OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ERRONEOUS OUTPUT: ADDRESS CHECK FAILURE, DATA ERROR TO MDM MODULE, OR MODULE SELECT FAILURE".
IOA DID NOT INITIALLY CONSIDER DEGRADED STATE VECTORS.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-104
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 104
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ROCKWELL/NASA DID NOT COVER THIS FAILURE MODE.
THIS FAILURE MODE, "PREMATURE OPERATION TO GPC", IS DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-105
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 105
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "PREMATURE OPERATION TO LRU" IS DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/96
ASSESSMENT ID: DPS-106
NASA FMEA #: 05-5-B03-2-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 106
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOA DID NOT INITIALLY CONSIDER DEGRADED STATE VECTORS.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/07/86
ASSESSMENT ID: DPS-107
NASA FMEA #: 05-5-B03-2-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 107
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "STUCK ON A CONSTANT OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ERRONEOUS OUTPUT: ADDRESS CHECK FAILURE, DATA ERROR TO MDM MODULE, OR MODULE SELECT FAILURE".
IOA DID NOT INITIALLY CONSIDER DEGRADED STATE VECTORS.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-108
NASA FMEA #: 05-5-B03-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 108
ITEM: MDM FF1,FF2,FF3,FF4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "FALSELY STUCK ON BUSY MODE" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "NO OUTPUT: FAILED MDM PORT - SCU, MIA, A/D, POWER SUPPLIES, OR I/O CARD/CHANNEL FAILURE".
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA. MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206.
IOA RECOMMENDS REPLACING THIS PHRASE IN THE NASA/RI FMEA'S EFFECTS FIELD, "COUPLED WITH AN UNDETECTED FCS FAILURE (IN THE NULL POSITION)", WITH "COUPLED WITH A LIKE FAILURE IN ANOTHER MDM". IOA DID NOT CONSIDER DEGRADED STATE VECTORS.
IOA DOES NOT BELIEVE THE LOSS OF TWO STATE VECTORS WILL CAUSE LOSS OF CREW OR VEHICLE. IN THE WORST CASE ON ENTRY, THE LOSS OF THE SECOND STATE VECTOR WILL PERMIT THE ORBITER TO FLY WITH ONE REMAINING STATE VECTOR.
IOA DOES NOT CONCUR WITH NASA'S REEVALUATION AND RATIONALE. IOA RECOMMENDS DOWNGRADING HARDWARE CRITICALITY TO 3, THEREBY REMOVING THE FMEA FROM THE CIL.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-120
NASA FMEA #: 05-5-B03-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 120
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA. MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206. IOA RECOMMENDS REPLACING THIS PHRASE IN THIS NASA/RI FMEA'S EFFECTS FIELD, "COUPLED WITH AN UNDETECTED FCS FAILURE (IN THE NULL POSITION)", WITH "COUPLED WITH A LIKE FAILURE IN ANOTHER MDM".
IOA DOES NOT CONCUR WITH NASA'S REEVALUATION AND RATIONALE. IOA RECOMMENDS DOWNGRADING THE HARDWARE CRITICALITY TO 3, THEREBY REMOVING THE FMEA FROM THE CIL.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-121
NASA FMEA #: 05-5-B03-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 121
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[3 /1R]	[P]	[P]	[P]	[D] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "NO OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THE ROCKWELL FMEA WITH FAILURE MODE "NO OUTPUT: FAILED MDM PORT - SCU, MIA, A/D, POWER SUPPLIES, OR I/O CARD/CHANNEL FAILURE".
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA. MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206.
IOA RECOMMENDS REPLACING THIS PHRASE IN THIS NASA/RI FMEA'S EFFECTS FIELD, "COUPLED WITH AN UNDETECTED FCS FAILURE (IN THE NULL POSITION)", WITH "COUPLED WITH A LIKE FAILURE IN ANOTHER MDM".
IOA DOES NOT CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
IOA RECOMMENDS DOWNGRADING THE HARDWARE CRITICALITY TO 3, THEREBY REMOVING THE FMEA FROM THE CIL.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-122
NASA FMEA #: 05-5-B03-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 122
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOA DID NOT INITIALLY CONSIDER E/T SEP DOORS CLOSING PREMATURELY.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-123
NASA FMEA #: 05-5-B03-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 123
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[2 /1R]	[P]	[P]	[P]	[X]	*
IOA	[3 /1R]	[P]	[P]	[P]	[ ]	
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]	

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "ERRONEOUS OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ERRONEOUS OUTPUT: ADDRESS CHECK FAILURE, DATA ERROR TO MDM MODULE, OR MODULE SELECT FAILURE".
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-124
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 124
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ROCKWELL/NASA DID NOT COVER THIS FAILURE MODE.
THIS FAILURE MODE, "PREMATURE OPERATION TO GPC", IS DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-125
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 125
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ROCKWELL/NASA DID NOT COVER THIS FAILURE MODE.
THIS FAILURE MODE, "PREMATURE OPERATION TO LRU", IS DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-126
NASA FMEA #: 05-5-B03-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 126
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOA DID NOT INITIALLY CONSIDER E/T SEP DOORS CLOSING PREMATURELY.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-127
NASA FMEA #: 05-5-B03-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 127
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "STUCK ON A CONSTANT OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ERRONEOUS OUTPUT: ADDRESS CHECK FAILURE, DATA ERROR TO MDM MODULE, OR MODULE SELECT FAILURE".
IOA DID NOT INITIALLY CONSIDER E/T SEP DOORS CLOSING PREMATURELY.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-128
NASA FMEA #: 05-5-B03-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 128
ITEM: MDM FA1,FA2,FA3,FA4

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[3 /1R]	[P]	[P]	[P]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "FALSELY STUCK ON BUSY MODE" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "NO OUTPUT: FAILED MDM PORT-SCU, MIA, A/D, POWER SUPPLIES, OR I/O CARD/CHANNEL FAILURE".
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA. MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206.
IOA RECOMMENDS REPLACING THIS PHRASE IN THIS NASA/RI FMEA'S EFFECTS FIELD, "COUPLED WITH AN UNDETECTED FCS FAILURE (IN THE NULL POSITION)", WITH "COUPLED WITH A LIKE FAILURE IN ANOTHER MDM."
IOA DOES NOT CONCUR WITH NASA'S REEVALUATION AND RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-140
NASA FMEA #: 05-5-B03-5-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 140
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOA DID NOT INITIALLY CONSIDER LOSS OF PAYLOAD BAY DOORS CLOSE COMMAND.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-141
NASA FMEA #: 05-5-B03-5-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 141
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "LOSS OF OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "NO OUTPUT: FAILED MDM PORT-SCU, MIA, A/D, POWER SUPPLIES, OR I/O CARD/CHANNEL FAILURE".
IOA DID NOT INITIALLY CONSIDER LOSS OF PAYLOAD BAY DOORS CLOSE COMMAND.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-142
NASA FMEA #: 05-5-B03-5-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 142
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOA DID NOT INITIALLY CONSIDER INADVERTENT COMMAND TO PAYLOAD BAY DOOR'S LATCH TO UNLATCH.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-143
NASA FMEA #: 05-5-B03-5-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 143
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "ERRONEOUS OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ERRONEOUS OUTPUT: ADDRESS CHECK FAILURE, DATA ERROR TO MDM MODULE, OR MODULE SELECT FAILURE".
IOA DID NOT INITIALLY CONSIDER INADVERTENT COMMAND TO PAYLOAD BAY DOOR'S LATCH TO UNLATCH.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-144
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 144
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ROCKWELL/NASA DID NOT COVER THIS FAILURE MODE.
THIS FAILURE MODE, "PREMATURE OPERATION TO GPC", IS DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-145
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 145
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ROCKWELL/NASA DID NOT COVER THIS FAILURE MODE.
THIS FAILURE MODE, "PREMATURE OPERATION TO LRU", IS DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-146
NASA FMEA #: 05-5-B03-5-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 146
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOA DID NOT INITIALLY CONSIDER INADVERTENT COMMAND TO PAYLOAD BAY DOOR'S LATCH TO UNLATCH.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-147
NASA FMEA #: 05-5-B03-5-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 147
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "STUCK ON A CONSTANT OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ERRONEOUS OUTPUT: ADDRESS CHECK FAILURE, DATA ERROR TO MDM MODULE, OR MODULE SELECT FAILURE".
IOA DID NOT INITIALLY CONSIDER INADVERTENT COMMAND TO PAYLOAD BAY DOOR'S LATCH TO UNLATCH.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-148
NASA FMEA #: 05-5-B03-5-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 148
ITEM: MDM PF1,PF2

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "FALSELY STUCK ON BUSY MODE" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "NO OUTPUT: FAILED MDM PORT - SCU, MIA, A/D, POWER SUPPLIES, OR I/O CARD/CHANNEL FAILURE".
IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.
A SECOND MDM FAILURE WOULD REQUIRE EVA TO CLOSE PAYLOAD BAY DOORS FOR WORST CASE FAILURE MODE.
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-180
NASA FMEA #: 05-5-B03-4-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 180
ITEM: MDM LF1, LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-181
NASA FMEA #: 05-5-B03-4-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 181
ITEM: MDM LF1,LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "LOSS OF OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "NO OUTPUT: FAILED MDM PORT - SCU, MIA, A/D, POWER SUPPLIES, OR I/O CARD/CHANNEL FAILURE".
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-182
NASA FMEA #: 05-5-B03-4-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 182
ITEM: MDM LF1,LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-183
NASA FMEA #: 05-5-B03-4-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 183
ITEM: MDM LF1,LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "ERRONEOUS OUTPUT TO LRU" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ERRONEOUS OUTPUT: OUTPUT CHANNEL".
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-184
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 184
ITEM: MDM LF1,LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ROCKWELL/NASA DID NOT COVER THIS FAILURE MODE.
THIS FAILURE MODE, "PREMATURE OPERATION TO GPC", IS DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-185
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 185
ITEM: MDM LF1,LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ROCKWELL/NASA DID NOT COVER THIS FAILURE MODE.
THIS FAILURE MODE, "PREMATURE OPERATION TO LRU", IS DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-186
NASA FMEA #: 05-5-B03-4-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 186
ITEM: MDM LF1,LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-187
NASA FMEA #: 05-5-B03-4-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 187
ITEM: MDM LF1,LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "STUCK ON A CONSTANT OUTPUT" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ERRONEOUS OUTPUT: OUTPUT CHANNEL".
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-188
NASA FMEA #: 05-5-B03-4-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 188
ITEM: MDM LF1,LA1

LEAD ANALYST: W. A. Haufler

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "FALSELY STUCK ON BUSY MODE" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "NO OUTPUT: MDM FAILED PORT - SCU, A/D, MIA, POWER SUPPLY, OR I/O CHANNEL". NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/15/86
ASSESSMENT ID: DPS-190
NASA FMEA #: 05-6S-BRES3-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 190
ITEM: RESISTOR, CURRENT LIMITING

LEAD ANALYST: W. A. HAUFLER

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THE IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
THE IOA DOES CONCUR WITH NASA'S REEVALUATION.
THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/15/86
ASSESSMENT ID: DPS-191
NASA FMEA #: 05-6S-BRPC3-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 191
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: W. A. HAUFLER

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THE IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS. THE IOA DOES CONCUR WITH NASA'S REEVALUATION. THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/15/86
ASSESSMENT ID: DPS-192
NASA FMEA #: 05-6S-BRPC3-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 192
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: W. A. HAUFLER

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /3]	[P]	[NA]	[P]	[ ]	*
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]	
COMPARE	[/]	[N]	[ ]	[N]	[ ]	

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
THE IOA DOES CONCUR WITH NASA'S REEVALUATION.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/15/86
ASSESSMENT ID: DPS-193
NASA FMEA #: 05-6S-BSW3-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 193
ITEM: SWITCH, MDM POWER

LEAD ANALYST: W. A. HAUFLER

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THE IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
THE IOA DOES CONCUR WITH NASA'S REEVALUATION.
THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/15/86
ASSESSMENT ID: DPS-194
NASA FMEA #: 05-6S-BSW3-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 194
ITEM: SWITCH, MDM POWER

LEAD ANALYST: W. A. HAUFLER

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[NA]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[ ]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS. ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/15/86
ASSESSMENT ID: DPS-195
NASA FMEA #: 05-6S-BSW5-3

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 195
ITEM: SWITCH, MDM POWER

LEAD ANALYST: W. A. HAUFLER

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THE IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
THE IOA DOES CONCUR WITH NASA'S REEVALUATION.
THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-201
NASA FMEA #: 05-5-B02-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 201
ITEM: Input/Output Processor (IOP)

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA. MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206. NASA'S FAILURE EFFECTS COUPLED THIS FAILURE WITH AN UNDETECTED FLIGHT CONTROL SYSTEM FAILURE. THIS COULD RESULT IN TWO HEALTHY PATHS BEING VOTED OUT. THIS COULD POSSIBLY CAUSE LOSS OF VEHICLE.
IOA RECOMMENDS CHANGING THE EFFECTS TO DELETE THE SENTENCE "DURING ASCENT/ENTRY, THIS...".
IOA DOES CONCUR WITH THE REST OF NASA'S REEVALUATION AND RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-202
NASA FMEA #: 05-5-B02-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 202
ITEM: Input/Output Processor (IOP)

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES IN ANALYSIS RESULTS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-203
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 203
ITEM: Input/Output Processor (IOP)

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DID NOT COVER THIS FAILURE MODE OF PREMATURE OPERATION. THE FAILURE MODE AND EFFECTS ARE DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-204
NASA FMEA #: 05-5-B02-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 204
ITEM: Input/Output Processor (IOP)

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCE. FAILURE MODE'S EFFECT COULD HAVE BEEN CONSIDERED IN ROCKWELL'S 05-5 -B02-1-2. IOA'S FAILURE MODE ANALYSIS DID NOT CHANGE CRITICALITY OF FUNCTION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-205
NASA FMEA #: 05-5-B01-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 205
ITEM: Central Processing Unit (CPU)

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA. MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206. NASA CONSIDERED ONE GPC AND ONE FCS FAILURE IN ASSIGNING THEIR CRITICALITY FOR THIS FMEA.
THE IOA RECOMMENDS CHANGING THE EFFECTS TO DELETE THE SENTENCE "DURING ASCENT/ENTRY, THIS...".
IOA DOES CONCUR WITH THE REST OF NASA'S REEVALUATION AND RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-206
NASA FMEA #: 05-5-B01-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 206
ITEM: Central Processing Unit (CPU)

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-207
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 207
ITEM: Central Processing Unit (CPU)

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA DOES CONCUR WITH NASA'S REEVALUATION.
THE IOA DOES NOT RECOMMEND THAT A NEW FMEA BE WRITTEN, SINCE THE CRITICALITY OF THIS ITEM WAS NOT INCREASED BY THE FAILURE MODE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-208
NASA FMEA #: NONE

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 208
ITEM: Central Processing Unit (CPU)

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[2 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE FAILURE MODE AND EFFECTS ARE DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-209
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 209
ITEM: CPU Power Switch

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE WOULD REQUIRE A SECOND FAILURE OF THE GPC BEFORE THE CRITICALITY OF THE POWER SWITCH COULD BE UPGRADED. SECOND FAILURES ARE NOT ANALYZED TO ESTABLISH FUNCTIONAL CRITICALITY.
THIS FAILURE MODE AND EFFECTS ARE DETERMINED TO BE NON-CREDIBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:	10/06/86	NASA DATA:	
ASSESSMENT ID:	DPS-210	BASELINE	[ ]
NASA FMEA #:	05-5-B17-1-1	NEW	[X]

SUBSYSTEM: DPS
MDAC ID: 210
ITEM: GPC Mode Switch

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THE IOA DOES NOT RECOMMEND THAT A NEW FMEA BE WRITTEN, SINCE THE CRITICALITY OF THIS ITEM WAS NOT INCREASED BY THE FAILURE MODE. IOA DOES CONCUR WITH NASA'S REEVALUATION. THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-211
NASA FMEA #: 05-5-B15-1-3

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 211
ITEM: GPC Output Switch

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE IS CONSIDERED TO BE COVERED BY ROCKWELL'S 05-5-B15-1-3 WHICH HAS THE SAME CRITICALITY AS THIS FAILURE MODE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE:
ASSESSMENT ID: DPS-213
NASA FMEA #: NONE

NASA DATA:
BASELINE [ ]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 213
ITEM: GPC Power Switch

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/]	[ ]	[ ]	[ ]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DID NOT COVER THIS FAILURE MODE. IOA DOES NOT RECOMMEND A FMEA BEING WRITTEN SINCE THE CRITICALITY OF THIS ITEM WAS NOT INCREASED BY THE FAILURE MODE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/16/86
ASSESSMENT ID: DPS-214
NASA FMEA #: 05-6S-BDMC1-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 214
ITEM: DRIVER MODULE CONTROLLER

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA DID NOT COVER THIS ITEM IN ORIGINAL ANALYSIS. NO HARMFUL EFFECTS TO POWER UP A GPC. ROCKWELL SHOULD DOWNGRADE THE FMEA. NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION. ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/16/86
ASSESSMENT ID: DPS-215
NASA FMEA #: 05-6S-BDMC1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 215
ITEM: DRIVER MODULE CONTROLLER

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN ORIGINAL ANALYSIS. THE CRITICALITY OF THE FUNCTION WAS NOT INCREASED BY THE FAILURE OF THE HARDWARE ITEM.

C-2

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/17/86
ASSESSMENT ID: DPS-216
NASA FMEA #: 05-6S-BSW1-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 216
ITEM: SWITCH, GPC POWER

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS. THE FAILURE MODE OF PREMATURE OPERATION CAUSES NO HARMFUL EFFECTS. THE CRITICALITY OF THE ROCKWELL FMEA SHOULD BE DOWNGRADED TO A 3/3.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/17/86
ASSESSMENT ID: DPS-217
NASA FMEA #: 05-6S-BSW1-3 (NEW)

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 217
ITEM: SWITCH, GPC POWER

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
NO DIFFERENCES. THIS ITEM WAS PRESENTED AT THE DPS PRE-BOARD AS NEW FMEA. IOA DID NOT COVER THE FAILURE MODE IN THE ORIGINAL ANALYSIS.
THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.
IOA AGREES THAT CRITICALITY SHOULD BE SAME AS LOSS OF GPC OUTPUT FOR THIS FAILURE MODE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/20/86
ASSESSMENT ID: DPS-218
NASA FMEA #: 05-5-B27-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 218
ITEM: STATUS LIGHT

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/20/86
ASSESSMENT ID: DPS-219
NASA FMEA #: 05-5-B27-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 219
ITEM: CICU

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/20/86
ASSESSMENT ID: DPS-220
NASA FMEA #: 05-5-B16-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 220
ITEM: SWITCH, IPL

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/20/86
ASSESSMENT ID: DPS-221
NASA FMEA #: 05-5-B18-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 221
ITEM: INDICATOR, IPL

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/20/86
ASSESSMENT ID: DPS-222
NASA FMEA #: 05-5-B18-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 222
ITEM: INDICATOR, IPL

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/20/86
ASSESSMENT ID: DPS-223
NASA FMEA #: 05-5-B19-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 223
ITEM: INDICATOR OUTPUT, BARBER POLE

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/20/86
ASSESSMENT ID: DPS-224
NASA FMEA #: 05-5-B19-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 224
ITEM: INDICATOR OUTPUT, BARBER POLE

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/27/86
ASSESSMENT ID: DPS-225
NASA FMEA #: 05-5-B02-1-3

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 225
ITEM: INPUT/OUTPUT PROCESSOR (IOP)

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[2 /1R]	[P]	[P]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS FAILURE MODE IN ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/30/86
ASSESSMENT ID: DPS-226
NASA FMEA #: 05-6S-BRES1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 226
ITEM: RESISTOR

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[/NA]	[NA]	[NA]	[NA]	[ ] *
IOA	[/NA]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
FMEA HAS BEEN DELETED BECAUSE RESISTOR HAS BEEN REPLACED WITH A FUSE.
IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/30/86
ASSESSMENT ID: DPS-227
NASA FMEA #: 05-6S-BFUS1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 227
ITEM: FUSE

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/30/86
ASSESSMENT ID: DPS-228
NASA FMEA #: 05-6S-BRPC1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 228
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/30/86
ASSESSMENT ID: DPS-229
NASA FMEA #: 05-6S-BRPC1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 229
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDNACY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/03/86
ASSESSMENT ID: DPS-230
NASA FMEA #: 05-6S-BDIOX-1 (NEW)

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 230
ITEM: DIODE

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.
THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/03/86
ASSESSMENT ID: DPS-231
NASA FMEA #: 05-5-B15-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 231
ITEM: SWITCH, NORMAL-TERM BACK-UP

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-232
NASA FMEA #: 05-6S-BSW1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 232
ITEM: SWITCH, GPC POWER

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE OF ONE SET OF CONTACTS ON THE POWER SWITCH HAS THE SAME EFFECT AS THE LOSS OF A DRIVER MODULE CONTROLLER. ONE OF THREE REDUNDANT POWER SOURCES IS LOST.
NO DIFFERENCES. IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/07/86
ASSESSMENT ID: DPS-300
NASA FMEA #: 05-5-B22-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 300
ITEM: KEYBOARD SWITCH

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING LIFTOFF AND DEORBIT. KEYBOARD COMMAND CAPABILITY WOULD BE INHIBITED. THE SECOND RELATED FAILURE WOULD RESULT IN LOSS OF LIFE/VEHICLE. IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-300A
NASA FMEA #: 05-5-B24-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 300
ITEM: KEYBOARD SWITCH

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/N]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.
IOA DOES CONCUR WITH NASA'S REEVALUATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-300B
NASA FMEA #: 05-5-B24-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 300
ITEM: KEYBOARD SWITCH

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
IOA DOES CONCUR WITH NASA'S REEVALUATION.
THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-301
NASA FMEA #: 05-5-B21-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 301
ITEM: X/Y DEFLECTION AMPLIFIERS

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
CRTS (DUS) ARE ESSENTIAL FOR LIFE OR VEHICLE.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.
IOA DOES CONCUR WITH NASA'S REEVALUATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 8/08/86
ASSESSMENT ID: DPS-302
NASA FMEA #: 05-5-B21-1-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 302
ITEM: VIDEO AMPLIFIER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
CRTS (DUS) ARE ESSENTIAL FOR LIFE OR VEHICLE.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.
IOA DOES CONCUR WITH NASA'S REEVALUATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-303
NASA FMEA #: 05-5-B21-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 303
ITEM: CATHODE-RAY TUBE

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
CRTS (DUS) ARE ESSENTIAL FOR LIFE OR VEHICLE.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.
IOA DOES CONCUR WITH NASA'S REEVALUATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-304
NASA FMEA #: 05-5-B21-1-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 304
ITEM: HI AND LOW VOLTAGE POWER SUPPLIES

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
CRTS (DUS) ARE ESSENTIAL FOR LIFE OR VEHICLE.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-305
NASA FMEA #: 05-6S-BRPC4-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 305
ITEM: RPC

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
CRTS (DUS) ARE ESSENTIAL FOR LIFE OR VEHICLE. VERIFICATION IN FLIGHT OF REDUNDANT STRINGS WHICH IS PROVIDED BY MDM MEASUREMENTS MAY BE ERRONEOUS SINCE THE STATUS MEASUREMENT DERIVATION IS INITIATED BY A REDUNDANT CIRCUIT.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-306
NASA FMEA #: 05-5-B23-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 306
ITEM: MEMORY

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-307
NASA FMEA #: 05-5-B23-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 307
ITEM: KEYBOARD ADAPTER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-307A
NASA FMEA #: 05-5-B23-1-3

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 307
ITEM: KEYBOARD ADAPTER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
MULTIPLE FAILURES ARE INCONSISTENT WITH NSTS 22206. SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA.
PREMATURE TRANSITION FROM ONE MODE TO ANOTHER MODE WHEN OPS KEYBOARD ENTRY IS TO BE CLEARED IS A TWO FAILURE EFFECT SINCE A PREVIOUS FAILURE IS REQUIRED TO NECESSITATE CREW INITIATION OF OPS MODE RECALL, AS STATED IN NASA FMEA 05-5-B23-1-3.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-308
NASA FMEA #: 05-5-B23-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 308
ITEM: SYMBOL GENERATOR

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-308A
NASA FMEA #: 05-5-B23-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 308
ITEM: SYMBOL GENERATOR

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "LOSS OF OUTPUT".
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-309
NASA FMEA #: 05-5-B23-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 309
ITEM: MIA

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-310
NASA FMEA #: 05-5-B23-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 310
ITEM: CONTROL LOGIC

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-311
NASA FMEA #: 05-5-B23-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 311
ITEM: POWER SUPPLIES

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-312
NASA FMEA #: 05-6S-BRPC5-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 312
ITEM: RPC

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
VERIFICATION IN FLIGHT OF REDUNDANT STRINGS WHICH IS PROVIDED BY MDM MEASUREMENTS MAY BE ERRONEOUS SINCE THE STATUS MEASUREMENT DERIVATION IS INITIATED BY A REDUNDANT CIRCUIT.
THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-312A
NASA FMEA #: 05-6S-BDI01-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 312
ITEM: RPC

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS NASA FMEA NUMBER WAS COVERED IN THE ORIGINAL IOA ANALYSIS. THIS FAILURE MODE "OPEN/CLOSED/PREMATURE OPERATION" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "OPENS". IOA DOES CONCUR WITH NASA'S REEVALUATION. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.
VERIFICATION IN FLIGHT OF REDUNDANT STRINGS WHICH IS PROVIDED BY MDM MEASUREMENTS MAY BE ERRONEOUS SINCE THE STATUS MEASUREMENT DERIVATION IS INITIATED BY A REDUNDANT CIRCUIT.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-312B
NASA FMEA #: 05-6S-BSW4-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 312
ITEM: RPC

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS NASA FMEA NUMBER WAS NOT COVERED IN THE ORIGINAL IOA ANALYSIS. THIS FAILURE MODE "OPEN/CLOSED/PREMATURE OPERATION" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "PREMATURE OPERATION".
VERIFICATION IN FLIGHT OF REDUNDANT STRINGS WHICH IS PROVIDED BY THE MDM MEASUREMENTS MAY BE ERRONEOUS SINCE THE STATUS MEASUREMENT DERIVATION IS INITIATED BY A REDUNDANT CIRCUIT.
IOA DOES CONCUR WITH NASA'S REEVALUATION. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-312C
NASA FMEA #: 05-6S-BFUS2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 312
ITEM: RPC

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS NASA FMEA NUMBER WAS NOT COVERED IN THE ORIGINAL IOA ANALYSIS. THIS FAILURE MODE "OPEN/CLOSED/PREMATURE OPERATION" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "PREMATURE OPERATION".
VERIFICATION IN FLIGHT OF REDUNDANT STRINGS WHICH IS PROVIDED BY THE MDM MEASUREMENTS MAY BE ERRONEOUS SINCE THE STATUS MEASUREMENT DERIVATION IS INITIATED BY A REDUNDANT CIRCUIT.
IOA DOES CONCUR WITH NASA'S REEVALUATION. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-313
NASA FMEA #: 05-5-B25-1-3

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 313
ITEM: LOAD SWITCH

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
DEU'S ARE NOT NORMALLY RELOADED DURING A MISSION. SWITCH IS NOT NEEDED.
IOA DOES CONCUR WITH NASA'S REEVALUATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-314
NASA FMEA #: 05-5-B26-1-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 314
ITEM: FUNCTION SWITCH

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-314A
NASA FMEA #: 05-5-B26-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 314
ITEM: FUNCTION SWITCH

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-314B
NASA FMEA #: 05-5-B26-1-3

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 314
ITEM: FUNCTION SWITCH

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-315
NASA FMEA #: 05-5-B14-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 315
ITEM: DATA BUS COUPLER (DBC)

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[P]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[ ]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING LIFTOFF AND DEORBIT.
IF THE SECOND RELATED FAILURE WAS ASSOCIATED WITH EITHER PRE-VALVES OR PURGE DURING RTLS ABORT THIS FAILURE WOULD RESULT IN LOSS OF LIFE/VEHICLE. SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA.
MULTIPLE FAILURES ARE INCONSISTENT WITH THE NSTS 22206.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/08/86
ASSESSMENT ID: DPS-316
NASA FMEA #: 05-5-B13-1-4

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 316
ITEM: DBIA

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[NA]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-316A
NASA FMEA #: 05-6S-BCKT-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 316
ITEM: DBIA

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[NA]	[P]	[ ]
COMPARE	[/N]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "OPEN/SHORT/ERRONEOUS/ERRATIC OUTPUT" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "ALL CREDIBLE MODES".
THE IOA DOES CONCUR WITH NASA'S REEVALUATION. THIS FAILURE MODE DID NOT UPGRADE THE FUNCTIONAL CRITICALITY.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/27/86
ASSESSMENT ID: DPS-317
NASA FMEA #: 05-6S-BRES4-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 317
ITEM: RESISTOR

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THE IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
THE IOA DOES CONCUR WITH NASA'S REEVALUATION.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-318
NASA FMEA #: 05-6S-BRPC4-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 318
ITEM: RPC

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "PREMATURE OPERATION" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "INADVERTENT OUTPUT".
NO EFFECT SINCE DU WILL HAVE POWER APPLIED PREMATURELY, BUT DISPLAY WILL NOT APPEAR UNTIL THE DEU IS TURNED ON.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.
THE IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-319
NASA FMEA #: 05-6S-BSW4-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 319
ITEM: SWITCH, CRT POWER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "PREMATURE OPERATION" IS CONSIDERED TO BE COVERED THIS ROCKWELL FMEA WITH FAILURE MODE "PREMATURE OPERATION".
NO EFFECT SINCE DU WILL HAVE POWER APPLIED PREMATURELY, BUT DISPLAY WILL NOT APPEAR UNTIL DEU IS TURNED ON.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.
IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-320
NASA FMEA #: 05-6S-BRPC5-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 320
ITEM: RPC

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE "PREMATURE OPERATION" IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE "INADVERTENT OUTPUT".
NO EFFECT SINCE DEU WILL HAVE POWER APPLIED PREMATURELY.
IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/03/86
ASSESSMENT ID: DPS-321
NASA FMEA #: 05-6S-BDIO1-2 (NEW)

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 321
ITEM: DIODE, SUPPRESSOR

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[NA]	[NA]	[NA]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/10/86
ASSESSMENT ID: DPS-322
NASA FMEA #: 05-6S-BSW4-3 (NEW)

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 322
ITEM: SWITCH, CRT POWER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /1R]	[P]	[P]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
REF. 05-6Q-2201-3. NASA-JSC FMEA & CIL REVIEW COMMENTS, 9-11-86.
IOA DID NOT COVER THIS FAILURE MDOE IN THE ORIGINAL ANALYSIS.
IOA DOES CONCUR WITH NASA'S REEVALUATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-400
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 400
ITEM: Tape transport mechanism

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-401
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 401
ITEM: Tape transport mechanism

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-402
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 402
ITEM: Read electronics

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-403
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 403
ITEM: Read electronics

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-404
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 404
ITEM: MIA

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/] [ ] [ ] [ ] [ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-405
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 405
ITEM: MIA

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-406
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 406
ITEM: Write electronics

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-407
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 407
ITEM: RPC

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM	
NASA	[3 /2R]	[P]	[P]	[P]	[ ]	*
IOA	[3 /2R]	[P]	[P]	[P]	[ ]	
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]	

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-408
NASA FMEA #: 05-6S-BSW2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 408
ITEM: Switch

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/10/86
ASSESSMENT ID: DPS-409
NASA FMEA #: 05-6S-BSW2-2

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 409
ITEM: Switch

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[P]	[P]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-410
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 410
ITEM: Control logic

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-411
NASA FMEA #: 05-5-B04-2-2

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 411
ITEM: Control logic

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-412
NASA FMEA #: 05-5-B04-2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 412
ITEM: Power supply

LEAD ANALYST: K. Pietz

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
THIS FAILURE MODE, "FAILS OUT OF TOLERANCE", IS CONSIDERED TO BE COVERED BY THIS ROCKWELL FMEA WITH FAILURE MODE, "LOSS OF OUTPUT".

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/17/86
ASSESSMENT ID: DPS-413
NASA FMEA #: 05-6S-BRES2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 413
ITEM: RESISTOR, CURRENT LIMITER

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS. THE EFFECTS OF THIS FAILED ITEM COULD BE CONSIDERED TO BE COVERED BY MDAC ID. 408, A SWITCH WHICH IS IN SERIES WITH THIS RESISTOR.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/30/86
ASSESSMENT ID: DPS-414
NASA FMEA #: 05-6S-BRPC2-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 414
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS FAILURE IN THE ORIGINAL ANALYSIS.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/06/86
ASSESSMENT ID: DPS-415
NASA FMEA #: 05-5-B20-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 415
ITEM: IPL Source Switch

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /2]	[P]	[P]	[P]	[X] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[N]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [X]
INADEQUATE [ ]

REMARKS:
IOA CRITICALITY ASSIGNMENT WAS MADE BECAUSE AFTER INITIAL PROGRAM LOAD IS COMPLETE A SYSTEMS SOFTWARE PROBLEM OF SOME TYPE WOULD HAVE TO OCCUR BEFORE ANY ATTEMPT WOULD BE MADE TO RE-IPL A GIVEN GPC.
SIMULTANEOUS DISSIMILAR FAILURES WERE EXCLUDED FROM THE IOA. MULTIPLE FAILURES ARE INCONSISTENT WITH NSTS 22206.
ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA' OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.
IOA DOES CONCUR WITH NASA'S REEVALUATION AND RATIONALE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/10/86
ASSESSMENT ID: DPS-416
NASA FMEA #: MMU-1 (NEW)

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 416
ITEM: CONTROLLER, REMOTE POWER

LEAD ANALYST: T. B. Cribbs

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /3]	[NA]	[NA]	[NA]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS. ACCORDING TO NSTS 22206, REDUNDANCY SCREENS MUST BE "NA" OR BLANK FOR FMEAS WITH A CRITICALITY OF 3/3.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/10/86
ASSESSMENT ID: DPS-417
NASA FMEA #: MMU-2 (NEW)

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 417
ITEM: SWITCH, IPL

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[3 /2R]	[P]	[P]	[P]	[ ] *
IOA	[3 /2R]	[P]	[P]	[P]	[ ]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
REF. 05-5-B16-1-1. NASA-JSC FMEA & CIL REVIEW COMMENTS, 9-19-86.
IOA DID NOT COVER THIS ITEM IN THE ORIGINAL ANALYSIS.
NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-501
NASA FMEA #: 05-5-B08-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 501
ITEM: CIA

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THIS FAILURE MODE, "LOSS OF OUTPUT TO MAIN ENGINE ON ONE CHANNEL", COULD BE CONSIDERED TO BE COVERED BY ROCKWELL 05-05-B08-1-1 WITH FAILURE MODE, "NO OUTPUT".
IOA DOES CONCUR WITH NASA'S REEVALUATION. THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-502
NASA FMEA #: 05-5-B08-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 502
ITEM: MIA

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
IOA DOES CONCUR WITH NASA'S REEVALUATION. THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVIALABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-503
NASA FMEA #: 05-5-B08-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 503
ITEM: POWER CONTROL SWITCH

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[ ] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[N]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THIS FAILURE MODE, "LOSS OF OUTPUT TO MAIN ENGINE ON ALL COMMAND CHANNELS", IS CONSIDERED TO BE COVERED BY ROCKWELL 05-5-B08-1-1 WITH THIS FAILURE "LOSS OF REDUNDANT POWER SUPPLIES". IOA DOES CONCUR WITH NASA'S REEVALUATION. THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVIALBLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-504
NASA FMEA #: 05-5-B08-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 504
ITEM: INTERNAL POWER SUPPLIES

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THIS FAILURE MODE, "LOSS OF OUTPUT TO MAIN ENGINE ON ALL COMMAND CHANNELS", IS CONSIDERED TO BE COVERED BY ROCKWELL 05-5-B08-1-1, WITH THIS FAILURE "LOSS OF REDUNDANT POWER SUPPLIES".
IOA DOES CONCUR WITH NASA'S REEVALUATION.
THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-505
NASA FMEA #: 05-5-B08-1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 505
ITEM: CONTROLLER INTERFACE ADAPTER

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[3 /1R]	[P]	[P]	[P]	[ ]
COMPARE	[N /]	[ ]	[N]	[ ]	[N]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
THIS FAILURE MODE, "LOSS OF OUTPUT ON STATUS OF ENGINES", IS CONSIDERED TO BE COVERED BY ROCKWELL 05-5-B08-1-1, WITH THIS FAILURE MODE "NO OUTPUT".
IOA DOES CONCUR WITH NASA'S REEVALUATION.
THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/14/86
ASSESSMENT ID: DPS-506
NASA FMEA #: 05-5-B08-1-1

NASA DATA:
BASELINE [X]
NEW [ ]

SUBSYSTEM: DPS
MDAC ID: 506
ITEM: OIE

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[ ] *
IOA	[3 /3]	[NA]	[NA]	[NA]	[ ]
COMPARE	[N /N]	[N]	[N]	[N]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [ ]

REMARKS:
NASA/RI DID NOT SPECIFICALLY COVER THIS FAILURE MODE, "LOSS OF OUTPUT TO S-BAND, MAINTENANCE RECORDS, AND LPS T-O UMBILICAL". THIS FAILURE MODE IS CONSIDERED TO BE COVERED BY ROCKWELL FMEA 05-5-B08-1-1, WITH FAILURE MODE "NO OUTPUT".

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 10/16/86
ASSESSMENT ID: DPS-507
NASA FMEA #: 05-6S-BCKT1-1

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 507
ITEM: CIRCUIT, EIU POWER

LEAD ANALYST: B. ROBB

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[2 /1R]	[P]	[F]	[P]	[X] *
IOA	[2 /1R]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

	[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)

ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
NO DIFFERENCES. IOA DID NOT COVER THIS ITEM IN ORIGINAL ANALYSIS. IOA DOES CONCUR WITH THE NASA REEVALUATION. THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/03/86
ASSESSMENT ID: DPS-508
NASA FMEA #: EIU-1 (NEW)

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 508
ITEM: EIU

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[P]	[F]	[P]	[X] *
IOA	[1 /1]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS. NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION. THE RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE. THIS IS A NEW FMEA PRESENTED AT THE DPS PREBOARD.

APPENDIX C
ASSESSMENT WORKSHEET

ASSESSMENT DATE: 11/03/86
ASSESSMENT ID: DPS-509
NASA FMEA #: EIU-2 (NEW)

NASA DATA:
BASELINE [ ]
NEW [X]

SUBSYSTEM: DPS
MDAC ID: 509
ITEM: SWITCH, POWER

LEAD ANALYST: H J LOWERY

ASSESSMENT:

	CRITICALITY FLIGHT HDW/FUNC	REDUNDANCY SCREENS A	B	C	CIL ITEM
NASA	[1 /1]	[P]	[F]	[P]	[X] *
IOA	[1 /1]	[P]	[F]	[P]	[X]
COMPARE	[/]	[ ]	[ ]	[ ]	[ ]

RECOMMENDATIONS: (If different from NASA)

[/]	[ ]	[ ]	[ ]	[ ] (ADD/DELETE)

* CIL RETENTION RATIONALE: (If applicable)
ADEQUATE [ ]
INADEQUATE [X]

REMARKS:
IOA DID NOT COVER THIS FAILURE MODE IN THE ORIGINAL ANALYSIS. NASA AGREED WITH THE IOA ASSESSMENT RECOMMENDATION. THE CIL RETENTION RATIONALE IS INADEQUATE BECAUSE IT IS NOT YET AVAILABLE. THIS IS A NEW FMEA PRESENTED AT THE DPS PREBOARD.

APPENDIX D

CRITICAL ITEMS

APPENDIX D

CRITICAL ITEMS

NASA FMEA	IOA ID	ITEM NAME	FAILURE MODE
MDM			
* 05-5 -B03-1-1	120	FA MDM	LOSS OF OUTPUT
05-5 -B03-1-2	122	FA MDM	LOSS OF OUTPUT
* 05-5 -B03-2-1	108	FF MDM	LOSS OF OUTPUT
05-5 -B03-2-2	107	FF MDM	LOSS OF OUTPUT
05-5 -B03-5-1	141	PF MDM	LOSS OF OUTPUT
05-5 -B03-5-2	142	PF MDM	LOSS OF OUTPUT
% 05-6S-BRES3-1	190	RESISTOR	OPEN
% 05-6S-BRPC3-1	191	RPC	LOSS OF OUTPUT
% 05-6S-BSW3 -1	193	SWITCH	PREMATURE OPERATION
% 05-6S-BSW5 -3	195	SWITCH	FAILS-TO-TRANSFER
GPC			
* 05-5 -B01-1-1	205	CPU	LOSS OF OUTPUT
* 05-5 -B02-1-1	201	IOP	LOSS OF OUTPUT
05-5 -B02-1-3	225	IOP	ERRONEOUS OUTPUT
% 05-5 -B17-1-1	210	SWITCH	LOSS OF OUTPUT
% 05-6S-BDIOX-1	230	DIODE	FAILS OPEN
% 05-6S-BSW1 -3	217	SWITCH	FAILS OPEN
MCDS			
05-5-B22-1-1	300	SWITCH	ERRONEOUS OUTPUT
05-5-B23-1-3	307	KBD ADAPTER	ERRONEOUS OUTPUT
% 05-5-B24-1-1	300	SWITCH	FAILS OPEN
DBC			
05-5-B14-1-1	315	DBC	FAILS OPEN/SHORT
MMU			
05-5-B20-1-1	415	SWITCH	FAILS-TO-TRANSFER
EIU			
% EIU-1	508	EIU	ERRONEOUS OUTPUT
% EIU-2	509	SWITCH	SHORT-TO-GROUND
% 05-5 -B08-1-1	501	CIA	NO OUTPUT
% 05-6S-BCKT1-1	507	POWER CKT	FAILS OPEN/SHORT

NOTE * IOA ISSUE
% ADDED TO CIL POST 51-L

APPENDIX E
DETAILED ANALYSIS

This section contains the IOA analysis worksheets generated during the analysis of this subsystem. The information on these worksheets is intentionally similar to the NASA FMEAs. Each of these sheets identifies the hardware item being analyzed, and parent assembly, as well as the function. For each failure mode, the possible causes are outlined, and the assessed hardware and functional criticality for each mission phase is listed, as described in the NSTS 22206, Instructions for Preparation of FMEA and CIL, 10 October 1986. Finally, effects are entered at the bottom of each sheet, and the worst case criticality is entered at the top.

LEGEND FOR IOA ANALYSIS WORKSHEETS

Hardware Criticalities:
- 1 = Loss of life or vehicle
- 2 = Loss of mission or next failure of any redundant item (like or unlike) could cause loss of life/vehicle
- 3 = All others

Functional Criticalities:
- 1R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of life or vehicle.
- 2R = Redundant hardware items (like or unlike) all of which, if failed, could cause loss of mission.

Redundancy Screen A:
- 1 = Is Checked Out PreFlight
- 2 = Is Capable of Check Out PreFlight
- 3 = Not Capable of Check Out PreFlight
- NA = Not Applicable

Redundancy Screens B and C:
- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 100

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Loss of Output to GPC

LEAD ANALYST: W. A. Haufler   SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM, but not allowed during ascent until after 2nd MDM failure.
If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 101

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Loss of Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 102

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Erroneous Output to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM, but not allowed during ascent until after 2nd MDM failure.
If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 103

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Erroneous Output to LRU

LEAD ANALYST: W. A. Haufler   SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/1R
MDAC ID:	104	ABORT:	3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Premature Operation to GPC

LEAD ANALYST: W. A. Haufler   SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1]   B [P]   C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
This failure on either port can interfere with FCOS returning data from other BTU(s) and cause healthy BTU(s) to be bypassed. Port moding will not fix a blabbing MDM. Power cycling may reset electronics, but cannot be performed during ascent (power switches cannot be reached), and will not always stop premature operations. If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 105

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Premature Operation to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/1R
MDAC ID:	106	ABORT:	3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Selected All Channels Wrong

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
The GPC's FCOS and the LRUs would reject all data from that MDM except any data that happened to be in the same format as the expected data. Redundancy Mgt. soon detects and bypasses that MDM, and the effects of wrong data input or output is minimized. If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 107

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Stuck on a Constant Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 108

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FF1,FF2,FF3,FF4
FAILURE MODE: Falsely Stuck on Busy Mode

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Forward MDM (FF1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2,3,2
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination, SCU Busy Cross-strap stuck high

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM, but not allowed during ascent until after 2nd MDM failure.
If all redundancy fails, lose use of IMU torquing, forward RCS jets, Hand Controls (THC,RHC), most switches and indicators.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 120

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Loss of Output to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM, but not allowed during ascent until after 2nd MDM failure.
If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 121

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Loss of Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 122

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Erroneous Output to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM, but not allowed during ascent until after 2nd MDM failure.
If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 123

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Erroneous Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 124

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Premature Operation to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
This failure on either port can interfere with FCOS returning data from other BTU(s) and cause good BTU(s) to be bypassed. Port moding will not fix a blabbing MDM. Power cycling may reset electronics, but cannot be performed during ascent (power switches cannot be reached), and will not always stop premature operations. If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 125

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Premature Operation to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 126

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Selected All Channels Wrong

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
The GPC's FCOS and the LRUs would reject all data from that MDM except any data that happened to be in the same format as the expected data. Redundancy Mgt. soon detects and bypasses that MDM, and the effects of wrong data input or output is minimized. If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 127

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Stuck on a Constant Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 128

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MDM FA1,FA2,FA3,FA4
FAILURE MODE: Falsely Stuck on Busy Mode

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Flight critical Aft MDM (FA1..4)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 4,5,6,6
PART NUMBER: MC615-0004-6110,5110

CAUSES: Vibration, Corrosion, Contamination, SCU Busy Cross-strap stuck high

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM, but not allowed during ascent until after 2nd MDM failure.
If all redundancy fails, lose use of aft RCS, Body Flap, Ailerons, Rudder, Speedbrake, and ability to purge SSMEs and tanks.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 140

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Loss of Output to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS/BSS sets Commfault flag for that data. Application SW ignores that data. System software bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may not recover MDM.
If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 141

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Loss of Output to LRU

LEAD ANALYST: W. A. Haufler   SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS/BSS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant PF MDMs. Detection depends on separate, redundant feedback signals. If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 142

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Erroneous Output to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS/BSS sets Commfault flag for that data. Application SW ignores that data. System software bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may not recover MDM.
If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 143

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Erroneous Output to LRU

LEAD ANALYST: W. A. Haufler   SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS/BSS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant PF MDMs. Detection depends on separate, redundant feedback signals. If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 144

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Premature Operation to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
This failure on either port can interfere with FCOS/BSS returning data from other PF MDM and cause good MDM to be bypassed. Port moding will not fix a blabbing MDM. Power cycling may reset electronics, but will not always stop premature operations.
If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 145

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Premature Operation to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS/BSS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant PF MDMs. Detection depends on separate, redundant feedback signals. If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 146

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Selected All Channels Wrong

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
The GPC's FCOS and the LRUs would reject all data from that MDM except any data that happened to be in the same format as the expected data. Redundancy Mgt. soon detects and bypasses that MDM, and the effects of wrong data input or output is minimized. If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/1R
MDAC ID:	147	ABORT:	3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Stuck on a Constant Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS/BSS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant PF MDMs. Detection depends on separate, redundant feedback signals. If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 148

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/3

ITEM: MDM PF1,PF2
FAILURE MODE: Falsely Stuck on Busy Mode

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) Payload Forward MDM (PF1..2)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC615-0004-6710,5710

CAUSES: Vibration, Corrosion, Contamination, SCU Busy Cross-strap stuck high

EFFECTS/RATIONALE:
FCOS/BSS sets Commfault flag for that data. Application SW ignores that data. System software bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may not recover MDM.
If all redundancy fails, lose ability to release, open, close, and latch Payload Bay Doors, and ability to cradle and latch RMS arm without an EVA.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 180

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: MDM LF1, LA1
FAILURE MODE: Loss of Output to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) PreLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM. If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 181

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: MDM LF1,LA1
FAILURE MODE: Loss of Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) preLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 182

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: MDM LF1,LA1
FAILURE MODE: Erroneous Output to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) preLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM, but not allowed during ascent until after 2nd MDM failure.
If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 183

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: MDM LF1,LA1
FAILURE MODE: Erroneous Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) preLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 184

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: MDM LF1,LA1
FAILURE MODE: Premature Operation to GPC

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) preLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
This failure on either port can interfere with FCOS returning data from other BTU(s) and cause good BTU(s) to be bypassed. Port moding will not fix a blabbing MDM. Power cycling may reset electronics, but will not always stop premature operations. If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 185

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: MDM LF1,LA1
FAILURE MODE: Premature Operation to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) preLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 186

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: MDM LF1,LA1
FAILURE MODE: Selected All Channels Wrong

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) preLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
The GPC's FCOS and the LRUs would reject all data from that MDM except any data that happened to be in the same format as the expected data. Redundancy Mgt. soon detects and bypasses that MDM, and the effects of wrong data input or output is minimized. If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/2R
MDAC ID:	187	ABORT:	/NA

ITEM: MDM LF1,LA1
FAILURE MODE: Stuck on a Constant Output to LRU

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) preLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination

EFFECTS/RATIONALE:
FCOS does not directly detect this error via MDM Return Word processing. Fault tolerance depends on redundant strings to voting LRUs. Detection depends on separate, redundant feedback signals.
If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 188

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	/NA

ITEM: MDM LF1,LA1
FAILURE MODE: Falsely Stuck on Busy Mode

LEAD ANALYST: W. A. Haufler SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) Multiplexer-DeMultiplexers (MDM)
3) preLaunch Forward & Aft MDM (LF,LA)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: Av Bay 1,6
PART NUMBER: MC615-0004-6610,5600

CAUSES: Vibration, Corrosion, Contamination, SCU Busy Cross-strap stuck high

EFFECTS/RATIONALE:
FCOS sets Commfault flag for that data. Application SW ignores that data. FCOS bypasses MDM after 2nd consecutive commfault, and displays fault msg on CRTs. Port moding may recover MDM. If all redundancy fails, lose ability of GSE to monitor and control systems while attached.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: DPS
MDAC ID: 190

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: RESISTOR, CURRENT LIMITING
FAILURE MODE: OPEN

LEAD ANALYST: W. A. HAUFLER SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIPLEXER-DEMULTIPLEXERS (MDM)
3) POWER DISTRIBUTION
4) RESISTOR, CURRENT LIMITING
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:
PART NUMBER: RWR80S1211FR

CAUSES: THERMAL STRESS, VIBRATION, SHOCK, FRACTURE

EFFECTS/RATIONALE:
NO EFFECT ON ONE FAILURE SINCE MDM ARE NOT INTERRUPTED WITH LOSS OF ONE-OF-TWO POWER CIRCUITS. NO EFFECT ON FAILURES OF BOTH RESISTORS (NO LOSS OF VECHICLE) SINCE MDM ARE ALSO REDUNDANT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: DPS
MDAC ID: 191

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: LOSS OF OUTPUT, FAILS TO CONDUCT, OPEN OR SHORT TO GROUND

LEAD ANALYST: W. A. HAUFLER SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIPLEXER-DEMULTIPLEXERS (MDM)
3) POWER DISTRIBUTION
4) CONTROLLER, REMOTE POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:
PART NUMBER: MC450-0017-2050, 2075

CAUSES: PIECE PART STRUCTURE FAILURE, VIBRATION, THERMAL STRESS

EFFECTS/RATIONALE:
NO EFFECT ON ONE FAILURE SINCE MDM ARE NOT INTERRUPTED WITH LOSS OF ONE-OF-TWO POWER CIRCUITS. NO EFFECT ON FAILURE (NO LOSS OF VEHICLE) OF BOTH RESISTORS SINCE MDM ARE ALSO REDUNDANT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: DPS
MDAC ID: 192

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: INADVERTENT OPERATION: CONDUCTS PREMATURELY

LEAD ANALYST: W. A. HAUFLER SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIPLEXER-DEMULTIPLEXERS (MDM)
3) POWER DISTRIBUTION
4) CONTROLLER, REMOTE POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: CONTAMINATION, SHOCK, PIECE PART FAILURE

EFFECTS/RATIONALE:
NO EFFECT ON ANY MDMs THAT ARE OPERATIONAL THROUGHOUT THE ENTIRE MISSION (FF1,3 AND FA1,2). POWER WILL BE APPLIED TO ANY ONE OF THE FOLLOWING MDMs: FF2,4 AND FA3,4 IF ITS DEDICATED SWITCH FAILS AND IF THE APPROPRIATE POWER BUSSES ARE "ON".

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: DPS
MDAC ID: 193

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: SWITCH, MDM POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W. A. HAUFLER   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIPLEXER-DEMULTIPLEXERS (MDM)
3) FA, FF2, FF4, AND PF MDMs
4) POWER DISTRIBUTION
5) SWITCH, MDM POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:
PART NUMBER: ME452-0102-7201

CAUSES: PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
NO EFFECT ON ONE FAILURE SINCE MDM ARE NOT INTERRUPTED WITH LOSS OF ONE-OF-TWO POWER CIRCUITS. NO EFFECT ON FAILURES OF BOTH RESISTORS (NO LOSS OF VEHICLE) SINCE MDMs ARE ALSO REDUNDANT.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: DPS
MDAC ID: 194

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: SWITCH, MDM POWER
FAILURE MODE: PREMATURE OPERATION: CLOSES INADVERTENTLY

LEAD ANALYST: W. A. HAUFLER SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIPLEXER-DEMULTIPLEXERS (MDM)
3) FA, FF2, FF4, AND PF MDMs
4) POWER DISTRIBUTION
5) SWITCH, MDM POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER: ME452-0102-7201

CAUSES: PIECE-PART STRUCTURAL FAILURE, SHOCK, VIBRATION, THERMAL STRESS

EFFECTS/RATIONALE:
NO EFFECT ON MDMs THAT ARE OPERATIONAL THROUGHOUT THE ENTIRE MISSION. THIS SWITCH FAILURE WILL INADVERTENTLY POWER UP MDMs THAT MIGHT BE OFF; I.E. FA3, FA4, FF2, AND FF4. NO LOSS OF VEHICLE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/22/86
SUBSYSTEM: DPS
MDAC ID: 195

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: SWITCH, MDM POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: W. A. HAUFLER SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIPLEXER-DEMULTIPLEXERS (MDM)
3) FF1, AND FF3 MDMs
4) POWER DISTRIBUTION
5) SWITCH, MDM POWER
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:
PART NUMBER: ME452-0102-7210

CAUSES: STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:
NO EFFECT ON ONE FAILURE SINCE MDM ARE NOT INTERRUPTED WITH LOSS OF ONE-OF-TWO POWER CIRCUITS. TWO FAILURE (LOSS OF BOTH POWER CIRCUITS AND THUS BOTH FF1 AND FF3) WOULD CAUSE LOSS OF ONE NSP INTERFACE.
WORKAROUND EXISTS TO UPDATE STATE VECTOR WITH LOSS OF BOTH FF1 AND FF3.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 201

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: Input/Output Processor (IOP)
FAILURE MODE: Loss of output

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Input/Output Processor (IOP)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bays
PART NUMBER:

CAUSES: MIA Fails to output to data bus due to piece/part failure from contamination or mechanical, thermal, or electrical overstress, or power failure

EFFECTS/RATIONALE:
Loss of a bus-commanding MIA results in loss of a GPC's ability to communicate over that bus, attached bus terminal units (BTU's), and all inputs and outputs connected to those BTU's. In dynamic flight phases, where a single BTU controls an actuator, the crew would have to manually intervene on a single failure, and switching transients could arise. Loss of all redundancy would cause loss of vehicle control.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 202

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: Input/Output Processor (IOP)
FAILURE MODE: Erratic/Erroneous Output

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Input/Output Processor (IOP)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bays
PART NUMBER:

CAUSES: Component failure due to contamination or mechanical, thermal, or electrical overstress in MIA, ALU, MUX, Local Store, or Memory

EFFECTS/RATIONALE:
Critical GPC outputs are validated by sumword comparison; however, errors are downlinked and logged, but not corrected. MDM/Actuator hardware cancels the effects of an erroneous output from a single channel by "Force fighting", but multiple failures during critical flight phases would likely result in loss of vehicel/life.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/22/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/1R
MDAC ID:	203	ABORT:	3/1R

ITEM: Input/Output Processor (IOP)
FAILURE MODE: Premature Operation

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Input/Output Processor (IOP)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	2/1R	ATO:	3/1R
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bays
PART NUMBER:

CAUSES: Control monitor, channel control, MSC, or microcode store failure results in invalid execution of program. Caused by piece/part failure.

EFFECTS/RATIONALE:
Premature issuance of critical outputs is detected by other GPC's in the Redundant Set. GPC fails to sync and strings are bypassed by other GPC's. Faulty commands are still passed to the actuator by failed GPC. Premature commands to actuators during dynamic flight phases would likely result in loss of vehicle/life, if actuator redundancy was lost or if simultaneous loss of two output channels.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 204

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: Input/Output Processor (IOP)
FAILURE MODE: Erroneous Input

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Input/Output Processor (IOP)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bays
PART NUMBER:

CAUSES: Component failure due to contamination or mechanical, thermal, or electrical overstress in MIA, ALU, MUX, Local Store, Memory, or DMA Queue

EFFECTS/RATIONALE:
Critical GPC/IOP inputs are validated thru parity checking. Recurring input errors result in either GPC "fail-to-sync" bringing down an erring GPC, or ignoring inputs from an erring MDM via a GPC mask. Erroneous inputs, if propagated through the GPC, could result in erroneous command outputs and loss of vehicle/life, if complete function was lost.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 205

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: Central Processing Unit (CPU)
FAILURE MODE: Loss of output

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bays
PART NUMBER:

CAUSES: CPU fails to function due to loss of power or failure of memory timing page

EFFECTS/RATIONALE:
In dynamic flight phases where redundant set (RS) is operating, other GPC's recognize GPC failing to sync and issue fail votes against it. The failing GPC's voting logic then removes it from the RS. Four RS GPC's control critical flight functions; if at least three are lost, the 5th GPC (backup flight computer, BFS) is engaged. Loss of BFS would result in loss of vehicle/life.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 206

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: Central Processing Unit (CPU)
FAILURE MODE: Erroneous/erratic output

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bays
PART NUMBER:

CAUSES: CPU outputs invalid data to IOP due to memory parity error, or failure of Master Bus Control, ALU, Data Flow Mux, or Local Store

EFFECTS/RATIONALE:
Critical GPC outputs are validated by sumword comparison to outputs from redundant GPC's; however, detected errors are merely logged and downlinked without corrective action. Invalid command outputs are passed through Bus Terminal Units (BTU's) to actuators which "force fight" the redundant commands in order to vote out the erroneous command. Loss of more than one output channel to the same actuator would require crew intervention, possibly causing instable switchover transients.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 207

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: Central Processing Unit (CPU)
FAILURE MODE: Delayed/premature/inadvertent operation

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bays
PART NUMBER:

CAUSES: CPU attempts to output data at inappropriate time due to processor slow-down while servicing recurring I/O errors, failure of interrupt logic, or intermittence in timing page.

EFFECTS/RATIONALE:
Redundant Set GPC's synch up by waiting for synch point messages from other GPC's to indicate completion of identical operations. Excessive processor load could require all GPC's to wait excessively, but each GPC would recognize the slow down and issue a fail-to-synch vote, and the slow GPC's voting logic would remove it from the RS. If performance of all GPC's was degraded during dynamic flight phases, vehicle instability could occur unless crew took control.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 208

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	2/1R
ABORT:	2/1R

ITEM: Central Processing Unit (CPU)
FAILURE MODE: Inadvertent operation

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bays
PART NUMBER:

CAUSES: CPU attempts to output data on incorrect data bus due to errors in memory locations containing configuration or bus-stringing parameters.

EFFECTS/RATIONALE:
Loss of memory in bus assignment table (NBAT) could result in a GPC attempting to command a data bus commanded by another GPC. Both examine their respective NBAT and assume no error condition, and continue transmission on that same bus.
This would cause all data on that bus to be erroneous.
Furthermore, idle bus is created and 2 command paths are lost.
Possible to outvote good commands: loss of vehicle/life.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 209

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: CPU Power Switch
FAILURE MODE: Fails closed

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4) CPU Power Switch
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: Panel O6
PART NUMBER:

CAUSES: CPU power switch is stuck in the "on" position due to contamination

EFFECTS/RATIONALE:
Flight rules dictate that the crew should power off any GPC which has recurring errors during dynamic flight phases, as soon as possible to avoid erroneous outputs being sent to actuators. If the CPU power switch were stuck in the "on" position and another GPC began sending erroneous data, the actuators could not vote out the erroneous commands and the crew would need to take manual control.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 210

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: GPC Mode Switch
FAILURE MODE: Fails closed

LEAD ANALYST: T. B. Cribbs   SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4) GPC Mode Switch
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Panel O6
PART NUMBER:

CAUSES: CPU mode switch is stuck in the "halt" or "standby" position due to contamination

EFFECTS/RATIONALE:
If the mode switch for a GPC were stuck in a non-run position the GPC would in effect be disabled, similar to failing to halt. The remaining GPC's would ignore this GPC, and the GPC would not be available as a backup or redundant member. If all GPC's were stuck in the standby mode, the crew could not perform critical flight control functions.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/1R
MDAC ID:	211	ABORT:	3/1R

ITEM: GPC Output Switch
FAILURE MODE: Fails closed

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4) GPC Output Switch
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/3	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Panel 06
PART NUMBER:

CAUSES: CPU output switch is stuck in the "terminate" or "backup" position due to contamination

EFFECTS/RATIONALE:
If the Output Switch were stuck in the "terminate" position, this would have the same effect of disabling the GPC's output; all switches in this position would cause loss of vehicle control. If the switch were stuck in the "backup" position this GPC would only be available as BFS. If all switches in "backup" GPC 5 would be backup when engaged.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 213

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: GPC Power Switch
FAILURE MODE: Fails open

LEAD ANALYST: T. B. Cribbs   SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4) GPC Power Switch
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/2R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Panel O6
PART NUMBER:

CAUSES: CPU power switch is stuck in "off" position, or GPC power is lost

EFFECTS/RATIONALE:
If the GPC power switch were stuck in the "OFF" position, the GPC could not function, same as CPU Loss of Output.

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 214

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: /NA

ITEM: DRIVER MODULE CONTROLLER
FAILURE MODE: PREMATURE OUTPUT

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) POWER DISTRIBUTION
4) DRIVER MODULE CONTROLLER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: INTERNAL COMPONENT FAILURE

EFFECTS/RATIONALE:
PREMATURE OPERATION CAUSES POWER TO BE APPLIED TO A GPC. NO HARMFUL EFFECTS TO POWER UP A GPC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 215

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: DRIVER MODULE CONTROLLER
FAILURE MODE: NO OUTPUT

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) POWER DISTRIBUTION
4) DRIVER MODULE CONTROLLER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: INTERNAL COMPONENT

EFFECTS/RATIONALE:
LOSS ONE OF THREE REDUNDANT POWER SOURSES TO A GPC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 216

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: SWITCH, GPC POWER
FAILURE MODE: PREMATURE CLOSURE

LEAD ANALYST: B. ROBB   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) POWER DISTRIBUTION
4) SWITCH, GPC POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:
THE MAIN DC POWER IS APPLIED TO THE GPC. NO HARMFUL EFFECTS TO APPLY POWER TO A GPC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 217

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 2/1R
ABORT: 2/1R

ITEM: SWITCH, GPC POWER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) POWER DISTRIBUTION
4) SWITCH, GPC POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, PIECE PART FAILURE

EFFECTS/RATIONALE:
POSSIBLE MISSION TERMINATION ON FIRST FAILURE. SECOND FAILURE COULD CAUSE LOSS OF CREW AND VEHICLE. IF FAILURE OCCURS CLOSE TO MECO THERE IS NOT ENOUGH TIME TO MANUALLY SHUT DOWN ENGINES TO PREVENT CAVITATION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 218

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: STATUS LIGHT
FAILURE MODE: NO OUTPUT

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) GENERAL PROCESSING UNIT (CPU)
4) STATUS LIGHT
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: FILAMENT FAILURE, VIBRATION

EFFECTS/RATIONALE:
NO EFFECT. CRT DISPLAYS GPC STATUS, BARBER POLE INDICATES OUTPUT OF FAILED GPC IS TERMINATED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 219

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: CICU
FAILURE MODE: NO OUTPUT

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) GENERAL PROCESSING UNIT (CPU)
4) COMPUTER INTERFACE CONDITIONING UNIT (CICU)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: INTERNAL COMPONENT FAILURE, VIBRATION

EFFECTS/RATIONALE:
NO EFFECT. LOSS OF CONVERSION POWER TO DRIVE GPC STATUS LIGHTS HAS SAME EFFECT AS LOSS OF STATUS LIGHT. OTHER INDICATORS PROVIDE GPC HEALTH STATUS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 220

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/2R

ITEM: SWITCH, IPL
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) SWITCH, IPL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/2R
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, PIECE PAST FAILURE

EFFECTS/RATIONALE:
NO EFFECT IF GPC IS IN RUN OR STANDBY MODE. IPL NOT NECESSARY IN-FLIGHT UNLESS ANOTHER FAILURE OCCURS TO GPC FIRST.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 221

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: INDICATOR, IPL
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) INDICATOR, IPL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, SHOCK

EFFECTS/RATIONALE:
A FALSE INDICATOR OF THE IPL FUNCTION HAS NO EFFECT ON THE GPC. IPL FUNCTION CAN BE MONITORED ON COMPUTER ANNUNICATOR PANEL FOR GPC STATUS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 222

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: INDICATOR, IPL
FAILURE MODE: FAILS TO TRANSFER INDICATION OF GPC MODE

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) INDICATOR, IPL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, SHOCK

EFFECTS/RATIONALE:
AN ERRONEOUS INDICATION OF THE GPC STATUS WILL BE DISPLAYED. NO EFFECT ON THE GPC'S FUNCTIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 223

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: INDICATOR OUTPUT, BARBER POLE
FAILURE MODE: ERRONEOUS INDICATION

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) INDICATOR OUTPUT
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: FAILED DRIVER, SHOCK, VIBRATION

EFFECTS/RATIONALE:
INDICATES ERRONEOUS GPC STATUS. NO EFFECT OF GPC FUNCTION. GPC STATUS DISPLAYED ON GPC STATUS ANNUNCIATOR.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 224

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: INDICATOR OUTPUT, BARBER POLE
FAILURE MODE: FAILS TO TRANSFER

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) INDICATOR OUTPUT
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, SHOCK, PIECE PART FAILURE

EFFECTS/RATIONALE:
ERRONEOUS INDICATION OF GPC STATUS. GPC STATUS ANNUNCIATOR CAN BE MONITORED OF GPC STATUS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/24/86
SUBSYSTEM: DPS
MDAC ID: 225

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	2/1R
ABORT:	2/1R

ITEM: INPUT/OUTPUT PROCESSOR (IOP)
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER
3) INPUT/OUTPUT PROCESSOR (IOP)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	2/1R	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: INTERNAL COMPONENT FAILURE

EFFECTS/RATIONALE:
MAY EXECUTE COMMAND TO WRONG MDM WITH ADDRESS ERROR. THE WORST CASE WOULD BE TO AN UNVOTED EFFECTOR. NO EFFECT ON 1ST FAILURE. CREW CAN PRECLUDE SENSITIVITY TO 2ND FAILURE.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/30/86
SUBSYSTEM: DPS
MDAC ID: 226

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: /NA
ABORT: /NA

ITEM: RESISTOR
FAILURE MODE: NOT APPLICABLE

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GPC
3) RESISTOR
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: RESISTOR HAS BEEN REPLACED WITH A FUSE.

EFFECTS/RATIONALE:
THIS RESISTOR HAS BEEN REPLACED WITH PART NUMBER ME451-0018-0300 (SEE FMEA #05-6S-BFUS1-1)

REFERENCES: FMEA NO. 05-6S-BRES1-1 NASA-JSC FMEA CIL REVIEW COMMENTS.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/30/86
SUBSYSTEM: DPS
MDAC ID: 227

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: FUSE
FAILURE MODE: OPEN

LEAD ANALYST: H J LOWERY   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GPC
3) FUSE
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1]   B [P]   C [P]

LOCATION:
PART NUMBER:

CAUSES: MECHANICAL FRACTURE

EFFECTS/RATIONALE:

REFERENCES: FMEA NO. 05-6S-BFUS1-1

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/30/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/1R
MDAC ID:	228	ABORT:	3/1R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GPC
3) CONTROLLER, REMOTE POWER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: TEMPERATURE STRESS, MECHANICAL FRACTURES, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
ONE OF THREE REDUNDANT RPC IS DISABLED.

REFERENCES: FMEA NO. 05-6S-BRPC-1. NASA JSC FMEA CIL REVIEW COMMENTS.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/30/86
SUBSYSTEM: DPS
MDAC ID: 229

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: CONDUCTS PREMATURELY

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GPC
3) CONTROLLER, REMOTE POWER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: TEMPERATURE STRESS, MECHANICAL FRACTURE, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
NONE. POWER WOULD BE APPLIED PREMATURELY.

REFERENCES: FMEA NO. 05-6S-BRPC1-2. NASA-JSC FMEA CIL REVIEW COMMENTS.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86
SUBSYSTEM: DPS
MDAC ID: 230

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: DIODE
FAILURE MODE: FAILS OPEN

LEAD ANALYST: H J LOWERY   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GPC
3) DIODE
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: THERMAL STRESS, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
NONE ON FIRST/SECOND FAILURE. THREE RPC OUTPUTS ARE "OR" TOGETHER TO PROVIDE TRIPLY REDUNDANT POWER PATH TO CPU AND IOP. THREE FAILURES COULD CAUSE LOSS OF GPC.

REFERENCES: 05-6S-BDIOX-1. NASA-JSC FMEA & CIL REVIEW COMMENTS.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86
SUBSYSTEM: DPS
MDAC ID: 231

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: SWITCH, NORMAL-TERM BACK-UP
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GPC
3) SWITCH, NORMAL-TERM BACKUP
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: THERMAL STRESS, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
WILL TERMINATE FC DATA BUS I/O ACTIVITY OF A GOOD GPC.

REFERENCES: FMEA 05-5-B15-1-1

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 232

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: SWITCH, GPC POWER
FAILURE MODE: NO OUTPUT

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) GENERAL PURPOSE COMPUTER (GPC)
3) POWER DISTRIBUTION
4) DRIVER MODULE CONTROLLER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: INTERNAL COMPONENT

EFFECTS/RATIONALE:
LOSS ONE OF THREE REDUNDANT POWER SOURSES TO A GPC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 300

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: KEYBOARD SWITCH
FAILURE MODE: OPEN/CLOSED

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) KEYBOARD
4) SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: MECHANICAL FRACTURE/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF INPUTTING COMMAND CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 301

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: X/Y DEFLECTION AMPLIFIERS
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DISPLAY UNIT
4) X/Y DEFLECTION AMPLIFIERS
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: TEMPERATURE STRESS/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 302

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: VIDEO AMPLIFIER
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DISPLAY UNIT
4) VIDEO AMPLIFIER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: TEMPERATURE STRESS/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 303

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: CATHODE-RAY TUBE
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DISPLAY UNIT
4) CATHODE-RAY TUBE
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: SHOCK/ TEMPERATURE STRESS/ MECHANICAL FRACTURE/ VIBRATION/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 304

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: HI AND LOW VOLTAGE POWER SUPPLIES
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DISPLAY UNIT
4) HIGH AND LOW (+/-5, 15, 28 & 80 VDC) VOLTAGE POWER SUPPLIES
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: MECHANICAL FRACTURES/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 305

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: RPC
FAILURE MODE: OPEN/CLOSED/PREMATURE OPERATION

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DISPLAY UNIT
4) RPC
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREA AREA
PART NUMBER:

CAUSES: MECHANICAL FRACTURE/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 306

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MEMORY
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) MEMORY
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/1R
MDAC ID:	307	ABORT:	3/1R

ITEM: KEYBOARD ADAPTER
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) KEYBOARD ADAPTER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF INPUTTING COMMAND CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 308

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: SYMBOL GENERATOR
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) SYMBOL GENERATOR
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 309

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: MIA
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) MIA
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 310

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: CONTROL LOGIC
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) CONTROL LOGIC
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 311

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: POWER SUPPLIES
FAILURE MODE: NO OUTPUT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) POWER SUPPLIES (+/-5, 12 & 15 VDC)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 312

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: RPC
FAILURE MODE: OPEN/CLOSED/PREMATURE OPERATION

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) RPC
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: TEMPERATURE STRESS/ MECHANICAL FRACTURE/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF MONITORING CAPABILITY. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 313

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: LOAD SWITCH
FAILURE MODE: OPEN/CLOSED/PREMATURE OPERATION

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) LOAD SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: MECHANICAL FRACTURE/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
DEUS ARE NOT NORMALLY RELOADED DURING A MISSION. SWITCH IS NOT NEEDED.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 314

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: FUNCTION SWITCH
FAILURE MODE: OPEN/CLOSED/PREMATURE OPERATION

LEAD ANALYST: H J LOWERY   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) FUNCTION SWITCH
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: UPPER CREW AREA
PART NUMBER:

CAUSES: MECHANICAL FRACTURE/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
IMPROPER MAJOR FUNCTION IDENTIFICATION

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 315

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: DATA BUS COUPLER (DBC)
FAILURE MODE: OPEN/SHORT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DBC
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: ALL AV BAYS
PART NUMBER:

CAUSES: MECHANICAL FRACTURE/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF DATA BUS. REDUNDANT HARDWARE WOULD NOT BE ACCESSIBLE DURING PERIODS OF ANTICIPATED HIGH ACCELERATION/DEACCELERATION FORCES.
ie. 1. LIFT-OFF THROUGH MAIN ENGINE CUT-OFF - APPROXIMATELY 8 MIN 40 SEC; 2. ENTRY THROUGH SAFEING -APPROXIMATELY 400,000ft (TD -40 MIN) THROUGH SAFEING.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 316

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: /NA

ITEM: DBIA
FAILURE MODE: OPEN/SHORT/ERRONEOUS/ERRATIC OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DBIA
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/2R
LIFTOFF:	3/2R	TAL:	/NA
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [NA] C [P]

LOCATION: AV BAY 5
PART NUMBER:

CAUSES: MECHANICAL FRACTURE/ CONTAMINATION/ DEBRIS

EFFECTS/RATIONALE:
LOSS OF ONE COMMAND/DATA PATH

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: DPS
MDAC ID: 317

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RESISTOR
FAILURE MODE: OPEN

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) EPD&C
2) DPS&C
3) MCDS
4) RESISTOR
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: THERMAL STRESS, CONTAMINATION

EFFECTS/RATIONALE:
NO EFFECT. POWER TO MCDS IS NEITHER AFFECTED NOR INTERRUPTED. RESISTOR PROVIDES SIGNAL THAT INDICATES THE MCDS (DEU/DU) POWER STATUS "ON" OR "STBY". THE MDM (OF4) WILL INTERPRET NO SIGNAL AS POWER "OFF" CONDITION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/27/86
SUBSYSTEM: DPS
MDAC ID: 318

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: RPC
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: H J LOWERY   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MCDS
3) DU
4) RPC
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: MECHANICAL FRACTURE/CONTAMINATION/DEBRIS

EFFECTS/RATIONALE:
NONE. DU WILL HAVE POWER APPLIED PREMATURELY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 319

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: SWITCH, CRT POWER
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DU
4) SWITCH, CRT POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: MECHANICAL FRACTURE, CONTAMINATION

EFFECTS/RATIONALE:
NONE. DU WILL HAVE POWER APPLIED PREMATURELY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 320

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: RPC
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MULTIFUNCTIONAL CRT DISPLAY SYSTEM (MCDS)
3) DEU
4) CONTROLLER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: TEMPERATURE STRESS/MECHANICAL FRACTURE/CONTAMINATION/DEBRIS

EFFECTS/RATIONALE:
NONE. DEU WILL HAVE POWER APPLIED PREMATURELY.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86
SUBSYSTEM: DPS
MDAC ID: 321

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: DIODE, SUPPRESSOR
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MCDS
3) DEU
4) DIODE, SUPPRESSOR
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: THERMAL STRESS, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
LACK OF SUPPRESSION OF DEU TO MDM REVERSE TRANSIENTS WOULD ENABLE PREMATURE "ON" INDICATION OF THE DEU.

REFERENCES: FMEA-05-6S-BDI01-1. NASA JSC FMEA & CIL REVIEW COMMENTS.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/10/86
SUBSYSTEM: DPS
MDAC ID: 322

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: SWITCH, CRT POWER
FAILURE MODE: SHORT TO GROUND

LEAD ANALYST: H J LOWERY   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MCDS
3) DU
4) SWITCH, CRT POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/1R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	3/1R	AOA:	3/1R
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: MECHANICAL SHOCK, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
ACTIVATION OF ASSOCIATED OVERLOAD PROTECTIVE CIRCUITS. LOSS OF DU.

REFERENCES: FMEA 05-6Q-2201-3. NASA-JSC FMEA & CIL REVIEW COMMENTS, 9-11-86.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/2R
MDAC ID:	400	ABORT:	3/2R

ITEM: Tape transport mechanism
FAILURE MODE: Loss of Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Tape transport mechanism
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Worn tape or foreign matter on tape, Motor failure (worn brushes, etc.), Worn heads, Failure of negator spring causing Tape slippage due to incorrect tension.

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 401

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/2R

ITEM: Tape transport mechanism
FAILURE MODE: Erroneous Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Tape transport mechanism
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Worn tape or foreign matter on tape, Tape slippage due to incorrect tension.

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/2R
MDAC ID:	402	ABORT:	3/2R

ITEM: Read electronics
FAILURE MODE: Loss of Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Read electronics
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Electrical failure

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 403

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	3/2R

ITEM: Read electronics
FAILURE MODE: Erroneous Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Read electronics
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Electrical failure

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 404

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/2R

ITEM: MIA
FAILURE MODE: Loss of Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) MIA
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Electrical failure

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 405

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	3/2R

ITEM: MIA
FAILURE MODE: Erroneous Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) MIA
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Electrical failure

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 406

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	3/2R

ITEM: Write electronics
FAILURE MODE: Loss of Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Write electronics
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Electrical failure

EFFECTS/RATIONALE:
If the ability to write to MMUs were lost, the mission could be terminated early. No danger to crew or vehicle.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 407

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	3/2R

ITEM: RPC
FAILURE MODE: Failed Open

LEAD ANALYST: K. Pietz   SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Power supply
4) RPC
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1]   B [P]   C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Broken contact

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 408

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	3/2R

ITEM: Switch
FAILURE MODE: Failed Open

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Power supply
4) Switch
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Broken contact

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 409

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: Switch
FAILURE MODE: Failed Closed (on)

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Power supply
4) Switch
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	/NA	ATO:	3/3
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Stray particle

EFFECTS/RATIONALE:
None

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 410

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	3/2R

ITEM: Control logic
FAILURE MODE: Loss of Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Control logic
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Electrical failure

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 or 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 411

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	3/2R

ITEM: Control logic
FAILURE MODE: Erroneous Output

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Control logic
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Electrical failure

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 or 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 412

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/2R

ITEM: Power supply
FAILURE MODE: Fails out of tolerance or Interrupt

LEAD ANALYST: K. Pietz SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNITS (MMU)
3) Power supply
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	/NA
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	/NA	ATO:	3/2R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: Av Bay 1,2
PART NUMBER: MC 615-0005

CAUSES: Electrical failure

EFFECTS/RATIONALE:
If both MMUs fail, OPS 2 and 3 software cannot be loaded. However, OPS 3 can be uplinked or BFS engaged for entry. Neither of these options require the use of MMUs.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 413

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/2R
ABORT:	3/2R

ITEM: RESISTOR, CURRENT LIMITER
FAILURE MODE: FAILS OPEN

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MASS MEMORY UNIT (MMU)
3) POWER DISTRIBUTION
4) RESISTOR, CURRENT LIMITER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/2R
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, SHOCK, PIECE PART FAILURE

EFFECTS/RATIONALE:
LOSS CONTROL AND USE OF ONE MMU. LOAD GPC OR MCDS WITH REMAINING GOOD MMU.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/30/86
SUBSYSTEM: DPS
MDAC ID: 414

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/2R
ABORT: 3/2R

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: H J LOWERY   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) MMU
3) CONTROLLER, REMOTE POWER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/2R
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1]   B [P]   C [P]

LOCATION:
PART NUMBER:

CAUSES: TEMPREATURE STRESS, MECHANICAL FRACTURE, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
NONE. BFS GPC AND A FROZEN PRIMARY GPC DO NOT REQUIRE IPL OR OVERLAY DURING ORBIT BEFORE ENTRY.

REFERENCES: FMEA NO. 05-6S-BRPC2-1. NASA-JSC FMEA CIL REVIEW COMMENTS.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 415

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/3

ITEM: IPL Source Switch
FAILURE MODE: Fails open

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) General Purpose Computer (GPC)
3) Central Processing Unit (CPU)
4) MMU Initial Program Load (IPL) Source Switch
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: Panel O6
PART NUMBER:

CAUSES: IPL selector switch is shorted or power source is lost due to contamination

EFFECTS/RATIONALE:
IPL source switch is used at pre-launch to initialize GPC's. This failure could cause loss of a mission opportunity due to launch delay. During flight the GPC's are not typically re-IPL'ed, even though the MMU is used to retrieve new memory overlays (as opposed to the IPL loading the entire system software, including MCDS initialization).

REFERENCES: JSC 18820, JSC 11174, JSC 12770

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/10/86
SUBSYSTEM: DPS
MDAC ID: 416

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/3
ABORT: 3/3

ITEM: CONTROLLER, REMOTE POWER
FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: T. B. Cribbs SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MMU
3) CONTROLLER, REMOTE POWER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION:
PART NUMBER:

CAUSES: MECHANICAL SHOCK, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
NO EFFECT. PREMATURE TURN ON.

REFERENCES: 05-6S-BRPC2-1. NASA-JSC FMEA & CIL REVIEW COMMENTS, 9-19-86.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	11/10/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/2R
MDAC ID:	417	ABORT:	3/2R

ITEM: SWITCH, IPL
FAILURE MODE: SWITCH SHORT, BOTH IPL OUTPUTS ARE TRUE.

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. Robb

BREAKDOWN HIERARCHY:
1) DPS
2) MMU
3) SWITCH, IPL
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/2R
LIFTOFF:	3/2R	TAL:	3/2R
ONORBIT:	3/2R	AOA:	3/2R
DEORBIT:	3/2R	ATO:	3/2R
LANDING/SAFING:	3/2R		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION:
PART NUMBER:

CAUSES: MECHANICAL SHOCK, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
LOSS OF GPC IF IN HALT MODE.

REFERENCES: 05-5-B16-1-1. NASA-JSC FMEA & CIL REVIEW COMMENTS, 9-19-86.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 501

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: CIA
FAILURE MODE: LOSS OF OUTPUT TO MAIN ENGINE ON ONE CHANNEL

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) ENGINE INTERFACE UNIT (EIU)
3) CONTROLLER INTERFACE ADAPTER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	/NA	AOA:	3/1R
DEORBIT:	/NA	ATO:	3/1R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: AV BAY 4,5,6
PART NUMBER:

CAUSES: CONTROLLER INTERFACE ADAPTER FAILS

EFFECTS/RATIONALE:
LOSS OF THROTTLE COMMANDS, SHUTDOWN COMMANDS, LIMIT INHIBIT/ENABLE COMMANDS, GPC SHUTDOWN COMMANDS, AND MPS DUMP COMMANDS.
LOSS OF ONE OF THREE COMMAND PATHS WILL BE VOTED INVALID. NO EFFECT ON ENGINE OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 502

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: MIA
FAILURE MODE: LOSS OF OUTPUT TO MAIN ENGINE ON ONE CHANNEL

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) ENGINE INTERFACE UNIT (EIU)
3) MULTIPLEXER INTERFACE ADAPTER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	/NA	AOA:	3/1R
DEORBIT:	/NA	ATO:	3/1R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: AV BAY 4,5,6
PART NUMBER:

CAUSES: MULTIPLEXER INTERFACE ADAPTER FAILS

EFFECTS/RATIONALE:
LOSS OF THROTTLE COMMANDS, SHUTDOWN COMMANDS, LIMIT INHIBIT/ENABLE COMMANDS, GPC SHUTDOWN COMMANDS, AND MPS DUMP COMMANDS.
LOSS OF ONE OF THREE COMMAND PATHS WILL BE VOTED INVALID. NO EFFECT ON ENGINE OPERATIONS.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE:	10/03/86	HIGHEST CRITICALITY	HDW/FUNC
SUBSYSTEM:	DPS	FLIGHT:	3/1R
MDAC ID:	503	ABORT:	3/1R

ITEM: POWER CONTROL SWITCH
FAILURE MODE: LOSS OF OUTPUT TO MAIN ENGINE ON ANY OF THREE COMMAND CHANNELS

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) ENGINE INTERFACE UNIT (EIU)
3) POWER CONTROL SWITCH
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	/NA	AOA:	3/1R
DEORBIT:	/NA	ATO:	3/1R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: AV BAY 4,5,6
PART NUMBER:

CAUSES: EIU POWER CONTROL SWITCH FAILS OPEN

EFFECTS/RATIONALE:
LOSS OF ALL COMMANDS AND STATUS OF THE ENGINE FOR THIS FAILURE MODE
THE LOSS OF THE ENTIRE EIU WILL RESULT IN ENGINE SHUTDOWN BY CREW BY SWITCHING AC POWER TO THE ENGINE TO OFF POSITION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 504

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/1R
ABORT:	3/1R

ITEM: INTERNAL POWER SUPPLIES
FAILURE MODE: LOSS OF OUTPUT TO MAIN ENGINE ON ANY OF THREE COMMAND CHANNELS

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) ENGINE INTERFACE UNIT (EIU)
3) INTERNAL POWER SUPPLIES
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	/NA	AOA:	3/1R
DEORBIT:	/NA	ATO:	3/1R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: AV BAY 4,5,6
PART NUMBER:

CAUSES: INTERNAL POWER SUPPLIES FAIL

EFFECTS/RATIONALE:
LOSS OF THROTTLE COMMANDS, SHUTDOWN COMMANDS, LIMIT INHIBIT/ENABLE COMMANDS, GPC SHUTDOWN COMMANDS, AND MPS DUMP COMMANDS.
THE LOSS OF THE ENTIRE EIU WILL RESULT IN ENGINE SHUTDOWN BY CREW BY SWITCHING AC POWER TO THE ENGINE TO OFF POSITION.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 505

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 3/1R
ABORT: 3/1R

ITEM: CONTROLLER INTERFACE ADAPTER
FAILURE MODE: LOSS OF OUTPUT TO ONE OR THREE GPC ON STATUS OF ENGINES.

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) ENGINE INTERFACE UNIT (EIU)
3) CONTROLLER INTERFACE ADAPTER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/1R	TAL:	3/1R
ONORBIT:	/NA	AOA:	3/1R
DEORBIT:	/NA	ATO:	3/1R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [P] C [P]

LOCATION: AV BAY 4,5,6
PART NUMBER:

CAUSES: CONTROLLER INTERFACE ADAPTER FAILURE

EFFECTS/RATIONALE:
NO MAIN ENGINE MONITORING BY ONE OR THREE OF FOUR GPCS. MCC CONFIRMS COMMAND PATH GOOD BY MONITORING 3-G THROTTLE CONTROL. IF ENGINE IS NOT OPERATING, THE PUSHBUTTON FOR THE ENGINE MUST BE USED TO INFORM GUIDANCE FOR PREVALVE CLOSURES.
FLIGHT RULE 2-17 PRECLUDES RESTRINGING DURING POWERED ASCENT THROUGH MECO.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/03/86
SUBSYSTEM: DPS
MDAC ID: 506

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	3/3
ABORT:	3/1R

ITEM: OIE
FAILURE MODE: LOSS OF OUTPUT TO S-BAND, MAINTENANCE RECORDER, OR LPS T-0 UMBILICAL

LEAD ANALYST: B. ROBB SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) ENGINE INTERFACE UNIT (EIU)
3) OPERATIONAL INTERFACE ELEMENT
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/2R	RTLS:	3/1R
LIFTOFF:	3/3	TAL:	3/1R
ONORBIT:	/NA	AOA:	3/1R
DEORBIT:	/NA	ATO:	3/1R
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [NA] B [NA] C [NA]

LOCATION: AV BAY 4,5,6
PART NUMBER:

CAUSES: OPERATIONAL INTERFACE ELEMENT FAILURE

EFFECTS/RATIONALE:
NO FM DATA RECORDING, NO MCC STATUS MONITORING OF ENGINE EXCEPT IN DOWNLIST DATA FROM GPC.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 10/20/86
SUBSYSTEM: DPS
MDAC ID: 507

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	2/1R
ABORT:	2/1R

ITEM: CIRCUIT, EIU POWER
FAILURE MODE: ALL CREDIBLE MODES, OPEN, SHORTS

LEAD ANALYST: B. ROBB   SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) ENGINE INTERFACE UNIT (EIU)
3) POWER DISTRIBUTION
4) CIRCUIT, EIU POWER
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	2/1R
LIFTOFF:	2/1R	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	/	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: PIECE PART FAILURE, SHOCK, VIBRATION

EFFECTS/RATIONALE:
THE LOSS OF ONE OF TWO REDUNDANT CIRCUITS WILL NOT EFFECT THE EIU. THE LOSS OF BOTH CIRCUITS WILL CAUSE LOSS OF EIU TO MAIN ENGINE INTERFACE. MAIN ENGINE WOULD HAVE TO BE MANUALLY SHUT DOWN AT MECO.

REFERENCES:

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86
SUBSYSTEM: DPS
MDAC ID: 508

HIGHEST CRITICALITY	HDW/FUNC
FLIGHT:	1/1
ABORT:	1/1

ITEM: EIU
FAILURE MODE: ERRONEOUS OUTPUT

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) EIU
3)
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	1/1	RTLS:	1/1
LIFTOFF:	1/1	TAL:	1/1
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: THERMAL STRESS, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
ERRONEOUS OUTPUT MAY CAUSE THE GPC'S TO THINK THAT THE ENGINE HAS SHUT DOWN OR THE ENGINE TO CHANGE ITS THROOTLE SETTING, EITHER OF WHICH COULD BE CATASTROPHIC.

REFERENCES: NASA-JSC FMEA & CIL REVIEW COMMENTS.

INDEPENDENT ORBITER ASSESSMENT
ORBITER SUBSYSTEM ANALYSIS WORKSHEET

DATE: 11/03/86
SUBSYSTEM: DPS
MDAC ID: 509

HIGHEST CRITICALITY HDW/FUNC
FLIGHT: 1/1
ABORT: 1/1

ITEM: SWITCH, POWER
FAILURE MODE: SHORT BOTH CONTACTS TO GROUND

LEAD ANALYST: H J LOWERY SUBSYS LEAD: B. ROBB

BREAKDOWN HIERARCHY:
1) DPS
2) EIU
3) SWITCH, POWER
4)
5)
6)
7)
8)
9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	1/1	RTLS:	1/1
LIFTOFF:	1/1	TAL:	1/1
ONORBIT:	/NA	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING:	/NA		

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: THERMAL STRESS, CONTAMINATION, DEBRIS

EFFECTS/RATIONALE:
LOSS OF SWITCH CAUSES LOSS OF THAT EIU. LOSS OF EIU CAUSES LOSS OF COMMAND CAPABILITY TO THAT MAIN ENGINE. RESULTS COULD BE CATASTROPHIC.

REFERENCES: NASA-JSC FMEA & CIL REVIEW COMMENTS.

APPENDIX F

NASA FMEA TO IOA WORKSHEET CROSS REFERENCE/RECOMMENDATION

This section provides a cross reference between the NASA FMEA and corresponding IOA analysis worksheet(s) included in Appendix E. The Appendix F identifies: NASA FMEA Number, IOA Assessment Number, NASA criticality and redundancy screen data, and IOA recommendations.

Appendix F Legend

Code	Definition
1	IOA recommends changing the second failure mode described in the effects field.
2	IOA recommends deleting the IOA failure mode.

APPENDIX F

NASA FMEA TO IOA WORKSHEET CROSS REFERENCE / RECOMMENDATIONS

IDENTIFIERS		NASA		IOA RECOMMENDATIONS *			
NASA FMEA NO:	IOA ASSESSMENT	CRIT HW/F	SCREEN A B C	CRIT HW/F	SCREEN A B C	OTHER (SEE LEGEND CODE)	ISSUE
05-5 -B01-1-1	DPS-205	2 /1R	P P P			1	X
05-5 -B01-1-2	DPS-206	3 /1R	P P P				
05-5 -B02-1-1	DPS-201	2 /1R	P P P			1	X
05-5 -B02-1-2	DPS-202	3 /1R	P P P				
"	DPS-204	"	"				
05-5 -B02-1-3	DPS-225	2 /1R	P P P				
05-5 -B03-1-1	DPS-120	2 /1R	P P P	3 /1R	P P P	1	X
"	DPS-121	"	"	3 /1R	P P P	"	"
"	DPS-128	"	"	3 /1R	P P P	"	"
05-5 -B03-1-2	DPS-122	2 /1R	P P P				
"	DPS-123	"	"				
"	DPS-126	"	"				
"	DPS-127	"	"				
05-5 -B03-2-1	DPS-100	2 /1R	P P P	3 /1R	P P P	1	X
"	DPS-101	"	"	3 /1R	P P P	"	"
"	DPS-108	"	"	3 /1R	P P P	"	"
05-5 -B03-2-2	DPS-102	2 /1R	P P P				
"	DPS-103	"	"				
"	DPS-106	"	"				
"	DPS-107	"	"				
05-5 -B03-4-1	DPS-180	3 /2R	P N P				
"	DPS-181	"	"				
"	DPS-188	"	"				
05-5 -B03-4-2	DPS-182	3 /2R	P N P				
"	DPS-183	"	"				
"	DPS-186	"	"				
"	DPS-187	"	"				
05-5 -B03-5-1	DPS-140	2 /1R	P P P				
"	DPS-141	"	"				
"	DPS-148	"	"				
05-5 -B03-5-2	DPS-142	2 /1R	P P P				
"	DPS-143	"	"				
"	DPS-146	"	"				
"	DPS-147	"	"				
05-5 -B04-2-1	DPS-400	3 /2R	P P P				
"	DPS-401	"	"				
"	DPS-402	"	"				
"	DPS-403	"	"				
"	DPS-404	"	"				
"	DPS-405	"	"				
"	DPS-406	"	"				
"	DPS-407	"	"				
"	DPS-410	"	"				
"	DPS-412	"	"				
05-5 -B04-2-2	DPS-411	3 /2R	P P P				
05-5 -B08-1-1	DPS-501	2 /1R	P F P				

* IF DIFFERENT FROM NASA

APPENDIX F

NASA FMEA TO IDA WORKSHEET CROSS REFERENCE / RECOMMENDATIONS

IDENTIFIERS		NASA		IDA RECOMMENDATIONS *			
NASA FMEA NO:	IDA ASSESSMENT	CRIT HW/F	SCREEN A B C	CRIT HW/F	SCREEN A B C	OTHER (SEE LEGEND CODE)	ISSUE
"	DPS-502	"	"				
"	DPS-503	"	"				
"	DPS-504	"	"				
"	DPS-505	"	"				
"	DPS-506	"	"				
05-5 -B13-1-4	DPS-316	3 /2R	P N P				
05-5 -B14-1-1	DPS-315	2 /1R	P P P				
05-5 -B15-1-1	DPS-231	3 /1R	P P P				
05-5 -B15-1-3	DPS-211	3 /1R	P P P				
05-5 -B16-1-1	DPS-220	3 /2R	P P P				
05-5 -B17-1-1	DPS-210	2 /1R	P P P				
05-5 -B18-1-1	DPS-221	3 /3	P P P				
05-5 -B18-1-2	DPS-222	3 /3	P P P				
05-5 -B19-1-1	DPS-223	3 /3	P P P				
05-5 -B19-1-2	DPS-224	3 /3	P P P				
05-5 -B20-1-1	DPS-415	2 /2	P P P				
05-5 -B21-1-1	DPS-301	3 /1R	P P P				
"	DPS-303	"	"				
05-5 -B21-1-2	DPS-302	3 /1R	P P P				
"	DPS-304	"	"				
05-5 -B22-1-1	DPS-300	2 /1R	P P P				
05-5 -B23-1-1	DPS-308A	3 /1R	P P P				
05-5 -B23-1-2	DPS-306	3 /1R	P P P				
"	DPS-307	"	"				
"	DPS-308	"	"				
"	DPS-309	"	"				
"	DPS-310	"	"				
"	DPS-311	"	"				
05-5 -B23-1-3	DPS-307A	2 /1R	P P P				
05-5 -B24-1-1	DPS-300B	2 /1R	P P P				
05-5 -B24-1-2	DPS-300A	3 /2R	P P P				
05-5 -B25-1-3	DPS-313	3 /1R	P P P				
05-5 -B26-1-1	DPS-314A	3 /1R	P P P				
05-5 -B26-1-2	DPS-314	3 /1R	P P P				
05-5 -B26-1-3	DPS-314B	3 /1R	P P P				
05-5 -B27-1-1	DPS-218	3 /3	P P P				
05-5 -B27-2-1	DPS-219	3 /3	P P P				
05-6S-BCKT1-1	DPS-507	2 /1R	P F P				
05-6S-BCKT2-1	DPS-316A	3 /3	P P P				
05-6S-BDIO1-1	DPS-312A	3 /1R	P P P				
05-6S-BDIO1-2	DPS-321	3 /3	N N N				
05-6S-BDIOX-1	DPS-230	3 /1R	P F P				
05-6S-BDMC1-1	DPS-215	3 /1R	P P P				
05-6S-BDMC1-2	DPS-214	3 /3	P P P				
05-6S-BFUS1-1	DPS-227	3 /1R	P P P				
05-6S-BFUS2-1	DPS-312C	3 /1R	P P P				

* IF DIFFERENT FROM NASA

APPENDIX F

NASA FMEA TO IOA WORKSHEET CROSS REFERENCE / RECOMMENDATIONS

IDENTIFIERS		NASA		IOA RECOMMENDATIONS *			
NASA FMEA NO:	IOA ASSESSMENT	CRIT HW/F	SCREEN A B C	CRIT HW/F	SCREEN A B C	OTHER (SEE LEGEND CODE)	ISSUE
05-6S-BRES1-1	DPS-226	/NA	N N N				
05-6S-BRES2-1	DPS-413	3 /2R	P P P				
05-6S-BRES3-1	DPS-190	3 /1R	P F P				
05-6S-BRES4-1	DPS-317	3 /3	P P P				
05-6S-BRPC1-1	DPS-228	3 /1R	P P P				
05-6S-BRPC1-2	DPS-229	3 /3	P P P				
05-6S-BRPC2-1	DPS-414	3 /2R	P P P				
05-6S-BRPC3-1	DPS-191	3 /1R	P F P				
05-6S-BRPC3-2	DPS-192	3 /3	P N P				
05-6S-BRPC4-1	DPS-305	3 /1R	P P P				
05-6S-BRPC4-2	DPS-318	3 /3	P P P				
05-6S-BRPC5-1	DPS-312	3 /1R	P P P				
05-6S-BRPC5-2	DPS-320	3 /3	P P P				
05-6S-BSW1 -1	DPS-232	3 /1R	P P P				
05-6S-BSW1 -2	DPS-216	3 /3	P P P				
05-6S-BSW1 -3	DPS-217	2 /1R	P P P				
05-6S-BSW2 -1	DPS-408	3 /2R	P P P				
05-6S-BSW2 -2	DPS-409	3 /3	P P P				
05-6S-BSW3 -1	DPS-193	3 /1R	P F P				
05-6S-BSW3 -2	DPS-194	3 /3	P N P				
05-6S-BSW4 -1	DPS-312B	3 /1R	P P P				
05-6S-BSW4 -2	DPS-319	3 /3	P P P				
05-6S-BSW4 -3	DPS-322	3 /1R	P P P				
05-6S-BSW5 -3	DPS-195	3 /1R	P F P				
EIU-1 (NEW)	DPS-508	1 /1	P F P				
EIU-2 (NEW)	DPS-509	1 /1	P F P				
MMU-1 (NEW)	DPS-416	3 /3	N N N				
MMU-2 (NEW)	DPS-417	3 /2R	P P P				
NONE	DPS-104	/				2	
NONE	DPS-105	/				2	
NONE	DPS-124	/				2	
NONE	DPS-125	/				2	
NONE	DPS-144	/				2	
NONE	DPS-145	/				2	
NONE	DPS-184	/				2	
NONE	DPS-185	/				2	
NONE	DPS-203	/				2	
NONE	DPS-207	/				2	
NONE	DPS-208	/				2	
NONE	DPS-209	/				2	
NONE	DPS-213	/				2	

* IF DIFFERENT FROM NASA