INDEPENDENT ORBITER ASSESSMENT

ANALYSIS OF THE LIFE SUPPORT & AIRLOCK SUPPORT SUBSYSTEMS

02 NOVEMBER 1987

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MCDONNELL DOUGLAS ASTRONAUTICS COMPANY ENGINEERING SERVICES

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

WORKING PAPER NO. 1.0-WP-VA87001-02

INDEPENDENT ORBITER ASSESSMENT ANALYSIS OF THE LIFE SUPPORT AND AIRLOCK SUPPORT SYSTEMS

02 NOVEMBER 1987

This Working Paper is Submitted to NASA under Task Order No. VA87001, Contract NAS 9-17650

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Independent Orbiter Assessment

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Independent Orbiter Assessment Analysis of the Life Support and Airlock Support Systems

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 approach features a top-down analysis of the hardware to determine failure modes, criticality, and potential critical To preserve independence, this analysis was accomplished items. without reliance upon the results contained within the NASA FMEA/CIL documentation. This report documents the independent analysis results corresponding to the Orbiter Life Support System (LSS) and Airlock Support System (ALSS) (Appendix C). All the Electrical Power Distribution and Control (EPDC) hardware items, and the mechanical hardware items are included in this report.

The IOA analysis process utilized available LSS and ALSS hardware drawings and schematics for defining hardware assemblies, components, and hardware items. Each level of hardware was evaluated and analyzed for possible failure modes and effects. Criticality was assigned based upon the severity of the effect for each failure mode.

Figure 1 presents a breakdown of the two major systems analysed and a summary of the failure criticalities. The data is shown summarized at the subsystem level of the LSS, namely the Supply Water, the Waste Management, and the Smoke Detection and Fire Suppression subsystems. The airlock does not have any major subsystem. The data is also summarized at the system level and then totalled for the LSS/ALSS Analysis Summary. A summary of the number of failure modes by criticality is presented below with hardware (HW) criticality first and then functional (F) criticality second.

Summary of IOA	Possib	Le Fail	ure Moo	les by (Critica:	lities	(HW/F)
Criticality: LSS	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
o SWS	-	3	36	1	40	59	139
O WMS O SD/FS	9	10 6	25 6	3 12	81	96 33	224 65
ALSS	-	7	21	3	17	35	83

	-	CRIT CRITICALTY EM - EALLIDE MARE	PCI - POTENTIAL CRITICAL ITEM	-			AIRLOCK SUPPORT SYSTEM	CRIT JEN JPCI CRIT JEN JPCI		8 7 7	35				7		/ H		m All										
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SS/A	*												SBNS		æ	œ			X	1	œ	~		12	SY			~	3/3
r/ss/a	CRIT #	2/1R	2/2									ł	•	١ <u>ج</u>	1	2	2	IX	Ē	E	Ξ	125	/3	X X	3ŬB	12	Ξ	2	
LSS/A	—	2/1R	2/2			_							VATER S	PCI CRIT	0 3/1R	3 3/2R	36 3/3	E MANAC	UBSYSTI	PCI CRIT	9 3/1R		25 3/3	TECTION A	SION SUB	PCI CRIT		6 3/2R	~
rss/A	—	2/1R	2/2			ſ		#PCI	9	7	•		PPLY WATER (M #PCI	-		6 36	WASTE MANAGEMENT	SUBSYSTEM		9 9 3/1	0 10	5 25	KE DETECTION A	PRESSION SUB	M #PCI CRIT	80	6 6 3/21	
rss/A	—	2/1R	2/2					FFM #PCI	16 0	121 7	188 0		SUPPLY WATER SUBSYSTEM	#FM #PCI	0		36 36	WASTE MANAC	SUBSYSTI	#FM 3	87 87	10 10	25 25	SMOKE DETECTION AND FIRE	SUPPRESSION SUBSYSTEM	1	80 80	9	
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rss/A	—	2/18	2/2					CRIT #FM +	17 3/1R 16 0	3/2R	67 3/3 188 0		SUPPLY WATER	#FM #PCI	0		36 36	WASTE MANAG	SUBSYSTI	#FM 3	87 87	10 10	25 25	SMOKE DETECTION A	SUPPRESSION SUB	1	80 80	9	
rss/v	—	2/18	2/2					F MJ≠	17 3/1R	3/2R	67 3/3		SUPPLY WATER	#FM #PCI	0		36 36	WASTE MANAG	SUBSYSTI	#FM 3	87 87	10 10	25 25	SMOKE DETECTION A	SUPPRESSION SUB	1	80 80	9	

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For each failure mode identified, the criticality and redundancy screens were examined to identify potential critical items. A summary of Potential Critical Items (PCIs) is presented as follows:

Summary	of IOA	Potentia	al Crit	cical It	ems (HW	/F)
Criticality:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
LSS O SWS	-	3	36	-	7	46
O WMS	9	10	25	-	-	44
o SD/FS	8	6	6	-	-	20
ALSS	-	7	21	2	-	30

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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 Orbiter FMEA/CIL reevaluation results 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 NASA and Prime Contractor FMEA/CIL reevaluation results. 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/CILs that is performed and documented at a later date.

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 LSS and ALSS Ground Rules and Assumptions

The LSS and ALSS ground rules and assumptions used in the IOA are defined in Appendix B.

3.0 SUBSYSTEM DESCRIPTION

3.1 Design and Function

The LSS provides for the management of the supply water, collection of the metabolic waste, management of the waste water, smoke detection, and fire suppression. The ALSS provides water, oxygen, and electricity to support an Extra vehicular Activity (EVA) in the airlock. Below is a brief description of each of these categories.

 Supply Water Subsystem - The SWS provides ullage for the storage of the fuel cells generated water and the management of this water throughout the mission. The water is used to meet the Flash Evaporator System (FES) requirement, crew usage, and EVA requirement. For the purpose of this study the SWS was divided into five main assemblies as shown in Figures 2 through 5.

The tank assembly is made up of four tanks (A, B, C, and D) and associated plumbing which interconnects them as shown in Figure 2. Each tank is constructed of thin-wall aluminum with Inconel steel bellows pressurized by the gaseous nitrogen from the Atmospheric Revitalization Pressure Control System (ARPCS). Each tank can be isolated from the line by an inlet valve and an outlet valve in the event of a leak. The fuel cells generated water flows into the tanks A, B, C, and D respectively after passing through two hydrogen separators. The flow to a given tank is accomplished automatically by use of two 1.5 psid relief valves. Before flowing into the Tank A the water passes through a microbial filter/check valve which prevents passage of micro-organisms into the potable water tank.

The galley line assembly contains the plumbing for the transport of the potable water from Tank A to the Environmental Control and Life Support System (ECLSS) bay for connection to the galley or the water dispenser as shown in Figure 3. The water is avaiable at the bay either directly (70 F) or chilled. Chilled water is accomplished by interfacing the potable water with the ARS water coolant loops through a heat exchanger called water chiller.

The FES line assembly is comprised of two separate FES feed water lines supplying water to meet FES requirement as shown in Figures 4 and 5. The two lines may be isolated from each other by a crossover valve or an isolation valve on Line B. All the associated hardware beyond this isolation valve is considered as part of the ATCS analysis, and therefore not covered in this report.

The dump line assembly, shown in Figures 2 and 4, provides for expulsion of excess water through a dump nozzle during on-orbit dump operation. The line incorporates an isolation valve, a dump valve, and line and nozzle heaters. Also, capability exists to cross-tie the supply water dump line to the waste water dump line in the event one dump line becomes inoperative. The line and nozzle heaters provide thermal conditioning of the dump line and nozzle to prevent ice formation in the area. The line heaters are thermostatically controlled.

The gaseous nitrogen line assembly pressurizes the tanks with the nitrogen from the ARPCS storage tanks as shown in Figure 3. Cabin atmosphere may also be used to pressurize the tanks if the GN2 pressurization is lost. Most of the hardware in this assembly are covered in the ARPCS analysis except for the Tank A pressure/vent panel which is included in this report.

2. Waste Management Subsystem - The WMS is made up of Waste Collection Subsystem (WCS), Waste Water Subsystem (WWS), and the Vacuum Vent Subsystem (VVS) as shown in Figure 6. These subsystems are used in an integrated process for the collection and storage of the crewmember biowaste and the overboard dumping of the waste fluid and gases. The schematics for these subsystems are shown in Figures 7 through 10.

The WCS, shown in Figure 7, is an integrated multifunctional zero-g device used to collect and process biowaste from the crewmembers, gases from the wet trash stowage area, and waste water from the EMU/Airlock support station. The WCS accomodates both male and female crewmembers and is comprised of the commode assembly, urinal assembly, interconnecting plumbing, mounting framework, crew restraints, and instrumentation. The subsystem uses a system of valves to direct cabin air flow through the urinal and fecal collection systems to draw the biowaste into the collection chamber. In the case of the waste fluids, a centrifugal separator is used to separate the waste fluids from the transport air flow. The waste fluids are then directed into the waste water subsystem and the separated air passes through the muffler assembly for bacteria and odor removal. This air is then injected into the crew cabin atmosphere. The WCS incorporates two redundant fan/separator units with one unit being operational at a time.

The WWS, shown in Figure 8, provides storage and overboard dump capability for urine, atmospheric condensate, EMU waste water, and contingency cooling water to the FES. The waste water storage is a single thin wall aluminum tank shell surrounding an Inconel steel bellows. The tank is identical to the supply water tanks. The bellows is pressurized with nitrogen gas to facilitate waste water expulsion. All tubing is stainless steel. Flow control into and out of the tank is via the inlet valve. The outlet valve is used only during GSE operation. Both valves are electrically operated solenoid latching type valves.

The WWS provides control for the overboard dump of the waste water through a dump nozzle at the mid fuselage as shown in Figure 9. All plumbing exterior to the crew module is protected by electrical heaters and thermal insulation. The subsystem also contains a provision to cross-tie the waste dump line to the supply water dump line which make it possible to provide waste water to the FES or supply water dump nozzle under contingency cases. The use of the supply water dump line or FES line poses serious contamination problems. Further, a Contingency Water Container (CWC) is flown which provides additional ullage to the waste water tank, but has not been used nor flight tested.

The VVS, shown in figures 10, provides voluntary and involuntary venting of the ECLSS gases. Voluntary use of the vacuum vent occurs during airlock and cabin depressurization, and the WCS use. During on-orbit operation, the VVS may also be utilized in order to regain automatic pressure control of the cabin atmosphere in the event that the cabin pressure should exceed 14.7 psia. Involuntary venting is available for hydrogen gas from the H2/H2O separators, fecal vapors from the WCS, and wet trash vapors from the trash stowage.

The VVS consists of a 2.0 inch O.D., 302 stainless steel duct, two independent line heaters, thermostats, an isolation valve, a single nozzle heatr, and a 1.93 inch O.D. nozzle. The isolation valve was analyzed under the ALSS in this report. The line heaters are continuously wrapped together for the full length of the line. Each of the heaters contains a single thermostat.

3. Smoke Detection and Fire Suppression Subsystems - These two subsystems are emergency subsystems within the shuttle Caution and Warning (C&W) system. The smoke detection uses electronic sensors to provide on-board warning of an impending fire pre-smoke phase. Indications are provided through a light matrix, siren tone, and various CRT data. Fire suppression is provided by fire suppressant (Halon) bottles to suppress the ignition source. The schematic for these subsystems are shown in Figures 11 through 14.

The Smoke/Detection Subsystem consists of nine smoke detectors. A typical detector is shown in Figures 11. Six detectors provide redundant sensing within Avionics Bays 1, 2, and 3 and three detectors sense the cabin atmosphere. Each avionics bay has two redundant sensors (Sensors A&B). The cabin sensors are two sensors in the flight deck at the left and right return air ducts, and one sensor in the cabin fan plenum outlet. The cabin fan plenum sensor is considered to provide redundancy to the left and right flight deck sensors. Further, a fire sensed by the left or right sensor will be followed by an indication on the cabin sensor. Another input is also available for certain types of payloads such as Spacelab modules. Smoke detection operation is based upon sensing of invisible submicron particles emitted from materials subjected to abnormal energy levels. The detectors measure current flow in a measuring chamber, and the current flow in a reference chamber, shown in Figure 12. Air molecules in each chamber are ionized by a radiation source and in the measuring chamber the interaction of particles with the air molecules reduces current flow. The difference in the level sensed provides an indication of the particle level present. If either a preset level (2000+/- 200 micro g per m3) for five seconds or an increase in rate build-up (22 micro g per m3 per sec) for twenty seconds is maintained, then a continuous alarm signal is output until a reset signal is issued. The system is powered from circuit breakers on Panel 014, 015, The indicator light matrix is located on Panel L1A1 and 016. in the CDRs station and CRT data is available on the flight The siren alarm is output through speakers in the deck CRTs. flight and middeck and through headset assemblies via the Audio Terminal Units.

A test circuit controlled by a switch on Panel LIA1 provides for sensor and alarm checkout. The actual sensing capability is not checked but the electronics which process the measuring and reference chamber current outputs are verified by inducing signals representative of the sensor trip levels. Reset of a test or actual sensor trip is through a switch also located on Panel LIA1. In this test mode, three conditions must be present to indicate an operable sensor namely: pump running, particle concentration, and the particle rate of change greater than the preset levels.

The Fire Suppression Subsystem consists of three permanently mounted fire suppressant bottles mounted in Avionics Bay 1, 2, and 3. A typical bottle is shown in Figure 13. These bottles are permanently attached within each bay and remotely activated from panel L1A1 since access to the bay Activation requires an Arm/Fire Pyrotechnic is difficult. Initiator Controller (PIC) sequence from a switch and pushbutton indicator. A pressure switch on the bottle is used to indicate bottle discharge. The power for the system comes through circuit breakers on panels 014, 015, and 16. The agent discharge indication is part of the Push-Button indicator on Panel L1A1. The PIC capacitor voltage and bottle empty indications are telemetered to the ground. In addition to the permanently mounted bottles, the crew has available portable bottles mounted in the crew compartment. A typical portable bottle is shown in Figure 14. These are used by the crew to dispense suppressant to the source of ignition within the cabin area and behind panels through the fire holes.

4. Airlock Support System - The airlock is a modular cylindrical structure with two hatch openings as shown in Figure 15. It provides oxygen, water, and electrical interfaces to accomodate EVA operation. It is also equipped with pressure equalization valves on each hatch and a decompression system. The vacuum vent isolation valve is also included with the airlock analysis even though it is mounted at the Xo576 bulkhead.

The interface between the airlock and an Extravehicular Mobility Unit (EMU) is provided by the Service and Cooling Umbilical (SCU), shown in Figure 16. The SCU is composed of hoses and electrical wiring to supply the oxygen, water, and electricity to the EMU while in the airlock. The SCU also contains valving which allows supply and waste water flow through a single connection at the SCU/EMU interface. The SCU is bolted to the airlock, leak proved and checked prior to launch and is permanently attached for the duration of the mission.

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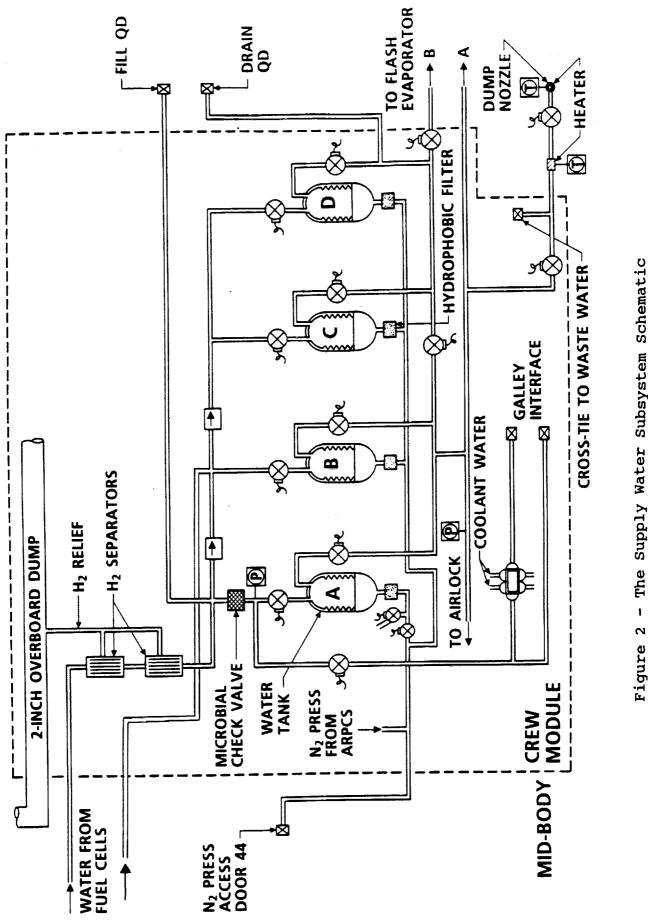
The oxygen interface is used by the crew while in the airlock and it is used to recharge the EMU oxygen tanks. The water in the three EMU tanks can be dumped through the SCU into the orbiter water water tank and the quantity observed on the orbiter water tank gauge. They are then refilled from tank C of the supply water system. During the refilling process (approximately 15 minutes), the supply water system crossover valve is opened, the FES is disabled and tank C is isolated so the quantity of water loaded into the EMU can be checked by the tank C gauge.

The airlock depressurization is controlled by a three position valve, the valve and system are shown in Figures 16 and 17. The valve is connected to a 2 inch, stainless steel, overboard vacuum vent line. The closed position prevents any airflow from escaping the airlock. The second position, labeled "5", opens the smallest orifice which allows the pressure to decrease to 5 psi at an initial rate of 0.09 psi/sec. The third valve position, labeled "0", reduces the airlock pressure to 0.2 psi. At this pressure the airlock can be opened. When not in use, the valve is covered with a pressure/dust cap. Prior to removing the cap, it is necessary to equalize the pressure across it with the cap vent valve.

The airlock repressurization is controlled by two pressure equalization values on the hatch to the cabin, a typical set is shown in Figure 17. Normal repressurization is accomplished by placing one value in the "normal" position. When completed, the airlock and the cabin are pressurized to approximately 14 psia. The orbiter environmental control system will automatically compensate for the lower pressure and repressurize the cabin and airlock to 14.7 psia. The equalization values on the payload bay hatch may be used to depressurize the airlock in the event of depress value failure.

The EMU power supply/battery charger provides 17.0 volts dc at 5 amps at the airlock interface. The Electrical System is shown in Figure 18. MAIN Bus A or B must be selected with the bus select switch and the mode selection switch must be in the POWER position to supply the power to the SCU. The mode switch in the POWER position makes the power available at the SCU connector and also closes a circuit that provides a battery feedback voltage charger control. This circuit inhibits EMU power when any discontinuity is sensed in the SCU/EMU circuitry. The mode switch in the POWER position also supplies power through the SCU for the EMU microphone amplifiers for hardline communication.

The vacuum vent isolation valve is mounted at the Xo576 bulkhead which provides capability to isolate the waste management vent lines and the airlock vent line. However, the valve has an internal bleed port to vent the hydrogen separator and waste collection gases when it is in the closed position. The valve is designed to close within 2 seconds in the event of an excessive cabin pressure loss rate. This is accomplished via the cabin oxygen system 1 and 2 flow sensor circuitry. The valve can also be opened on demand through a bus selection and control switches (S10 & S11) mounted in the panel ML31C and shown in Figure 19.



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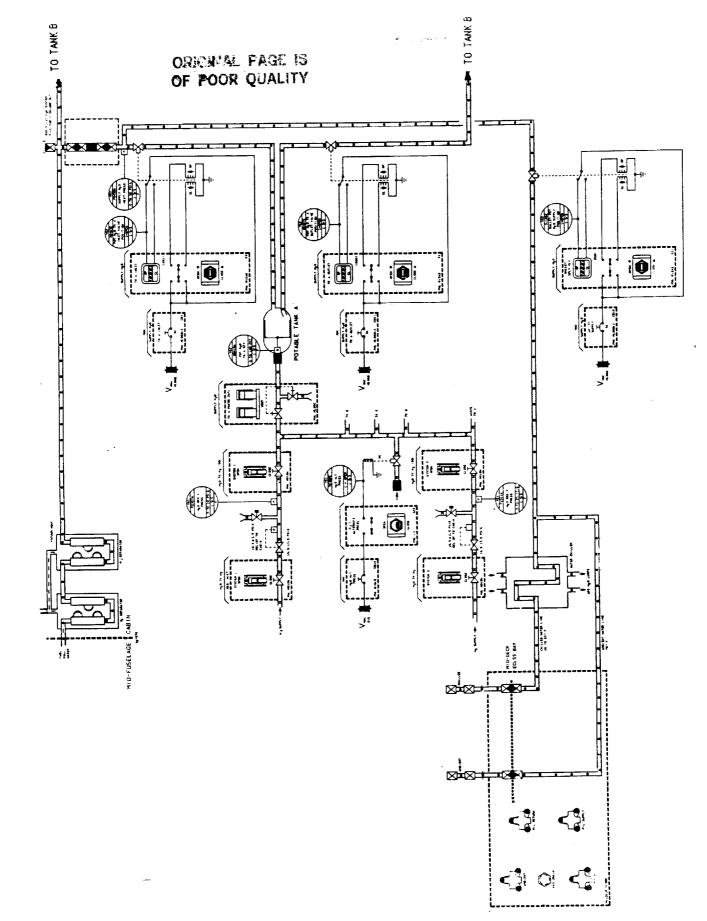
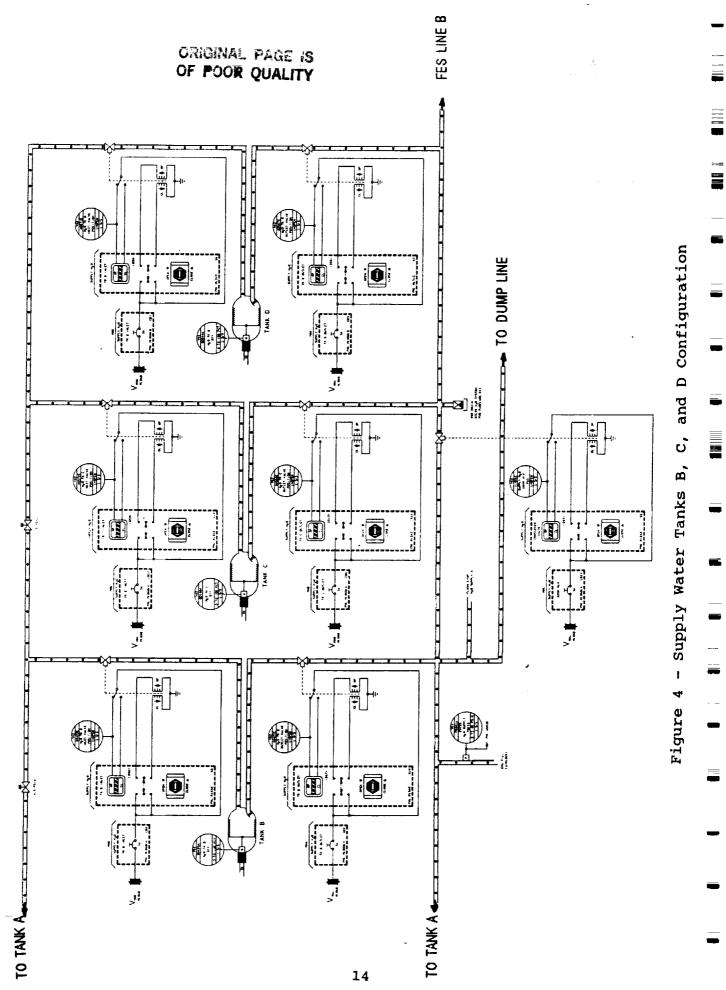


Figure 3 - Supply Water Pressurization and Galley Lines



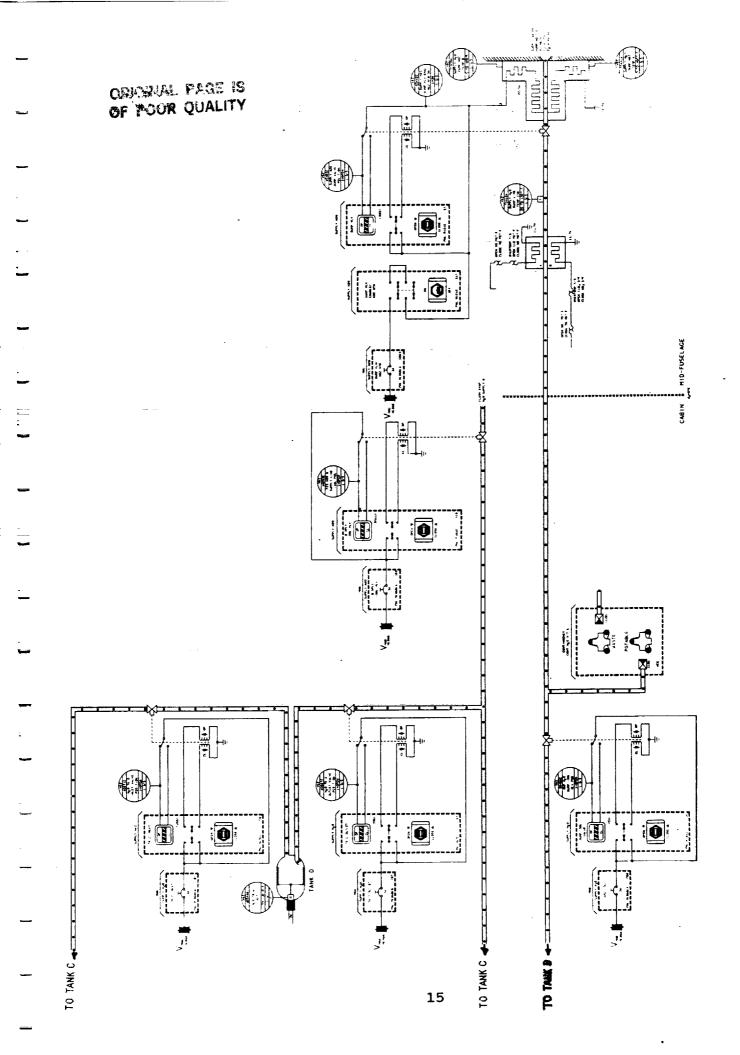
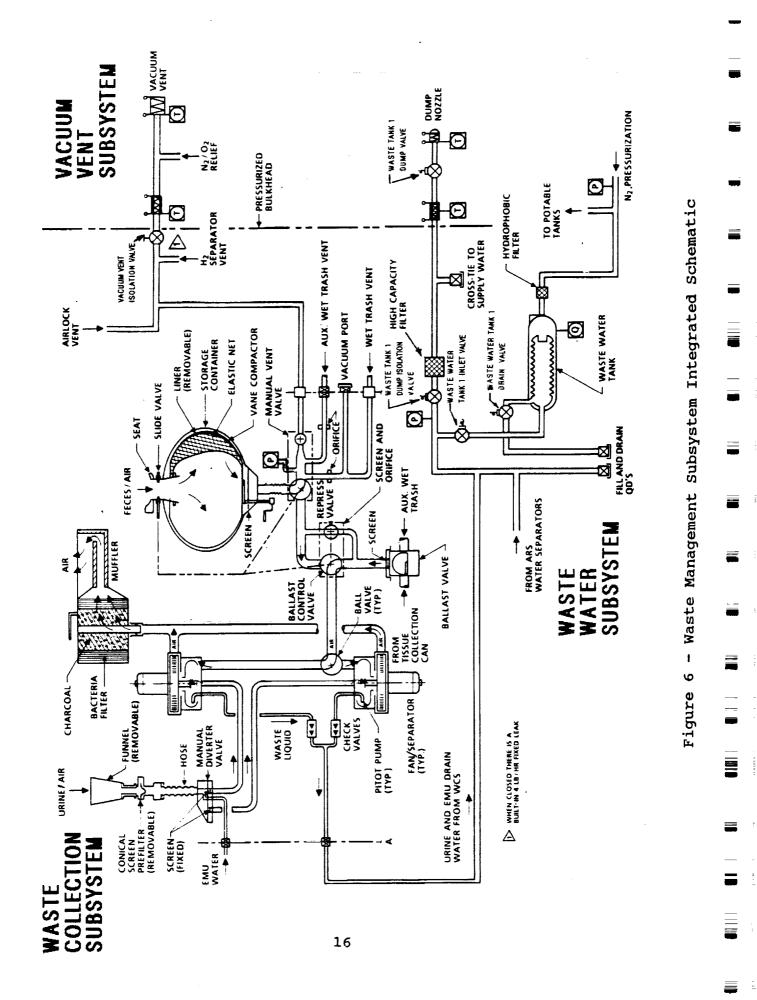
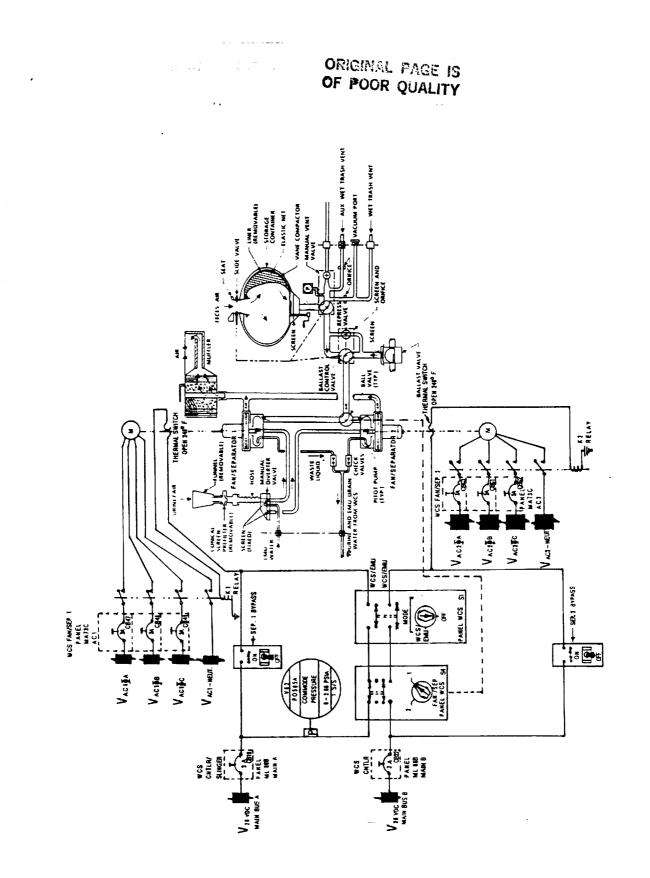
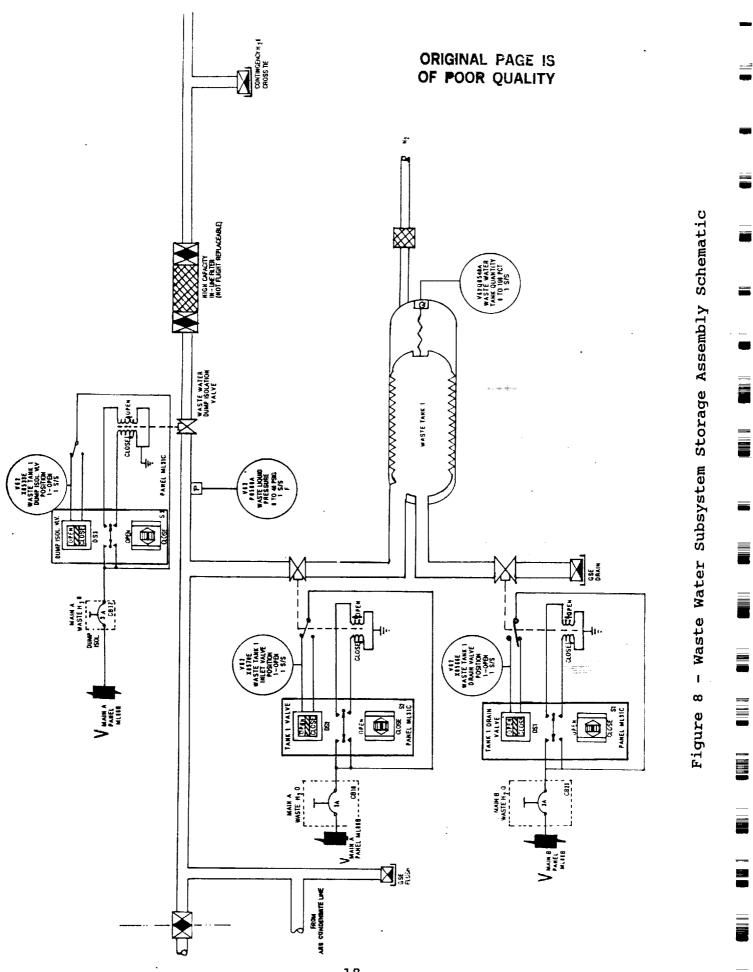


Figure 5 - Supply Water FES and Dump Lines





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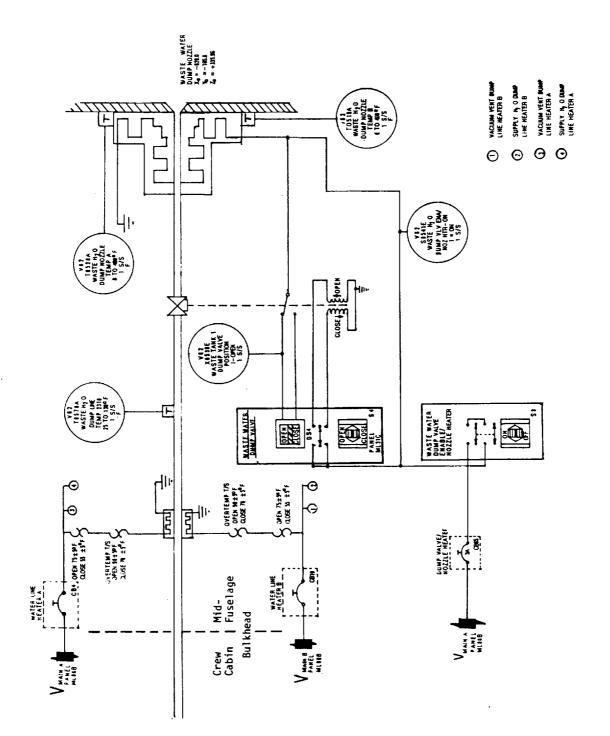
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- Waste Water Subsystem Dump Line Assembly Schematic Figure 9

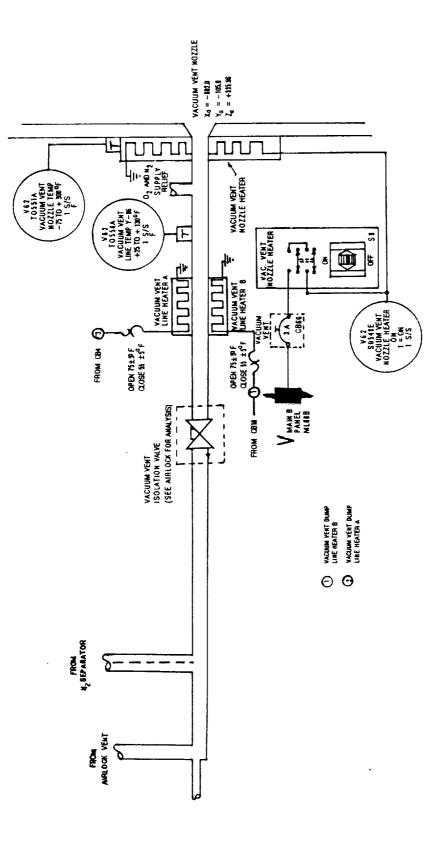
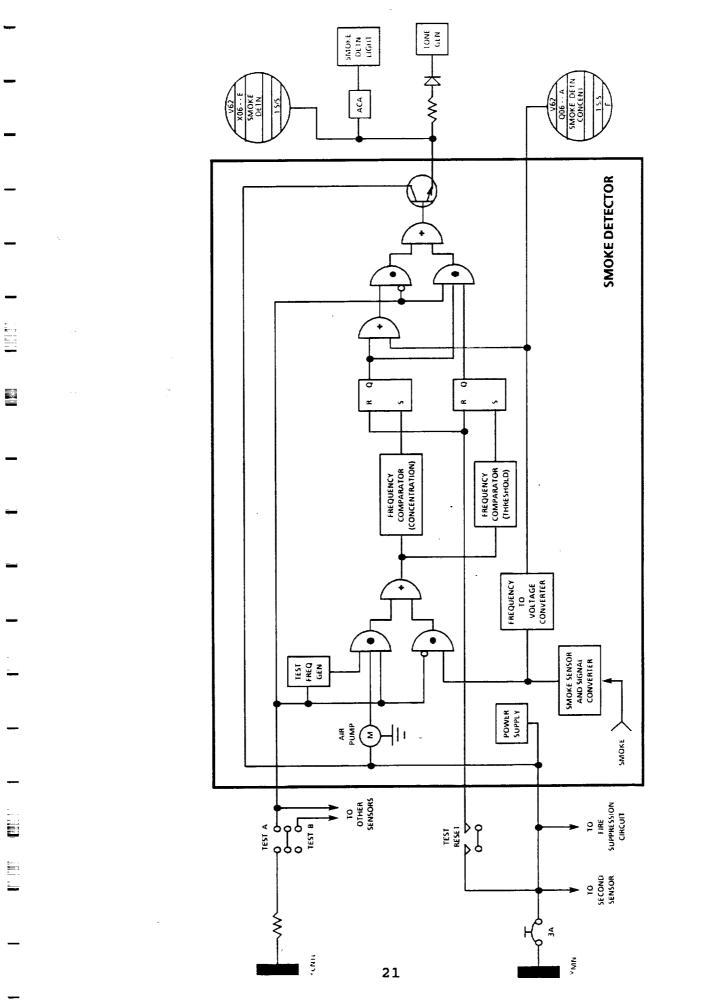


Figure 10 - Vacuum Vent Subsystem Schematic

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Figure 11 - Typical Smoke Detector Schematic

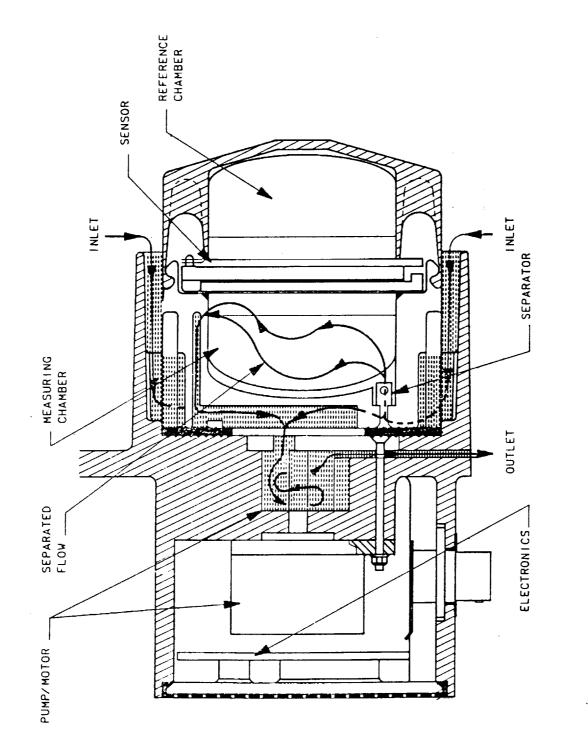
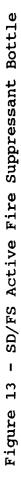
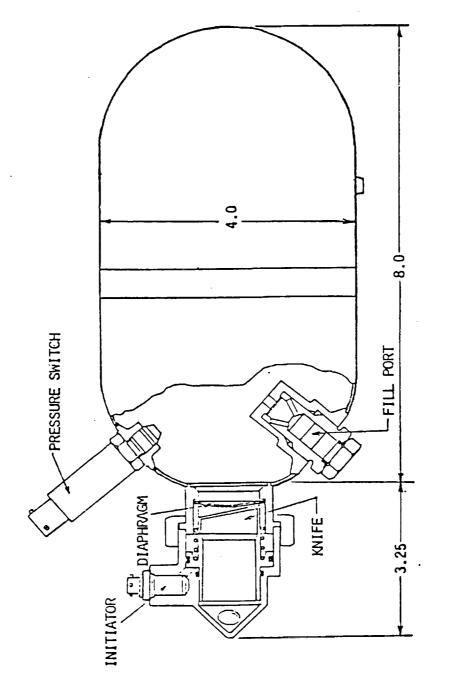


Figure 12 - SD/FS Typical Smoke Detector







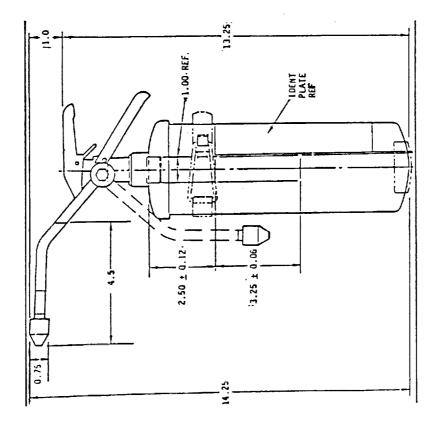


Figure 14 - SD/FS Portable Fire Extinguisher

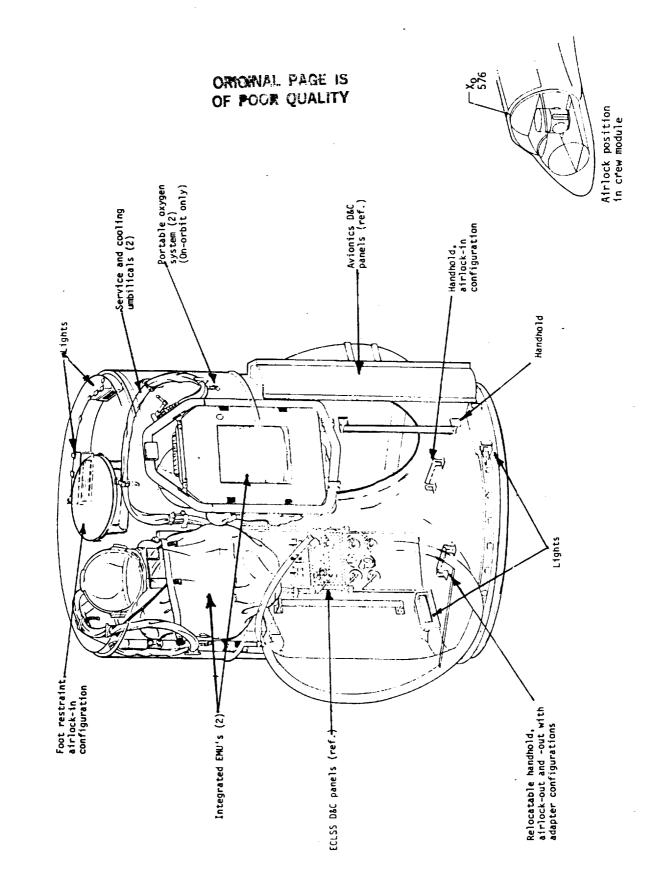
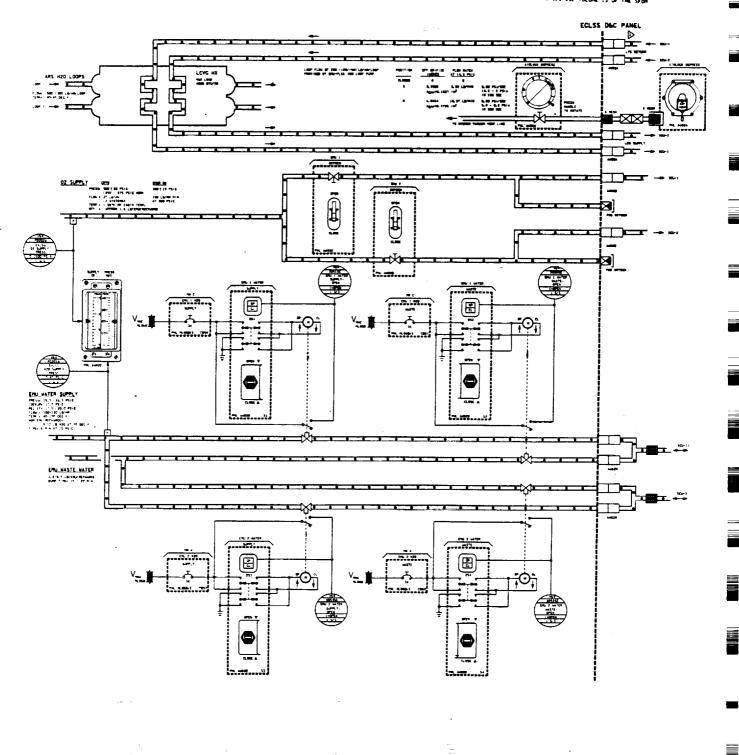
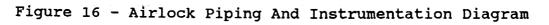


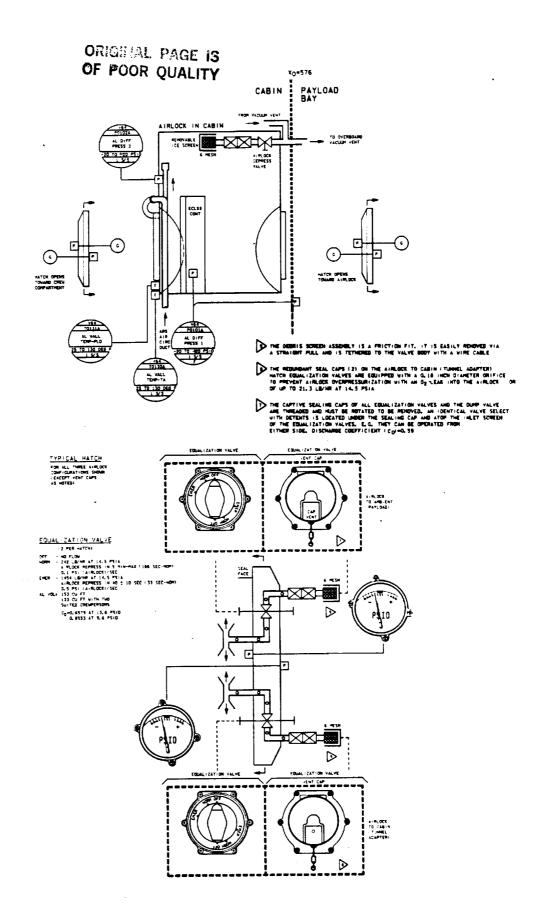
Figure 15 - Airlock Support System

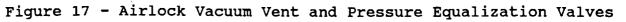
THE ECLSS/SCU INTERFACES SHOWN ARE FIXED DYNA-TUBE CONNECTORS I EXCEPT ELECTRICALL, FOR DETAILS OF THE SCULENU INTERFACES. REFER TO FIG 2.2-25, VOLUME 15 OF THE SFOR





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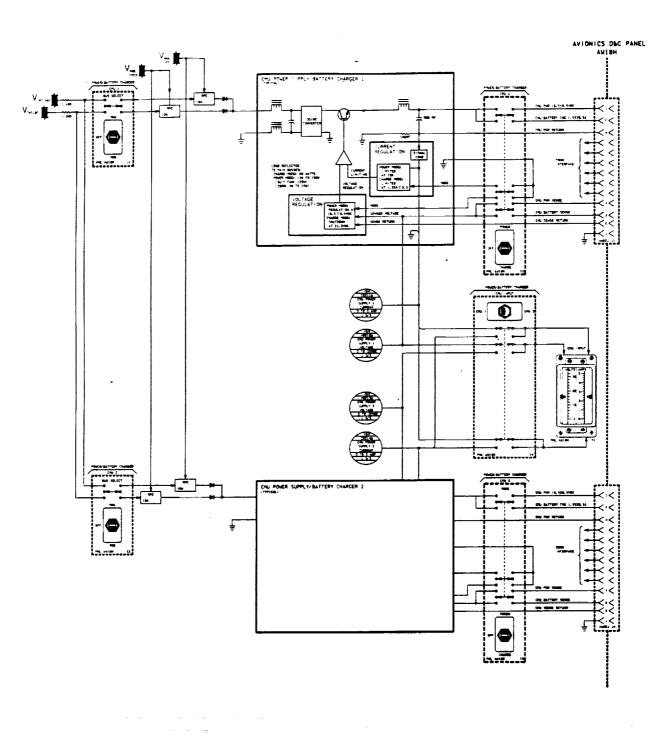


Figure 18 - Airlock Electrical Schematic

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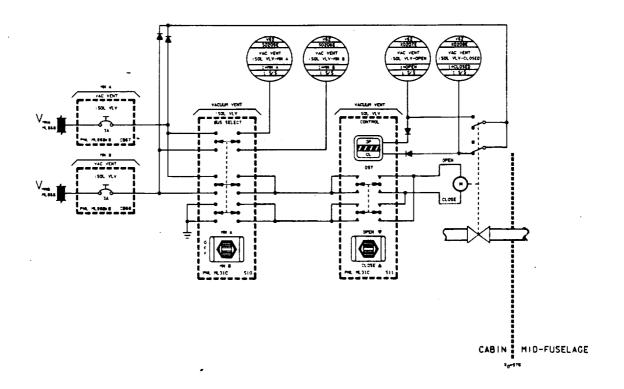


Figure 19 - Vacuum Vent Isolation Valve

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3.2 Interfaces and Locations

The life support and airlock support items are located at various places within the crew compartment, and avionics bays as shown in Figures 20 to 22. The FES and dump nozzles are located outside the payload bay past 576 bulkhead.

The LSS and ALSS interfaces with the adjoining subsytems were identified, and are explained below:

- 1. EPS The Electrical Power Subsystem provides bus power to drive valves, switches, instrumentation, and heaters throughout the systems. Also, the EPS recharges the EMU batteries in the airlock at the SCU.
- 2. ARPCS Gaseous nitrogen from the ARPCS storage tanks are used to pressurize the supply/waste water tanks. It is also used to recharge the MMU nitrogen tanks. Cabin pressure may be used to maintain pressure in the water tanks in the event that gaseous nitrogen is not available.
- 3. ARS The water coolant loops from the ARS chills the potable water through the water chiller heat exchanger. They are aloso used to cool the EMU suites while in the airlock.
- 4. ATCS The Flash Evaporator System (FES) uses water from the water tanks to provide thermal cooling of the freon loops.
- 5. PRSD The Power Reactant Storage and Distribution System provides oxygen for recharge of the EMU bottles in the airlock at the SCU interface.
- 6. EMU The EMU interfaces with the ALSS through the SCU for water, oxygen, and electrical power recharges.
- 7. CE Crew Euipment such as galley or water dispenser is connected to the potable lines at the ECLSS bay in the crew compartment.

3.3 Hierarchy

Figures 23 and 24 illustrates the hierarchy of the LSS and ALSS hardware and the corresponding subcomponents.

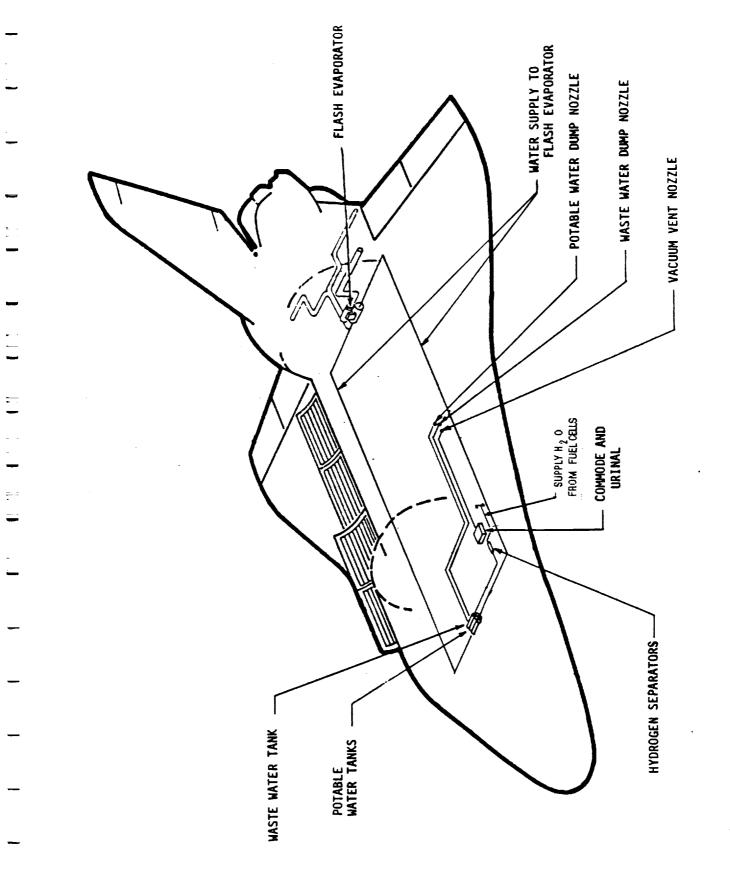


Figure 20 - General Location of the Supply and Waste Management Subsystems

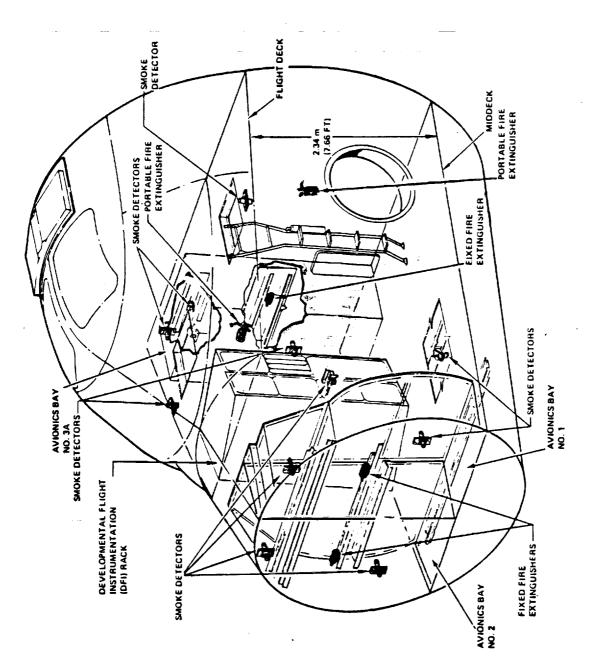


Figure 21 - General Location of the Smoke Detection and Fire Suppression Subsystems

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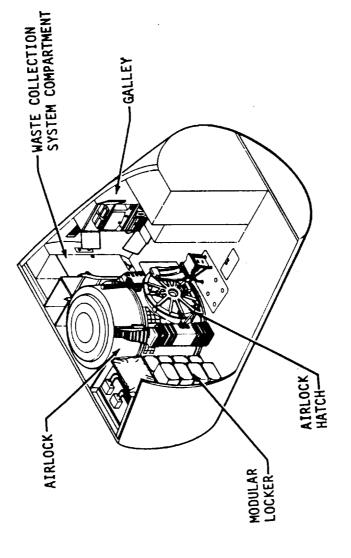


Figure 22 - General Location of Airlock Support System and Waste Collection Subsystem

SUPPRESSION EXTINGUISHER ASSEMBLY ASSEMBLY DETECTION PORT. FIRE EPO&C SMOKE/FIRE SUBSYSTEM ASSEMBLY ASSEMBLY STORAGE DUMP LINE WASTE WATER WATER EPD&C SUBSYSTEM LIFE SUPPORT SYSTEM MANAGEMENT SUBSYSTEM HARDWARE VACUUM VENT SUBSYSTEM EPD&C WASTE URINE/WASTE ALT. WASTE ASSEMBLY ASSEMBLY AIR LINE ASSEMBLY COOLECTION EPD&C ASSEMBLY ASSEMBLY RESTRAINT FE CAL/ Emisis CREW COLLECTION FLUID LIQUID/ WASTE GALLEY LINE ASSEMBLY ASSEMBLY ASSEMBLY ASSEMBLY ASSEMBLY STORAGE DUMP LINE GN2 LINE FES LINE SUPPLY WATER EPD&C

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Figure 23 - Life Support System Hierarchy

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EPD&C VACUUM VENT ISOL. VALVE PRESS. EQUAL ASSEMBLY A/L TO CABIN A/L TO P/L AIRLOCK SUPPORT SYSTEM DEPRESS Assembly POWER SUPPLY ASSEMBLY OXYGEN Assembly WATER ASSEMBLY

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Figure 24 - Airlock Support System Hierarchy

4.0 ANALYSIS RESULTS

Detailed analysis results for each of the identified failure modes are presented in Appendix C. Table I presents a summary of the failure criticalities for each of the two major subdivisions of the LSS and ALSS. Further discussion of each of these subdivisions and the applicable failures are provided in subsequent paragraphs.

TABLE I - Summary of IOA Possible Failure Modes by Criticalities (HW/F)							
Criticality: LSS	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
o SWS	-	3	36	1	40	59	139
O WMS	.9	10	25	3	81	96	224
o SD/FS	8	6	6	12	-	33	65
ALSS	-	7	21	- 3	17	35	83
TOTAL	17	26	88	19	138	223	511

Of the 511 failures analyzed, 17 failures were determined to result in loss of crew or vehicle, and 114 were determined to result in loss of mission. A summary of the potential critical items is presented in Table II. Appendix D presents a cross reference between each potential critical item (PCI) and a specific worksheet in Appendix C.

TABLE II - Summ	ary of 2	IOA Pote	ential	Critica	al Items	5 (HW/F)
Criticality: LSS	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
o SWS	-	3	36	-	7	46
O WMS O SD/FS	9	10 6	25 6	-	-	44 20
ALSS		7	21	2	-	30
TOTAL	17	26	88	2	7	140

The following subsections provide discussions of the indiviual subsystems with the emphasis on the potential critical items.

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4.1 SWS Analysis Results - The SWS analysis incorporates all of the associated electrical and mechanical hardware items. The results for the various criticalities are presented in Table I. Of the total of 139 failure modes identified, 46 failures were found to be Potential Critical Items due to mission loss. No 1/1 criticalities were identified in this anaylsis.

The failures which precluded hydrogen separators function (separating hydrogen and water) were essentially considered to be a mission loss category. This was done since the excessive presence of hydrogen in the tanks could jeopardize the operation of FES, dump, EMU, and it may cause crew sickness. All of these were deemed necessary functions to maintain a successful mission.

Also some PCIs were due to failures which resulted in loss of providing clean filtered potable water to the crew. Under severe case, mission may be shorten if water is not available for such things as drinking, hygiene, and food preparation.

Of the remaining PCIs, several were identified to be due to failure of Redundancy Screen C. These were primarily associated with the dump line items where a severe contamination could cause blockage of the line and the redundant FES line.

Please refer to MDAC-IDs 1100 to 1238 Appendix C.1 for further definition.

- 4.2 WMS Analysis Results The WMS analysis incorporates all of the associated electrical and mechanical hardware items. The results for the various criticalities are presented in Table I. Of the total of 224 failures identified, 44 failures were found to be Potential Critical Items (PCIs) due to mission loss. Further breakdown of these criticalities as explained below:
 - a. The Waste Collection Subsystem (WCS) analysis identified 110 failures, MDAC-ID 2001 to 2110 (Appendix C.2). Most of the failures were identified as criticality 3/2R and 3/3. Only 7 failures were identified as PCIs, and were mostly due to external leakage of waste fluids to the cabin.
 - b. The Waste Water Subsystem (WWS) analysis identified 96 failures, MDAC-ID 2111 to 2206 (Appendix C.2). Most of the failures were identified as criticality 3/2R and 3/3. 26 failures were identified as potential critical items, due to three major failure modes of electrical, restricted flow, and external leakage.

- c. The Vacuum Vent Subsystem (VVS) analysis identified 18 failures, MDAC ID 2207 to 2224 (Appendix C.2). Nine were identified as criticality 1/1 due to external leakage of the lines and fittings, and the failure of the heaters. The remaining failures were two at 2/1R, and seven at 3/3.
- 4.3 Smoke Detection and Fire Suppression Analysis Results -Of the 65 failures identified, 21 failures were found to be PCIs producing mission loss. There were no 1/1 failure criticalities identified in this analysis. The majority of the failure modes were identified as 3/1R and 3/3, however none of these failures were PCIs.

Please refer to MDAC-IDs 3001 thru 3065 in Appendix C.3 for further definition.

4.4 ALSS Analysis Results - The 2/2 potential critical items were mostly due to failure modes which prevented completion of the EMU pre-EVA activities. For example, the inability to top off the EMU water tanks and purge the system of air bubbles were caused by the supply valve failure to open. Failure to deliver oxygen to a crewman was also deemed a loss of mission due to depletion of the PLSS oxygen tanks prior to an EVA. Other failure modes which were considered mission critical pertained to waste water valve failed closed, failure to depressurize the airlock, and various power losses.

Oxygen external leaks were deemed to pose a serious threat for fire, therefore they were assigned 2/1R criticalities. Other failures such as airlock pressure leak, failure of the pressure equalization valve to open to the cabin, and restricted flow failure of the filter to allow repressurization of the airlock were considered life threatening.

Two of the 3/1R electrical failures related to closing the vacuum isolation valve on demand did not pass the redundancy Screen B. These failures, will not be detectable in time to allow corrective action by the crew.

Please refer to MDAC-IDs 5001 to 5083 in Appendix C.4 for further definition.

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5.0 REFERENCES

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

- 1. JSC-ECLSS 2102, Environmental Control and Life Support Systems Workbook, November 21, 1983.
- 2. JSC-19935, Environmental Systems Console Handbook, Basic Rev A, October 15, 1985.
- 3. RI-VS70-960102,-960103,-960104, Integrated Systems Schematics.
- 4. JSC-12820, STS Operational Flight Rules, Final PCN-3, June 28, 1985.
- 5. JSC-V61-File III, Operations Maintenance Requirements and Specification Document, February 6, 1986.
- NSTS-22206, Instruction for Preparation of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL), October 10, 1986 changes 1 and 2.
- 7. JSC-12770, Shuttle Flight Operation Manual, EVA System, Basic Rev A, Volume 15, January 6, 1984.
- 8. JSC-12770, Shuttle Flight Operation Manual, Crew Systems, Rev A, Volume 12, August 16, 1985.
- 9. JSC-2102C, Waste Collection System Workbook, November 26, 1984.

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APPENDIX A ACRONYMS

AAP	Airlock Adapter Plate
ac	Alternating Current
ACA	Annunciator Control Assembly
ALSS	Airlock Support System
AOA	Abort Once Around
AOS	Acquisition of Signal
ARPCS	Atmospheric Revitalization Pressure Control System
ARS	Atmospheric Revitalization System
ASSY	Assembly
ATCS	Active Thermal Control System
ATO	Abort to Orbit
AUX	Auxillary
AV	Avionics
CB CCH CDR CE CIL CL CNTL CNTRL CONT CRIT CRT CV CWC C&W	Circuit Breaker Commode Control Handle Commander Crew Equipment Critical Items List Close Control Control Control Contingency Criticality Cathode Ray Tube Check Valve Contingency Water Container Caution and Warning
dc	Direct Current
ECLSS	Environmental Control and Life Support System
EI	Entry Interface
EMU	Extravehicular Mobility Unit
EPD&C	Electrical Power Distribution and Control
EPS	Electrical Power Subsystem
EVA	Extravehicular Activity
F	Functional
F	Fan/Separator
FAN/Sep FDA FES FLT FMEA	Fault Detection Annunciation Flash Evaporator System Flight Failure Modes and Effects Analysis

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ACRONYMS (continued)

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Government Furnished Equipment Gaseous Nitrogen Gaseous Oxygen Ground Support Equipment
Heater Hardware Hydrogen Water
Independent Orbiter Assessment
Johnson Space Center
Life Support System Lights Level
McDonnell Douglas Astronautics Company Main Engine Cut-off Mission Elapsed Time Major Mode Manned Maneuvering Unit
Not Applicable National Aeronautics and Space Administration National Space Transportation System Nitrogen
Operations Sequence
Potential Critical Items Pressure Control System Pyrotechnic Initiator Controller Payload Payload Bay Portable Life Support Subsystem Panel Portable Power Reactant Storage and Distribution Pounds per Square Inch Pounds per Square Inch, Absolute Pounds per Square Inch, Differential Pounds per Square Inch, Gauge

A-2

ACRONYMS (continued)

QD QR	Quick Disconnect Quick Release
REG RTLS	Regulator Return To Landing Site
SCU SD/FS Sec SM SOP STS SW SWS	Service and Cooling Umbilical Smoke Detection and Fire Suppression Subsystem second System Management Secondary Oxygen Pack Space Transportation System Switch Supply Water Subsystem
TAL	Transoceanic Abort Landing
UCD	Urine Collection Device
VAC VLV VVS	Volts - AC Valve Vacuum Vent Subsystem
WCS WMS WWS	Waste Collection Subsystem Waste Management Subsystem Waste Water Subsystem
X-DCR XOVR	Transducer Cross-over

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APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

- B.1 DefinitionsB.2 Project Level Ground Rules and AssumptionsB.3 Subsystem-Specific Ground Rules and Assumptions

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions

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

INTACT ABORT DEFINITIONS:

<u>RTLS</u> - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

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

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

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

<u>CREDIBLE (CAUSE)</u> - 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

<u>CONTINGENCY CREW PROCEDURES</u> - 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

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

<u>HIGHEST CRITICALITY</u> - the highest functional criticality determined in the phase-by-phase analysis

<u>MAJOR MODE (MM)</u> - major sub-mode of software operational sequence (OPS)

<u>MC</u> - Memory Configuration of Primary Avionics Software System (PASS)

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

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

<u>OPS</u> - software operational sequence

<u>PRIMARY MISSION OBJECTIVES</u> - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

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

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

<u>ONORBIT PHASE</u> - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

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

<u>LANDING/SAFING PHASE</u> - 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 <u>NSTS 22206, Instructions for</u> <u>Preparation of FMEA/CIL, 10 October 1986</u>, was employed with the following amplifications and additions.

 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.

 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.

APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.3 LSS and ALSS Specific Ground Rules and Assumptions

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

- 1. The Flash Evaporator System (topper only) was considered an unlike but redundant operation to the supply water dump operation during on-orbit phase.
 - RATIONALE: Past missions have adequately demonstrated the use of FES for dumping excess water without significant impact to the mission timeline.
- 2. The fuel cells dedicated dump line was considered an unlike but redundant way of expelling the generated water.
 - RATIONALE: The fuel cells dedicated line has not been flight tested, but the NSTS-22206 (para 2.3.2.d) considers interfacing subsystems to be operating within their specified tolerances.
- 3. The cross-tie capability was considered an unlike but redundant to the supply water dump line.
 - RATIONALE: The use of cross-tie capability is anticipated to be under severe circumstances when no other method is available to expel the water.

4. The newly added water line from the fuel cells to Tank B was considered in this study.

RATIONALE: This line is an approved design change and will be incorporated on all vehicles.

5. The airlock analysis assumed two crewmen for a typical EVA activity.

RATIONALE: Rule 2-24 of the JSC-12820, STS Operational Flight Rules.

6. The airlock analysis did not consider emergency EVA to close the payload bay doors.

RATIONALE: The payload bay door failure was considered to constitute a second failure.

- 7. The Apollo Fecal Bags and the Urine Collection Devices (UCD) are considered as unlike redundant hardware to the WMS.
 - RATIONALE: The Apollo Fecal Bags or UCD are not employed unless the WMS is non-functional. There are adequate contingency waste collection supplies for every crew member for at least 3 days usage of the UCD and enough Apollo Fecal Bags for the mission life. If there is a generic material failure present in the contingency waste collection supplies, a mission loss would be developed at that time.
- 8. The Contingency Water Container (CWC) is emergency hardware and if failed requires a change in the mission schedule and loss of waste collection methods.
 - RATIONALE: The CWC is not employed unless the waste water storage and dump subsystems are inoperative. There is a mission schedule impact.
- 9. If either the Vacuum Vent line or nozzle heater fails, a mission critical failure is assumed to have occured.
 - RATIONALE: If the heaters fail, there is a potential for line or nozzle freezing and the possibility of line blockage due to ice formation. The line blockage would cause H2 contamination of the supply water due to excessive H2 pressure. There could be a life or vehicle critical condition if the hydrogen concentration in the vacuum vent dump line reaches an explosive concentration.
- 10. Noxious gases released into the cabin atmosphere was not considered a mission loss event.
 - RATIONALE: There is a crew discomfort judgement and the effects on the crew is to be determined on a real-time basis.

- 11. The siren is the primary indication of a fire with FDA as a redundant indication.
 - RATIONALE: The annunciator requires someone at the CDR station to know a fire exists if the siren fails. Telemetry data requires AOS.
- 12. The Flight Deck RT and LT sensors are parallel redundant to each other and the Cabin sensor is serial redundant to both the RT and LT sensors. The time lag in sensor triggers could be a problem.
 - RATIONALE: The ECLSS ductwork where the RT, LT and Cabin sensors are located, is such that the other flight deck sensor would not be triggered until the airflow had proceeded to the middeck and back up to the flight deck. By the time the contaminated air reaches the other flight deck sensor, any incipient fire condition could be a well developed fire base, thus producing a possible loss of life condition.
- 13. The Test and Reset switches were not considered as emergency hardware, i.e., do not need to function during a fire situation.
 - RATIONALE: The consideration is that once used after lift-off, they could create situations where redundancy was lost and therefore directly affect the emergency system.

14. Loss of fire sensor checkout capabilities was considered a condition for mission termination.

RATIONALE: The fear of a loss of crew as a result of the safety hardware failure.

- 15. The portable fire-suppression bottles were not considered redundant to the AV Bay bottles during ascent or entry.
 - RATIONALE: The mission event loads preclude crew motion about the cabin during these mission phases.

- 16. A ground rule for the SD/FS analysis was that the only failure modes for the portable fire extinguishers were premature operation or inoperative. No component level analysis was performed.
 - RATIONALE: The details of the portable fire extinguishers were not available at the time the analysis was performed, thus no component analysis was possible.

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APPENDIX C DETAILED ANALYSIS

This section contains the IOA analysis worksheets employed during the analysis of the Life Support system. The information on these worksheets is intentionally similar to the FMEA's written by Rockwell and the NASA. Each of these sheets identifies the 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 <u>Rockwell</u> <u>Desk Instructions 100-2G</u>. 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
- 3 = Non loss of life or vehicle or mission

Functional Criticalities :

1R = Redundant identical hardware components or redundant functional paths all of which, if failed, could cause loss of life or vehicle.

2R = Redundant identical hardware components or redundant functional paths 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
- 4 = Do Not Know

Redundancy Screens B and C :

- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

c.1

SUPPLY WATER SUBSYSTEM

Analysis Worksheets

3

SUPPLY WATER SUBSYSTEM

MDAC-ID			SCREENS A B C	ITEM NAME
1100 (*)				H2 SEPARATOR (2)
1101 (*)	2/2	2/2		H2 SEPARATORS (2)
1102 (*)	$\frac{1}{2}/2$	$\frac{1}{2}/2$		H2 SEPARATORS (2)
1103(*)	$\frac{1}{2}/2$	2/2		
1104	3/2R	3/2R	РРР	H2 SEPARATORS MICROBIAL FILTER (1)
1105 (*)	2/2	2/2		MICROBIAL FILTER (1)
1105 (*) 1106 (*) 1107	2/2	2/2		MICROBIAL FILTER QD (2)
1107	3/3	/NA		MICROBIAL FILTER QD (2)
1100	3/22	3/28	PPP	TANKS INLET SOLENOID VLV (4)
1110 (*)	2/2	2/2	PPP	TANKS INLET ISOLATION VLV (4
1111	3/2R	$\frac{1}{3/2R}$	P P P P P P P P P P P P	TANKS OUTLET ISOLATION VLV (4)
1112	3/2R	3/2R	PPP	TANKS OUTLET ISOLATION VLV (4)
1113 (*)	2/2	2/2		TANKS OUTLET ISOLATION VLV (4)
1114	3/2R	3/2R	РРР	SWITCH, INLET ISOL VALVE (4)
1115	3/2R	3/2R	РРР	SWITCH, INLET ISOL VALVE (4)
1116	3/3	3/3		SWITCH, INLET ISOL VALVE (4)
1117	3/3	3/3		FOS. IND., IDOL VIA DA (0)
1118	3/3	3/3		RESISTOR, ISOL VLV SW (8)
1117 1118 1119	3/3	3/3		DIODE, ISOL VALVE SWITCH (8)
1120	3/3	3/3		SOLENOID, INLET ISOL VALVE (4)
1121	3/2R	3/2R	PPP	SOLENOID, INLET ISOL VALVE (4)
1122	3/3	3/3		SOLENOID, OUTLET ISOL VALVE (4)
			РРР	
1124				CB, INLET ISOL VALVE (4)
1125 1126	3/3	3/3		CB, INLET ISOL VALVE (4)
1126	3/3	3/3		CB, OUTLET ISOL VALVE (4)
1127	3/3	3/3		CB, OUTLET ISOL VALVE (4)
1128	3/2R	3/2R	PPP	TANKS A, B, C AND D (4)
1129	3/1R	3/1R	P P P P P P P P P P P P	TANKS A, B, C AND D (4)
1130	3/2R	3/2R	PPP	TANKS A, B, C AND D (4)
1131	3/2R	3/2R	PPP	SENSOR, TANKS QUANTITY (4)
1132	3/2R	3/2R	PPP	FILTER, GN2-TANKS INLET (4)
1133	3/3	3/3		FILTER, GN2-TANKS INLET (4)
1134	3/3	3/3		SENSOR, PRESSURE (1)
1135 (*)	2/2			RELIEF VALVE, 1.5 PSID (2)
1136	3/3	3/3		RELIEF VALVE, 1.5 PSID (2)
1137 (*)		2/2		RELIEF VALVE, 1.5 PSID (2)
1138	3/3	/NA		QD, GSE FILL/DRAIN (2)
	3/3	/NA		QD, GSE FILL/DRAIN (2)
1140	3/3	/NA		QD, GSE FILL/DRAIN (2)

(*) Potential Critical Items.

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SUPPLY WATER SUBSYSTEM (cont'd)

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	CRITICA	LITY R	EDUNDANCY	
	FLIGHT	ABORT	SCREENS	
MDAC-ID			ABC	ITEM NAME
				OD COP PITT (DDAIN (2)
1141 (*)	2/2	2/2		QD, GSE FILL/DRAIN (2)
1142	3/2R	3/2R	PPP	QD, GSE FILL/DRAIN (2)
1143	3/3	/NA		CAP, GSE QD (2)
1144	3/2R	3/2R	PPP	CAP, GSE QD (2)
1145 (*)	2/2	3/3		TANK A PRESS CNTRL VALVE (1)
1146	3/3	3/3		TANK A PRESS CNTRL VALVE (1)
1147 (*)	2/2	3/3		TANK A PRESS CNTRL VALVE (1)
1148 (*)		3/3		TANK A PRESS CNTRL VALVE (1)
1140 (*)	2/2	3/3		TANK A VENT VALVE (1)
1149 (*)	2/2	3/3		
1150 1151 (*)	3/3	3/3		TANK A VENT VALVE (1)
1151 (*)	2/2	3/3		TANK A VENT VALVE (1)
1151 (*) 1152 1153 1154 (*) 1155 1156 1157	3/3	3/3		CROSSOVER VALVE (1)
1153	3/3	3/3		CROSSOVER VALVE (1)
1154 (*)	2/2	2/2	· · · ·	CROSSOVER VALVE (1)
1155	3/3	3/3		SOLENOID, XOVR VALVE (1)
1156	3/3	3/3 3/3		SOLENOID, XOVR VALVE (1)
1157	3/3	3/3		SWITCH, XOVR VALVE (1)
1158	3/3 3/3	3/3		
1150	3/3	3/3		SWITCH, XOVR VALVE (1)
1159	3/3	3/3		SWITCH, XOVR VALVE (1)
1160	3/3	3/3		POS. IND., XOVR VALVE (1)
1161	3/3 3/3	3/3		DIODE, XOVR VALVE (1)
1162	3/3	3/3		RESISTOR, XOVR VALVE (1)
1163	3/3	3/3		CB, XOVR VALVE (1)
1164	3/3	3/3		CB, XOVR VALVE (1)
			PPP	ISOL VALVE, FES B LINE (1)
1166	3/3	3/3		ISOL VALVE, FES B LINE (1)
1167 (*)		2/2		ISOL VALVE, FES B LINE (1)
1168	3/2R	3/28	РРР	SOLENOID, FES ISOL VALVE (1)
1169	3/3	3/3		SOLENOID, FES ISOL VALVE (1)
1170	3/3	3/3		SWITCH, FES ISOL VALVE (1)
1171	3/3	3/3		SWITCH, FES ISOL VALVE (1)
1172	3/2R	3/2R	PPP	SWITCH, FES ISOL VALVE (1)
1173	3/3	3/3		CB, FES ISOL VALVE (1)
1174	3/3	3/3		CB, FES ISOL VALVE (1)
1175	3/3	3/3		POS. IND., FES ISOL VALVE (1)
1176	3/3	3/3		RESISTOR, FES ISOL VALVE (1)
1177	3/3	3/3		DIODE, FES ISOL VALVE (1)
1178 (*)	3/3			
		3/3		SUPPLY VALVE, GALLEY (1)
1179 (*)		3/3		SUPPLY VALVE, GALLEY (1)
1180 (*)				SUPPLY VALVE, GALLEY (1)
1181 (*)	2/2	3/3		SOLENOID, GALLEY VALVE (1)
1182 (*)				SOLENOID, GALLEY VALVE (1)
1183 (*)	2/2	3/3		SWITCH, GALLEY VALVE (1)
1184 (*)				SWITCH, GALLEY VALVE (1)
1185 (*)				SWITCH, GALLEY VALVE (1)
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(*) Potential Critical Items.

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SUPPLY WATER SUBSYSTEM (cont'd)

MDAC-ID		ABORT H/F	SCREENS A B C	ITEM NAME
		··/ ·		
1186	3/3	3/3		POS. IND., GALLEY VALVE (1)
1187	3/3	3/3 3/3		DIODE, GALLEY VALVE (1)
1188	3/3	3/3		RESISTOR, GALLEY VALVE (1)
1189 (*)		3/3		CB, GALLEY VALVE (1)
1190	3/3	3/3		CB, GALLEY VALVE (1)
1191 (*)		/NA	PPF	DUMP ISOL VALVE (1)
1191 (*)	3/3	/NA		DUMP ISOL VALVE (1)
1192 (*)		3/3	PPF	DUMP ISOL VALVE (1)
			FFF	SOLENOID, DUMP ISOL VALVE (1)
	3/3	3/3	מממ	
1195		•	PPP	
1196		/NA	PPP	
1197		/NA	PPP	
1198		/NA	PPP	
1199		3/3		POS. IND., DUMP ISOL VALVE (1)
	3/3	3/3		DIODE, DUMP ISOL VALVE (1)
1201	3/3	3/3		RESISTOR, DUMP ISOL VALVE (1)
1202	3/2R	/NA	PPP	CB, DUMP ISOL VALVE (1)
1203		3/3		CB, DUMP ISOL VALVE (1)
1204 (*)		/NA	PPF	DUMP VALVE (1)
1205 (*)	3/2R	3/3	PPF	DUMP VALVE (1)
1206 (*)	3/2R	/NA	PPF	
1207	3/2R	/NA	PPP	SOLENOID, DUMP VALVE (1)
1208	3/2R	3/3		
1209	3/2R	/NA	PPP	SWITCH, DUMP VALVE (1)
1210 (*)	2/1R	3/3	PFP	SWITCH, DUMP VALVE (1)
1211	3/2R	/NA	PPP	
1212	3/2R	/NA	PPP	
1213	3/2R	/NA	РРР	SWITCH, DUMP NOZZLE HEATER (1)
1214	3/3	/NA		SWITCH, DUMP NOZZLE HEATER (1)
1215	3/2R	/NA	PPP	CB, DUMP VALVE (1)
1216	3/3	/NA		CB, DUMP VALVE (1)
1217	3/3	3/3		POS. IND., DUMP VALVE (1)
1218	3/3	3/3		RESISTOR, DUMP VALVE (2)
1219	3/3	3/3		DIODE, DUMP VALVE (1)
1220	3/2R	/NA	PPP	SENSOR, NOZZLE TEMPERATURE (2)
1221 (*)	2/2	/NA		NOZZLE HEATER (1)
1222 (*)	2/2	/NA		NOZZLE HEATER (1)
1223 (*)		/NA		DUMP NOZZLE
1224	3/2R	/NA	PPP	DUMP LINE HEATER (2)
1225	3/2R	/NA	PPP	DUMP LINE HEATER (2)
1226	3/2R	/NA	PPP	THERMOSTAT, LINE HEATER (4)
	•	/NA	•	THERMOSTAT, DUMP LINE HTR (4)
1228 (*)	2/2	/NA		QD, CONTINGENCY CROSS-TIE (1)
1229 (*)		/NA		QD, CONTINGENCY CROSS-TIE (1)
1230	3/3	/NA		SENSOR, DUMP LINE TEMP (1)

(*) Potential Critical Items.

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SUPPLY WATER SUBSYSTEM (concluded)

	CRITICA	LITY R	EDUNDANCY	
	FLIGHT	ABORT	SCREENS	
MDAC-ID	H/F	H/F	ABC	ITEM NAME
1231 (*)	3/2R	3/3	PPF	QD, ECLSS BAY (2)
1232 (*)	3/2R	3/3	PPF	QD, GALLEY/DISPENSER (2)
1233 (*)	2/2	2/2		LINES AND FITTINGS
1234 (*)	2/2	2/2		LINES AND FITTINGS
1235 (*)	2/2	2/2		LINES AND FITTINGS
1236 (*)	2/2	2/2		LINES AND FITTINGS
1237 (*)	2/1R	2/1R	РРР	WATER CHILLER (1)
1238 (*)	3/2R	/NA	PPF	WATER CHILLER (1)

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(*) Potential Critical Items.

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1100	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2				
ITEM: H2 SEPARATOR (2) FAILURE MODE: RESTRICTED FLOW					
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)					
Сртит	CALITIES				
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 2/2 ONORBIT: 2/2 DEORBIT: 2/2 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 2/2 TAL: 2/2 AOA: 2/2 ATO: 2/2				
REDUNDANCY SCREENS: A []	B[] C[]				
LOCATION: ECLSS BAY PART NUMBER: 90V62AB1					
CAUSES: CONTAMINATION EFFECTS/RATIONALE: LOSS OF PRIMARY WATER LINE TO THE TANKS. GENERATED WATER WILL FLOW TO TANK B THROUGH A SECONDARY LINE (NEW DESIGN) WITH NO H2 REMOVAL CAPABILITY. EXCESSIVE AMOUNT OF H2 IN THE WATER WILL CAUSE FES SHUTDOWN AND DUMP FREEZING AND THE WATER WILL NOT BE PALATABLE FOR CREW USAGE. THE MISSION SHOULD BE TERMINATED AND RETURNED ON REMAINING WATER IN THE TANK.					

REFERENCES:

REPORT DATE 10/23/87

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DATE: 6/25/87 HIGH SUBSYSTEM: LIFE SUPPORT MDAC ID: 1101	EST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2					
ITEM: H2 SEPARATORS (2) FAILURE MODE: INTERNAL LEAKAGE						
LEAD ANALYST: M.J. SAIIDI SUBSYS L	EAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	· · · · · · · · · · · · · · · · · · ·					
CRITICALITIES						
FLIGHT PHASEHDW/FUNCABOPRELAUNCH:3/3LIFTOFF:2/2ONORBIT:2/2DEORBIT:2/2LINDING (SAFING: 3/3)	DRTHDW/FUNCRTLS:2/2					
LIFTOFF: 2/2 ONORBIT: 2/2	TAL: 2/2 AOA: 2/2					
DEORBIT: 2/2	ATO: 2/2					
LANDING/SAFING: 3/3						
REDUNDANCY SCREENS: A [] B [] C[]					
LOCATION: ECLSS BAY PART NUMBER: 90V62AB1						
CAUSES: MECHANICAL SHOCK, STRUCTURAL FAI	LURE, VIBRATION					
EFFECTS/RATIONALE: LOSS OF GENERATED WATER TO VACUUM RESULT						

LOSS OF GENERATED WATER TO VACUUM RESULTING IN REDUCED WATER FOR FES, CREW, AND P/L. ALSO, THE FUEL CELLS WATER AND HYDROGEN LINES WILL BE EXPOSED TO VACUUM STARVING FUEL CELLS OF HYDROGEN IF THE VENT LINE IS NOT ISOLATED. ISOLATION OF THE VENT LINE WILL FORCE DUMPING OF THE FUEL CELLS WATER VIA EPS LINE, AND ABORT MISSION AND RETURN ON EXISTING WATER IN THE TANK. WASTE WATER ALSO AVAILABLE TO SUPPLEMENT SUPPLY WATER FOR FES OPERATION.

REFERENCES:

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1102 ITEM: H2 SEPARATORS (2)	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2					
FAILURE MODE: INTERMITTENT OPERATI						
LEAD ANALYST: M.J. SAIIDI SUN	SSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)						
	LITIES					
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:2/2ONORBIT:2/2DEORBIT:2/2LANDING/SAFING:3/3	RTLS: 2/2 TAL: 2/2					
REDUNDANCY SCREENS: A []	B[] C[]					
LOCATION: ECLSS BAY PART NUMBER: 90V62AB1						
CAUSES: CONTAMINATION						
EFFECTS/RATIONALE: REDUCED HYDROGEN REMOVAL CAPABILITY. EXCESSIVE HYDROGEN IN THE WATER LINE WILL CAUSE FREEZING DURING DUMP OPERATION AND WILL FORCE FES SHUTDOWNS. ALSO, CREW STOMACH DISCOMFORT/NAUSEA WILL BE INDUCED AS CREW CONSUMES THE WATER. TOTAL LOSS OF CAPABILITY TO DISCHARGE H2 CAN BE SERIOUS. PRESENCE OF H2 IN THE TANKS MAY NOT BE READILY DETECTABLE UNTIL FES/DUMP OPS OR CREW DRINKS IT.						
REFERENCES:						

REPORT DATE 10/23/87

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1103	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2	
ITEM: H2 SEPARATORS FAILURE MODE: EXTERNAL LEAKAGE	and the second of the second	
LEAD ANALYST: M.J. SAIIDI SUB	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR		
2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:2/2ONORBIT:2/2DEORBIT:2/2LANDING/SAFING:3/3	ABORTHDW/FUNCRTLS:2/2TAL:2/2AOA:2/2ATO:2/2	
REDUNDANCY SCREENS: A [] LOCATION: ECLSS BAY PART NUMBER: 90V62AB1	B[] C[]	

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CAUSES: MECHANICAL SHOCK, STRUCTURAL FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE EXTERNAL LEAKAGE WILL EXPOSE CREW CABIN ATMOSPHERE TO VACUUM LINE THEREBY RESULTING IN CABIN DECOMPRESSION. VACUUM LINE CAN BE SHUTOFF BUT IT WOULD PLACE H2 INTO THE CABIN - FIRE HAZARD. THE FUEL CELLS SHOULD BE ISOLATED FROM THE WATER LINES GENERATED WATER DUMPED THROUGH EPS VENT, ABORT THE MISSION, AND RETURN ON EXISTING WATER IN THE TANKS. PRESENCE OF H2 IN THE CABIN IS NOT READILY DETECTABLE.

REFERENCES:

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1104	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/2R	
ITEM: MICROBIAL FILTER FAILURE MODE: RESTRICTED FLOW	(1)	
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)		
CDIMI	CALITIES	
FLIGHT PHASE HDW/FUNC		
\mathbf{DDFT} . ALINCH • 3/3		
LIFTOFF: 3/2R ONORBIT: 3/2R DEORBIT: 3/2R	TAL: 3/2R	
ONORBIT: 3/2R	AOA: 3/2R	
DEORBIT: 3/2R	ATO: 3/2R	
LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: MID-DECK (CABIN) PART NUMBER: 90V62BC1	an a	
CAUSES: CONTAMINATION	n e an an an thair an	
EFFECTS/RATIONALE: REDUCED/LOSS OF POTABLE WATER TO REPLENISH TANK A FOR DIRECT CREW USE. ADEQUATE WATER IS IN TANK A TO PROVIDE FOR CREW BUT MAY BE LIMITED FOR A FULL MISSION SCENARIO. CREW MAY USE POTABLE WATER BOTTLES (SURVIVAL KIT). ALSO WATER DISPENSER INCORPORATES AN ADDITIONAL MICROBIAL FILTER IF TANK A WATER IS USED.		
REFERENCES:		

REPORT DATE 10/23/87

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1105	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2	
ITEM: MICROBIAL FILTER FAILURE MODE: EXTERNAL LEAKAGE		
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	· · ·	
CRITICALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 2/2 ONORBIT: 2/2 DEORBIT: 2/2 LANDING/SAFING: 3/3	ABORTHDW/FUNCRTLS:2/2TAL:2/2AOA:2/2ATO:2/2	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS BAY PART NUMBER: 90V62BC1		
CAUSES: MECHANICAL SHOCK, VIBRA		
EFFECTS/RATIONALE: LOSS OF MICROBE REMOVING CAPABILITY TO PROVIDE POTABLE WATER TO THE CREW AND EXPULSION OF WATER INTO THE CABIN (MID-DECK) FLOOR. LEAK CANNOT BE ISOLATED AND MAY CAUSE ELECTRICAL SHORTS. ABORT MISSION IF LEAKAGE IS SEVERE.		

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REFERENCES:

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1106	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2
ITEM: MICROBIAL FILTER Q FAILURE MODE: EXTERNAL LEAKAGE	UICK DISCONNECT (2)
LEAD ANALYST: M.J. SAIIDI S	UBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	· · · · · · · · · · · · · · · · · · ·
CRITIC	ALITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:2/2ONORBIT:2/2DEORBIT:2/2LANDING/SAFING:3/3	ABORTHDW/FUNCRTLS:2/2TAL:2/2AOA:2/2ATO:2/2
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: ECLSS BAY PART NUMBER: 90V62BC1	
CAUSES: MECHANICAL SHOCK, VIBRAT	ION
EFFECTS/RATIONALE: LOSS OF MICROBE REMOVING CAPABILI THE CREW AND EXPULSION OF WATER I LEAK CANNOT BE ISOLATED AND MAY C MISSION IF LEAKAGE IS SEVERE.	NTO THE CABIN (MID-DECK) FLOOR.
REFERENCES:	

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1107	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: MICROBIAL FILTER QU FAILURE MODE: INABILITY TO MATE/N	
LEAD ANALYST: M.J. SAIIDI SU	JBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	y a statistica de la companya de la Companya de la companya de la company Companya de la companya de la company
CRITICA	ALITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:/NAONORBIT:/NADEORBIT:/NALANDING/SAFING:3/3	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS BAY PART NUMBER: 90V62BC1	
CAUSES: CONTAMINATION, MISHANDLIN	IG/ABUSE
EFFECTS/RATIONALE: THE FILTER IS INSTALLED PRELAUNCH MAJOR IMPACT IS SEEN.	AND REMOVED POST FLIGHT - NO
REFERENCES:	

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	ORDITER SODSTSTEM ANAL			
DATE: SUBSYSTEM: MDAC ID:	LIFE SUPPORT	HIGHEST (CRITICALITY FLIGHT: ABORT:	•
ITEM: FAILURE MODE	TANKS INLET SOLENOI FAILS TO CLOSE, INT	D VALVES (4 ERNAL LEAKA	4) Age	
LEAD ANALYST	: M.J. SAIIDI SU	BSYS LEAD:	M.J. SAIIDI	
3) TANK AS 4) 5) 6) 7) 8) 9)	WATER SUBSYSTEM			
×	CRITICA	TTOTEC		
	PHASE HDW/FUNC		HOW / FILM	ic
	THASE HDW/FUNC		5: 3/3	
	AUNCH: 3/3 DFF: 3/3 BIT: 3/3 BIT: 3/3			
	OFF: 3/3		: 3/3	
ONORE	BIT: 3/3		: 3/3	
DEORE	BIT: 3/3	ATO	: 3/3	
LANDI	NG/SAFING: 3/3			
	•			
REDUNDANCY S	SCREENS: A []	B[]	C []	
LOCATION: PART NUMBER:	ECLSS BAY 90V62LV1, LV3, LV5,	LV7		
CAUSES: MEC	CHANICAL SHOCK, PIECE-F	PART FAILURI	E, VIBRATION	f Statigene
			an at a fe de mente de la color d'	11 C - 1
EFFECTS/RATI	ONALE:			NICH MUR
NOMINALLY NO			S FLOWN THRO	
TANK. HOWEV	VER, THE CAPABILITY IS	LOST TO ISC	OLATE A TANK	FROM THE
LINE IN THE	EVENT THERE IS A LEAKA	GE. UNDER	SINGLE FAIL	URE
	HE VALVE HAS FAILED IN	ITS NOMINAL	L POSITION A	ND NO
MAJOR IMPACT	IS ANTICIPATED.			
1. A. A. A.				
REFERENCES:				

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1109	HIGHES	T CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/2R
ITEM: TANKS INL FAILURE MODE: FAILS TO T FLOW	ET SOLENOID VALVE REMAIN OPEN, FAILS	(4) TO OPEN, RESTRICTED
LEAD ANALYST: M.J. SAIID	I SUBSYS LEA	D: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYS 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	FEM	· · · · · · · · · · · · · · · · · · ·
	CRITICALITIES	
LIFTOFF:	N/FUNC ABOR 3/3 R 3/2R T 3/2R A 3/2R A 3/2R A	I HDW/FUNC ILS: 3/2R AL: 3/2R DA: 3/2R IO: 3/2R
REDUNDANCY SCREENS: A	[2] B[P]	С[Р]
LOCATION: ECLSS BAY		

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PART NUMBER: 90V62LV1, LV3, LV5, LV7

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART STRUCTURE, VIBRATION

EFFECTS/RATIONALE:

LOSS OF ONE TANK (UNDER SINGLE FAILURE) TO ACCEPT GENERATED WATER - SMALLER VOLUME FROM REMAINING THREE TANKS WILL FORCE MORE PERIODIC DUMPS. LOSS OF ALL REDUNDANT VALVES WILL PRECLUDE CAPABILITY FOR WATER MANAGEMENT. FUEL CELLS WATER MAY HAVE TO BE VENTED OUTSIDE AT EPS, AND ADEQUATE WATER COULD NOT BE MANAGED FOR CONTINGENCY SCENARIOS - THUS LOSS OF MISSION THAT IS ABORT AND RETURN ON EXISTING WATER AT THE TIME. THE SECONDARY WATER LINE MAY BE USED TO ACCEPT GENERATED WATER, BUT WITH NO H2 REMOVAL CAPABILITY.

REFERENCES:

DATE:6/25/87HIGHEST CRITICALITYHDW/FUSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:1110ABORT:2/2	INC		
ITEM: TANKS INLET ISOLATION VALVE (4) FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:2/2LIFTOFF:2/2TAL:2/2ONORBIT:2/2AOA:2/2DEORBIT:2/2ATO:2/2LANDING/SAFING:3/33/33/3			
LANDING/SAFING: 5/5			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS BAY PART NUMBER: 90V62LV1, LV3, LV5, LV7			
CAUSES: MECHANICAL SHOCK, VIBRATION			
EFFECTS/RATIONALE: EXPULSION OF FUEL CELLS GENERATED WATER INTO THE ECLSS BAY. THE WATER IN THE AFFECTED TANK MAY BE DUMPED OVERBOARD AND THE TANK KEPT EMPTY IF THE LEAK IS ON THE TANK SIDE. THIS WILL REDUCE OPERATIONAL FLEXIBILITY FOR WATER MANAGEMENT. LOSS OF ONE OR MORE REDUNDANT ITEMS MAY FORCE MISSION TO RETURN WITH EXISTING WATER IN THE TANKS AND WATER LEAK INTO THE BAY. IF THE LEAKAGE IS ON THE UPSTREAM SIDE, IT CANNOT BE STOPPED WITHOUT ISOLATING FUEL CELL LINE - SPECIALLY FOR TANK A ISOL VALVE.			
REFERENCES:			

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1111 ITEM: TANKS OUT FAILURE MODE: FAILS TO	LET ISOLATION VALV		3/2R 3/2R
LEAKAGE	· ·	···· · · · ·	
LEAD ANALYST: M.J. SAIID	DI SUBSYS LEA	AD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYS 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	TEM		
	CRITICALITIES		
FLIGHT PHASE HD	W/FUNC ABOR	T HDW/FUN	°C .
PRELAUNCH:	3/3 R	XTLS: 3/2R YAL: 3/2R	1
LIFTOFF:	3/2R T	AL: 3/2R	
ONORBIT:	3/2R A	OA: 3/2R	
DEORBIT:		TO: 3/2R	
LANDING/SAFING:	3/3		
REDUNDANCY SCREENS: A	[2] B[P]	С[Р]	
LOCATION: ECLSS BAY PART NUMBER: 90V62LV2,	LV4, LV6, LV8		
CAUSES: CONTAMINATION, VIBRATION	MECHANICAL SHOCK,	PIECE-PART FAI	LURE,
EFFECTS/RATIONALE: LOSS OF CAPABILITY TO IS DOWNSTREAM VALVES (CROSS ISOLATE TANKS A, B FROM MORE SEVERE AND LESS FLE INTEGRITY MAY NOT BE PRO	OLATE THE AFFECTED OVER VALVE OR DUMP C & D. HOWEVER, W XIBLE. FURTHERMOR) TANK FROM WAT ? VALVE) MAY BE (ATER MANAGEMEN	ER LINE. USED TO T WILL BE
	1997 - 19		
REFERENCES:			

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1112	HIGHEST CRITICALITY FLIGHT: ABORT:	3/2R
ITEM: TANKS OUTLET ISOLAT FAILURE MODE: FAILS TO REMAIN OPE FLOW		RICTED
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)		
CRITICA	1.777789	
FLICHT DHASE HOW/FINC		IC
	BTLS · 3/2R	
$\frac{1111011}{00000000000000000000000000000$	AOA: 3/2R	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/2R ONORBIT: 3/2R DEORBIT: 3/2R	ATO: 3/2R	
LANDING/SAFING: 3/3		
HANDING/ DAI INC. 3/ 5		
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS BAY		
PART NUMBER: 90V62LV2, LV4, LV6,	LV8	
CAUSES: CONTAMINATION, MECHANICAI	SHOCK, PIECE-PART FAI	LURE,

EFFECTS/RATIONALE:

LOSS OF WATER USAGE FROM THE AFFECTED TANK FORCING MORE PERIODIC DUMPS AND LESS WATER RESERVED FOR CONTINGENCY P/L BAY DOOR PROBLEM. LOSS OF FUNCTION (WATER MANAGEMENT) WILL FORCE WATER DUMPS THROUGH FUEL CELLS LINE, AND WILL FORCE FES SHUTDOWN. MISSION IS TERMINATED AND RETURNED WITHOUT FES OPS. LOSS OF FES OPERATION DURING ENTRY AND ASCENT IS NOT FULLY UNDERSTOOD WITHOUT TEST/ANALYSIS RESULTS. WASTE WATER MAY BE USED FOR FES, BUT SEVERE CONTAMINATION WILL OCCUR IN THE LINES.

REFERENCES:

VIBRATION

REPORT DATE 10/23/87

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SUBSYSTEM: LIFE SUPPORT MDAC ID: 1113 ITEM: TANKS OUTLET ISOLATION	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2
FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: M.J. SAIIDI SUBSY	S LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICALIT	TES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 2/2 ONORBIT: 2/2 DEORBIT: 2/2 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 2/2 TAL: 2/2 AOA: 2/2 ATO: 2/2
REDUNDANCY SCREENS: A [] B	[] C[]
LOCATION: ECLSS BAY PART NUMBER: 90V62LV2, LV4, LV6, LV8	
CAUSES: MECHANICAL SHOCK, VIBRATION	
EFFECTS/RATIONALE: EXPULSION OF WATER INTO THE ECLSS BAY SHOOTS IN THE ASSOCIATED EQUIPMENT. DRAINED AND ISOLATED (SHUTOFF INLET V FUNCTIONAL LOSS WILL PRECLUDE SUPPLY UNDER SEVERE LEAKAGE (LEAKAGE >> GENE WASTE WATER. AN EXTERNAL LEAKAGE ON ISOLATED AND MAY DRAIN THE TANK CONTE BAY.	THE AFFECTED TANK MUST BE ALVE) IF LEAKAGE IS SEVERE. WATER FOR FES USAGE RATION). FES OPS MAY USE UPSTREAM SIDE CANNOT BE

REFERENCES:

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1114	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R 3/2R
ITEM: SWITCH, INLE FAILURE MODE: PHYSICAL BIN			
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD	: M.J. SAIID	I
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	ſ		
	CRITICALITIES		
FLIGHT PHASE HDW/H	UNC ABORT	HDW/FUI	NC
PRELAUNCH: 3/3	3 RT	LS: 3/2R	
LIFTOFF: 3/2	R TA	L: 3/2R	
ONOPRIT: 3/2		Δ· 3/2P	
		$\sim 2/2D$	
FLIGHT PHASE HDW/H PRELAUNCH: 3/3 LIFTOFF: 3/2 ONORBIT: 3/2 DEORBIT: 3/2	IR AI	0: 3/2R	
LANDING/SAFING: 3/3	å –		
REDUNDANCY SCREENS: A [2	2] B[P]	С[Р]	
	13 DTM		
LOCATION: PNL R12A2 - C	ABIN		
PART NUMBER: S3, 9, 14 ANI) 6		
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: THIS FAILURE MODE (PHYSICALLY JAMMED IN CLOSED POSITION) WILL PREVENT OPENING OF THE INLET ISOL VALVE TO ALLOW FLOW OF WATER TO THE AFFECTED TANK - THAT IS LOSS OF ONE TANK FROM WATER MANAGEMENT SCENARIO. FUNCTIONAL LOSS OF REDUNDANT ITEMS WILL HAVE SAME EFFECTS AS MDAC-1109.			
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REFERENCES:

REPORT DATE 10/23/87

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 1115	ORT	HIGHEST	CRITICALITY FLIGHT: ABORT:	
ITEM: SWITCH FAILURE MODE: SHORTE	, INLET ISOL V D, SINGLE CONT	ALVE (4) ACT		
LEAD ANALYST: M.J. SA	IIDI SUB	SYS LEAD:	: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUB: 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	SYSTEM			
	CRITICAL			
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	3/3 3/2R 3/2R 3/2R 3/2R	RTI TAI AOP	HDW/FUN LS: 3/2R L: 3/2R A: 3/2R D: 3/2R	
REDUNDANCY SCREENS:	A [2]	B [P]	С[Р]	
LOCATION: PNL R12 PART NUMBER: S3, 9, CAUSES: CONTAMINATION EFFECTS/RATIONALE: A SHORT ACROSS "CLOSE THAN ACROSS "OPEN" CO WILL BE ISOLATED FROM AS EXPLAINED FOR INLE	14 AND 6 N, CORROSION " CONTACTS IS NTACTS. IN TH GENERATED WAT	IS CASE, ER LINE A	THE AFFECTED AND THE EFFEC	TANK

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REFERENCES:

REPORT DATE 10/23/87

SUBSYSTEM:LIFE SUPPORTFLIGHT:3MDAC ID:1116ABORT:3ITEM:SWITCH, INLET ISOL VALVE (4)	/FUNC 3/3 3/3
FAILURE MODE: OPEN (ELECTRICAL), SINGLE CONTACT	
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: 3/3 RTLS: 3/3	
PRELAUNCH: 3/3 RTLS: 3/3	
LIFTOFF: 3/3 IRD. 3/3	
ONORBIT: 3/3 AOA: 3/3	
DEORBIT: 3/3 ATO: 3/3	
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [] B [] C []	<u> </u>
LOCATION: PNL R12A2 - CABIN PART NUMBER: S3, 9, 14 AND 6	44 4 10 F V
CAUSES: CONTAMINATION, MECHANICAL SHOCK, VIBRATION	
EFFECTS/RATIONALE:	

A SINGLE CONTACT OPEN ACROSS "OPEN" PINS WILL PREVENT OPENING OF THE ISOL VALVE THEREFORE ISOLATING THE AFFECTED TANK FROM GENERATED WATER LINE - SEE MDAC-1109. HOWEVER, THE VALVES ARE ALL CONFIGURED TO OPEN POSITION THROUGHOUT MISSION, AND NO CREW ACTION IS ANTICIPATED TO CLOSE THEM.

REFERENCES:

REPORT DATE 10/23/87

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1117	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: POSITION INDICATION, FAILURE MODE: LOSS OF OUTPUT	ISOL VALVE SWITCH (8)
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	
REDUNDANCY SCREENS: A []	в[]. С[]
LOCATION: PNL R12A2 - CABIN PART NUMBER: DS1, 2, 5, 2*6, 7, 9,	10

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CAUSES: PIECE-PART STRUCTURE

EFFECTS/RATIONALE: LOSS OF BARBER POLE VALVE POSITION INDICATION IS INSIGNIFICANT SINCE THE VALVE POSITION CAN BE VERIFIED BY CHANGE OF WATER IN THE TANK AND TELEMETRY DATA.

REFERENCES:

REPORT DATE 10/23/87 C-24

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1118	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: RESISTOR, ISOL VA FAILURE MODE: OPEN (ELECTRICAL)	LVE SWITCH (8) , LOSS OF OUTPUT
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITI	CALITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: PNL R12A2 - CABIN PART NUMBER: A3R1/42, A6R1/R2,	A9R1/R2, A4R1/R2
CAUSES: THERMAL SHOCK	
EFFECTS/RATIONALE: OPEN RESISTOR WILL RESULT IN LOS THE MDM OTHERWISE NO MAJOR IMPAC	S OF VALVE POSITION INDICATION TO T.
REFERENCES:	

REPORT DATE 10/23/87

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1119	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: DIODE, ISOL VALVE S FAILURE MODE: OPEN (ELECTRICAL),	
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	RTLS: 3/3 TAL: 3/3
ONORBIT: 3/3	AOA: 3/3
DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO: 3/3
LANDING/SAFING: 5/5	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: PNL R12A2 - CABIN PART NUMBER: A10CR1/CR2, A10CR6/C	R7, A10CR9/CR10, A5CR1/CR2
CAUSES: THERMAL SHOCK	
EFFECTS/RATIONALE: OPEN DIODE WILL RESULT IN LOSS OF ON THE BARBER POLE, OTHERWISE NO M	
REFERENCES :	

REPORT DATE 10/23/87

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1120		HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: SOLENOID, FAILURE MODE: OPEN (ELE	, INLET ISOL ECTRICAL), F	VALVE (4) AILS TO ST	ART/STOP	
LEAD ANALYST: M.J. SAIII	DI SUB	SYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYS 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	STEM			
	CRITICAL	ITIES		
FLIGHT PHASE HI PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	DW/FUNC	ABORT	HDW/FUN	C
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	[]	B[]	с[]	
LOCATION: ECLSS BAY				
PART NUMBER: 90V62LV1,	3,5&7			
CAUSES: CONTAMINATION,	PIECE-PART	FAILURE		
EFFECTS/RATIONALE:				
LOSS OF CAPABILITY TO O	PERATE THE A	FFECTED VA	LVE - THE V	ALVE
REMAINS IN ITS EXISTING	POSITION.	THE WORST	CASE IS CON	SIDERED

LOSS OF CAPABILITY TO OPERATE THE AFFECTED VALVE - THE VALVE REMAINS IN ITS EXISTING POSITION. THE WORST CASE IS CONSIDERED FOR WANTING TO CLOSE THE VALVE (VALVE IS CONFIGURED OPEN THROUGHOUT MISSION) IN ORDER TO ISOLATE THE TANK. HOWEVER, THIS SCENARIO WOULD BE OFF-NOMINAL AND UNDER MULTIPLE CONDITION.

REFERENCES:

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REPORT DATE 10/23/87

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 1121	RT	HIGHEST C	RITICALITY FLIGHT: ABORT:	
ITEM: SOLENOI FAILURE MODE: FAILS T	D, INLET ISOL O REMAIN OPEN	VALVE (4) , SHORTED	LATCH	
LEAD ANALYST: M.J. SAI	IDI SUB	SYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBS 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	YSTEM		2	·
	CRITICAL	ITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LNTING (SAFING:	HDW/FUNC	ABORT	HDW/FUN : 3/2R	С
PRELAUNCH:	3/3	RTLS	: 3/2R	
LIFTOFF:	3/2R	TAL:	3/2R	
ONORBIT:	3/2R	AOA:	3/2R	
DEORBIT:	3/2R	ATO:	3/2R	•
LANDING/SAFING:	3/3			
REDUNDANCY SCREENS:	A [2]	В[Р]	С[Р]	
LOCATION: ECLSS BA PART NUMBER: 90V62LV1				
CAUSES: CONTAMINATION	, PIECE-PART	FAILURE, C	ORROSION	
FFFFCMC /DAMIONALE.				
EFFECTS/RATIONALE: LOSS OF CAPABILITY TO	ODEN THE VALV	ד ייעדוכ ייע	F AFFFCTINC	TANK
WILL BE ISOLATED FROM				

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WILL BE ISOLATED FROM THE GENERATED WATER LINE RESTRICTING FLEXIBILITY IN WATER MANAGEMENT. SAME EFFECT AS THE VALVE FAILED TO OPEN - MDAC-1109. THE FAILURE MAY NOT BE READILY APPARENT TO BE DUE TO SOLENOID FAILURE.

REFERENCES:

REPORT DATE 10/23/87

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1122	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: SOLENOID, OUTLET FAILURE MODE: FAILS TO REMAIN O TO START/STOP	ISOL VALVE (4) LOSED, OPEN (ELECTRICAL), FAILS
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
	ICALITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	RTLS: 3/3 TAL: 3/3
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS BAY PART NUMBER: 90V62LV2, 4, 6, 8	- · · ·
CAUSES: CONTAMINATION, THERMAL	SUCK

EFFECTS/RATIONALE:

NO MAJOR EFFECT SINCE ALL THE VALVES REMAIN OPEN (NOMINAL CONFIGURATION) EXCEPT FOR TANK A. TANK A WOULD REMAIN CLOSED THROUGHOUT MISSION, BUT COULD NOT BE USED FOR ADDITIONAL WATER REQUIREMENT TO SUSTAIN NOMINAL MISSION. THE LATCH FAILURE MAY NOT BE READILY APPARENT.

REFERENCES:

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 1123	DRT		TICALITY LIGHT: BORT:	HDW/FUNC 3/2R 3/2R
ITEM: SOLENOI FAILURE MODE: FAILS T	ID, OUTLET ISOI TO REMAIN OPEN,		тсн	
LEAD ANALYST: M.J. SAI	IIDI SUBS	YS LEAD: M.	J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBS 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	SYSTEM			
	CRITICALI	TIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 3/3 3/2R 3/2R 3/2R 3/2R		3/2R 3/2R	2
REDUNDANCY SCREENS:	A [2] B	[P]	C [P]	

LOCATION: ECLSS BAY PART NUMBER: 90V62LV2, 4, 6, 8

CAUSES: CONTAMINATION, CORROSION

EFFECTS/RATIONALE:

THIS FAILURE WILL FORCE THE VALVE TO CLOSE THEREBY PRECLUDING THE TANK FOR FES/DUMP OPS AND RESERVE REQUIREMENT. THE EFFECT WILL BE SAME AS ISOL VALVE FAILED CLOSED, MDAC-1112. THE FAILURE MAY NOT BE READILY APPARENT TO BE DUE TO SOLENOID.

REFERENCES:

REPORT DATE 10/23/87

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DATE:6/25/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1124ABORT:3/3
ITEM: CB, INLET ISOL VALVE (4) FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO OPEN, OPEN (ELECTRICAL)
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: PNL ML86B PART NUMBER: CB1, 5, 7, 12

CAUSES: CONTAMINATION, MECHANICAL SHOCK, THERMAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

LOSS OF POWER TO OPERATE THE INLET ISOL VALVES. HOWEVER, NO MAJOR IMPACT SINCE THE VALVE REMAIN IN THEIR OPERATING POSITIONS. WITH A SUBSEQUENT FAILURE, THE TANK(S) COULD NOT BE ISOLATED FROM LINE - MULTIPLE FAILURE.

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REFERENCES:

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REPORT DATE 10/23/87

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1125	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: CB, INLET ISOL VALV FAILURE MODE: FAILS TO REMAIN OPE		to open	
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD	: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	·		
CRITICA	LTTTES		
FLIGHT PHASE HDW/FUNC	ABORT	,	C
PRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3	RT	LS: 3/3	
LIFTOFF: 3/3	TA	L: 3/3	
ONORBIT: 3/3	AO		
DEORBIT: 3/3	ATC	D: 3/3	
LANDING/SAFING: 3/3	•		
REDUNDANCY SCREENS: A []	В[]	с[]	
LOCATION: PNL ML86B PART NUMBER: CB1, 5, 7, 12	• •		
ONTOFICE CONTINUETON CORDOCTON			

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CAUSES: CONTAMINATION, CORROSION

EFFECTS/RATIONALE:

NO MAJOR PROBLEM, EXCEPT FOR LOSS OF OVERLOAD CIRCUIT PROTECTION.

REFERENCES:

REPORT DATE 10/23/87

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DATE:6/25/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1126ABORT:3/3	
ITEM: CB, OUTLET ISOL VALVE (4) FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, OPEN (ELECTRICAL)	
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC	
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3	
LIFTOFF: 3/3 TAL: 3/3	
ONORBIT: $3/3$ AOA: $3/3$	
DEORBIT: 3/3 ATO: 3/3	
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: PNL ML86B PART NUMBER: CB2, 3, 6, 11	
CAUSES:	
EFFECTS/RATIONALE:	-

LOSS OF CAPABILITY TO RE-CONFIGURE THE VALVES. HOWEVER, NO MAJOR PROBLEM SINCE THE VALVES REMAIN IN THEIR NOMINAL OPERATING POSITION, EXCEPT THAT TANK A WATER WOULD NO LONGER BE AVAILABLE IF NEEDED. WATER MANAGEMENT IS DO-ABLE.

REFERENCES:

REPORT DATE 10/23/87

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DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1127	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: CB, OUTLET ISOL VALVE FAILURE MODE: FAILS TO REMAIN OPEN,	
LEAD ANALYST: M.J. SAIIDI SUBS	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICALI	TIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORTHDW/FUNCRTLS:3/3TAL:3/3AOA:3/3ATO:3/3
REDUNDANCY SCREENS: A [] B	c[] c[]
LOCATION: PART NUMBER:	· · · · · · · · · · · · · · · · · · ·
CAUSES: CONTAMINATION	
EFFECTS/RATIONALE: NO MAJOR IMPACT EXCEPT FOR LOSS OF O	VERLOAD CIRCUIT PROTECTION.
REFERENCES:	•••••••••••••••••

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1128	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/2R	
ITEM: TANKS A, B, C A FAILURE MODE: INTERNAL LEAKAG	ND D (4) SE, RUPTURE BLADDER	
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)		
CR	ITICALITIES	
FLIGHT PHASE HDW/FUNG	ABORT HDW/FUNC RTLS: 3/2R	
PRELAUNCH: 3/3	$\frac{RTLS: 3/2R}{2}$	
LIFTOFF: 3/2R	TAL: 3/2R	
ONORBIT: 3/2R DEORBIT: 3/2R	AOA: 3/2R	
LANDING/SAFING: 3/3	ATO: 3/2R	
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS BAY PART NUMBER: 90V62TK1, 2, 3		
PARI NUMBER. 900021R1, 2, 5		
CAUSES: OVERLOAD, STRUCTURAL	FAILURE	
EFFECTS/RATIONALE: THE RUPTURE OF BLADDER WILL RESULT IN HIGH PRESSURE NITROGEN TO MIX AND FLOW DOWN THE WATER LINE TO FES/DUMP NOZZLE, CAUSING POSSIBLE SHUTDOWN OF FES AND ICING OF THE DUMP NOZZLE UPON DUMP. ALSO THE NITROGEN WILL BE CONSUMED VERY RAPIDLY. THE TANK SHOULD BE ISOLATED FROM THE LINE WHICH MAKES THE WATER MANAGEMENT MORE STRINGENT. LOSS OF FUNCTION WILL FORCE DUMPING OF GENERATED WATER THROUGH THE FUEL CELLS DEDICATED VENT LINE AND RETURN WITH FES ON WASTE WATER.		
REFERENCES:		

REPORT DATE 10/23/87 C-35

DATE: 6/25/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1129 ITEM: TANKS A, B, C FAILURE MODE: EXTERNAL LEAKA		
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SATIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	SUBSIS LEAD. M.S. SAIIDI	
CR	ITICALITIES	
FLIGHT PHASE HDW/FUN	C ABORT HDW/FUNC	
PRELAUNCH: 3/3	RTLS: $3/1R$	
LIFTOFF: 3/1R	TAL: $3/1R$	
ONORBIT: 3/1R DEORBIT: 3/1R	AOA: 3/1R	
DEORBIT: 3/1R	ATO: 3/1R	
LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS BAY PART NUMBER: 90V62TK1, 2, 3 AND 4		
CAUSES: MECHANICAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: AN EXTERNAL LEAK OF GN2 INTO THE CABIN WILL RAISE THE PPN2 IN THE CABIN, FORCING CABIN POSITIVE RELIEF VALVE TO CONTINUOUSLY VENT		

CABIN, FORCING CABIN POSITIVE RELIEF VALVE TO CONTINUOUSLY VENT CABIN ATMOSPHERE. THE TANK MUST BE ISOLATED FROM THE LINE, THUS NEGATING ITS USE FOR WATER MANAGEMENT. LOSS OF FUNCTION MAY REQUIRE WASTE WATER CROSS-TIE TO SUPPORT FES UPON ENTRY. LOSS OF FUNCTION WITHOUT CREW ACTION WILL DEPLETE GN2 SUPPLY REQUIRED FOR CABIN PRESSURE MAINTENANCE.

REFERENCES:

DATE: 6/25/87 SUBSYSTEM: LIFE SUPP MDAC ID: 1130	ORT	HIGHEST CRI I A	ITICALITY FLIGHT: ABORT:	3/2R
ITEM: TANKS FAILURE MODE: PHYSIC	A, B, C AND D AL BINDING/JAI		BELLOWS	
LEAD ANALYST: M.J. SA	IIDI SU	BSYS LEAD: M.	J. SAIIDI	
BREAKDOWN HIERARCHY: 1) ERROR 2) SUPPLY WATER SUB: 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	System	·		
	CRITICA	LTTTES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC 3/3 3/2R 3/2R 3/2R 3/2R	ABORT RTLS: TAL: AOA: ATO:	HDW/FUN 3/2R 3/2R 3/2R 3/2R 3/2R	с
REDUNDANCY SCREENS:	A [2]	В [Р]	С[Р]	•
LOCATION: PART NUMBER: CAUSES: CONTAMINATION		FAILURE	••• 2000 - 10 2000 - 10	untie teas
EFFECTS/RATIONALE: LOSS OF PRESSURE TO E FUNCTION (PRESSURIZAT CROSS-TIE IN ORDER TO WASTE TANK.	ION) IN ALL TA	ANKS MAY FORC	E WASTE W	ATER
REFERENCES:				

REPORT DATE 10/23/87

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1131	HIGHEST CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R 3/2R
ITEM: SENSOR, TANKS QUANTI FAILURE MODE: FAILS OUT OF TOLERANG ERRONEOUS OUTPUT, LOSS OF OUTPUT		RATION,
LEAD ANALYST: M.J. SAIIDI SUBS	SYS LEAD: M.J. SAIID	I
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)		
CRITICAL	ITTES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/2R ONORBIT: 3/2R DEORBIT: 3/2R LANDING/SAFING: 3/3	ABORT HDW/FUI RTLS: 3/2R TAL: 3/2R AOA: 3/2R ATO: 3/2R	NC
REDUNDANCY SCREENS: A [2]	B [P] C [P]	
LOCATION: ECLSS BAY PART NUMBER: V62Q0410A, 420A, 548A	, 544A	
CAUSES: CONTAMINATION, MECHANICAL S	SHOCK, THERMAL SHOCK	,

EFFECTS/RATIONALE:

LOSS OF A SINGLE TRANSDUCER IS NOT SIGNIFICANT. THE WATER QUANTITY CAN BE ESTIMATED BY WATER GENERATION MINUS USAGE. HOWEVER, LOSS OF FUNCTION (NO WATER MEASUREMENT) MAY CAUSE OVER FILLING OF THE TANKS, AND FLOODING OF THE FUEL CELLS - NOMINAL DUMP SCHEDULES BUILT INTO THE FLIGHT PROCEDURE SHOULD PRECLUDE THIS. PRECISE WATER REQUIREMENT/RESERVES MAY NOT BE MET. _

REFERENCES:

DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:1132ABORT:3/2R
ITEM: FILTER, GN2-TANKS INLET (4) FAILURE MODE: RESTRICTED FLOW
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/2RLIFTOFF:3/2RTAL:3/2RONORBIT:3/2RAOA:3/2RDEORBIT:3/2RATO:3/2RLANDING/SAFING:3/33/3
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: ECLSS BAY PART NUMBER: 90V62FL1, FL2, FL4, FL5
CAUSES: CONTAMINATION
EFFECTS/RATIONALE: LOSS OF PRESSURIZATION TO EXPEL WATER FOR FES, DUMP, AND CREW USAGE. A SINGLE FAILURE WILL HAVE MINOR PROBLEM FOR TANK A ONLY - WATER MAY NOT FLOW EASILY. LOSS OF FUNCTION (EXPULSION OF WATER) MAY REQUIRE CROSS-TIE TO SUPPORT FES FROM WASTE TANK AND RETURN. FAILURE MAY BE DETECTED BY NO CHANGE IN THE TANK QUANTITY.
REFERENCES:

REPORT DATE 10/23/87

DATE: 7/09/87 HI SUBSYSTEM: LIFE SUPPORT MDAC ID: 1133	GHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: FILTER, GN2-TANKS INLET FAILURE MODE: STRUCTURAL FAILURE (RUP	
LEAD ANALYST: M.J. SAIIDI SUBSYS	LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICALITI	ES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A [] B [] c[]
LOCATION: ECLSS BAY PART NUMBER: 90V62FL1, FL2, FL4, FL5	
CAUSES: STRUCTURAL FAILURE	
EFFECTS/RATIONALE: UNDER A SINGLE FAILURE, THERE IS NO MA A SUBSEQUENT BLADDER RUPTURE WATER WIL	
REFERENCES:	

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1134	HI	GHEST CRITIC FLIG ABOR	ALITY HDW/FUNC HT: 3/3 T: 3/3
ITEM: SENSOR, PR FAILURE MODE: FAILS OUT ERRONEOUS OUTPUT, LOSS OF	OF TOLERANCE,	INTERMITTEN	T OPERATION,
LEAD ANALYST: M.J. SAIIDI	SUBSYS	LEAD: M.J.	SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYST 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)			
	CRITICALITI	ES	
FLIGHT PHASEHDWPRELAUNCH:3LIFTOFF:3ONORBIT:3DEORBIT:3	/FUNC	ABORT H	DW/FUNC
PRELAUNCH: 3	/3	RTLS: TAL: AOA:	3/3
LIFTOFF: 3	/3	TAL:	3/3
	/3	AUA:	3/3
LANDING/SAFING: 3	/3	A10.	5/5
REDUNDANCY SCREENS: A [] B [] C	[]
LOCATION: OUTLET OF M PART NUMBER: V62P0430A	ICROBIAL FILT	ER	
CAUSES: MECHANICAL SHOCK	, THERMAL SHO	CK, VIBRATIO	N
		·	
EFFECTS/RATIONALE: LOSS OF WATER LINE PRESSU SENSOR IS NOT TERRIBLY IM PROVIDE ADEQUATE SUPPORT.	PORTANT - TAN		
REFERENCES:			
REPORT DATE 10/23/87	C-41		

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1135	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 2/2
ITEM: RELIEF VALVE, FAILURE MODE: FAILS TO OPEN	1.5 PSID (2) , RESTRICTED FLO	W	
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD	: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	 予想 2011 へ -	n at in	n n n n n n kan kan n n n
C	RITICALITIES		
FLIGHT PHASE HDW/FU	NC ABORT	HDW/FUN	с
PRELAUNCH: 3/3	RTI	LS: 2/2	. =
LIFTOFF: 2/2	TAI	5: 2/2	
ONORBIT: 2/2		A: 2/2	
DEORBIT: 2/2 LANDING/SAFING: 3/3	АТС): 2/2	
REDUNDANCY SCREENS: A [] B[]	C []	
LOCATION: ECLSS BAY PART NUMBER: 90V62RV1 AND R	V2		
CAUSES: CONTAMINATION, PIEC	E-PART FAILURE		

EFFECTS/RATIONALE:

THE FAILURE OF EITHER VALVE WILL PRECLUDE THE PRIMARY WATER LINE. THE WATER FROM FUEL CELLS WILL BE FLOWN TO THE TANKS THROUGH THE NEWLY DESIGNED SECONDARY BUT WITH NO HYDROGEN REMOVAL CAPABILITY. THE FAILURE OF FIRST VALVE WILL ISOLATE TANKS B, C, AND D FROM THE LINE, AND THE FAILURE OF THE SECOND VALVE WILL ISOLATE TANKS C & D. AT ANY RATE, THERE WILL BE LESS STORAGE CAPABILITY FOR WATER MANAGEMENT/RESERVE.

REFERENCES:

REPORT DATE 10/23/87

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DATE: 7/09/ SUBSYSTEM: LIFE SU MDAC ID: 1136	'87 JPPORT	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: RELI FAILURE MODE: FAIL	EF VALVE, 1.5 Parts TO CLOSE, INT	SID (2) Ernal leaka	GE	
LEAD ANALYST: M.J.	SAIIDI SU	BSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY 1) LIFE SUPPORT (2) SUPPLY WATER (3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	SYSTEM SUBSYSTEM			· · ·
	CRITICA	LITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAF	HDW/FUNC 3/3 3/3 3/3 3/3 3/3 ING: 3/3	ABORT RTLS TAL: AOA: ATO:	HDW/FUN : _3/3 3/3 3/3 3/3	с
REDUNDANCY SCREENS	: A[]	B[]	с[]	
LOCATION: ECLS PART NUMBER: 90V6	S BAY 2RV1 AND RV2			1997 - 1999 1997 - 1997 1997 - 1997
CAUSES: CONTAMINA	TION, PIECE-PART	FAILURE		
EFFECTS/RATIONALE: NO MAJOR IMPACT, E STOPPED WITH A SUB	XCEPT THAT THE E SEQUENT FAILURE	ACK FLOW OF (DOUBLE FAI	WATER CANN LURE).	IOT BE
REFERENCES:				

REPORT DATE 10/23/87

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SUBSYSTEM: LIFE SUPPORT F	TICALITY HDW/FUNC LIGHT: 2/2 BORT: 2/2
ITEM: RELIEF VALVE, 1.5 PSID (2) FAILURE MODE: EXTERNAL LEAKAGE	· · · · · · · · · · · · · · · · · · ·
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.	J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTPRELAUNCH:3/3RTLS:LIFTOFF:2/2TAL:ONORBIT:2/2AOA:DEORBIT:2/2ATO:LANDING/SAFING:3/3REDUNDANCY SCREENS:A []B []	2/2 2/2 2/2 2/2
LOCATION: ECLSS BAY PART NUMBER: 90V62RV1 AND RV2	c []
CAUSES: MECHANICAL SHOCK, VIBRATION	
EFFECTS/RATIONALE: THIS FAILURE WILL RESULT IN CONTINUOUS FLOW OF W ECLSS BAY, AND POSSIBLY CAUSING CORROSION AND EI THE EXTERNAL LEAKAGE CANNOT BE STOPPED WITHOUT S FUEL CELLS. MISSION IS ABORTED AND RETURNED WIT WATER IN THE TANKS AND EXTERNAL LEAKAGE.	ECTRICAL SHORTS. HUTTING DOWN THE
REFERENCES:	

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1138	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: QD, GSE FILL/DRAI FAILURE MODE: INABILITY TO MATE	
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITI	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: /NA DEORBIT: /NA	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: /NA TAL: /NA
ONORBIT: /NA	TAL: /NA AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: FWD FUSELAGE PART NUMBER: 90V62TP80, 80V62TP	85
CAUSES: CONTAMINATION, PIECE-PA	RT FAILURE
EFFECTS/RATIONALE: THIS FAILURE WILL ONLY AFFECT TH AND NOT APPLICABLE TO FLIGHT. N ANTICIPATED.	E PRELAUNCH/POSTLANDING OPERATION O SIGNIFICANT PROBLEM IS
REFERENCES:	

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DATE: 7/09/8 SUBSYSTEM: LIFE SUP MDAC ID: 1139	7 PORT		ITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: QD, G FAILURE MODE: FAILS	SE FILL/DRAIN (TO OPEN, RESTR	2) ICTED FLOW		· · · · · · · · · · · · · · · · · · ·
LEAD ANALYST: M.J. S	AIIDI SUB	SYS LEAD: M	.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SY 2) SUPPLY WATER SU 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	STEM BSYSTEM			
	CRITICAI	ITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFIN	HDW/FUNC 3/3 /NA /NA /NA G: 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUN /NA /NA /NA /NA	C
REDUNDANCY SCREENS: LOCATION: FWD FU	SELAGE	B[]	c []	t i i
PART NUMBER: 90V62T	P80, 80V62TP85			
CAUSES: CONTAMINATI		FAILURE		
EFFECTS/RATIONALE: LOSS OF RECHARGE/SER	VICING ACTIVIT	ES - THE UN	IT MÁY BE	REPLACED.
REFERENCES:				

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REPORT DATE 10/23/87

MDAC ID: ITEM:	QD, GSE FILL	/DRAIN (2		CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
FAILURE MOD	E: FAILS TO CLO	SE			
LEAD ANALYS	T: M.J. SAIIDI	SUBS	YS LEAD:	M.J. SAIIDI	
	UPPORT SYSTEM WATER SUBSYSTEM			- - -	
		CRITICALI			
PREL LIFT ONOR DEOR	OFF: /N BIT: /N	A A A	ABORT RTI TAI AOA ATC	LS: /NA L: /NA A: /NA	с
REDUNDANCY	SCREENS: A [] E	•[]	c[]	
	FWD FUSELAGE : 90V62TP80, 80	V62TP85			
CAUSES: CO	NTAMINATION, PIE	CE-PART F	AILURE		-
EFFECTS/RAT LOSS OF REC REPLACED.	IONALE: HARGE/SERVICING	OF THE TA	INKS – TH	IE UNIT MAY B	E
REFERENCES:					
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REPORT DATE 10/23/87

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1141		HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 2/2
ITEM: QD, GSE FIL FAILURE MODE: EXTERNAL LEA		2)		
LEAD ANALYST: M.J. SAIIDI	SUBS	SYS LEAD	: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)				·
	CRITICAL	ITIES		
FLIGHT PHASEHDW/IPRELAUNCH:3/3LIFTOFF:2/3ONORBIT:2/3DEORBIT:2/3LANDING/SAFING:3/3	FUNC 3 2 2 2 3	ABORT RT: TA: AO: ATO	HDW/FUN LS: 2/2 L: 2/2 A: 2/2 O: 2/2	Ċ
REDUNDANCY SCREENS: A [] 1	в[]	с[]	
LOCATION: FWD FUSELAGE PART NUMBER: 90V62TP80, 80				
CAUSES: MECHANICAL SHOCK,	VIBRATION	N		
EFFECTS/RATIONALE: THE LEAKAGE FROM THE FILL I STOPPED, AND IF SEVERE, IT REPLENISHED - LIMITED WATEN SIDE OF THE VEHICLE. THE I CAN BE STOPPED BY ISOLATING MANAGEMENT BECOMES TOO STR ENOUGH RESERVE FOR CERTAIN	WILL PREY R MANAGEMI LEAKAGE WI G TANKS C INGENT ANI	VENT THE ENT, AND ITH THE I AND D. I D LESS FI	TANKS FROM B POSSIBLE ICI DRAIN DISCONN HOWEVER, WATE	EING NG ON THE ECT R

REFERENCES:

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REPORT DATE 10/23/87 C-48

DATE:7/09/87HIGHEST CRITICALITY HDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:1142ABORT:3/2R								
ITEM: QD, GSE FILL/DRAIN (2) FAILURE MODE: INTERNAL LEAKAGE								
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI								
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)								
CRITICALITIES								
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/2RLIFTOFF:3/2RTAL:3/2RONORBIT:3/2RAOA:3/2RDEORBIT:3/2RATO:3/2RLANDING/SAFING:3/33/3								
REDUNDANCY SCREENS: A [2] B [P] C [P]								
LOCATION: FWD FUSELAGE PART NUMBER: 90V62TP80, 80V62TP85								
CAUSES: MECHANICAL SHOCK, VIBRATION								
EFFECTS/RATIONALE: AN INTERNAL LEAKAGE THROUGH THE QD WILL HAVE NO EFFECT SINCE THE CAP PROVIDES A REDUNDANT SEAL. HOWEVER, WITH SUBSEQUENT FAILURE OF THE CAP, THE WATER LEAKAGE CANNOT BE STOPPED FROM THE FILL LINE CAUSING ICING AND LOSS OF WATER MANAGEMENT.								
REFERENCES:								

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DATE: SUBSYSTE MDAC ID:	EM:	LIFE SU			HI	GHEST	FLI	CALITY GHT: RT:	HDW/FUNC 3/3 /NA
ITEM: FAILURE	MODE	CAP, : INAE	GSE SILITY	QD (2) TO MAT	e/Demai	'E			
LEAD ANA	LYST	: M.J.	SAIID	I	SUBSYS	LEAD:	: M.J.	SAIIDI	
BREAKDOW 1) LIF 2) SUF 3) TAN 4) 5) 6) 7) 8) 9)	FE SU PPLY	PPORT S WATER S	YSTEM						
				CRIT	ICALITI	ES			
FLIG	HT P	HASE	HD	W/FUNC		ABORT		HDW/FUNG /NA /NA /NA /NA	2
P T	'RELA TETO	UNCH: FF:		3/3 /NA		RTI TAI	.s:	/ NA /NA	
Ō	NORB	IT:		/NA		AOA	4:	/NA	
D)EORB	IT: NG/SAFI	NG:	/NA 3/3		ATC):	/NA	-
REDUNDAN	ICY S	CREENS:	A	[]	B []	с	[]	
LOCATION PART NUM		FWD F	USELA	GE					
CAUSES:	CON	TAMINAT	'ION						
EFFECTS/ THE CAP LIFT OFF	MAY		ACED,	AND TH	E FAILU	RE IS	NOT A	PPLICABI	LE AFTER
REFERENC	:es:								

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DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:1144ABORT:3/2R								
ITEM: CAP, GSE QD (2) FAILURE MODE: EXTERNAL LEAKAGE								
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI								
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)								
CRITICALITIES								
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/2RLIFTOFF:3/2RTAL:3/2RONORBIT:3/2RAOA:3/2RDEORBIT:3/2RATO:3/2RLANDING/SAFING:3/33/3								
REDUNDANCY SCREENS: A [2] B [P] C [P]								
LOCATION: FWD FUSELAGE PART NUMBER:								
CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, VIBRATION								

EFFECTS/RATIONALE:

THE GSE DISCONNECTS ARE SELF-SEALING DISCONNECTS WHICH PREVENT ANY INTERNAL LEAKAGE. UNDER SINGLE FAILURE, THERE WILL BE NO SIGNIFICANT IMPACT. HOWEVER, WITH A SUBSEQUENT FAILURE OF THE QD, THE LEAKAGE CANNOT BE STOPPED AND THE FUEL CELLS WATER WILL CONTINUOUSLY DRAIN OUT CAUSING POSSIBLE ICING AND LOSS OF WATER MANAGEMENT.

REFERENCES:

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1145	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3
ITEM: TANK A PRESSURE CO FAILURE MODE: FAILS TO OPEN	ONTROL VALVE (1)
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GN2 LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: 3/3	TAL: 3/3 AOA: 3/3
ONORBIT: 2/2	AOA: 3/3
ONORBIT: 2/2 DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: /	· · · · · ·
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: CABIN PART NUMBER: PNL-ML26C	
CAUSES: MECHANICAL SHOCK, VIBRA	TION, PIECE-PART FAILURE
EFFECTS/RATIONALE: LOSS OF PRESSURIZATION ON TANK. (NOMINALLY CLOSED) AND ENTRY (WAY	

(NOMINALLY CLOSED) AND ENTRY (WATER AVAILABLE FROM B, C, AND D). ON-ORBIT POTABLE WATER WILL NOT BE AVAILABLE FROM TANK A. WATER FLOW VERY SLOW AND IF NOT ADEQUATE FOR CREW USE WILL HAVE MISSION IMPACT.

REFERENCES:

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ITEM: TANK A PRESSURE CONTROL VALVE (1)	
FAILURE MODE: FAILS TO CLOSE, INADVERTENT OPERATION/OPEN, INTERNAL LEAKAGE	
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GN2 LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING://	
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: /	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: CABIN PART NUMBER: PNL-ML26C	
CAUSES: MECHANICAL SHOCK, VIBRATION, PIECE-PART FAILURE	
EFFECTS/RATIONALE: TANK A WILL BE PRESSURIZED DURING ASCENT WHICH MAY CAUSE WATH BACK PRESSURE TO RISE AND ALLOWS THE GENERATED WATER TO FILL B DIRECTLY (SECONDARY PATH). TANK B IS GENERALLY FULL AND SUPPORT FES DURING ASCENT WILL RATE OF USE MUCH GREATER THAN GENERATION. THEREFORE, NO SIGNIFICANT PROBLEM WILL BE ANTICIPATED.	
REFERENCES:	

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1147	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3							
ITEM: TANK A PRESSURE CONTROL VALVE (1) FAILURE MODE: PHYSICAL BINDING/JAMMING								
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI								
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GN2 LINE ASSEMBLY 4) 5) 6) 7) 8) 9)								
CRI	FICALITIES							
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC							
PRELAUNCH: 3/3								
LIFTOFF: 3/3	TAL: 3/3							
ONORBIT: 2/2	AOA: 3/3							
DEORBIT: 3/3	ATO: 3/3							
LANDING/SAFING: 3/3								
REDUNDANCY SCREENS: A []	B[] C[]							
LOCATION: CABIN PART NUMBER: PNL-ML26C								
CAUSES: CONTAMINATION, MECHANI	ICAL SHOCK, VIBRATION							
EFFECTS/RATIONALE: LOSS OF CAPABILITY TO PRESSURI	ZE TANK A, RESULTING IN PARTIAL							

LOSS OF CAPABILITY TO PRESSURIZE TANK A, RESULTING IN PARTIAL LOSS OF WATER FOR CREW USE. WATER IS STILL AVAILABLE FROM DISPENSER, BUT AT A VERY LOW SPEED - IT MAY NOT BE ADEQUATE FOR HIGH DEMAND. CREW INCONVENIENCE MAY NECESSITATE MAJOR CHANGES IN THE ORIGINAL MISSION PROFILE - REAL TIME CALL. ALSO, ONE TANK LESS IN THE OVERALL WATER MANAGEMENT, THUS MORE STRINGENT AND COMPLICATED WATER MANAGEMENT, RESULTING IN MORE FREQUENT DUMPS OR FES OPS, AND NOT ADEQUATE RESERVE FOR CERTAIN SCENARIOS.

REFERENCES:

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1148	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3
ITEM: TANK A PRES FAILURE MODE: EXTERNAL LE	• •
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTE 3) GN2 LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	M
	CRITICALITIES
FLIGHT PHASE HDW/ PRELAUNCH: 3/ LIFTOFF: 3/ ONORBIT: 2/ DEORBIT: 3/ LANDING/SAFING: 3/	FUNC ABORT HDW/FUNC 3 RTLS: 3/3 3 TAL: 3/3 2 AOA: 3/3 3 ATO: 3/3
REDUNDANCY SCREENS: A [] B[] C[]
LOCATION: CABIN PART NUMBER: PNL-ML26C	
CAUSES: MECHANICAL SHOCK,	VIBRATION
PRESSURE CONTROL SYSTEM.	N INTO CABIN COMPLICATING CABIN A LEAK UPSTREAM OF THE VALVE CANNOT BE LATION OF ALL TANKS FROM GN2 L BE AVAILABLE AS BACK-UP.
REFERENCES:	

REPORT DATE 10/23/87

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SUBS		7/09/87 LIFE SUPP 1149		HIGHEST	CRITICALITY FLIGHT: ABORT:	•
FAIL		E: FAILS	VENT VALVE TO CLOSE, IN		AGE, PHYSICA	L
LEAD	ANALYST	r: M.J. SA	IIDI S	UBSYS LEAD:	M.J. SAIIDI	:
1) 2)	LIFE SU SUPPLY	IERARCHY: JPPORT SYS WATER SUB NE ASSEMBL	System	-		
			CRITIC	ALITIES		
					HDW/FUN	IC
	_	AUNCH:	3/3	RTI	-	
•		OFF:	3/3	TAI	•	
	ONORE	BIT:	2/2	AOA	: 3/3	

ATO:

3/3

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LANDING/SAFING:	3/3				·
REDUNDANCY SCREENS: A	۱	1	B[]	C	′ 1

3/3

LOCATION: CABIN PART NUMBER: PNL-ML26C

DEORBIT:

CAUSES: MECHANICAL SHOCK, PIECE-PART STRUCTURE, VIBRATION

EFFECTS/RATIONALE:

TANK A CANNOT BE PRESSURIZED FROM GN2 LINE. LOSS OF TANK A FROM OVERALL WATER MANAGEMENT. CABIN PRESSURE MAY BE USED TO EXPEL WATER FROM ALL TANKS. LOSS OF ONE TANK FROM PRIMARY WATER MANAGEMENT, THUS LESS RESERVE FOR CERTAIN MISSION REQUIREMENTS. WATER FLOW FROM THE TANK WILL BE SEVERELY DIMINISHED.

REFERENCES:

DATE: 7/09/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 1150 ABORT: 3/3 ITEM: TANK A VENT VALVE (1) FAILURE MODE: FAILS TO OPEN, PHYSICAL BINDING/JAMMING,						
RESTRICTED FLOW						
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI						
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GN2 LINE ASSEMBLY 4) 5) 6) 7) 8) 9)						
CRITICALITIES						
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3						
REDUNDANCY SCREENS: A [] B [] C []						
LOCATION: CABIN PART NUMBER: PNL-ML26C						
CAUSES: CONTAMINATION, PIECE-PART FAILURE						
EFFECTS/RATIONALE: THE VALVE IS USED PRELAUNCH TO VENT TANK A PRESURE TO CABIN. UNDER NOMINAL AND SINGLE FAILURE, NO EFFECT IS ANTICIPATED.						

REFERENCES:

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REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1151	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3
ITEM: TANK A VENT VALVE (1) FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: M.J. SAIIDI SUBS	YS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GN2 LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICALI	TIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: 3/3	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: /NA	TAL: 3/3
ONORBIT: 2/2	AOA: 3/3
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [] E	[] C[]
LOCATION: CABIN PART NUMBER: PNL-ML26C	
CAUSES: MECHANICAL SHOCK, VIBRATION	
EFFECTS/RATIONALE:	<u> </u>

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UNREGULATED FLOW OF NITROGEN INTO THE CABIN AFTER THE TANK IS PRESSURIZED. COMPLICATING CABIN PRESSURE CONTROL SYSTEM TANK SHOULD BE ISOLATED THUS RESULTING IN LOSS A TANK FROM WATER MANAGEMENT SCHEME AND POSSIBLE MISSION IMPACT.

REFERENCES:

REPORT DATE 10/23/87

DATE: SUBSYSTE MDAC ID:	7/09/87 I: LIFE SUPP 1152	ORT	HIGHEST CF	RITICALITY FLIGHT: ABORT:	3/3			
ITEM: FAILURE I	CROSSO IODE: FAILS	VER VALVE (1 TO OPEN, RES	L) STRICTED FLOW		-			
LEAD ANA	LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI							
1) LIF 2) SUP	2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8)							
		CRITI	CALITIES					
FLIG	IT PHASE	HDW/FUNC	ABORT RTLS: TAL: AOA: ATO:	HDW/FUN	C			
P	RELAUNCH:	3/3	RTLS	3/3				
L	FTOFF:	3/3	TAL:	3/3				
0	JORBIT:	3/3	AOA:	3/3				
D	CORBIT:	3/3	ATO:	3/3				
L	ANDING/SAFING	: 3/3						
REDUNDAN	CY SCREENS:	A []	B[]	с [.] []				
	ECLSS E EER: 90V62LV							
CAUSES: CONTAMINATION, SHOCK, VIBRATION, PIECE-PART FAILURE								
EFFECTS/RATIONALE: NO SIGNIFICANT PROBLEM EXCEPT THAT WATER FROM FOUR TANKS WILL NOT BE AVAILABLE AT THE SAME TIME. WITH SINGLE FAILURE OF THIS VALVE ONLY, THE WATER MANAGEMENT AND FES/DUMP OPS ARE DOABLE. TWO TANKS RESERVE IS ADEQUATE FOR NOMINAL ENTRY.								

REFERENCES:

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REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1153	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3		
ITEM: CROSSOVER VALVE (1) FAILURE MODE: FAILS TO CLOSE, INTER	NAL LEAKAGE		
LEAD ANALYST: M.J. SAIIDI SUBS	SYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)			
CRITICALI	TIES		
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3		
REDUNDANCY SCREENS: A [] B	[] [`] c[]		
LOCATION: ECLSS BAY PART NUMBER: 90V62LV13			
CAUSES: MECHANICAL SHOCK, VIBRATION	, CONTAMINATION		
EFFECTS/RATIONALE: DIRECT CAPABILITY IS LOST TO ISOLATE TANK A AND B FROM TANKS C AND D. THIS MAY BE ACCOMPLISHED THROUGH TANKS OUTLET VALVES AND THE FES LINE B ISOL VALVE. HOWEVER, WITH A SUBSEQUENT FAILURE SUCH AS EXTERNAL LEAKAGE ON FES LINE A, THE LEAK CANNOT BE ISOLATED WITHOUT ISOLATING ALL TANKS.			
REFERENCES:			
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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1154	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2
ITEM: CROSSOVER VALVE (1) FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: M.J. SAIIDI SUBS	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICALI	TTIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 2/2 ONORBIT: 2/2 DEORBIT: 2/2 LANDING/SAFING: 3/3	ABORTHDW/FUNCRTLS:2/2TAL:2/2AOA:2/2ATO:2/2
REDUNDANCY SCREENS: A [] E	s[] c[]
LOCATION: ECLSS BAY PART NUMBER: 90V62LV13	
CAUSES: MECHANICAL SHOCK, VIBRATION	r
EFFECTS/RATIONALE: AN EXTERNAL LEAKAGE IF SEVERE AND NO FORCE SHUTTING DOWN THE TANKS OUTLET THE LEAK. THIS IN ESSENCE WILL PREC WATER TO BE VENTED ABOARD THROUGH FU ABORT WITHOUT FES (POSSIBLY).	VALVES IN ORDER TO ISOLATE

REFERENCES:

REPORT DATE 10/23/87

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1155	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: SOLENOID, XOVR VALVE FAILURE MODE: FAILS TO CLOSE, OPEN	(1) (ELECTRICAL), SHORTED
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS BAY PART NUMBER: 90V62LV13	
CAUSES: PIECE-PART FAILURE, THERMA	L SHOCK
EFFECTS/RATIONALE: THE CROSSOVER VALVE WILL REMAIN OPEN	N - SEE MDAC-1153.
REFERENCES:	

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DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1156ABORT:3/3
ITEM: SOLENOID, XOVR VALVE (1) FAILURE MODE: FAILS TO OPEN, OPEN (ELECTRICAL), SHORTED
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS BAY PART NUMBER: 90V62LV13
CAUSES: CONTAMINATION
EFFECTS/RATIONALE: UPON ACTIVATION OF THIS SWITCH AND THE FAILURE, POWER WILL BE APPLIED TO BOTH SIDES OF THE SOLENOID RESULTING IN POPPING THE CIRCUIT BREAKER AND/OR BURNING OF THE SOLENOID. VALVE RECONFIGURATION WILL BE LOST. HOWEVER, UNDER SINGLE FAILURE SCENARIO NO SIGNIFICANT IMPACT IS ANTICIPATED.

REFERENCES:

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REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 1157	ORT	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: SWITCH FAILURE MODE: PHYSIC			LS TO SWITCH	I
LEAD ANALYST: M.J. SA	IIDI S	SUBSYS LEAD:	M.J. SAIID	Ι
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)				
	CRITIC	CALITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUN	IC
PRELAUNCH:	3/3 3/3 3/3 3/3 3/3	RTL TAL	S: 3/3 : 3/3 : 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 []	В[]	с[]	
LOCATION: PNL R122 PART NUMBER: S5	A2			
CAUSES: CONTAMINATIO	1			
EFFECTS/RATIONALE: LOSS OF SWITCH ACTION	TO RECONFIC	GURE THE XOV	R VALVE. TH	IE VALVE

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LOSS OF SWITCH ACTION TO RECONFIGURE THE XOVR VALVE. THE VALVE IS SET CLOSED PRELAUNCH AND WILL REMAIN CLOSED THROUGHOUT THE MISSION - SEE MDAC-1152. ANY SINGLE POSITION FOR BINDING/JAMMING WILL HAVE NO SIGNIFICANT IMPACT (VALVE EITHER OPEN OR CLOSED).

REFERENCES:

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1158 ITEM: SWITCH, XOVR VALVE (1) FAILURE MODE: OPEN (ELECTRICAL), ANY SINGLE CONTACT, FAILS TO SWITCH			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3			
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 [] B [] C [] LOCATION: ECLSS BAY			
PART NUMBER: 90V62LV13			
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK EFFECTS/RATIONALE: THIS FAILURE CAUSES THE CROSSOVER VALVE TO REMAIN OPEN - SEE			
MDAC-1153.			

REFERENCES:

REPORT DATE 10/23/87

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DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1159ABORT:3/3	
ITEM: SWITCH, XOVR VALVE (1) FAILURE MODE: SHORTED, ANY SINGLE CONTACT	
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC	
PRELAUNCH: 3/3 RTLS: 3/3	
ONORBIT: 3/3 AOA: 3/3 DEORBIT: 3/3 ATO: 3/3	
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: ECLSS BAY PART NUMBER: 90V62LV13	
CAUSES: CONTAMINATION, PIECE-PART FAILURE	

EFFECTS/RATIONALE:

CONTINUOUS POWER IS APPLIED TO THE SOLENOID CAUSING IT TO FAIL (BURN OUT) OR POP THE CIRCUIT BREAKER. ALSO, IF A SHORT OCCURS AND THE SWITCH IS ACTIVATED THE POWER MAY BE APPLIED TO BOTH SIDES OF THE SOLENOID, BURNING THE SOLENOID. AT EITHER CASE, THE ABILITY TO RECONFIGURE THE VALVE IS LOST AND THE WORST CASE IS THE LOSS OF ABILITY TO OPEN THE VALVE - SEE MDAC-1152.

REFERENCES:

DATE: 7/09/87 I SUBSYSTEM: LIFE SUPPORT MDAC ID: 1160	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: POSITION INDICATION, T FAILURE MODE: ERRONEOUS OUTPUT, LOSS	
LEAD ANALYST: M.J. SAIIDI SUBS	YS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICALI	FIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A [] B	[] C[]
LOCATION: PNL 412A2 PART NUMBER: DS3	
CAUSES: MECHANICAL SHOCK, LOSS OF I	NPUT, VIBRATION
EFFECTS/RATIONALE: THE POSITION OF THE VALVE MAY BE DET FLOW THROUGH THE LINE OR TELEMETRY DA	
REFERENCES :	

REPORT DATE 10/23/87

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1161	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: DIODE, XOVR VALVE (1 FAILURE MODE: OPEN (ELECTRICAL))
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A []	В[] С[]
LOCATION: PNL 412A2 PART NUMBER: A10CR3	
CAUSES: MECHANICAL SHOCK, THERMAL	SHOCK, VIBRATION
EFFECTS/RATIONALE: LOSS OF THE CROSSOVER VALVE POSITIC POLE. NO SIGNIFICANT EFFECT.	N INDICATION ON THE BARBER
REFERENCES :	
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REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1162	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: RESISTOR, XOVR VALVE FAILURE MODE: OPEN (ELECTRICAL), SI	(1) Horted
LEAD ANALYST: M.J. SAIIDI SUBS	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	·
CRITICAL	ITIES
	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A []	В[] С[]
LOCATION: PNL 412A2 PART NUMBER: A17R1	
CAUSES: MECHANICAL SHOCK, TEMPERATU	URE, THERMAL SHOCK
EFFECTS/RATIONALE: LOSS OF VALVE POSITION INDICATION TO IMPACT.	O MDM-OF4. NO SIGNIFICANT
REFERENCES:	

REPORT DATE 10/23/87

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INDEPENDENT OF LUTER SSESSMENT ORBITER SUBSYSTEM LITELYSIS WORKSHEET

7/09/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: LIFE SUPPORT 3/3 FLIGHT: 3/3 MDAC ID: 1163 ABORT: CB, XOVR VALVE (1) ITEM: FAILURE MODE: FAILS TO REMAIN CLOSED, OPEN (ELECTRICAL) LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM SUPPLY WATER SUBSYSTEM 2) 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE 3/3 PRELAUNCH: 3/3 RTLS: LIFTOFF: 3/3 TAL: 3/3 3/3 3/3 AOA: **ONORBIT:** ATO: **DEORBIT:** 3/3 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [1 LOCATION: PNL R12A2 PART NUMBER: CB14 CAUSES: PIECE-PART FAILURE, CONTAMINATION EFFECTS/RATIONALE: LOSS OF POWER TO RE-CONFIGURE THE XOVR VALVE. THE VALVE WILL REMAIN IN ITS POSITION BEFORE THE FAILURE - SEE MDAC-1152 AND 1153.

REFERENCES:

REPORT DATE 10/23/87

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DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1164ABORT:3/3			
ITEM: CB, XOVR VALVE (1) FAILURE MODE: FAILS TO REMAIN OPEN, SHORTED			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) TANK ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: PART NUMBER:			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: LOSS OF CIRCUIT PROTECTION WITH OVER VOLTAGE/CURRENT, OTHERWISE NO MAJOR IMPACT.			
REFERENCES:			

REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1165	HIGHEST CRITICALITY HDW/FU FLIGHT: 3/2R ABORT: 3/2R	
ITEM: ISOL VALVE, FES B LI FAILURE MODE: FAILS TO OPEN, RESTR		
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) 5) 6) 7) 8) 9)		
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/2R ONORBIT: 3/2R DEORBIT: 3/2R LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/2R TAL: 3/2R AOA: 3/2R ATO: 3/2R	
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS BAY PART NUMBER: 90V62LV12		
CAUSES: CONTAMINATION, MECHANICAL VIBRATION	SHOCK, PIECE-PART FAILURE,	
EFFECTS/RATIONALE: LOSS OF ONE LEG OF REDUNDANCY TO PR A IS AVAILABLE TO SUPPORT FES. FUN IS CONSIDERED MISSION IMPACT ONLY. FUNCTIONAL LOSS, THE TANKS A AND B CROSSOVER VALVE SHOULD HAVE FAILED OTHER FAILURES WHICH MAY PRECLUDE U (FES) ANALYSIS AND MUST BE CONSIDER IS NO DIRECT REDUNDANCY FOR THIS VA FES WITH ONE FEED WATER LINE. VALV	CTIONAL LOSS (NO WATER TO FES HOWEVER, IN ORDER TO HAVE A OUTLET VALVES AND CLOSED (MULTIPLE FAILURE). SE OF LINE A ARE IN THE ATCS ED OPERATIONALLY SOUND. THEI LVE. THE FAILURE LEAVES	S)

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CLOSED AND RECONFIGURED ON-ORBIT FOR LINE B REDUNDANCY CHECKOUTS.

REFERENCES:

DATE: SUBSYSTEM: MDAC ID:	7/09/87 LIFE SUPP 1166	ORT	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: FAILURE MO LEAKAGE	ISOL V. DE: FAILS '	ALVE, FES B TO REMAIN CI	LINE (1) OSED, FAILS	5 TO CLOSE, 1	INTERNAL
LEAD ANALY	ST: M.J. SA	IIDI S	UBSYS LEAD	: M.J. SAIIDI	:
2) SUPPL	HIERARCHY: SUPPORT SYS Y WATER SUB INE ASSEMBL	SYSTEM		· · · · · ·	
		CRITIC	ALITIES		
FLIGHT		HDW/FUNC	ABORT	HDW/FUN	1C
	LAUNCH:	3/3	RTI	LS: 3/3	
	roff:	3/3	TAI	,	•
ONO	RBIT:	3/3	AOA	A: 3/3	
	RBIT:	3/3	ATC): 3/3	
LAN	DING/SAFING	: 3/3			

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: ECLSS BAY PART NUMBER: 90V62LV12

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

LOSS OF CAPABILITY TO ISOLATE FES FEEDLINE B IN CASE OF A LEAKAGE DOWNSTREAM, OTHERWISE CONTINUE TO OPERATE ON LINE B. XOVER VALVE AND TANKS C/D OUTLET VALVES MAY BE USED TO ISOLATE THE FEEDLINE. FES, ALSO HAS DEDICATED ISOL VALVE TO COMPENSATE FOR THE LOSS. NOMINAL CONFIGURATION OF THE VALVE.

REFERENCES:

REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 1167		HIGHEST (CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 2/2		
ITEM: ISOL VALVE, FES B LINE (1) FAILURE MODE: EXTERNAL LEAKAGE						
LEAD ANALYST: M.J. SAI	LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) 5) 6) 7) 8) 9)						
	CRITICAL					
	HDW/FUNC	ABORT	HDW/FUN	С		
PRELAUNCH:	3/3	RTLS				
LIFTOFF:	2/2	TAL				
ONORBIT:	2/2	AOA				
DEORBIT: 2/2 ATO: 2/2 LANDING/SAFING: 3/3						
		B[]	c[]			
LOCATION: ECLSS BAY PART NUMBER: 90V62LV1			,			
CAUSES:						
EFFECTS/RATIONALE:						

EXPULSION OF WATER INTO THE ECLSS BAY. THE LINE MUST BE ISOLATED VIA XOVR VALVE AND TANKS C/D OUTLET VALVES. REDUCED FLEXIBILITY IN WATER MANAGEMENT, AND LOSS OF ONE LEG OF REDUNDANT FEEDWATER LINE TO FES.

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REFERENCES:

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1168	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/2R		
ITEM: SOLENOID, FES ISOL VA FAILURE MODE: FAILS TO OPEN, OPEN (LVE (1) ELECTRICAL), SHORTED		
LEAD ANALYST: M.J. SAIIDI SUBS	YS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALI	TIES		
CRITICALI FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/2R ONORBIT: 3/2R DEORBIT: 3/2R	ABORT HDW/FUNC		
PRELAUNCH: 3/3	RTLS: 3/2R		
LIFTOFF: 3/2R	TAL: 3/2R		
ONORBIT: 3/2R DEORBIT: 3/2R	AOA: 3/2R		
DEORBIT: 3/2R	ATO: 3/2R		
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [2] B	B[P] C[P]		
LOCATION: ECLSS BAY PART NUMBER: 90V62LV12			
CAUSES: PIECE-PART FAILURE, THERMAL SHOCK			
EFFECTS/RATIONALE: IN THIS CASE THE VALVE REMAINS CLOSED - SEE MDAC-1165. THE EFFECT OF THE FAILURE IS DETECTABLE, BUT IT COULD NOT BE DETECTED TO BE DUE TO SOLENOID.			

REFERENCES:

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REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1169	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3				
ITEM: SOLENOID, FES ISOL VALVE (1) FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL, SHORTED					
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)					
CRITICAL	ITIES				
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC				
PRELAUNCH: 3/3	RTLS: 3/3				
LIFTOFF: 3/3	TAL: 3/3				
ONORBIT: 3/3 DEORBIT: 3/3	AOA: 3/3 ATO: 3/3				
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	RIU. 373				
REDUNDANCY SCREENS: A [] H	3[] C[]				
LOCATION: ECLSS BAY PART NUMBER: 90V62LV12					
CAUSES: PIECE-PART FAILURE, THERMAL SHOCK					
EFFECTS/RATIONALE: THE VALVE REMAINS OPEN - SEE MDAC-1166.					

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REFERENCES:

REPORT DATE 10/23/87

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DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1170ABORT:3/3			
ITEM: SWITCH, FES ISOL VALVE (1) FAILURE MODE: PHYSICAL BINDING/JAMMING			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS BAY PART NUMBER: S16			
CAUSES: CONTAMINATION, CORROSION			
EFFECTS/RATIONALE: LOSS OF CAPABILITY TO ACTIVATE THE FES ISOL VALVE. THE VALVE IS CONFIGURED OPEN THROUGHOUT THE MISSION AND NO FURTHER ACTION IS REQUIRED. THUS THE VALVE WILL REMAIN OPEN - SEE MDAC-1166.			
REFERENCES:			

REPORT DATE 10/23/87

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DATE: 7/09/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 1171 ABORT: 3/3 ITEM: SWITCH, FES ISOL VALVE (1) FAILURE MODE: OPEN (ELECTRICAL), ANY SINGLE FAILURE, FAILS TO				
SWITCH				
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)				
CRITICALITIES				
CRITICALITIESFLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3A				
REDUNDANCY SCREENS: A [] B [] C []				
LOCATION: PNL R12A2 PART NUMBER: S16				
CAUSES: CONTAMINATION, PIECE-PART FAILURE				
EFFECTS/RATIONALE: LOSS OF SWITCHING CAPABILITY TO ACTIVATE THE VALVE. THE VALVE REMAINS OPEN (NOMINALLY SETTING) - SEE MDAC-1166.				

REFERENCES:

REPORT DATE 10/23/87

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DATE: SUBSYSTEM: L MDAC ID: 1	7/09/87 JIFE SUPPORT .172	2	HIGHES	FLIC		HDW/FUNC 3/2R 3/2R
ITEM: FAILURE MODE:						
LEAD ANALYST:	M.J. SAIID)I S	SUBSYS LEA	AD: M.J.	SAIIDI	
BREAKDOWN HIE 1) LIFE SUP 2) SUPPLY W 3) FES LINE 4) EPDC 5) 6) 7) 8)	PPORT SYSTEM					
		CDTTT	CALITIES			
FLICHT DH	INCE HE			ו ידיכ	HDW/FUN	C
FLIGHI PH	IASE HE	a /a	ADUI			
PRELAU	INCH:	3/3	1	RTLS:	3/2R	
LIFTOF	'F:	3/3 3/2R 3/2R 3/2R 3/2R		TAL: AOA:	3/2R	
ONORBI	.T:	3/2R	. 2	AOA:	3/2R	
DEORBI	Т:	3/2R	2	ATO:	3/2R	
LANDIN	G/SAFING:	3/3				
		-, -				
REDUNDANCY SC	REENS: A	[2]	Β[Ρ]] c	[P]	
LOCATION: PART NUMBER:						
CAUSES:						
EFFECTS/RATIONALE: CONTINUOUS POWER APPLIED TO THE SOLENOID WHICH MAY CAUSE IT TO BURN OUT. ALSO, UPON ACTIVATION OF SWITCH ON THE OPPOSITE CONTACT, POWER WILL BE APPLIED TO BOTH SIDES OF THE SOLENOID RESULTING IN LOSS OF SOLENOID AND POTENTIAL FOR FIRE (IF CB DOES NOT POP). THE WORST CASE IS THE FAILURE WHICH CAUSES THE VALVE TO REMAIN CLOSED - LOSS OF FES FEEDWATER LINE B - SEE MDAC-1165. REFERENCES:						

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HIGHEST CRITICALITY HDW/FUNC 7/09/87 DATE: FLIGHT: SUBSYSTEM: LIFE SUPPORT 3/3 3/3 ABORT: MDAC ID: 1173 ITEM: CB, FES ISOL VALVE (1) FAILURE MODE: RAILS TO REMAIN CLOSED, OPEN (ELECTRICAL) LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE 3/3 3/3 🐨 RTLS: PRELAUNCH: 3/3 3/3 TAL: LIFTOFF: 3/3 AOA: ONORBIT: 3/3 3/3 ATO: DEORBIT: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: PNL ML86B PART NUMBER: CB9 CAUSES: MECHANICAL SHOCK, VIBRATION EFFECTS/RATIONALE: LOSS OF POWER TO ACTIVATE THE ISOL VALVE - VALVE WILL REMAIN IN ITS POSITION (OPEN-NOMINAL SETTING) - SEE MDAC-1166. and a second **REFERENCES:**

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1174	HIGHEST	CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: CB, FES I FAILURE MODE: FAILS TO	SOL VALVE (1) REMAIN OPEN, SHORTE	D
LEAD ANALYST: M.J. SAIID	SUBSYS LEAD	: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYS 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	I Stem	
	CRITICALITIES	
PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	W/FUNC ABORT 3/3 RT 3/3 TA 3/3 AO	HDW/FUNC LS: 3/3 L: 3/3 A: 3/3 O: 3/3
REDUNDANCY SCREENS: A	[] B[]	с[]
LOCATION: PNL ML86B PART NUMBER: CB9		
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE: NO SIGNIFICANT EFFECT EX OVERCURRENT.	CEPT FOR CIRCUIT PR	OTECTION AGAINST
REFERENCES:		

REPORT DATE 10/23/87

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DATE: 7/09/87 1 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1175	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3			
ITEM: POSITION INDICATION, I FAILURE MODE: ERRONEOUS OUTPUT, LOSS	FES ISOL VALVE (1) 5 OF OUTPUT			
LEAD ANALYST: M.J. SAIIDI SUBSY	(S LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)				
CRITICALI				
CRITICALI FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3	ABORT HDW/FUNC RTLS: 3/3			
LIFTOFF: 3/3	TAL: 3/3			
ONORBIT: 3/3	AOA: 3/3 ATO: 3/3			
DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO: 3/3			
REDUNDANCY SCREENS: A [] B				
LOCATION: PNL R12A2 PART NUMBER: DS11				
CAUSES: PIECE-PART FAILURE				
EFFECTS/RATIONALE: NO SIGNIFICANT EFFECT. THE VALVE POSITION IS DETECTED BY SIGNAL TO THE MDM OF4, OR BY ITS EFFECT DOWNSTREAM.				

REFERENCES:

REPORT DATE 10/23/87

C-82

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPOR MDAC ID: 1176	HIGHEST	CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3		
ITEM: RESISTOR, FES ISOL VALVE (1) FAILURE MODE: ERRONEOUS OUTPUT, OPEN (ELECTRICAL), LOSS OF OUTPUT				
LEAD ANALYST: M.J. SAIII	DI SUBSYS LEAD:	M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)				
	CRITICALITIES			
FLIGHT PHASE H	DW/FUNC ABORT 3/3 RTL 3/3 TAL 3/3 AOA 3/3 ATO	HDW/FUNC		
PRELAUNCH:	3/3 RTL 3/3 RTL 3/3 TAL 3/3 AOA 3/3 ATO	S: 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	[] B []	с[]		
LOCATION: PNL R12A2 PART NUMBER: A5R1				
CAUSES: THERMAL SHOCK				
EFFECTS/RATIONALE: LOSS OF SIGNAL TO THE MI AVAILABLE.		INDICATION IS		

REFERENCES:

REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1177	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3			
ITEM: DIODE, FES ISOL VALVE (1) FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT				
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) FES LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)				
CRITICA	LITIES			
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC			
PRELAUNCH: 3/3	RTLS: 3/3			
LIFTOFF: 3/3	TAL: 3/3 AOA: 3/3			
ONORBIT: 3/3	AOA: 3/3			
LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	ATO: 3/3			
LANDING/SAFING: 3/3				
REDUNDANCY SCREENS: A []	B[] C[]			
LOCATION: PNL R12A2 PART NUMBER: A10CR11				
CAUSES: THERMAL SHOCK				
EFFECTS/RATIONALE:				

LOSS OF BARBER POLE INDICATION - MDM SIGNAL IS AVAILABLE.

REFERENCES:

REPORT DATE 10/23/87

	INDEPENDENT ORBITER ASSESSMENT ORBITER SUBSYSTEM ANALYSIS WORKSHEET
_	DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:1178ABORT:3/3
	ITEM: SUPPLY VALVE, GALLEY (1) FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, INTERNAL LEAKAGE
	LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
_	BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 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: 2/2 AOA: 3/3 DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3
-	REDUNDANCY SCREENS: A [] B [] C []
	LOCATION: ECLSS BAY PART NUMBER: 90V62LV9 CAUSES: MECHANICAL SHOCK, VIBRATION, PIECE-PART FAILURE
_	EFFECTS/RATIONALE: UNDER SINGLE FAILURE NO PROBLEM IS ANTICIPATED SINCE THE VALVE HAS FAILED TO ITS NORMAL SETTING. HOWEVER, CAPABILITY IS LOST TO
	ISOLATE THE GALLEY LINE IN THE EVENT OF A LEAKAGE. IN THIS CASE, WATER LEAKAGE COULD NOT BE STOPPED. THEREFORE WITH THIS SINGLE FAILURE, MISSION ABORT IS SUGGESTED. FAILURE IS NOT DETECTED UNTIL AN ATTEMPT IS MADE TO CLOSE THE VALVE.
	REFERENCES:

REPORT DATE 10/23/87

N INDEPENDENT ORBITER ASSESSMENT ORBITER SUBSYSTEM ANALYSIS WORKSHEET					
DATE: SUBSYSTEM: MDAC ID:	7/09/87 LIFE SUPPOR 1179	T	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 3/3
	SUPPLY V E: FAILS TO			OPEN	
LEAD ANALYS	T: M.J. SAII	DI SU	BSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) 5) 6) 7) 8) 9)					
		CRITICA	LITIES		
FLIGHT		DW/FUNC	ABORT	HDW/FUNC	
DIFT(AUNCH: OFF:	3/3 3/3	RTLS TAL:		
ONOR	BIT:	2/2	AOA:	3/3	
DEOR LAND	BIT: ING/SAFING:	3/3 3/3	ATO:	3/3	n na star Friedrich ann
REDUNDANCY	SCREENS: A	• •		c []	
LOCATION: PART NUMBER				in the second s	
CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION					
EFFECTS/RATIONALE: LOSS OF POTABLE WATER TO CREW FOR DRINKING, FOOD PREP, HYGIEN,					
REFERENCES:					

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REPORT DATE 10/23/87

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DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:1180ABORT:2/2			
ITEM: SUPPLY VALVE, GALLEY (1) FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:2/2LIFTOFF:2/2TAL:2/2ONORBIT:2/2AOA:2/2DEORBIT:2/2ATO:2/2			
LIFTOFF: $2/2$ TAL: $2/2$			
DEORBIT: $2/2$ ATO: $2/2$			
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS BAY PART NUMBER: 90V62LV9			
CAUSES: MECHANICAL SHOCK, STRUCTURAL FAILURE, VIBRATION			
EFFECTS/RATIONALE: THE LEAK CANNOT BE STOPPED, AND IF SEVERE, IT MAY CAUSE ELECTRICAL SHORT, RAISING HUMIDITY IN THE CABIN, CAUSING CONDENSATION IN SOME AREAS OF CABIN: THE EFFECT OF THESE FACTORS IS NOT FULLY UNDERSTOOD TO ASSESS WHETHER A POTENTIAL FOR LOSS OF LIFE EXISTS. HOWEVER, THE MISSION IS TERMINATED AND RETURNED WITH EXISTING PROBLEM.			

REFERENCES:

REPORT DATE 10/23/87

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1181	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3		
ITEM: SOLENOID, GALLEY VAL FAILURE MODE: FAILS TO CLOSE, OPEN	NE (1) (ELECTRICAL), SHORTED		
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICAL	ITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3		
REDUNDANCY SCREENS: A []	в[] С[]		
LOCATION: ECLSS BAY PART NUMBER: 90V62LV9			
CAUSES: THERMAL SHOCK			
EFFECTS/RATIONALE: LOSS OF CAPABILITY TO ACTIVATE THE VALVE - VALVE REMAINS OPEN - SEE MDAC-1178.			
REFERENCES :			

REPORT DATE 10/23/87

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DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:1182ABORT:3/3			
ITEM: SOLENOID, GALLEY VALVE (1) FAILURE MODE: FAILS TO OPEN, OPEN (ELECTRICAL), SHORTED			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3			
LIFTOFF: 3/3 TAL: 3/3 ONORBIT: 2/2 AOA: 3/3			
DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS BAY PART NUMBER: 90V62LV9			
CAUSES: THERMAL SHOCK			
EFFECTS/RATIONALE: LOSS OF CAPABILITY TO OPEN THE VALVE - VALVE REMAINS CLOSED - SEE MDAC-1179.			
REFERENCES:			

REPORT DATE 10/23/87

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1183	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3		
ITEM: SWITCH, GALLEY FAILURE MODE: PHYSICAL BINDIN			
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRI	ITICALITIES		
	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3		
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: PNL R12A2 PART NUMBER: S11			
CAUSES: CONTAMINATION, PIECE-	-PART FAILURE		
EFFECTS/RATIONALE: LOSS OF THE VALVE RECONFIGURATION IF SWITCH CANNOT BE MOVED - SEE MDAC-1178 AND 1179.			
REFERENCES:			

DATE:7/09/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:1184ABORT:3/3			
ITEM: SWITCH, GALLEY VALVE (1) FAILURE MODE: OPEN (ELECTRICAL), ANY SINGLE CONTACT, FAILS TO SWITCH			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 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			
UNURBIT: 2/2 AUA: 3/3			
DEORBIT: 3/3 ATO: 3/3			
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: PNL R12A2 PART NUMBER: S11			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: LOSS OF POWER INPUT TO ACTIVATE THE VALVE IF THE VALVE COULD NOT BE OPENED OR CLOSED, THE EFFECT IS THE SAME AS MDAC-1178 AND			

BE OPENED OR CLOSED, THE EFFECT IS THE SAME AS MDAC-1178 AND 1179.

REFERENCES:

----**...** REPORT DATE 10/23/87

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1185 ITEM: SWITCH, GALLEY VALV	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3		
FAILURE MODE: SHORTED, ANY SINGLE	CONTACT		
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICA	LITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3		
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: PNL R12A2 PART NUMBER: S11			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: CONTINUOUS POWER APPLIED TO THE SOLENOID CAUSING IT TO FAIL (BURN), THUS LOSS OF CAPABILITY TO RECONFIGURE THE VALVE THEREAFTER.			
REFERENCES :			

REPORT DATE 10/23/87

DATE:7/09/87HIGHEST CRITICALITY HDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1186ABORT:3/3			
ITEM: POSITION INDICATION, GALLEY VALVE (1) FAILURE MODE: ERRONEOUS OUTPUT, LOSS OF OUTPUT			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS: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 [] B [] C []			
LOCATION: PART NUMBER:			
CAUSES: MECHANICAL SHOCK, STRUCTURAL FAILURE, VIBRATION			
EFFECTS/RATIONALE: LOSS OF BARBER POLE INDICATION; MDM-OF4 AND THE EFFECT OF VALVE ACTION ARE AVAILABLE TO DETECT VALVE POSITION.			
REFERENCES:			

REPORT DATE 10/23/87

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1187	HIGHEST C	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: DIODE, GALLEY VALVE FAILURE MODE:	(1)		
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	- -		
CRITICAL			
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT RTLS TAL: AOA: ATO:	5: 3/3 : 3/3 : 3/3	C
REDUNDANCY SCREENS: A []	в[]	с[]	
LOCATION: PNL R12A2 PART NUMBER: A10CR8			
CAUSES: THERMAL SHOCK			
EFFECTS/RATIONALE: LOSS OF BARBER POLE INDICATION - SEE MDAC-1186.			
REFERENCES :			

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DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1188	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3		
ITEM: RESISTOR, GALLEY VA FAILURE MODE: OPEN (ELECTRICAL),			
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICA	LITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORTHDW/FUNCRTLS:3/3TAL:3/3AOA:3/3ATO:3/3		
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: PNL R12A2 PART NUMBER: A7R2			
CAUSES: THERMAL SHOCK			
EFFECTS/RATIONALE: LOSS OF SIGNAL TO THE MDM-OF4; BARBER POLE INDICATION IS AVAILABLE TO COMPENSATE FOR THE LOSS.			
REFERENCES:			

REPORT DATE 10/23/87

DATE: 7/09/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1189	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3
ITEM: CIRCUIT BREAKER, GA FAILURE MODE: FAILS TO REMAIN CLO	LLEY VALVE (1) SED, OPEN (ELECTRICAL)
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: 3/3	TAL: 3/3
ONORBIT: 2/2	AOA: 3/3
DEORBIT: 3/3	ATO: 3/3
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B[]] C[]
LOCATION: PNL ML86B PART NUMBER: CB15	
CAUSES: CONTAMINATION, THERMAL SH	оск

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EFFECTS/RATIONALE: LOSS OF POWER TO RECONFIGURE THE VALVE. NOMINALLY NO PROBLEM SINCE THE VALVE IS OPEN ALWAYS, BUT CAPABILITY IS LOST TO CLOSE IT IF NEEDED.

REFERENCES:

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REPORT DATE 10/23/87

MDAC ID: 1190 ABOI	CALITY HDW/FUNC GHT: 3/3 RT: 3/3
ITEM: CIRCUIT BREAKER, GALLEY VALVE (1) FAILURE MODE: FAILS TO REMAIN OPEN, SHORTED	
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J.	SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC ABORT I PRELAUNCH: 3/3 RTLS: LIFTOFF: 3/3 TAL: ONORBIT: 3/3 AOA: DEORBIT: 3/3 ATO:	HDW/FUNC
PRELAUNCH: 3/3 RTLS:	3/3
ONORBIT: 3/3 AOA:	3/3
DEORBIT: 3/3 ATO:	3/3
PRELAUNCH:3/3RTLS:LIFTOFF:3/3TAL:ONORBIT:3/3AOA:DEORBIT:3/3ATO:LANDING/SAFING:3/3	
REDUNDANCY SCREENS: A [] B [] C	[]]
LOCATION: PNL R12A2 PART NUMBER: CB15	
CAUSES: CONTAMINATION, PIECE-PART FAILURE	
EFFECTS/RATIONALE: NO EFFECT, EXCEPT OVER VOLTAGE/OVERCURRENT PROTEC	TION IS LOST.
REFERENCES:	

REPORT DATE 10/23/87

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1191	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: DUMP ISOL VALVE (1 FAILURE MODE: FAILS TO REMAIN OP FLOW) EN, FAILS TO OPEN, RESTRICTED
LEAD ANALYST: M.J. SAIIDI S	UBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITIC	ALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A [2]	B[P] Ĉ[F]
LOCATION: ECLSS BAY PART NUMBER: 90V62LV11	
CAUSES: CONTAMINATION, PIECE-PAR	T FAILURE
EFFECTS/RATIONALE: LOSS OF PRIMARY METHOD OF EXPELIN 57 DEGREES F RADIATOR) TO BOIL EX THE MISSION DUE TO ADDED CREW ACT DUMP AND NO 57 DEGREES F FES) WIL MEANS OF EXPELING WATER (EXCEPT F IMPACT. SEVERE CONTAMINATION IN LINE AS WELL AS FES LINE - SCREEN	G WATER. FES IS AVAILABLE (WITH CESS WATER, BUT IT MAY IMPACT IVITY. LOSS OF FUNCTION (NO L CERTAINLY HAVE NO OTHER OR RAD BYPASS AND FES) - MISSION THE WATER LINE MAY SHUTDOWN DUMP

REFERENCES:

DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1192ABORT:/NA
ITEM: DUMP ISOL VALVE (1) FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, INTERNAL LEAKAGE
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC
LIFTOFF: /NA TAL: /NA
LIFTOFF: /NA TAL: /NA ONORBIT: 3/3 AOA: /NA
DEORBIT: /NA ATO: /NA
LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS BAY PART NUMBER: 90V62LV11
CAUSES: CONTAMINATION, PIECE-PART FAILURE
EFFECTS/RATIONALE:

THE VALVE IS CLOSED AND THE CB PULLED FOR ASCENT AND ENTRY. ON-ORBIT, THE VALVE IS CONFIGURED OPEN. HOWEVER, THE DIRECT CROSS-TIE (SUPPLY/WASTE) CAPABILITY WILL BE LOST WITH THE ISOL VALVE FAILED OPEN. THE CROSS-TIE IS USED ONLY UNDER SEVERE CONTINGENCY WHEN NO CAPABILITY EXISTS TO DUMP EITHER WASTE OR SUPPLY WATER. FES IS AVAILABLE FOR FES AND CWC IS AVAILABLE FOR WASTE WATER - ALSO THIS SCENARIO BECOMES MUTI-FAILURE SCENARIO. ON THE OTHER HAND, CROSS-TIE MAY BE STILL USED BY CLOSING THE XOVR VALVE AND TANKS A AND B OUTLET VALVES.

REFERENCES:

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1193	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: 3/3
ITEM: DUMP ISOL VALVE (1) FAILURE MODE: EXTERNAL LEAKAGE	e and the second se
LEAD ANALYST: M.J. SAIIDI SU	JBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/1R DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORTHDW/FUNCRTLS:3/3TAL:3/3AOA:3/3ATO:3/3
REDUNDANCY SCREENS: A [2]	B[P] C[F]
LOCATION: ECLSS BAY PART NUMBER: 90V62LV11	
CAUSES: MECHANICAL SHOCK, VIBRATI	ON
EFFECTS/RATIONALE: FLOW OF WATER TO THE ECLSS BAY. T & B OUTLET VALVES MUST BE SHUT OFF AND THEREFORE BOIL EXCESS WATER TH RECHARGE CAPABILITY FOR MMU AND FE INOPERATIVE. THE EFFECT OF THIS F CONSIDERED MINIMAL DUE TO THE SHOF IF THE LEAKAGE IS SEVERE, IT MAY I DURING ASCENT ENTRY.	CLOSED TO ISOLATE THE LEAK, ROUGH FES FEEDLINE B. HOWEVER, S FEEDLINE A BECOME VAILURE ON ASCENT AND ENTRY WAS T DURATION OF MISSION PHASE.

REFERENCES:

DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1194ABORT:3/3
ITEM: SOLENOID, DUMP ISOL VALVE (1) FAILURE MODE: FAILS TO CLOSE
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:/NATAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3
PRELAUNCH: $3/3$ RTLS: $3/3$
LIFTOFF: /NA TAL: 3/3
ONORBIT: $3/3$ AOA: $3/3$
DEORBIT: $3/3$ ATO: $3/3$
LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS BAY
PART NUMBER: 90V62LV11
CAUSES: PIECE-PART FAILURE, THERMAL SHOCK
EFFECTS/RATIONALE: THE VALVE CONFIGURED CLOSED PRELAUNCH AND REMAINS CLOSED DURING ASCENT, THEREFORE THE FAILURE IS NOT APPLICABLE. DURING ON- ORBIT, THE VALVE IS CONFIGURED OPEN UNTIL AFTER THE LAST DUMP AT WHICH TIME IT IS CLOSED FOR ENTRY. THEREFORE DURING ENTRY THE WATER IN THE LINE BETWEEN THE DUMP ISOL VALVE AND DUMP VALVE MAY

REFERENCES:

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FREEZE BUT SINCE THE MISSION IS COMPLETED NO SIGNIFICANT IMPACT

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1195	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: SOLENOID, DUMP ISOL FAILURE MODE: FAILS TO OPEN, OPEN	VALVE (1) (ELECTRICAL)
LEAD ANALYST: M.J. SAIIDI SUE	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A [2]	B [P]. C [P]
LOCATION: ECLSS BAY PART NUMBER: 90V62LV11	
CAUSES: PIECE-PART FAILURE, THERMA	L SHOCK
EFFECTS/RATIONALE: THE VALVE WILL REMAIN CLOSED. SEE	MDAC-1191.
REFERENCES:	• • • • • • • • • •

REPORT DATE 10/23/87 C-102

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1196	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: SWITCH, DUMP ISOL FAILURE MODE: PHYSICAL BINDING/J	VALVE (1) AMMING, FAILS TO SWITCH
LEAD ANALYST: M.J. SAIIDI S	UBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITIC	ALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 3/2R	AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: PNL R12A2	
PART NUMBER: S6	
CAUSES: CONTAMINATION, PIECE-PAR	T FAILURE
EFFECTS/RATIONALE: LOSS OF CAPABILITY TO SWITCH THE MDAC-1191.	VALVE OPEN AFTER LIFT OFF. SEE
	4 - 4
REFERENCES:	

REPORT DATE 10/23/87 C-103

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1197	HIGHEST CRITICAL FLIGHT ABORT:	ITY HDW/FUNC : 3/2R /NA
ITEM: SWITCH, DUMP ISOL VA FAILURE MODE: FAILS TO OPEN, OPEN CONTACT	LVE (1) (ELECTRICAL) ANY	SINGLE
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SA	IIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)		
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW RTLS: TAL: AOA: ATO:	/FUNC /NA /NA /NA /NA
REDUNDANCY SCREENS: A [2]	В[Р] С[P]
LOCATION: PNL R12A2 PART NUMBER: S6		
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE: A MORE SERIOUS CASE IS WHEN CONTACT CANNOT BE MADE DUE TO CONTAMINATION OPENED POST LIFT OFF. SEE MDAC-119	. IN THIS THE VA	SE PINS LVE CANNOT BE
REFERENCES:		
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REPORT DATE 10/23/87

C-104

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 1198	HI	IGHEST CRITICALIT FLIGHT: ABORT:	3/2R
ITEM: SWITCH, FAILURE MODE: FAILS 1	DUMP ISOL VALVE	E (1) ANY SINGLE CONT.	ACT
LEAD ANALYST: M.J. SAI	IDI SUBSYS	S LEAD: M.J. SAII	DI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYST 2) SUPPLY WATER SUBS 3) DUMP LINE ASSEMBT 4) EPDC 5) 6) 7) 8) 9)			
	CRITICALITI	IES	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	HDW/FUNC	ABORT HDW/F	
PRELAUNCH:	3/3	RTLS: /N TAL: /N	
LIFTOFF:		TAL: /N	
DEODBIT:	3/2R	AOA: /N	
LANDING/SAFING:	/NA 3/2	ATO: /N	3
LANDING/SAFING.	3/3		
REDUNDANCY SCREENS:	A [2] B [P] C[P]]
LOCATION: PNL R12A PART NUMBER: S6	.2		
CAUSES: CONTAMINATION	r ·		
EFFECTS/RATIONALE: A SHORT ACROSS THE CLC APPLY CONTINUOUS POWER EVENTUALLY - SEE MDAC- LIFT OFF AND SHORT HAS WILL RECEIVE POWER ON CB.	TO THE SOLENOID 1191. IF THE SW OCCURED ACROSS	WHICH WILL MAKE TTCH ATIVATED TO CLOSE PINS, THE S	IT BURN OPEN AFTER SOLENOID
REFERENCES:			

REPORT DATE 10/23/87 C-105

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1199	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: POSITION INDICATION FAILURE MODE: ERRONEOUS OUTPUT, I	, DUMP ISOL VALVE (1) OSS OF OUTPUT
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	TAL: $3/3$ TAL: $3/3$ AOA: $3/3$
DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO: 3/3
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: PNL R12A2 PART NUMBER: DS4	
CAUSES: MECHANICAL SHOCK, STRUCTO	JRAL FAILURE, VIBRATION
EFFECTS/RATIONALE: LOSS OF THE WATER POSITION INDICA MDM OF-4 AND THE EFFECT VALVE POSI VALVE CONFIGURATION.	LION BY THE BARBER-POLE. THE TION CAN BE USED TO DETECT THE
1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	
REFERENCES:	

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REPORT DATE 10/23/87 C-106

DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1200ABORT:3/3ITEM:DIODE, DUMP ISOL VALVE (1)
FAILURE MODE: OPEN (ELECTRICAL)
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 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 [] B [] C []
LOCATION: PNL R12A2 PART NUMBER: A10C4
CAUSES: THERMAL SHOCK
EFFECTS/RATIONALE: LOSS OF BARBER-POLE INDICATION. SEE MDAC-1198.
REFERENCES:

REPORT DATE 10/23/87 C-107

DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1201ABORT:3/3
ITEM: RESISTOR, DUMP ISOL VALVE (1) FAILURE MODE: OPEN (ELECTRICAL)
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3A
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: PART NUMBER: A4R1
CAUSES: THERMAL SHOCK

EFFECTS/RATIONALE:

LOSS OF VALVE POSITION SIGNAL TO THE MDM. BARBER-POLE INDICATION IS AVAILABLE TO COMPENSATE FOR THE LOSS.

REFERENCES:

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2년 4월 19일 - 1일 전 1월 19일 - 1일 1월 19일 - 1일 19일 19일 - 1일 19일 19일 19일 19일 19일 19일 19일 19

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1202	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: CB, DUMP ISOL VALVE FAILURE MODE: FAILS TO REMAIN CLOS			
LEAD ANALYST: M.J. SAIIDI SUB	BSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICAL	LITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC		
PRELAUNCH: 3/3	RTLS: /NA		
LIFTOFF: /NA	TAL: /NA		
ONORBIT: 3/2R	AOA: /NA		
DFORBIT: /NA	ATO: /NA		
LANDING/SAFING: 3/3	····· , ····		
REDUNDANCY SCREENS: A [2]	В[Р] С[Р]		
LOCATION: PNL ML86B PART NUMBER: CB8			
CAUSES: CONTAMINATION, PIECE-PART	FAILURE		
EFFECTS/RATIONALE: MOST LIKELY THE CB COULD BE HELD DO VALVE. BUT WITH SERIOUS FAILURE SU APPLIED, THE VALVE WILL REMAIN CLOS 1191.	UCH THAT POWER COULD NOT BE		

REFERENCES:

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DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1203ABORT:3/3
ITEM: CB, DUMP ISOL VALVE (1) FAILURE MODE: FAILS TO REMAIN OPEN, SHORTED
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3
REDUNDANCY SCREENS: A [] B [] C [] LOCATION: PNL ML86B
PART NUMBER: CB8
CAUSES: CONTAMINATION, PIECE-PART FAILURE
EFFECTS/RATIONALE: NO SIGNIFICANT IMPACT IS SEEN EXCEPT THAT OVERCURRENT/OVERVOLTAGE PROTECTION IS LOST. SWITCH NEUTRAL POSITION PROVIDES COMPENSATION FOR THE LOSS.
REFERENCES:

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1204	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: DUMP VALVE (1) FAILURE MODE: FAILS TO REMAIN OPEN FLOW	, FAILS TO OPEN, RESTRICTED		
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPD&C 5) 6) 7) 8) 9)			
CRITICAL	ITIES		
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC		
PRELAUNCH: 3/3	RTLS: /NA		
LIFTOFF: /NA	TAL: /NA		
ONORBIT: 3/2R	AOA: /NA		
DEORBIT: /NA	ATO: /NA		
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [2]	B[P] C[F]		
LOCATION: MID FUSELAGE PART NUMBER: 40V62LV10			
CAUSES: CONTAMINATION, PIECE-PART	FAILURE		
EFFECTS/RATIONALE: LOSS OF PRIMARY METHOD OF EXPELLING EXCESS WATER. FES MAY BE USED (WITH 57 DEGREES F RAD) TO COMPENSATE FOR THE LOSS. EMERGENCY CROSS-TIE IS ALSO AVAILABLE AS A LAST RESORT. HOWEVER, WITH LOSS OF FUNCTION (NO MEANS OF EXPELLING WATER), THE MISSION SHOULD BE TERMIANTED AND RETURNED. ALSO, THE FES USE AS A WAY OF DUMPING WATER MAY IMPACT THE MISSION TIMELINE. SEVERE CONTAMINATION MAY RESTRICT FLOW IN THE DUMP LINE AND FES LINES.			
REFERENCES:			

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 1205				DW/FUNC 3/2R 3/3
ITEM: DUMP VA FAILURE MODE: FAILS LEAKAGE	ALVE (1) FO REMAIN CLOS	SED, FAILS TO	CLOSE, INT	ERNAL
LEAD ANALYST: M.J. SA	IIDI SUI	BSYS LEAD: M.	J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYST 2) SUPPLY WATER SUBS 3) DUMP LINE ASSEMB 4) EPD&C 5) 6) 7) 8) 9)	SYSTEM			
	CRITICAL	LITIES	·	
FLIGHT PHASE			HDW/FUNC	
PRELAUNCH:	3/3	RTLS:	3/3	
LTFTOFF:	3/3	TAL:	3/3	
ONORBIT: DEORBIT:	3/2R		3/3	-
DEORBIT:	3/3	ATO:		
LANDING/SAFING	: 3/3			•
REDUNDANCY SCREENS:	A [2]	B [P]	C [F]	T # 1 1 1
LOCATION: MID FUSELAGE PART NUMBER: 40V62LV10				
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION				
EFFECTS/RATIONALE: LOSS OF PRIMARY METHOD OF DUMP PROCEDURE RESULTING IN ACTIVATION OF THE DUMP ISOL VALVE INSTEAD TO ACCOMPLISH A DUMP - POSSIBILITY OF WATER TRAPPED IN THE LINE AND FREEZING EXISTS IMMEDIATELY DOWNSTREAM OF THE ISOL VALVE. ALSO, THE DUMP LINE WILL BE EXPOSED TO VACUUM UPON A SUBSEQUENT FAILURE SUCH A INTERNAL LEAKAGE OF THE DUMP ISOL VALVE. IF FREEZING OCCURS IN THE LINE, FES SHOULD BE USED.				
REFERENCES:				

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1206	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: DUMP VALVE (1) FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPD&C 5) 6) 7) 8) 9)	
CRITI	CALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: /NA
LIFTOFF: /NA	TAL: /NA AOA: /NA
ONORBIT: 3/2R DEORBIT: /NA	AOA: /NA ATO: /NA
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [2]	B[P] C[F]
LOCATION: MID FUSELAGE PART NUMBER: 40V62LV10	
CAUSES: MECHANICAL SHOCK, STRUC	TURAL FAILURE, VIBRATION
EFFECTS/RATIONALE: THE LINE MUST BE ISOLATED BY DOS FES FOR WATER DUMPS. SEE MDAC-1	ING THE DUMP ISOL VALVE AND USING 204.
REFERENCES:	

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	ITY HDW/FUNC : 3/2R /NA
ITEM: SOLENOID, DUMP VALVE (1) FAILURE MODE: FAILS TO OPEN, OPEN (ELECTRICAL)	
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SA	IIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC ABORT HDW PRELAUNCH: 3/3 RTLS: LIFTOFF: /NA TAL:	/FUNC /NA /NA
LIFTOFF: /NA TAL: ONORBIT: 3/2R AOA: DEORBIT: /NA ATO: LANDING/SAFING: 3/3	/NA /NA
REDUNDANCY SCREENS: A [2] B [P] C [3	₽]
LOCATION: MID FUSELAGE PART NUMBER: 40V62LV10	
CAUSES: STRUCTURAL FAILURE, THERMAL SHOCK	
EFFECTS/RATIONALE: THE DUMP VALVE WILL REMAIN CLOSED. SEE MDAC-1204.	
REFERENCES:	

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REFERENCES:

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DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:1208ABORT:3/3			
ITEM: SOLENOID, DUMP VALVE (1) FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL)			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/2RAOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: MID FUSELAGE PART NUMBER: 40V62LV10			
CAUSES: STRUCTURAL FAILURE, THERMAL SHOCK			
EFFECTS/RATIONALE: THE VALVE WILL REMAIN OPEN. SEE MDAC-1205.			
REFERENCES:			

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1209	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: SWITCH, DUMP VALVE (1) FAILURE MODE: PHYSICAL BINDING/JAMMING			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRIT	ICALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC		
PRELAUNCH: 3/3	RTLS: /NA		
LIFTOFF: /NA	TAL: /NA		
ONORBIT: 3/2R	AOA: /NA		
DEORBIT: /NA	ATO: /NA		
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [2]	B[P] C[P]		
LOCATION: PNL R12A2 PART NUMBER: S7			
CAUSES: CONTAMINATION, PIECE-PART FAILURE			
EFFECTS/RATIONALE: LOSS OF CAPABILITY TO ACTIVATE/DEACTIVATE THE DUMP VALVE. THE WORST CASE WILL BE THE CASE FOR WHICH THE VALVE CANNOT BE OPENED. SEE REMARKS FOR MDAC-1204.			

REFERENCES:

DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/1RMDAC ID:1210ABORT:3/3			
ITEM: SWITCH, DUMP VALVE (1) FAILURE MODE: SHORTED, ANY SINGLE CONTACT			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:2/1RATO:3/3LANDING/SAFING:3/33/3			
REDUNDANCY SCREENS: A [2] B [F] C [P]			
LOCATION: PNL R12A2 PART NUMBER: S7			
CAUSES: CONTAMINATION, PIECE-PART FAILURE			
EFFECTS/RATIONALE: A SHORT ACROSS THE OPEN PINS WILL HAVE NO EFFECT DURING ASCENT OR ENTRY SINCE THE CB IS PULLED AND ALSO THE ISOL VALVE IS CLOSED. HOWEVER, PRIOR TO THE FIRST DUMP AND WITH THIS FAILURE, THE HEATER SWITCH WILL BE ACTIVATED "ON" IN ANTICIPATION FOR A DUMP. THIS PROCESS WILL AUTOMATICALLY OPEN THE DUMP VALVE. AND SINCE THE ISOL VALVE IS OPEN AT THIS TIME, WATER WILL FLOW BEFORE NOZZLE HEATERS DEVELOP ADEUQATE TEMPERATURE, THEREBY RESULTING IN ICE FORMATION OUTSIDE THE NOZZLE. ICE MUST BE REMOVED BEFORE ENTRY IS ATTEMPTED. ATTITUDE CHANGES, EVA, AND/OR RMS MAY BE USED TO BDEAK THE ICE			

REFERENCES:

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BE USED TO BREAK THE ICE.

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1211	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA			
ITEM: SWITCH, DUMP VALVE (1) FAILURE MODE: OPEN (ELECTRICAL), ANY SINGLE FAILURE				
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)				
CRITIC	CALITIES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC			
ITETOFE /NA	RTLS: /NA TAL· /NA			
ONORBIT: 3/2R	AOA: /NA			
DEORBIT: /NA	ATO: /NA			
LANDING/SAFING: 3/3	,			
REDUNDANCY SCREENS: A [2]	В[Р] С[Р]			
LOCATION: PNL R12A2 PART NUMBER: S7				
CAUSES: CONTAMINATION, PIECE-PAR	RT FAILURE			
EFFECTS/RATIONALE: THE MORE SEVERE CASE IS FOR OPEN PINS BEING OPEN THAT IS THE VALVE WILL REMAIN CLOSED AND THEREFORE LOSS OF DUMP CAPABILITY. SEE MDAC-1203 REMARKS.				

REFERENCES:

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1212	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: SWITCH, DUMP NOZZI FAILURE MODE: PHYSICAL BINDING/J	
LEAD ANALYST: M.J. SAIIDI S	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: /NA TAL: /NA
LIFTOFF: /NA ONORBIT: 3/2R	TAL: /NA AOA: /NA
ONORBIT: 3/2R DEORBIT: /NA	ATO: /NA
LANDING/SAFING: 3/3	,
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: PNL R12A2 PART NUMBER: S17	
CAUSES: CONTAMINATION, PIECE-PAP	T FAILURE
OPERATION OF THE DUMP VALVE AND N	USED TO COMPENSATE FOR THE LOSS.
REFERENCES:	

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1213	HIGHEST CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R /NA
ITEM: SWITCH, DUMP NOZZLE FAILURE MODE: FAILS TO OPEN, OPEN CONTACT	HEATER (1) (ELECTRICAL), ANY SIN	
LEAD ANALYST: M.J. SAIIDI SUB	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)		
CRITICAL	LITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUN RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	C
REDUNDANCY SCREENS: A [2]	B [P] C [P]	
LOCATION: PNL R12A2 PART NUMBER: S17		
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE: THE DUMP VALVE SWITCH CANNOT BE OPERATED TO ACTIVATE THE DUMP VALVE AND THE NOZZLE HEATERS WILL BE INOPERATIVE RENDERING LOSS OF DUMP CAPABILITY. FES OR X-TIE AVAILABLE TO COMPENSATE FOR THE LOSS.		
REFERENCES:		

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1214	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: SWITCH, DUMP NOZZLE FAILURE MODE: SHORTED, ANY SINGLE			
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICAI	LITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: 3/3	ABORT RTLS TAL: AOA: ATO:	: /NA /NA /NA	
REDUNDANCY SCREENS: A []	B[]	c[]	
LOCATION: PNL R12A2 PART NUMBER: S17			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: NO SIGNIFICANT EFFECT SINCE THE REDUNDANT PINS WILL PREVENT FLOW OF ELECTRICITY WHEN THE SWITCH IS TURNED OFF. THE REVERSE ACTION WOULD OPERATE NOMINALLY.			
REFERENCES :			

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1215	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: CIRBUIT BREAKER, DUM FAILURE MODE: FAILS TO REMAIN CLOS	
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC	
PRELAUNCH: 3/3	RTLS: /NA
LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	TAL: /NA AOA: /NA
ONORBIT: 3/2R	AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: PNL ML86B PART NUMBER: CB64	

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

DIFFICULT TO OPERATE THE NOZZLE HEATERS BY HOLDING DOWN THE CB. IF NOT, THE DUMP CAPABILITY IS LOST SINCE NO POWER WILL BE AVAILABLE TO OPERATE THE DUMP VALVE AND NOZZLE HEATERS - FES AND X-TIE AVAILABLE.

REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 7/20/87 3/3 SUBSYSTEM: LIFE SUPPORT FLIGHT: ABORT: /NA 1216 MDAC ID: CIRBUIT BREAKER, DUMP VALVE (1) ITEM: FAILURE MODE: FAILS TO REMAIN OPEN, SHORTED SUBSYS LEAD: M.J. SAIIDI LEAD ANALYST: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM SUPPLY WATER SUBSYSTEM 2) 3) DUMP LINE ASSEMBLY EPDC 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT /NA PRELAUNCH: 3/3 RTLS: LIFTOFF: /NA TAL: /NA 3/3 AOA: /NA ONORBIT: /NA ATO: /NA DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] СГ 1 LOCATION: PNL ML86B PART NUMBER: CB64 CAUSES: CONTAMINATION, PIECE-PART FAILURE EFFECTS/RATIONALE: NO SIGNIFICANT IMPACT SINCE THE HEATER SWITCH AND DUMP VALVE SWITCH HAVE OFF POSITIONS (NO POWER). **REFERENCES:**

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1217	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3		
ITEM: POSITION INDICATION FAILURE MODE: ERRONEOUS OUTPUT, L	, DUMP VALVE (1) OSS OF OUTPUT		
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICA	LITIES		
	ABORT HDW/FUNC		
PRELAUNCH: 3/3	RTLS: 3/3 TAL: 3/3 AOA: 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 []	в[] С[]		
LOCATION: PNL R12A2 PART NUMBER: DS5			
CAUSES: MECHANICAL SHOCK, PIECE-P VIBRATION	ART FAILURE, LOSS OF INPUT,		
EFFECTS/RATIONALE: LOSS OF BARBER-POLE INDICATION DETERMINING THE STATUS OF THE SWITCH (DUMP VALVE) POSITION. MDM SIGNALS, AND THE EFFECT OF VALVE POSITION ON THE DUMP LINE ARE AVAILABLE TO COMPENSATE FOR THE LOSS.			
REFERENCES:			

DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:1218ABORT:3/3			
ITEM: RESISTOR, DUMP VALVE (2) FAILURE MODE: OPEN (ELECTRICAL), SHORTED			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 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 [] B [] C []			
LOCATION: PNL R12A2			
PART NUMBER: A4R2 AND R3			
CAUSES: THERMAL SHOCK			
EFFECTS/RATIONALE: LOSS OF SIGNALS (DUMP VALVE SWITCH POSITION INDICATION AND THE			

LOSS OF SIGNALS (DUMP VALVE SWITCH POSITION INDICATION AND THE NOZZLE HEATER STATUS) TO THE MDM OF-4. BARBER-POLE INDICATION AND THE NOZZLE TEMPERATURE SENSORS ARE AVAILABLE TO COMPENSATE FOR THE LOSS.

REFERENCES:

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1219	FL:	ICALITY HDW/FUNC IGHT: 3/3 ORT: 3/3	
ITEM: DIODE, DUMP VALVE FAILURE MODE: OPEN (ELECTRICAL)		n National Antonio State National Antonio State	
LEAD ANALYST: M.J. SAIIDI S	UBSYS LEAD: M.J	. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
	ALITIES		
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	RTLS: TAL:	HDW/FUNC 3/3 3/3 3/3 3/3	
REDUNDANCY SCREENS: A []	B[]	c []	
LOCATION: PNL R12A2 PART NUMBER: A10CR5			
CAUSES: THERMAL SHOCK			
EFFECTS/RATIONALE: LOSS OF SIGNAL FOR THE BARBER-POLE INDICATION. MDM SIGNALS AND TEMP SENSORS ARE AVAILABLE TO COMPENSATE FOR THE LOSS.			
REFERENCES:			

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1220	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: SENSOR, NOZZLE TEMPE FAILURE MODE: OPEN (ELECTRICAL), SI			
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICAL			
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]		
LOCATION: MID FUSELAGE PART NUMBER: V62T0439 AND T0440			
CAUSES: PIECE-PART FAILUIRE, THERM	AL SHOCK		
EFFECTS/RATIONALE: LOSS OF ONE SENSOR IS NOT SIGNIFICANT, SINCE THE OTHER SENSOR IS STILL AVAILABLE. LOSS OF BOTH SENSORS WILL NEGATE DUMP OPERATION - FES IS AVAILABLE TO EXPEL ADDITIONAL WATER BUT MAY AFFECT MISSION TIMELINE.			
REFERENCES:			
REPORT DATE 10/23/87 C-1	27		

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1221	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA	
ITEM: NOZZLE HEATER (1) FAILURE MODE: OPEN (ELECTRICAL)		
LEAD ANALYST: M.J. SAIIDI SU	JBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	· · · · · · · · · · · · · · · · · · ·	
CRITICA	ALITIES	
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:/NAONORBIT:2/2DEORBIT:/NALANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: MID FUSELAGE PART NUMBER: 40V62HR3		
CAUSES: THERMAL SHOCK		
EFFECTS/RATIONALE: LOSS OF DUMP CAPABILITY THROUGH THE NOZZLE. SWITCH TO FES TO COMPENSATE FOR THE LOSS. WITHOUT HEATER, WATER FREEZE-UP IS EMMINENT. USE OF FES FOR WATER DUMP MAY IMPACT THE MISSION TIMELINE.		
REFERENCES:		

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DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:1222ABORT:/NA			
ITEM: NOZZLE HEATER (1) FAILURE MODE: SHORTED			
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:/NALIFTOFF:/NATAL:/NAONORBIT:2/2AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: MID FUSELAGE PART NUMBER: 40V62NZ1			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: THE HEATER WILL DRAW EXCESSIVE CURRENT POPPING THE CIRCUIT BREAKER RESULTING IN INTERRUPTION AND COOL-DOWN OF THE NOZZLE BAKE-OUT PROCEDURE. DUMP THROUGH THE NOZZLE MAY NOT BE ACCOMPLISH IF CB CANNOT BE HELD DOWN.			
REFERENCES:			

REPORT DATE 10/23/87

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1223	HIGHEST CF	RITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 /NA
ITEM: DUMP NOZZLE FAILURE MODE: RESTRICTED FLOW			
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M	4.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICAI	ITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA LANDING/SAFING: 3/3	ABORT RTLS: TAL: AOA: ATO:	,	c
REDUNDANCY SCREENS: A []	В[]	c []	
LOCATION: MID FUSELAGE			

LOCATION: MID FUSELAGE PART NUMBER: 40V62NZ1

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:

EXCESSIVE CONTAMINATION WILL REDUCE THE WATER DUMP FLOW CAUSING ICING PROBLEM AND HINDERING DUMP PROCEDURES.

REFERENCES:

REPORT DATE 10/23/87

DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:1224ABORT:/NA		
ITEM: DUMP LINE HEATER (2) FAILURE MODE: OPEN (ELECTRICAL)		
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC		
PRELAUNCH: 3/3 RTLS: /NA		
LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA		
DEORBIT: /NA ATO: /NA LANDING/SAFING: 3/3		
LANDING/SAFING: 5/5		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: MID BODY AREA 40 PART NUMBER: HTR A AND B		
CAUSES: THERMAL SHOCK		
EFFECTS/RATIONALE: LOSS OF ONE HEATER CAN BE COMPENSATED BY SWITCHING TO THE REDUNDANT HEATER. LOSS OF BOTH HEATERS MAY CREATE FREEZING OF WATER IN THE LINE NEGATING DUMP OPERATION AND POSSIBLY RUPTURING THE LINE. FES MAY BE USED TO EXPEL ADDITIONAL WATER.		

REFERENCES:

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1225	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: DUMP LINE HEATER FAILURE MODE: SHORTED	(2)		
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
	ICALITIES		
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC		
PRELAUNCH: 3/3 LIFTOFF: /NA	RTLS: /NA TAL: /NA		
ONORBIT: 3/2R	TAL: /NA AOA: /NA		
PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: 3/3	ATO: /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]		
LOCATION: MID BODY AREA 40 PART NUMBER: HTR A AND B			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: A SHORT WILL DRAW EXCESSIVE CURRENT POPPING THE CB AND/OR CAUSING THE THERMOSTAT TO OPEN. AT ANY RATE, THIS FAILURE WILL INTERRUPT UNIFORM HEATING OF THE HEATER IN THE LINE WHICH MAY CAUSE FREEZING AND BLOCKING OF LINE FOR ANY DUMP OPERATIONS. SWITCH TO REDUNDANT HEATER SET.			
REFERENCES:	· · · · ·		

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1226	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: THERMOSTAT, LINE HE FAILURE MODE: OPEN (ELECTRICAL),	ATER (4) FAILS TO START		
LEAD ANALYST: M.J. SAIIDI SU	BSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)			
CRITICA	LITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]		
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62S108, 208, 308 AND 408			
CAUSES: PIECE-PART FAILURE, THERMAL SHOCK			
EFFECTS/RATIONALE: LOSS OF ONE LEG OF HEATER REDUNDANCY (THERMOSTATS - 2 PER SIDE - ARE IN SERIES) - THE OTHER HEATER WILL BE AVAILABLE. LOSS OF FUNCTION (NO THERMOSTAT) WILL PRECLUDE DUMP OPERATION SINCE NO HEATER CAN BE ENERGIZED. DUMP TO BE ACCOMPLISHED THORUGH FES.			
REFERENCES:			
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REPORT DATE 10/23/87

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1227	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: THERMOSTAT, DUMP FAILURE MODE: SHORTED, FAILS TO	LINE HEATER (4) STOP
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) EPDC 5) 6) 7) 8) 9)	
CRITI	CALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: /NAN
LIFTOFF: /NA	TAL: /NA
ONORBIT: 3/3	AOA: /NA
DEORBIT: /NA	ATO: /NA
CRITI FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62S108, 208, 30	
CAUSES: PIECE-PART FAILURE, THE	RMAL SHOCK
EFFECTS/RATIONALE: THE AFFECTED THERMOSTAT WILL NOT THERMOSTAT WILL BE ABLE TO SHUT WARMER WATER IN THE LINE, OTHERW	CYCLE, BUT THE REDUNDANT OFF POWER AT HIGHER TEMPERATURE. ISE NO SIGNIFICANT IMPACT. ALSO,

REFERENCES:

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THE RESPECTIVE CB'S MAY BE USED TO DEACTIVATE THE HEATERS.

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1228	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: QD, CONTINGENCY FAILURE MODE: FAILS TO REMAIN LEAKAGE	CROSS-TIE (1) CLOSED, FAILS TO CLOSE, INTERNAL
LEAD ANALYST: M.J. SAIIDI	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRIT	ICALITIES
	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	В[] С[]

LOCATION: CABIN PART NUMBER: -1101

CAUSES: PIECE-PART FAILURE

EFFECTS/RATIONALE:

WATER WILL FLOW CONTINUOUSLY INTO THE CABIN UNLESS THE DUMP LINE IS ISOLATED BY CLOSING THE DUMP ISOLATION VALVE. THEREFORE LOSS OF SUPPLY WATER DUMP THROUGH THE NOZZLE AND SUBSEQUENT SWITCHING TO FES FOR EXPELLING EXCESSIVE WATER. DURING THE ASCENT AND ENTRY THE DUMP ISOL VALVE IS CLOSED AND THE FAILURE OF QD BECOMES NOT APPLICABLE.

REFERENCES:

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1229	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: QD, CONTINGENCY CROSS FAILURE MODE: FAILS TO REMAIN OPEN	S-TIE (1) , FAILS TO OPEN
LEAD ANALYST: M.J. SAIIDI SUB	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 2/2	
LANDING/SAFING: 3/3	AIO: /NA
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: CABIN PART NUMBER: -1101	
CAUSES: PIECE-PART FAILURE	
EFFECTS/RATIONALE: LOSS OF CONTINGENCY CROSS-TIE CAPAB THROUGH THE WASTE WATER DUMP NOZZLE	LITY TO EXPEL SUPPLY WATER

THROUGH THE WASTE WATER DUMP NOZZLE. THE CROSS-TIE BECOMES NECESSARY IF THERE IS NO MEANS OF EXPELLING (FES OR NOZZLE) EXCESS WATER. CONSIDERING THIS TO BE A CONTINGENCY ACTION, THE MISSION SHOULD BE TERMINATED AND RETURN WITH WATER FLOW THROUGH FUEL CELLS DEDICATED DUMP LINE.

REFERENCES:

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DATE: 7/20/87 HIGHEST CRITICALITY SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 1230 ABORT:	Y HDW/FUNC 3/3 /NA
ITEM: SENSOR, DUMP LINE TEMPERATURE (1) FAILURE MODE: ERRONEOUS OUTPUT, LOSS OF OUTPUT	
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAII	DI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) DUMP LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	•
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:3/3AOA:	A .
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: MID FUSELAGE PART NUMBER: V62T0418A	
CAUSES: PIECE-PART FAILURE, THERMAL SHOCK	
EFFECTS/RATIONALE: LOSS OF INDICATION TO FIND ANY MALFUNCTIONS WITH THE L OR THERMOSTATS. UNDER SINGLE FAILURE ONLY, THERE IS NO SIGNIFICANT PROBLEM SINCE HEATERS ARE OPERATING NOMINAL A SUBSEQUENT HATER AND/OR THERMOSTAT LOSS, THE LINE MAN RESULTING IN LOSS OF DUMP CAPABILITY AND USE OF FES INS	O LLY. WITH Y FREEZE UP
REFERENCES:	
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DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:1231ABORT:3/3
ITEM: QD, ECLSS BAY (2) FAILURE MODE: RESTRICTED FLOW
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/2RAOA:3/3DEORBIT:3/3ATO:3/3
PRELAUNCH: 3/3 RTLS: 3/3
LIFTOFF: 3/3 TAL: 3/3
ONORBIT: 3/2R AOA: 3/3
DEORBIT: 3/3 ATO: 3/3
LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [2] B [P] C [F]
LOCATION: MID DECK-ECLSS BAY PART NUMBER: -3302 AND -1201
CAUSES: CONTAMINATION, PIECE-PART FAILURE
EFFECTS/RATIONALE: LOSS OF ONE WATER PORT (CHILLED OR AMBIENT) FOR USE BY THE CREW. ADDITIONAL PORT WILL BE ADEQUATE TO CONTINUE WITHOUT IMPACTING THE MISSION. FUNCTIONAL LOSS WILL PRECLUDE USE OF WATER FOR DRINKING, HYGIENE, FOOD PREP,ETC. A SEVERE CONTAMINATION MAY RESTRICT FLOW THROUGH BOTH WATER PORTS - SCREEN C.

REFERENCES:

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1232		ITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R 3/3
ITEM: QD, GALLEY/DISPENSE FAILURE MODE: RESTRICTED FLOW	ER (2)		
LEAD ANALYST: M.J. SAIIDI SU	JBSYS LEAD: M.	.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) 5) 6) 7) 8) 9)			
	ALITIES		-
FLIGHT PHASE HDW/FUNC			C
PRELAUNCH: 3/3	RTLS:	3/3	
LIFTOFF: 3/3	TAL:	3/3	
	101.	2/2	
ONORBIT: 3/2R	AOA:		
DEORBIT: 3/3	ATO:	3/3	
LANDING/SAFING: 3/3			
,			
REDUNDANCY SCREENS: A [2]		C [F]	•
		• • • •	an a
LOCATION: CABIN			
PART NUMBER:			
CAUSES: CONTAMINATION, PIECE-PAR	FAILURE		
			1. m
	2		n an
EFFECTS/RATIONALE:	a a state of the second se		
LOSS OF ONE WATER PORT (CHILLED OI			
ADDITIONAL PORT WILL BE ADEQUATE '			
THE MISSION. FUNCTIONAL LOSS WILL			
DRINKING, HYGIENE, FOOD PREP,			
MAY RESTRICT FLOW THROUGH BOTH WAY			
MAI KESTKIUT FLOW THROUGH BUTH WA	16K PORTS = SC	CREEN C.	
REFERENCES:			

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1233	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2
ITEM: LINES AND FITTINGS FAILURE MODE: EXTERNAL LEAKAGE, STR	UCTURAL FAILURE (RUPTURE)
LEAD ANALYST: M.J. SAIIDI SUBS	YS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICALI	TIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 2/2
LIFTOFF: 2/2 ONORBIT: 2/2 DEORBIT: 2/2	TAL: 2/2 AOA: 2/2
ONORBIT: 2/2 DEORBIT: 2/2	AOA: 2/2 ATO: 2/2
LANDING/SAFING: 3/3	A10: 2/2
	[] C [].
REDONDANCI SCREENS. A [] D	
LOCATION: CABIN-UPSTREAM OF THE	FANKS INLET VALVES
CAUSES: MECHANICAL SHOCK, MISHANDLN	G/ABUSE, VIBRATION
EFFECTS/RATIONALE: CONTINUOUS FLOW OF THE FUEL CELLS GE MIDDECK AREA - LINE CANNOT BE ISOLAT FUEL CELLS.	
REFERENCES:	

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REPORT DATE 10/23/87

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1234	HIGH	EST CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 2/2
ITEM: LINES AND FAILURE MODE: EXTERNAL) FITTINGS LEAKAGE, STRUCTU	RAL FAILURE (RU)	PTURE)
LEAD ANALYST: M.J. SAIID)I SUBSYS LI	EAD: M.J. SAIID	I
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYS 3) GALLEY LINE ASSEMBN 4) 5) 6) 7) 8) 9)	STEM		-
	ODIMIONI IMIEC		
FLIGHT PHASE HI PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	CRITICALITIES		
FLIGHT PHASE HL	DW/FUNC AB	JRT HDW/FU	NC
PRELAUNCH:	3/3	RTLS: $2/2$	
LIFTOFF:	2/2	TAL: $\frac{2}{2}$	
ONORBIT:	2/2	AOA: 2/2	-
DEODBTT.	2/2	λτο: 2/2	
	2/2	AIO. 2/2	
LANDING/SAFING:	3/3		
REDUNDANCY SCREENS: A	[] B[] C[]	
LOCATION: CABIN, BET PART NUMBER:	WEEN THE TANKS I	NLET/OUTLET VAL	VES
CAUSES: MECHANICAL SHOO	CK, MISHANDLING/A	BUSE, VIBRATION	
EFFECTS/RATIONALE: THE AFFECTED TANK SHOULD LINE BY CLOSING THE INLE HAVE GREATER IMPACT SINC REDUCED SUBSTANTIALLY. CONTINGENCY RESERVES AND	ET/OUTLET VALVES. CE THE WATER FOR ALSO LESS TANKAG	LOSS OF TANK . CREW USAGE WILL E AVAILABLE FOR	A WILL BE
REFERENCES:			

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	CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2
ITEM: LINES AND FITTINGS FAILURE MODE: EXTERNAL LEAKAGE, STRUCTURAL	FAILURE (RUPTURE)
LEAD ANALYST: M.J. SAIIDI SUBSYS LEAD:	M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) 5) 6) 7) 8) 9)	
CRITICALITIES	
FLICHT PHASE HOW/FUNC ABORT	HDW/FUNC
PRELAUNCH: 3/3 RTL LIFTOFF: 2/2 TAL	S: 2/2 : 2/2 : 2/2
LIFTOFF: 2/2 TAL	: 2/2
ONORBIT: 2/2 AOA	: 2/2
PRELAUNCH:3/3RTLLIFTOFF:2/2TALONORBIT:2/2AOADEORBIT:2/2ATOLANDING/SAFING:3/3	: 2/2
REDUNDANCY SCREENS: A [] B []	C []
LOCATION: CABIN, DOWNSTREAM OF THE TANKS PART NUMBER:	OUTLET VALVES
CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE	, VIBRATION
EFFECTS/RATIONALE:	
THE MOST SEVERE CASE IS AN EXTERNAL LEAKAGE	ON THE LINE
DOWNSTREAM OF THE XOVR VALVE. IN THIS CASE,	
ADN DUMP CAPABILITY WOULD BE LOST SINCE IT WO	
ISOLATE THE LINE AFTER THE LEAK. WATER MANAG	
REDUCED TO TANKS C AND D ONLY THROUGH FES FE	
FAILURE IS MOST CRITICAL DURING ASCENT/ENTRY	WHEN THE FES IS
ΟΡΕΡΧΩΤΝΟ ΟΝ ΙΤΝΕ Χ	

REFERENCES:

OPERATING ON LINE A.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/2ABORT: 2/2 1236 MDAC ID: LINES AND FITTINGS ITEM: FAILURE MODE: EXTERNAL LEAKAGE, STRUCTURAL FAILURE (RUPTURE) SUBSYS LEAD: M.J. SAIIDI LEAD ANALYST: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM SUPPLY WATER SUBSYSTEM 2) 3) GALLEY LINE ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: 3/3 RTLS: 2/2LIFTOFF: 2/2 TAL: 2/22/2 AOA: · 2/2 ONORBIT: 2/2 ATO: 2/2 **DEORBIT:** LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: CABIN, GALLEY LINE PART NUMBER: CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, VIBRATION EFFECTS/RATIONALE: A LEAK UPSTREAM OF THE GALLEY SUPPLY VALVE CANNOT BE STOPPED -LINE CANNOT BE ISOLATED. CONTINUOUS FLOW OF WATER TO THE CABIN AND LOSS OF WATER TO THE CREW THROUGH GALLEY/DISPENSER LINES. IT MAY ALSO STARVE FES DURING ASCENT/ENTRY IF THE LEAKAGE IS APPRECIABLE.

REFERENCES:

REPORT DATE 10/23/87

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 1237		HIGHEST	CRITICALITY FLIGHT: ABORT:	,
ITEM: WATER C FAILURE MODE: INTERNA		L-H20		
LEAD ANALYST: M.J. SAI	IDI SUB	SYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYST 2) SUPPLY WATER SUBS 3) GALLEY LINE ASSEM 4) 5) 6) 7) 8) 9)	YSTEM			
	CRITICAL	TTES		
FLIGHT PHASE	HDW/FUNC		HDW/FUN	C
PRELAUNCH:	3/3	RTI	S: 2/1R	-
LIFTOFF:	2/1R	TAL	S: 2/1R : 2/1R	
ONORBIT:	3/3 2/1R 2/1R	AOA	.: 2/1R	
DEORBIT:	2/1R		2/1R	
LANDING/SAFING:	3/3			
REDUNDANCY SCREENS:	A [2] I	3 [P]	С[Р]	
LOCATION: ECLSS BA PART NUMBER: 9061HX1	Y			

CAUSES: MECHANICAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

THIS FAILURE MODE IS COVERED BY THE AIR REVITALIZATION SUBSYTEM (ARS) MDAC-204. IT WILL RESULT IN LOSS OF ONE WCL LOOP AS WELL AS CONTAMINATION OF THE POTABLE WATER FOR CREW USE. A SIMILAR LEAK IN THE REDUNDANT WCL WILL LEAVE NO THERMAL COOLING OF THE CABIN, AVIONICS, ... ETC - POTENTIAL LOSS OF VEHICLE DUE TO LOSS OF AVIONICS EQUIPMENT.

REFERENCES:

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 1238	FLI	CALITY HDW/FUNC GHT: 3/2R RT: /NA
ITEM: WATER CHILLER (1) FAILURE MODE: RESTRICTED FLOW, POT	ABLE WATER	
LEAD ANALYST: M.J. SAIIDI SUE	SYS LEAD: M.J.	SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SUPPLY WATER SUBSYSTEM 3) GALLEY LINE ASSEMBLY 4) 5) 6) 7) 8) 9)		
CRITICAI	ITIES	
FLIGHT PHASE HDW/FUNC		HDW/FUNC
PRELAUNCH: 3/3	RTLS:	/NA
LIFTOFF: /NA ONORBIT: 3/2R	TAL: AOA:	/NA
ONORBIT: 3/2R	AOA:	/NA
DEORBIT: /NA	ATO:	/NA
LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A [2]	B[P] C	[F]
LOCATION: ECLSS BAY		

PART NUMBER: 9061HX1

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:

A CONTAMINATION IN THE HX PASSAGES WILL BLOCK FLOW OF CHILLED WATER TO THE CREW. AMBIENT WATER IS AVAILABLE FOR USE, BUT NOT PALATABLE. ARS-201 STUDIED RESTRICTED FLOW FOR WCL - WCL ONLY. IF SEVERE CONTAMINATION OCCURS, THE AMBIENT WATER FLOW WILL BE CLOGGED AND NO WATER WILL BE AVAILABLE TO THE CREW AT ALL -MISSION ABORT.

REFERENCES:

REPORT DATE 10/23/87

C.2

WASTE MANAGEMENT SUBSYSTEM

Analysis Worksheets

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WASTE MANAGEMENT SUBSYSTEM

MDAC-ID	H/F	ABORT H/F		ITEM NAME
2001	3/2R	 /NA	P P P	URINAL, MALE AND FEMALE (1)
	3/2R	/NA	РРР	URINAL, MALE AND FEMALE (1)
	3/2R	/NA	PPP	URINAL COUPLER (1)
	3/3	/NA		URINAL CON SCRN PREFILTER(1)
2005	3/3	3/3		URINAL CON SCRN PREFILTER (1)
	3/2R		PPP	
	3/2R	/NA	PPP	URINAL HOSE (1)
2008 (*)		/NA	PPP	URINAL ADPTR QR (1)
2009	3/2R	/NA	РРР	URINAL ADPTR QR (1)
2010	3/3	/NA		URINAL HOSE CLAMP (1)
2011	3/2R	/NA	ΡΡΡ	URINAL DYNATUBE (2)
2012	3/2R	/NA	РРР	URINAL HOSE CLAMP (1) URINAL DYNATUBE (2) URINAL DYNATUBE (2) TUBE EMU EXTENSION (1)
2013 (*)	2/2	/NA		TUBE, EMU EXTENSION (1)
2014 (*)	2/2	/NA		TUBE, EMU EXTENSION (1)
2015 (*)	2/2	/NA		EMU OD (1)
2012 2013 (*) 2014 (*) 2015 (*) 2016 2017	3/2R	/NA	PPP	COMMODE STORAGE CONTAINER (1)
2016 2017 2018	3/2R	/NA	PPP	COMMODE/LINER (1)
2018	3/2R	/NA	PPP	COMMODE UPPER RING (1)
2019	3/2R	/NA	PPP	COMMODE SLIDE VLV (1)
2020	3/2R	/NA	PPP	COMMODE SLIDE VLV (1)
2021	3/3			
	3/2R	/NA	PPP	COMPACTOR DRIVE UNIT (1)
	3/3	/NA		COMPACTOR DRIVE UNIT (1)
2024	3/2R	/NA	РРР	COMPACTOR DRIVE UNIT (1) COMMODE BOTTOM FLANGE (1) COMMODE BOTTOM FLANGE (1)
2025	•	/NA		COMMODE BOTTOM FLANGE (1)
2026		/NA	PPP	COMMODE EXIT, MESH SCRN (1)
2027		/NA	-	COMMODE EXIT, MESH SCRN (1)
2028	3/3	/NA		COMMODE VANES (2)
2029	3/3	3/3		AUX. WET TRASH VENT LINE (1)
	3/3	3/3		AUX. WET TRASH VENT LINE QD (1)
	3/3	3/3		VACUUM PORT LINE (1)
	3/3	/NA		VACUUM PORT QD AND PLUG (1)
2033	3/2R	/NA	PPP	VACUUM PORT OD AND PLUG (1)
2034	3/2R	/NA	ΡΡΡ	VACUUM PORT OD AND PLUG (1)
2035	3/3	3/3		WET TRASH VENT LINE (1)
2036	3/3	3/3		WET TRASH VENT LINE (1)
2037	3/3	3/3		WET TRASH VENT QD (1)
2038	3/2R		PPP	
2039	3/2R		PPP	
2040	3/2R		PPP	
2041 (*)		/NA		WCS TO WWS QD (1)
2042 (*)		/NA	•	WCS TO WWS LINE (1)
2043 (*)		/NA		WCS TO WWS DYNATUBE (1)
2044	3/3	/NA		WCS TO WWS DYNATUBE (1)
2045	3/2R		РРР	CCH LINKAGE (1)

(*) Potential Critical Items.

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WASTE MANAGEMENT SUBSYSTEM (cont'd)

	CRITICA		EDUNDANCY SCREENS	
MDAC-ID	FLIGHT H/F	ABORT H/F	A B C	ITEM NAME
2046	3/3	/NA		MANUAL VENT VLV (1)
2040	3/2R	/NA	РРР	MANUAL VENT VLV (1)
2048	3/2R	3/3	PPP	MANUAL VENT VLV (1)
2048	3/2R	/NA	PPP	COMMODE OUTLET CNTRL VLV (1)
	3/2R	/NA	PPP	COMMODE OUTLET CNTRL VLV (1)
2050	3/2	/NA /NA	I I I	COMMODE OUTLET CNTRL VLV (1)
2051 2052	3/2R	/NA	PPP	COMMODE REPRESS VLV (1)
2052	3/2R	/NA	PPP	COMMODE REPRESS VLV (1)
	3/2R	/NA	PPP	COMMODE REPRESS VLV (1)
2054 2055	3/2R	/NA	PPP	BALLAST AIR CONTROL VLV (1)
2055	3/2	/NA		BALLAST AIR CONTROL VLV (1)
2058	3/3	/NA		BALLAST AIR CONTROL VLV (1)
2057	3/2R	/NA /NA	PPP	FAN/SEP VLV (1)
	3/2R 3/3	/NA /NA	F f f	FAN/SEP VLV (1)
2059 2060	3/3	/NA /NA		FAN/SEP VLV (1)
2060	3/3 3/2R	/NA	РРР	FAN/SEPARATORS (2)
2062	3/2R	/NA	PPP	
	3/2R		PPP	
2063 2064	3/2R 3/2R	/NA		FAN/SEPARATORS (2)
2065	3/2R 3/3	/NA	F F F	FAN/SEP TP (4)
2065	3/3	/NA /NA		FAN/SEP TP (4)
2067	3/3	/NA		FAN/SEP INLET HOSE (1)
2068	3/2R	/NA	PPP	FAN/SEP INLET HOSE (1)
2069	3/2R	/NA		FAN/SEP INLET HOSE (1)
2070	3/3	/NA		DUAL CHECK VALVES (2)
2071	3/2R	/NA	PPP	DUAL CHECK VALVES (2)
2072	3/2R	/NA	PPP	DUAL CHECK VALVES (2)
2073	3/2R	/NA	PPP	HOSE ASSY, FAN/SEP TO CV (1)
2074	3/3	/NA		MUFFLER HOUSING INLET DUCT (1)
2075	3/3	/NA		BACTERIA FILTER (2)
2076	3/3	/NA	· · · -	BALLAST VLV SCRN (1)
2077	3/2R	/NA	PNP	BALLAST VLV ASSY (1)
2078	3/3	/NA		BALLAST VLV ASSY (1)
2079	3/3	/NA		COMMODE SEAT (1)
2080	3/2R	/NA	PPP	COMMODE SEAT (1)
2081	3/3	/NA		SEAT BASE (1)
2082	3/3	/NA		THIGH BAR RESTRAINT (2)
2083	3/3	/NA		RESTRAINT HARNESS (THIGH) (4)
2084	3/2R	/NA	PPP	FOOT RESTRAINT (1)
2085	3/3	/NA		FOOT RESTRAINT (1)
2086	3/3	/NA		TOE BAR RESTRAINT (1)
2087	3/3	/NA		TOE BAR RESTRAINT (1)
2088	3/2R	•	P P P	
2089	3/2R		PPP	
2090	3/3	/NA		COMMODE PRESS XDCR (1)

(*) Potential Critical Items.

WASTE MANAGEMENT SUBSYSTEM (cont'd)

MDAC-ID	FLIGHT H/F	ABORT H/F		ITEM NAME
2091	3/2R		РРР	
2092	3/2R		PNP	SW, WCS FAN/SEP (1)
2093	3/3	/NA		SW, WCS FAN/SEP (1)
2094	3/3	/NA		WCS MODE SWITCH (1)
2095	3/2R	/NA	РРР	WCS MODE SWITCH (1)
2096	3/3	/NA		WCS MODE SWITCH (1)
2097	3/2R	/NA	РРР	WCS FAN/SEP RELAY (2)
2098	3/2R	/NA	PPP	WCS FAN/SEP RELAY (2)
2199	3/3	/NA		FAN/SEP NOISE SUPPRESSION (1
2100	3/2R	/NA	PPP	FAN/SEP NOISE SUPPRESSION (1
2101	3/2R	/NA	P P P P P P P P P	FAN/SEP MOTOR THERMOSTAT (1)
2102	3/2R	/NA	Р́РР	FAN/SEP MOTOR THERMOSTAT (1)
2103	3/3	/NA		FAN/SEP BYPASS SWITCH (2
2104	3/3	/NA		FAN/SEP BYPASS SWITCH (2
2105	3/2R	/NA	PPP	CB, WCS CNTLR (2)
2106	3/1R	/NA	PPP	CB, WCS CNTLR (2)
2107	3/2R	/NA	PPP	FAN/SEP MOTOR (2)
2108	3/2R	/NA	РРР	FAN/SEP MOTOR (2)
2109	3/2R		PPP	CB, WCS FAN/SEP (1)
2110	3/2R	/NA	PPP	CB, WCS FAN/SEP (1)
2111 (*)	2/2	3/3		WWS LINE, UNIONS, AND JUNCT
2112 (*)	2/2	3/3		WWS LINE, UNIONS, AND JUNCT
2113 (*)	2/2	3/3		ARS CONDENSATE SUPPLY TUBE (
2114 (*)	2/2	3/3		ARS CONDENSATE SUPPLY TUBE (
2115	3/2R	/NA	PPP	CWC (1)
2116 (*)	2/2	3/3		WTNK INLET VLV (1)
2117	3/3	/NA		WTNK INLET VLV (1)
2118	3/2R		РРР	WTNK INLET VLV (1)
2119	3/2R	3/3	РРР	WASTE TANK 1 (1)
2120	3/1R	3/1R	РРР	WASTE TANK 1 (1)
2121	3/2R	3/3	PPP	WTNK LINER (BELLOWS)(1)
2122	3/2R	3/3	РРР	WTNK INLET LINES (1)
2123	3/3	/NA		WTNK OUTLET LINES (1)
2124	3/3	/NA		WTNK FLUID LEVEL XDUCR (1)
2125	3/1R		РРР	WTNK N2 LINE (1)
2126	3/3	3/3		WTNK N2 HYDROPHOBIC FLTR (1)
2127	3/2R	•	PPP	WTNK DRAIN VLV (1)
2128	3/3	3/3		WTNK DRAIN VLV (1)
2129	3/3	/NA		WTNK DRAIN VLV (1)
2130	3/3	/NA		GSE FILL QD AND PLUG (1)
2131	3/3	3/3		GSE FILL AND PLUG (1)
	3/3	/NA		GSE FILL QD AND PLUG (1)
2133	3/3	/NA		GSE DRAIN QD AND PLUG (1)
2134	3/3	/NA		GSE DRAIN QD AND PLUG (1)
2135	3/3	/NA		GSE DRAIN QD AND PLUG (1)

WASTE MANAGEMENT SUBSYSTEM (cont'd)

			EDUNDANCY SCREENS	
MDAC-ID			A B C	ITEM NAME
2136 (*)	2/2	/NA		DUMP LINES (1)
2137 (*)	2/2	/NA		DUMP LINES (1)
2138 (*)	2/2	/NA		WWS DMP ISOL VLV (1)
2139 (*)	2/2	2/2		DUMP LINES (1) WWS DMP ISOL VLV (1) WWS DMP ISOL VLV (1) WWS DMP ISOL VLV (1) WWS DMP ISOL VLV (1)
2140	3/2R	/NA	PPP	WWS DMP ISOL VLV (1)
2141 (*)	2/2	/NA		QD @ HIGH CAP. FILTER (1)
2142 (*)	2/2	/NA		HIGH CAPACITY FILTER (1)
2143	3/3	/NA		WWS DMP ISOL VLV (1) WWS DMP ISOL VLV (1) QD @ HIGH CAP. FILTER (1) HIGH CAPACITY FILTER (1) HIGH CAPACITY FILTER (1) CONT X-TIE QD (1) WTNK DUMP VLV (1) WTNK DUMP VLV (1) WTNK DUMP VLV (1) DUMP NOZZLE (1) TANK FLD QTY LVL SENS (1) WTNK FLD LVL SIG COND (1) WTNK TN FLD LVL (1)
2144 (*)	2/2	/NA		CONT X-TIE QD (1)
2145 (*)	2/1R	2/1R	PPP	WTNK DUMP VLV (1)
2146	3/2R	/NA	PPP	WTNK DUMP VLV (1)
2147 (*)	2/1R	/NA	PPP	WINK DUMP VLV (1)
2148 2149 2150 2151	3/2R	/NA	РРР	DUMP NOZZLE (1)
2149	3/3	3/3		TANK FLD QTY LVL SENS (1)
2150	3/3	3/3		WTNK FLD LVL SIG COND (1)
2151	3/3	3/3		MINE THIET ADA (T)
2152	3/3	/NA 3/3 3/3 3/3 3/3		WTNK INLET VLV (1)
2153	3/3	3/3		WTNK INLET VLV SWITCH (1)
2154	3/2R	3/3	ΡΡΡ	WTNK INLET VLV SWITCH (1)
2155	3/3	/NA /NA 3/3		WTNK INLET VLV, SOLENOID (2)
2156	3/3	/ NA		WTNK INLET VLV, SOLENOID (2) WTNK INLET VLV OPN INDCTR (1)
2157	3/3	3/3	•	WINK INLET VLV OFN INDER (1) WINK INLET VLV INDETR DIODE (1)
2158	3/3	3/3		WTNK INLET VLV INDCTR RESIS (1)
2159 2160	3/3	/NA		CB, WTNK OUTLET VLV (1)
2161	3/3	/NA /NA		CB, WINK OUTLET VLV (1)
	3/3	/NA /NA		WTNK OUTLET VLV SWITCH (2)
	3/3	/NA		WTNK OUTLET VLV SWITCH (2)
	3/3	/NA		WTNK OUTLET VLV, SOLENOID (1)
	3/3	/NA /NA		WTNK OUTLET VLV, SOLENOID (1)
		3/3		SW, WTNK OUTLET VLV INDCTR (1)
	3/3	3/3	•	WTNK OUTLET VLV DIODE (1)
2168	3/3	3/3		WTNK OUTLET VLV RESIS, TO MDM (1)
2169	3/3	/NA		PRESS SENSOR (1)
2170	3/3	/NA		PRESS SENSOR SIG COND (1)
2171 (*)	2/2	/NA		CB, WWS DMP ISOL VLV (1)
2172	3/3	/NA		CB, WWS DMP ISOL VLV (1)
2173 (*)	2/2	/NA		CB, WWS DMP ISOL VLV (1)
2174 (*)	2/2	/NA		CB, WWS DMP ISOL VLV (1)
2175 (*)	2/2	/NA		CB, WWS DMP ISOL VLV (1)
2176 (*)	2/2	/NA		CB, WWS DMP ISOL VLV (1)
2177 (*)	2/2	/NA		CB, WWS DMP ISOL VLV (1)
2178	3/3	3/3		WWS DMP ISOL VLV INDCTR (1)
2179	3/3	3/3		WWS DMP ISOL VLV RESIS, OF2 (1)
2180	3/3	3/3		SW, WWS DMP ISOL INDCTR (1)

(*) Potential Critical Items.

WASTE MANAGEMENT SUBSYSTEM (concluded)

			EDUNDANCY	
	H/F		ABC	ITEM NAME
			P P P	CB, DMP LINE HTR (1)
2101 (^)	2/1R 2/2	3/3	FFF	CB, DMP LINE HTR (1)
2102	3/30	3/3	PPP	WWS DMP LINE HEATER (2)
2103	3/20	J/J /NA	PPP	WWS DMP LINE HEATER (2)
2184	3/20	3/3		WWS DMP HTR LINE THERMO (1)
2185	3/3	3/3	PPP	
2100	3/20	J/J /NA	ססס	WWS DMP LINE TEMP XDCR (1)
2107	3/20	/NA /NA	P P P P P P P P P	WWS DMP LINE TEMP XDCR (1)
2100	3/20	/NA /NA		CB, DMP VLV/NOZ HTR (1)
2109	3/28	/NA	FFF	CB, DMP VLV/NOZ HTR (1)
2190	3/3	/NA	ממם	SW, DMP VLV ENA/NOZ HTR (1)
2191	3/2R	/NA		SW, DMP VLV ENA/NOZ HTR (1)
2192	3/2R	/NA		SW, DMP VLV ENA/NOZ HTR (1)
2195	3/20	/NA	P P P P P P P P P P P P	INDCTR, DMP VLV ENA/NOZ HTR (1)
2194	3/2R 2/1P	/NA /NA	PPP	SW, WWS DMP VLV (1)
2195 (*)	2/10	/NA /NA		SW, WWS DMP VLV (1)
2190(")	2/1R 2/1P	/NA /NA	PPP	SW, WWS DMP VLV (1)
2197(")	2/18	/NA /NA	PPP	WWS DMP VLV SOLENOID (1)
2190 (*)	2/18	/NA /NA	PPP	WWS DMP VLV SOLENOID (1)
2299 (*)	3/3	/NA		WWS DMP VLV SOLENOID (1)
2200	3/3	/NA /NA		DUMP VLV INDCTR RESIS TO OF3 (1)
2202				WWS DMP VLV INDCTR DIODE (1)
2202	3/20	/NA	ססס	DUMP NOZZLE HEATER (1)
2203	3/28	/NA	PPP	WWS DMP NOZ TEMP XDCR (2)
2204	3/20	/NA	PPP	
	3/3	/NA		WWS DMP NOZ RESIS TO OF4 (1)
2200 (*)		1/1		CREW MODULE INTERNAL LINE (1)
2208 (*)		$\frac{1}{1}$		INTERNAL LINE AND FITTINGS (1)
2200 (*)		$\frac{1}{1}$		EXTERNAL LINE AND FITTINGS (1)
2210 (*)		1/1 1/1 1/1 3/3		DYNATUBE, CREW CABIN (1)
2211 (*)	1/1	3/3		VACUUM VENT NOZZLE (1)
2212	$\frac{-7}{3}$	3/3		VACUUM VENT LINE HTR THERM (2)
2212 2213 (*)	2/1R	/NA	РРР	VACUUM VENT LINE HTR THERM (2)
2213 (*)	2/1R	/NA	PPP	VACUUM VENT LINE HEATER (2)
2215	3/3	/NA		LINE TEMP SIG COND (1)
2216	3/3 3/3 3/3	3/3		LINE TEMPERATURE SENSOR (1)
2217	3/3	/NA		CB, NOZ HTR (1)
2218 (*)	1/1	/NA		CB, NOZ HTR (1)
2219 (*)	1/1	/NA		SW, NOZ HTR (1)
2220 (*)	$\frac{1}{1}$	/NA		SW, NOZ HTR (1)
	3/3			RESIS TO MDM OF4 (HTR INDCTR) (1)
2222 (*)	1/1	/NA		VACUUM VENT NOZZLE HEATER (1)
2223	3/3	/NA		VVS NOZZLE TEMPERATURE SENSOR (1)
2224				VVS NOZZLE TEMP SENS COND (1)

(*) Potential Critical Items.

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2001	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA				
ITEM: URINAL, MALE AND FAILURE MODE: EXTERNAL LEAKAGE	FEMALE (1 TYPE PER CREW MEMBER)				
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)					
CRITI	CALITIES				
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA				
REDUNDANCY SCREENS: A [2]	B[P] C[P]				
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (5.2) [G.E. DWG 199C3102P1, 199C3082P1]					
CAUSES: MISHANDLING/ABUSE, PIECE-PART FAILURE					
EFFECTS/RATIONALE: POSSIBLE WASTE FLUID CONTAMINATION INTO CABIN ATMOSPHERE DUE TO BLOCKAGE OF URINAL HOSE OR FAILURE (CRACKING)OF URINAL HOUSING OR GASKET SEALS. REQUIRES USE OF CONTINGENCY WASTE COLLECTION METHOD.					
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC					

DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2002	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA				
ITEM: URINAL, MALE AND FAILURE MODE: FAILS TO LATCH	FEMALE (1 TYPE PER CREW MEMBER)				
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)					
	CALITIES				
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC				
PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R	RTLS: /NA TAL: /NA AOA: /NA				
ONORBIT: 3/2R	AOA: /NA				
DEORDIT: /NA	ATO: /NA				
LANDING/SAFING: /NA					
REDUNDANCY SCREENS: A [2]	B[P] C[P]				
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (5.2) [G.E. DWG 199C3102P1, 199C3082P1]					
CAUSES: CONTAMINATION, MISHANDL	ING/ABUSE, PIECE-PART FAILURE				
EFFECTS/RATIONALE: REQUIRES CREW MEMBER TO USE CONTINGENCY URINAL COLLECTION BAGS. THERE IS ONLY A 3 DAYS' SUPPLY OF BAGS PER CREW MEMBER, THUS POTENTIAL LOSS OF MISSION.					
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC					

REPORT DATE 10/23/87 C-153

DATE: 7/28/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 2003	IGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA					
ITEM: URINAL COUPLER (1) FAILURE MODE: EXTERNAL LEAKAGE, PHYSICAL BINDING/JAMMING						
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI						
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)						
CRITICALIT	IES					
FLICHT DHASE HOW/FUNC	ABORT HOW/FUNC					
PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	RTLS: /NA					
LIFTOFF: /NA	TAL: /NA					
ONORBIT: 3/2R	AOA: /NA					
DEORBIT: /NA	ATO: /NA					
LANDING/SAFING: /NA	·					
REDUNDANCY SCREENS: A [2] B [P] C [P]						
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (5.2) [G.E. DWG 199C3088G2, P2]						
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE						
EFFECTS/RATIONALE: POSSIBLE WASTE FLUID CONTAMINATION OF CABIN ATMOSPHERE DUE TO INEFFECTIVE SEALING SURFACE AND GASKETS AND IMPROPER LATCHING OF ASSEMBLY. REQUIRES USE OF ALTERNATE WASTE COLLECTION METHOD.						
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC						

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2004	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: URINAL CONICAL SCH FAILURE MODE: RESTRICTED FLOW	REEN PREFILTER (1)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITIC	CALITIES	
FLIGHT PHASE HDW/FUNC		
PRELAUNCH: /NA LIFTOFF: /NA	RTLS: /NA TAL: /NA	
LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA	TAL: /NA AOA: /NA	
DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA	
REDUNDANCY SCREENS: A []	в[] С[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (5.2) [G.E. DWG 199C3083G1]		
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE: POSSIBLE CONTAMINATION OF CABIN ATMOSPHERE WITH WASTE FLUIDS DUE TO RESTRICTED AIR FLOW. FLIGHT REPLACEABLE HARDWARE, REPLACE FILTER.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2005	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: URINAL CONICAL SCI FAILURE MODE: INTERNAL LEAKAGE	REEN PREFILTER (1)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION 5) 6) 7) 8) 9)	N ASSEMBLY
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
	ΨΔΤ.• 3/3
	3/3
UNURBIT: 3/3	AUA: 3/3
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90	
PART NUMBER: WCS 80V62A14 (5.2)	[G.E. DWG 199C3083G1]
CAUSES: STRUCTURAL FAILURE	
EFFECTS/RATIONALE: UNFILTERED URINE HOSE, POSSIBLE CABIN CONTAMINATES INTO WCS LINES RESULTING IN POTENTIAL REQUIREMENT FOR CONTINGENCY WASTE COLLECTION METHODS OR AT WORST CASE JAMMING DUMP AND DUMP ISOLATION VALVES-PRODUCING LIFE CRITICAL SITUATION.	
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC	

DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2006ABORT:/NA		
ITEM: URINAL HOSE (1) FAILURE MODE: EXTERNAL LEAKAGE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC		
PRELAUNCH: /NA RTLS: /NA		
LIFTOFF: /NA TAL: /NA		
LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA DEORBIT: /NA ATO: /NA		
DEORBIT: /NA ATO: /NA		
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: ECLSS AREA 90 PART NUMBER: 80V62A14 (5.2)		
CAUSES: MISHANDLING/ABUSE, CHEMICAL REACTION		
EFFECTS/RATIONALE:		

WASTE FLUIDS DUMPED ONTO EXTERNAL SURFACE OF HOSE, CONTAMINATION OF CABIN ATMOSPHERE WITH WASTE FLUID AND NOXIOUS GASES. UNDER SEVERE CONDITIONS WILL NEED TO USE URINE COLLECTION BAGS.

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2007	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: URINAL HOSE (1) FAILURE MODE: RESTRICTED FLOW		
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION 5) 6) 7) 8) 9)		
CRITI	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/2R	AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2]		
LOCATION: ECLSS AREA 90 PART NUMBER: 80V62A14 (5.2)		
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE: INEFFECTIVE SUCTION, POSSIBLE CONTAMINATION OF CABIN ATMOSPHERE BY WASTE FLUID BY BACK FLOW INTO CABIN, REQUIRES IMPLEMENTATION OF FLIGHT RULE 13-17 FOR SPILL CLEAN-UP. REQUIRES USE OF ALTERNATE WASTE COLLECTION METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:2008ABORT:/NA		
ITEM: URINAL ADAPTER QUICK RELEASE (1) FAILURE MODE: MISALIGNMENT		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:2/2AOA:/NADEORBIT:/NAATO:/NA		
PRELAUNCH: /NA RTLS: /NA		
LIFTOFF: /NA TAL: /NA		
ONORBIT: 2/2 AOA: /NA DEORBIT: /NA ATO: /NA		
LEORDII. /MA AIG. /MA		
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: ECLSS AREA 90		
PART NUMBER: WCS 80V62A14 (5.2) [G.E. DWG 199C3016G1]		
PARI NUMBER. WCS SUVOZATA (5.2) [G.E. DWG ISSCIUCI]		
CAUSES: INADVERTENT OPERATION/ACTIVATION, SHOCK, VIBRATION.		
FFFFORC /DAMIANALE.		
EFFECTS/RATIONALE:		
POSSIBLE RELEASE OF URINE/WASTE FLUID CONTAMINANTS INTO CABIN DUE		
TO IMPROPER FAN/SEPARATOR MANUAL VALVE AND CLAMP QUICK RELEASE		
OPERATION, ALSO LOSS OF EMU DRAIN LINE CAPABILITY DUE TO PLUGGED		
LINE, RESULTING IN EMU DUMP LOSS AND SUBSEQUENT LOSS OF		
EVA CAPABILITY.		
AAN ANIADIMIII.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE		
SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC		
HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 E SUBSYSTEM: LIFE SUPPORT MDAC ID: 2009	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: URINAL ADAPTER QUICK F FAILURE MODE: EXTERNAL LEAKAGE	ELEASE (1)	
LEAD ANALYST: K. BARICKMAN SUBS	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALII	TIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	RTLS: /NA TAL: /NA AOA: /NA	
REDUNDANCY SCREENS: A [2] B	[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (5.2) [G.E. DWG 199C3016G1]		
CAUSES: CONTAMINATION, PHYSICAL BINDING/JAMMING OF THE CLAMP, GASKET FAILURE.		
EFFECTS/RATIONALE: WASTE FLUID LEAKAGE INTO CABIN ATMOSPHERE OR STANDBY FAN/SEPARATOR PRODUCING IMPLEMENTATION OF FLIGHT RULE 13-17. REQUIRES USE OF ALTERNATE WASTE COLLECTION PATHS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2010ABORT:/NA		
ITEM: URINAL HOSE CLAMP (1) FAILURE MODE: IMPROPER CLAMPING FORCE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NA		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (5.2) [G.E. DWG 199C3122G1]		
CAUSES: PIECE-PART FAILURE		
EFFECTS/RATIONALE: FAILURE OF THE CLAMP COULD LEAD TO LEAKAGE OF ADDITIONAL AIR BETWEEN THE URINAL HOSE AND ADAPTER QUICK RELEASE, PRODUCING LOSS IN COLLECTION EFFICIENCY.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2011	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: URINAL DYNATUBE (FAILURE MODE: EXTERNAL LEAKAGE	2)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
	CALITIES	
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA TAL: /NA	
LIFTOFF: /NA	TAL: /NA AOA: /NA	
ONORBIT: 3/2R DEORBIT: /NA	ATO: /NA	
DEORBIT: /NA		
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14		
CAUSES: MISHANDLING/ABUSE, STRUCTURAL FAILURE, VIBRATION, CHEMICAL REACTION		
EFFECTS/RATIONALE: WASTE FLUID LEAKAGE INTO CABIN ENVIRONMENT BECAUSE OF DYNATUBE FAILURE. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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REPORT DATE 10/23/87

DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2012 ITEM: URINAL DYNATUBE (2) FAILURE MODE: RESTRICTED FLOW	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
	DOVO LENDA W I CALIDI	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SATIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	TAL: /NA	
ONORBIT: 3/2R	AUA: /NA	
DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA	
HANDING/BATING. /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14		
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE:		
RESTRICTED FLOW AND OPERATION OF UR	INAL. POSSIBLE BACK FLOW OF	
WASTE FLUIDS INTO THE CABIN ATMOSPHERE.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		
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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2013	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: TUBE, EMU EXTENSION FAILURE MODE: RESTRICTED FLOW	ON (1)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION 5) 6) 7) 8) 9)	N ASSEMBLY
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 2/2	AOA: /NA
LANDING/SAFING: /NA	ATO: /NA
LANDING/SAFING. / NA	
REDUNDANCY SCREENS: A []	B[] C[]
LOGATION. ECLES ADEA 60	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E.	DWG 23885134G11
TAKI NOMBLIK. WEB SOVOZALI [C.2.	
CAUSES: CONTAMINATION	
EFFECTS/RATIONALE:	
POSSIBLE INABILITY TO DUMP EMU RI	ESERVOIRS, LOSS OF MISSION.
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC	

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REPORT DATE 10/23/87

DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2014	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: TUBE, EMU EXTENSION FAILURE MODE: EXTERNAL LEAKAGE	1 (1)
LEAD ANALYST: K. BARICKMAN S	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)	
CRITICA	ALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG 238B5134G1]	
CAUSES: PIECE-PART FAILURE, VIBRA	ATION, CORROSION
EFFECTS/RATIONALE: INABILITY TO DUMP EMU RESERVIORS WITHOUT FLUID LEAKAGE INTO CABIN ATMOSPHERE, LOSS OF MISSION.	
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2015	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA	
ITEM: EMU QD (1) FAILURE MODE: EXTERNAL LEAKAGE		
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) URINE/WASTE FLUID COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITIC	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG 238B5134G1]		
CAUSES: CONTAMINATION, PRESSURE	(HIGH), CORROSION	
EFFECTS/RATIONALE: INABILITY TO DUMP EMU RESERVIORS WITHOUT FLUID LEAKAGE INTO CABIN ATMOSPHERE, LEADING TO LOSS OF MISSION.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2016	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: COMMODE STORAGE CO FAILURE MODE: EXTERNAL LEAKAGE	NTAINER (1)		
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSE 5) 6) 7) 8) 9)	MBLY		
CRITIC	CALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC		
PRELAUNCH: /NA	RTLS: /NA		
LIFTOFF: /NA	TAL: /NA		
ONORBIT: 3/2R	AOA: /NA		
DEORBIT: /NA	ATO: /NA		
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [2]	В[Р] С[Р]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG 47E232901G3]			
CAUSES: MISHANDLING/ABUSE, PIECE CHEMICAL REACTION	-PART FAILURE, VIBRATION,		
EFFECTS/RATIONALE: BECAUSE OF CABIN PRESSURE LOSS TH COMMODE IS NOT IN USE THE VALVE M THE MANUAL VENT VALVE PRECLUDES V CONTENTS AND POSSIBLE NOXIOUS GAS LEAKAGE IS EXTREMELY SEVERE THE C METHODS MUST BE USED. CREW INCON BE EVALUATED AS A REAL TIME DECIS	UST BE CLOSED. THE CLOSURE OF ENTING/DRYING OF THE COMMODE RELEASE DURING WCS USAGE. IF CONTINGENCY WASTE COLLECTION VENIENCE, THE ODOR EFFECT MUST		
REFERENCES: 1) WCS ASSEMBLY [G.E SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC			

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2017	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: COMMODE/LINER (1) FAILURE MODE: INTERNAL LEAKAGE, (OPEN	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEN 5) 6) 7) 8) 9)	MBLY	
CRITICA	ALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E.]	DWG 63E905763G2]	
CAUSES: CONTAMINATION, MISHANDLIN CHEMICAL REACTION	NG/ABUSE, PIECE-PART FAILURE,	
EFFECTS/RATIONALE: POSSIBLE SOLID AND/OR FLUID WASTE CONTAMINATION OF MUFFLER ASSEMBLY OR WASTE FLUID IN CABIN ATMOSPHERE; REQUIRING ACTIVATION OF FLIGHT RULE 13-17. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.		
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	. DWG 47J232750G16]; 2) SPACE 6.5; 3) RI INTEGRATED SCHEMATIC	

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2018ABORT:/NA			
ITEM: COMMODE UPPER RING (1) FAILURE MODE: INTERNAL LEAKAGE			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEMBLY 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG 238B5052G1] CAUSES: PIECE-PART FAILURE, CHEMICAL REACTION			
EFFECTS/RATIONALE: FAILURE OF THIS RING OR ATTACHMENT TO COMMODE TANK ALLOWS SOLID WASTE CONTAMINANTS TO ENTER FAN/SEPARATOR LINES, POSSIBLE NOXIOUS FUMES DUE TO SOLID WASTE ENTRAPPED IN MUFFLER ASSEMBLY. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER. THE FAILURE IS DETECTABLE; HOWEVER, THE EXACT CAUSE OF THE FAILURE MAY NOT BE DETERMINED.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			
REPORT DATE 10/23/87 C-169			

DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2019	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R /NA
ITEM: COMMODE SLIDE VALVE (1) FAILURE MODE: EXTERNAL LEAKAGE, FAILS TO CLOSE			
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD	: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYS 3) WASTE COLLECTION SUBSYS 4) FECAL/EMISIS COLLECTION 5) 6) 7) 8) 9)	STEM HERE FOR STELLE		деца — :
	CRITICALITIES		
FLIGHT PHASE HDW/FU	JNC ABORT		
PRELAUNCH: /N	A RTL		
	A TAL		
	R AOA	,	
DEORBIT: /N		: /NA	
LANDING/SAFING: /NA	X		
REDUNDANCY SCREENS: A [2] B[P]	С[Р]	
LOCATION: ECLSS AREA 90		19C2 AND 47E2	וכסבחסכבי

PART NUMBER: WCS 80V62A14 [G.E. DWG 47E232918G2 AND 47E232903P2]

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CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE, CHEMICAL REACTION

EFFECTS/RATIONALE:

PRESSURE LOSS DUE TO INABILITY TO CLOSE SLIDE VALVE, WITHOUT CAPABILITY TO VENT COMMODE TO VACUUM, CREATES NOXIOUS OFFGASSING. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2020	ABORT: /NA	
ITEM: COMMODE SLIDE VALVE (FAILURE MODE: FAILS TO OPEN	1)	
LEAD ANALYST: K. BARICKMAN SUB	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEMBL 5) 6) 7) 8) 9)	Y	
CRITICALI	TIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/2R	AOA: /NA ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B	[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG	47E232903P2 AND 47E232918G2]	
CAUSES: CONTAMINATION, MISHANDLING/ CHEMICAL REACTION	ABUSE, PIECE-PART FAILURE,	
EFFECTS/RATIONALE: INABILITY TO OPEN COMMODE REQUIRES USE OF CONTINGENCY WASTE COLLECTION METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. D SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6. HANDBOOK, VS70-960102, PAGE 60EC	WG 47J232750G16]; 2) SPACE 5; 3) RI INTEGRATED SCHEMATIC	

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2021	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: COMPACTOR DRIVE UNIT FAILURE MODE: PHYSICAL BINDING/JAM	(1) MING
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEMB 5) 6) 7) 8) 9)	State of the second s
CRITICAL	
FLIGHT PHASE HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA	TAL: /NA AOA: /NA
ONORBIT: 3/3 DEORBIT: /NA	
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DW	G 63D717635G2]
CAUSES: CONTAMINATION, MISHANDLING CHEMICAL REACTION	ABUSE, PIECE-PART FAILURE,
EFFECTS/RATIONALE: INABILITY TO OPERATE COMPACTOR ASSE COMMODE EFFICIENCY DUE TO RESTRICTE	
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6 HANDBOOK, VS70-960102, PAGE 60EC	

DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2022ABORT:/NA		
ITEM: COMPACTOR DRIVE UNIT (1) FAILURE MODE: EXTERNAL LEAKAGE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG 63D717635G2]		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE		
EFFECTS/RATIONALE: FAILURE OF O-RING GASKET SEALS OF DRIVE SHAFT COULD PRODUCE CABIN PRESSURE LEAK THRU VACUUM VENT, REQUIRES MANUAL VACUUM VENT TO BE CLOSED. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2023	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: COMPACTOR DRIVE UNIT FAILURE MODE: STRUCTURAL FAILURE	(1)	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEMB 5) 6) 7) 8) 9)	LY	
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC		
PRELAUNCH: /NA	RTLS: /NA	
PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3	TAL: /NA	
ONORBIT: 3/3	TAL: /NA AOA: /NA	
DEORBIT: /NA	ATO: /NA	
DEORBIT: /NA LANDING/SAFING: /NA		
, , ,		
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG 63D717635G2]		
CAUSES: STRUCTURAL FAILURE, FRACTU	RE	
EFFECTS/RATIONALE: SHEARING OF DRIVE SHAFT OR GEARING DOES NOT ALLOW COMPACTING OF SOLID BIOWASTE PRODUCES POSSIBLE COMMODE AIRFLOW INEFFICIENCY, CREW INCONVENIENCE.		
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6 HANDBOOK, VS70-960102, PAGE 60EC	DWG 47J232750G16]; 2) SPACE .5; 3) RI INTEGRATED SCHEMATIC	

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2024	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: COMMODE BOTTOM FLA FAILURE MODE: EXTERNAL LEAKAGE	MGE (I)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSE 5) 6) 7) 8) 9)	SMBLY	
CRITIC	CALITIES	
FLIGHT PHASE HDW/FUNC		
PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/2R	AOA: /NA	
	ATO: /NA	
DEORBIT: /NA		
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14		
CAUSES: CONTAMINATION, PIECE-PAN	RT FAILURE, VIBRATION	
EFFECTS/RATIONALE: GASKET FAILURE WILL PRODUCE AN CABIN ATMOSPHERE LEAK THROUGH THE MANUAL VACUUM VENT VALVE. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.		
REFERENCES: 1) WCS ASSEMBLY [G.1 SHUTTLE SYSTEM HANDBOOK, DWG. NO HANDBOOK, VS70-960102, PAGE 60EC	. 6.5; 3) RI INTEGRATED SCHEMATIC	

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2025	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: COMMODE BOTTOM FL FAILURE MODE: STRUCTURAL FAILUR	ANGE (1) E ¹ Andreas and a state of the st
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSI 5) 6) 7) 8) 9)	EMBLY
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC	
PRELAUNCH: /NA LIFTOFF: /NA	RTLS: /NA TAL: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 3/3	AOA: /NA
ONORBIT: 3/3 DEORBIT: 3/3	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14	
CAUSES: STRUCTURAL FAILURE, FRAC	CTURE
EFFECTS/RATIONALE: WASTE GAS VAPORS INTO CREW CABIN, WHICH MUST BE EVALUATED AS A REAI	CAUSING CREW INCONVENIENCE TIME DECISION.
REFERENCES: 1) WCS ASSEMBLY [G.E SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	

DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2026ABORT:/NA	
ITEM: COMMODE EXIT, MESH SCREEN (1) FAILURE MODE: RESTRICTED FLOW, BLOCKED FLOW	
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEMBLY 5) 6) 7) 8) 9)	
CRITICALITIES	
CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [2] B [P] C [P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14	
CAUSES: CONTAMINATION	
EFFECTS/RATIONALE: RESULTS IN INEFFECTIVE COMMODE AIRFLOW AND REDUCED EFFICIENCY. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.	
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE	

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2027	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: COMMODE EXIT, MESH S FAILURE MODE: FAIL OPEN	SCREEN (1)	
LEAD ANALYST: K. BARICKMAN SU	JBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEME 5) 6) 7) 8) 9)	3LY	
CRITICAI		
	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/3	AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA	• •	
REDUNDANCY SCREENS: A []		
REDONDANCI SCREENS. A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, CHEMICAL REACTION		
EFFECTS/RATIONALE: THE IMMEDIATE LOSS OF THE FILTER DOES NOT EFFECT USABILITY, HOWEVER LOOSE CONTAMINATION COULD CAUSE FAILURE OF THE WASTE COLLECTION SUBSYSTEM.		
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6 HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2028	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: COMMODE MOVEABLE AND FAILURE MODE: STRUCTURAL FAILURE (R	STATIONARY VANES (2) UPTURE)	
LEAD ANALYST: K. BARICKMAN SUB	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) FECAL/EMISIS COLLECTION ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALI		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A [] B	[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWGS 199C3134P1, 199C3135P1]		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, CHEMICAL REACTION		
EFFECTS/RATIONALE: INABILITY TO COMPACT COMMODE CONTENTS, CREW INCONVENIENCE.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2029	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: AUX. WET TRASH VENT FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) 6) 7) 8) 9)	and the second
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	ABORT HDW/FUNC RTLS: 3/3
LIFTOFF: 3/3	TAL: 3/3
DEORBIT: 3/3	AUA: 3/3 ATO: 3/3
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14	
CAUSES: PIECE-PART FAILURE, VIBRA	TION
EFFECTS/RATIONALE:	
LOSS OF CABIN PRESSURE, REQUIRES C NOT POSSIBLE TO VENT COMMODE, PROD	LOSURE OF MANUAL VENT VALVE.
TANK AFTER ON-ORBIT INSERTION. IF	THE LEAK DEVELOPS UPSTREAM OF
THE ORIFICE, THE LEAK IS RESTRICTE	D TO 3 POUNDS/DAY.
REFERENCES: 1) WCS ASSEMBLY [G.E.	DWG 47.12327506161 . 2) SPACE
SHUTTLE SYSTEM HANDBOOK, DWG. NO.	6.5; 3) RI INTEGRATED SCHEMATIC
HANDBOOK, VS70-960102, PAGE 60EC	

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2030	HIGHEST C	RITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: AUX. WET TRASH VENT FAILURE MODE: EXTERNAL LEAKAGE	LINE QD (1)
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD:	M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) 6) 7) 8) 9)	ION	·
CRITICA	LITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: /NA	ABORT RTLS TAL: AOA: ATO:	HDW/FUNC : 3/3 3/3 3/3 3/3
REDUNDANCY SCREENS: A []	В[]	C[]
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14		
CAUSES: CONTAMINATION, PIECE-PART REACTION, VACUUM	FAILURE, V	IBRATION, CHEMICAL
EFFECTS/RATIONALE: LOSS OF PROPER VENTILATION OF THE WET TRASH VENT PATH, OTHERWISE NO SIGNIFICANT PROBLEM.		
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	DWG 47J232 6.5; 3) RI	750G16]; 2) SPACE INTEGRATED SCHEMATIC

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2031	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3	
ITEM: VACUUM PORT LINE (1) FAILURE MODE: EXTERNAL LEAKAGE)	
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) 6) 7) 8) 9)	ION	
CRITICA	LITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING (SAFING: /NA	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: 3/3 TAL: 3/3	
ONORBIT: 3/3	AOA: 3/3	
DEORBIT: 3/3	ATO: 3/3	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATICN		
EFFECTS/RATIONALE: PRODUCE LESS EFFICIENT VENTILATION OF THE WET TRASH AREA. THE COMMODE AND THE MANUAL VENT VALVE MAY STILL BE USED NOMINALLY, BUT SOME NOXIOUS GASES WILL LEAK INTO THE CABIN. THE UPSTREAM ORIFICE WILL RESTRICT THE LEAKAGE FLOW WITH THE VENT VALVE OPEN.		
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	DWG 47J232750G16]; 2) SPACE 6.5; 3) RI INTEGRATED SCHEMATIC	

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DATE: HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 2032 ABORT: /NA
ITEM: VACUUM PORT QD AND PLUG (1) FAILURE MODE: EXTERNAL LEAKAGE
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14
CAUSES: CONTAMINATION
EFFECTS/RATIONALE: WHEN THE QD IS CONNECTED, IT IS POSSIBLE TO DEVELOP AN EXTERNAL LEAK DUE TO LINE FITTING CONTAMINATION. THE VACUUM VENT IS ONLY USED IN THE EVENT OF A MAJOR FLUID SPILL. THIS LEAK WOULD BE A CABIN PRESSURE LEAK THAT WOULD HAVE TO BE EVALUATED ON A REAL TIME BASIS. AN EXTERNAL LEAK WITH THE QD PLUG IN PLACE IS UNLIKELY.
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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HIGHEST CRITICALITY HDW/FUNC DATE: 3/2R SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 2033 ABORT: /NA VACUUM PORT QD AND PLUG (1) ITEM: FAILURE MODE: FAILS TO OPEN, RESTRICTED FLOW LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM WASTE MANAGEMENT SUBSYSTEM 2) 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE /NA RTLS: /NA PRELAUNCH: TAL: LIFTOFF: /NA /NA ONORBIT: 3/2R AOA: /NA /NA ATO: /NA DEORBIT: LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: IMPOSSIBLE TO USE VACUUM VENT AS A MEANS TO DISPERSE A FLUID SPILL, MUST RELY ON ALTERNATE COLLECTION METHODS SUCH AS URINE/WASTE FLUID COLLECTION SYSTEM. REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

DATE: H SUBSYSTEM: LIFE SUPPORT MDAC ID: 2034	IIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: VACUUM PORT QD AND PLU FAILURE MODE: MATE AND DEMATE FAILUR	G (1) E	
LEAD ANALYST: K. BARICKMAN SUBS	YS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) 6) 7) 8) 9)		
CRITICALIT	IES	
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC	
PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	RTLS: /NA TAL: /NA	
ONORBIT: 3/2R	TAL: /NA AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA	·	
REDUNDANCY SCREENS: A [2] B	[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, CHEMICAL REACTION		
EFFECTS/RATIONALE: INABILITY TO USE VACUUM VENT LINE FOR FLUID SPILL CLEAN-UP OR TO USE VACUUM PORT TO DRAW A VACUUM. POTENTIAL MISSION IMPACT IF SECONDARY METHODS ALSO FAIL.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2035	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3	
ITEM: WET TRASH VENT LINE FAILURE MODE: EXTERNAL LEAKAGE	(1)	
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) 6) 7) 8) 9)	ION	
CRITICA	LITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: /NA	ABORTHDW/FUNCRTLS:3/3TAL:3/3AOA:3/3ATO:3/3	
REDUNDANCY SCREENS: A []		
LOCATION: ECLSS AREA 90, DOWNSTREAM OF ORIFICE PART NUMBER: WCS 80V62A14		
CAUSES: PIECE-PART FAILURE, VIBRA	TION · · · · · ·	
EFFECTS/RATIONALE: UNRESTRICTED LOSS OF CABIN PRESSURE, REQUIRES CLOSURE OF MANUAL VACUUM VENT VALVE. PRODUCES NOXIOUS GAS BUILD-UP IN COMMODE AND WET TRASH CONTAINERS, NO MISSION EFFECT OTHER THAN CREW DISCOMFORT.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2036	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: WET TRASH VENT LINE FAILURE MODE: EXTERNAL LEAKAGE	(1)
LEAD ANALYST: K. BARICKMAN SUB	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) 6) 7) 8) 9)	N
CRITICALI	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A [] E	3[] C[]
LOCATION: ECLSS AREA 90, UPSTREA PART NUMBER: WCS 80V62A14	M OF ORIFICE
CAUSES: PIECE-PART FAILURE, VIBRATI	CON
EFFECTS/RATIONALE: RESTRICTED LOSS OF CABIN PRESSURE. REDUCTION IN WET TRASH CONTAINER VENTILATION, BUT NO EFFECT ON MISSION SCHEDULE.	
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC	

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2037	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3	
ITEM: WET TRASH VENT QD FAILURE MODE: EXTERNAL LEAKAGE	(1) • • • • • • • • • • • • • • • • • • •	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALL 5) 6) 7) 8) 9)	ATION	
CRITIC	CALITIES	
FLIGHT PHASEHDW/FUNCPRELAUNCH:/NALIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:/NAREDUNDANCY SCREENS:A []LOCATION:ECLSS AREA 90PART NUMBER:WCS 80V62A14CAUSES:CONTAMINATION, PIECE-PAIREACTIONEFFECTS/RATIONALE:	AOA: 3/3 ATO: 3/3 B [] C []	
PRODUCES RESTRICTED CABIN PRESSURE LOSS. PRODUCES A REDUCTION IN WET TRASH CONTAINER VENTILATION, BUT NO EFFECT ON MISSION SCHEDULE.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2038ABORT:/NA		
ITEM: URINE COLLECTION HOSES (2) FAILURE MODE: RESTRICTED FLOW		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC		
PRELAUNCH: /NA RTLS: /NA		
LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA		
ONORBIT: 3/2R AOA: /NA		
DEORBIT: /NA ATO: /NA		
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: ECLSS AREA 90 (FROM MANUAL DIVERTER VALVE TO FAN/SEP)		
PART NUMBER: WCS 80V62A14		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE		
EFFECTS/RATIONALE: RESTRICTED FLOW TO FAN/SEPARATORS, POSSIBLE RELEASE OF WASTE FLUIDS INTO CABIN ATMOSPHERE. REQUIRES USE OF ALTERNATE FAN/SEPARATOR LINE FOR URINE COLLECTION. LOSS OF PRIMARY URINE COLLECTION METHOD REQUIRES USE OF CONTINGENCY URINE COLLECTION BAGS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2039	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: URINE COLLECTION HOS FAILURE MODE: EXTERNAL LEAKAGE	SES	
LEAD ANALYST: K. BARICKMAN SU		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATI 5) 6) 7) 8) 9)	ION	
CRITICAL	LITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
DEORBIT: 3/2R	AOA: /NA ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2]	B [P] C [P]	
LOCATION: ECLSS AREA 90 (FROM M FAN/SEP)	IANUAL DIVERTER VALVE TO	
PART NUMBER: WCS 80V62A14		
CAUSES: MISHANDLING/ABUSE, PIECE-E CHEMICAL REACTION	PART FAILURE, VIBRATION,	
EFFECTS/RATIONALE: LEAKAGE OF WASTE FLUIDS INTO CABIN ATMOSPHERE. REQUIRES USE OF ALTERNATE FAN/SEPARATOR SYSTEM. IF ALL ELSE FAILS, MUST USE CONTINGENCY URINE COLLECTION METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6 HANDBOOK, VS70-960102, PAGE 60EC		

DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2040 ITEM: WCS TO WWS QD (1) FAILURE MODE: RESTRICTED FLOW			
TEAD ANALVED. V DADIEWAN CUDEVE LEAD, W.T. CATTOL			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
PRELAUNCH: /NA RTLS: /NA			
ONORBIT: 3/2R AOA: /NA			
DEORBIT: /NA ATO: /NA			
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90			
PART NUMBER: WCS 80V62A14			
TRAI NOMBER: WC5 80002R14			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: EXCESSIVE BACK PRESSURE ON FAN/SEPARATOR, CAUSING OVERFLOW OF FAN SEPARATOR RESERVOIR WITH WASTE FLUIDS INTO CABIN ATMOSPHERE. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS			

SEPARATOR RESERVOIR WITH WASTE FLUIDS INTO CABIN ATMOSPHERE. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTIONWASTE FLUIDS INTO CABIN ATMOSPHERE DEVICES PER CREW MEMBER. POTENTIAL FLOODING DURING EMU DUMP INTO CABIN BY WAY OF URINE HOSE.

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2041	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA		
ITEM: WCS TO WWS QD (1) FAILURE MODE: EXTERNAL LEAKAGE	er a station de la cereta e composition.		
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALL 5) 6) 7) 8) 9)	nadersens no ∲ 2000 en la 1878 i 2000.		
CRITI	CALITIES		
FLIGHT PHASEHDW/FUNCPRELAUNCH:/NALIFTOFF:/NAONORBIT:2/2DEORBIT:3/3	TAL: /NA AOA: /NA		
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [5.22]			
CAUSES: VIBRATION, CHEMICAL REA	CTION		
EFFECTS/RATIONALE: WASTE FLUID LEAKAGE INTO WCS ENCLOSURE AND CABIN ATMOSPHERE. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER. THE FLUID LEAKAGE ALSO PRODUCES AN ARS CONDENSATE SPILL BECAUSE THE WASTE TANK 1 IS PRESSURIZED TO 30 PSIA AND FLUID WILL TRAVEL OUT THE LEAK POINT. THIS IS A MISSION IMPACT ITEM BECAUSE ARS CONDENSATE SYSTEM WOULD HAVE TO BE SHUT DOWN IF THE LEAK IS TO BE ELIMINATED.			
REFERENCES: 1) WCS ASSEMBLY [G.	0. 6.5; 3) RI INTEGRATED SCHEMATIC		

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DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/2 MDAC ID: 2042 ABORT: /NA ITEM: WCS TO WWS LINE (1)			
FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 2/2 AOA: /NA DEORBIT: 3/3 ATO: /NA LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 CAUSES: OVERLOAD, PIECE-PART FAILURE, IONIZING RADIATION,			
VIBRATION, CHEMICAL REACTION, VACCUM			
EFFECTS/RATIONALE: LEAKAGE OF WASTE FLUIDS INTO CREW MODULE MIDDECK FLOOR SPACE, REQUIRES SHUTTING DOWN WCS AND USE OF CONTINGENCY WASTE COLLECTION METHODS. THIS PRODUCES A LEAKAGE OF ARS CONDENSATE AND TO PRECLUDE THE LEAK THE ARS MUST BE SHUT DOWN, THUS LIMITING MISSIOM LIFE.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			
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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2043	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA		
ITEM: WCS TO WWS DYNATU FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALL 5) 6) 7) 8) 9)	ATION		
CRITIC	CALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: 3/3	ABORT HDW/FUNC		
PRELAUNCH: /NA	RTLS: /NA TAL· /NA		
ONORBIT: 2/2	AOA: /NA		
DEORBIT: 3/3	ATO: /NA		
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A []	в[] С[]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14			
CAUSES: OVERLOAD, PIECE-PART FAILURE, PRESSURE (HIGH), VIBRATION, CHEMICAL REACTION			
EFFECTS/RATIONALE: WASTE FLUID LEAK INTO THE WCS ENCLOSURE AND CABIN ATMOSPHERE, REQUIRES APPLICATION OF FLIGHT RULE 13-17 FOR NOXIOUS FLUID SPILL. PRODUCES ARS CONDENSATE SPILL BECAUSE THE WASTE TANK 1 IS PRESSURIZED TO 30 PSIA AND FLUID WILL TRAVEL OUT LEAK POINT. THIS IS A MISSION IMPACT BECAUSE THE ARS CONDENSATION UNIT WOULD HAVE TO BE SHUT DOWN AT THE SEPARATOR IF THE LEAK IS TO BE CONTROLLED OR ELIMINATED.			
REFERENCES: 1) WCS ASSEMBLY [G.] SHUTTLE SYSTEM HANDBOOK, DWG. NO HANDBOOK, VS70-960102, PAGE 60EC	. 6.5; 3) RI INTEGRATED SCHEMATIC		

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2044ABORT:/NA			
ITEM: WCS TO WWS DYNATUBE (1) FAILURE MODE: RESTRICTED FLOW			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
DEFLAINCH · /NA RTLS: /NA			
LIFTOFF: /NA TAL: /NA			
ONORBIT: 3/3 AOA: /NA			
DEORBIT: /NA ATO: /NA			
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14			

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:

DURING EMU DUMP IT IS POSSIBLE TO GET LEAKAGE UP THE URINAL HOSE INTO THE CREW CABIN DUE TO EXCESSIVE BACK PRESSURE. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER, OR EXCESSIVE BACKPRESSURE ON FAN/SEPARATORS, CAUSING FAN/SEPARATOR OVERFLOW AND WASTE FLUID/NOXIOUS GASES INTO CABIN ENVIRONMENT VIA MUFFLER/EXHAUST PORT.

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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ORBITER SUBSYSTEM ANALYSIS WORKSHEET			
DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2045ABORT:/NA			
ITEM: COMMODE CONTROL HANDLE LINKAGE (1) FAILURE MODE: FAILS TO SWITCH, LOSS OF OUTPUT. PHYSICAL BINDING/JAMMING (ANY POSITION)			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
PRELAUNCH: /NA RTLS: /NA			
LIFTOFF: /NA TAL: /NA			
ONORBIT: 3/2R AOA: /NA			
DEORBIT: /NA ATO: /NA			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWGS 47D232927G2-4, G6, P8]			
CAUSES: MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, VIBRATION, CONTAMINATION			
EFFECTS/RATIONALE: INEFFECTIVE WCS OPERATION, REQUIRES USE OF CONTINGENCY APOLLO COLLECTION BAGS. LOSS OF "UP MOTION" PRECLUDES REPRESSURIZATION OF COMMODE FOR USE OR STORAGE AND LOSS OF "GATE OPEN" SLIDE MOTION PRECLUDES COMMODE USAGE ARE THE WORST CASE FAILURE MODES.			

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MOTION PRECLUDES COMMODE USAGE ARE THE WORST CASE FAILURE MOD OTHER FAILURE EFFECT IS, IN IMPROPER SEQUENCE OF SWITCHING, CAUSING WASTE GASES INTO CABIN ATMOSPHERE DURING USE.

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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DATE: HI SUBSYSTEM: LIFE SUPPORT MDAC ID: 2046	GHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
ITEM: MANUAL VENT VALVE (1) FAILURE MODE: FAILS TO OPEN, PHYSICAL BINDING/JAMMING, RESTRICTED FLOW			
LEAD ANALYST: K. BARICKMAN SUBSY	'S LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)			
CRITICALITI	IES		
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC		
PRELAUNCH: /NA	RTLS: /NA		
LIFTOFF: /NA	TAL: /NA		
ONORBIT: 3/3	AOA: /NA		
DEORBIT: /NA	ATO: /NA		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [] B (·		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.8)	[G.E. DWG 47D264875G4]		
CAUSES: CONTAMINATION, PIECE-PART FAI	LURE, CORROSION		
EFFECTS/RATIONALE: CANNOT VENT COMMODE, WET TRASH OR AUX. WET OR FECAL MATERIAL, ALLOWS BUILDUP COMMODE, BUT COMMODE STILL FUNCTIONAL. TOO INTOLERABLE THE EFFECT ON MISSION TIME JUDGEMENT	OF NOXIOUS ODORS IN IF NOXIOUS GASES BECOME		

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2047	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA			
ITEM: MANUAL VENT VALVE (1 FAILURE MODE: FAILS TO CLOSE, PHYS LEAKAGE) ICAL BINDING/JAMMING, INTERNAL			
LEAD ANALYST: K. BARICKMAN SU	LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)				
CRITICAL	ITIES			
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC			
PRELAUNCH: /NA	RTLS: /NA			
LIFTOFF: /NA	TAL: /NA			
ONORBIT: 3/2R	AOA: /NA			
DEORBIT: /NA	ATO: /NA			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA				
REDUNDANCY SCREENS: A [2]	B[P] C[P]			
LOCATION: ECLSS AREA 90				
PART NUMBER: WCS 80V62A14 (VALVE 5	.8)[G.E. DWG 47D264875G4]			
CAUSES: CONTAMINATION, PIECE-PART FAILURE, CORROSION				
EFFECTS/RATIONALE: IMPOSSIBLE TO REPRESSURIZE COMMODE .	AND USE WCS SLIDE GATE. NEED			
TO USE CONTINGENCY WASTE COLLECTION				

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IMPOSSIBLE TO REPRESSURIZE COMMODE AND USE WCS SLIDE GATE. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2048	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/3		
ITEM: MANUAL VENT VALVE (FAILURE MODE: EXTERNAL LEAKAGE	1)		
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) VALVE ASSEMBLY 6) 7) 8) 9)	ION		
CRITICA	LITIES		
CRITICA FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/2R DEORBIT: 3/3 LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3		
REDUNDANCY SCREENS: A [2]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.8)[G.E. DWG 47D264875G4]			
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, CORROSION		
EFFECTS/RATIONALE: HIGHER LOSS OF CABIN ATMOSPHERE THAN ANTICIPATED PAST GASKET SEALS DUE TO RESTRICTED ATMOSPHERE LOSS THROUGH VACUUM VENT VALVE WHEN CLOSED. IMPOSSIBLE TO DEPRESSURIZE COMMODE. SUBSEQUENT LOSS OF VACUUM VENT ISOLATION VALVE WILL CAUSE MAJOR CABIN PRESSURE LOSS.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			
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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2049	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: COMMODE OUTLET CONTRO FAILURE MODE: FAILS TO OPEN, RESTRI	L VALVE (1) CTED FLOW		
LEAD ANALYST: K. BARICKMAN SUB	SYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)	N		
CRITICALI	TIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.10)[G.E. DWG 47D264875G4]			
CAUSES: CONTAMINATION, PIECE-PART F.	AILURE, CHEMICAL REACTION		
EFFECTS/RATIONALE: IMPOSSIBLE TO USE COMMODE AS STORAGE CONTAINER AFTER DEPRESSURIZATION OF TANK. MUST USE CONTINGENCY WASTE COLLECTION METHODS IN ANY CASE. REPRESSURIZATION FROM THE WET TRASH VENT LINES MAY BE POSSIBLE BUT VERY SLOW.			
REFERENCES: 1) WCS ASSEMBLY [G.E. D SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6. HANDBOOK, VS70-960102, PAGE 60EC			

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DATE: HIGHEST CRITICALITY SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 2050 ABORT: ITEM: COMMODE OUTLET CONTROL VALVE (1) FAILURE MODE: FAILS TO CLOSE, INTERNAL LEAKAGE	HDW/FUNC 3/2R /NA	
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIID	ſ	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA	C .	
REDUNDANCY SCREENS: A [2] B [P] C [P]		
REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.10)[G.E. DWG 47D264875G4] CAUSES: CONTAMINATION, PIECE-PART FAILURE, CORROSION EFFECTS/RATIONALE: VALVE DOES NOT CLOSE TO FAN/SEPARATOR LINE. POSSIBLE LOSS OF CABIN ATMOSPHERE THROUGH MANUAL VACUUM VENT VALVE. REQUIRES CLOSURE OF MANUAL VENT VALVE OR VACUUM VENT ISOLATION VALVE TO RESTRICT CABIN ATMOSPHERE LOSS. CREW INCONVENIENCE, THE ODOR EFFECT MUST BE EVALUATED AS A REAL TIME DECISION. THE URINE/WASTE COLLECTION SYSTEM IS STILL OPERATIONAL. REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		
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ORBI	INDEPENDENT OF TER SUBSYSTEM			
DATE: 7/ SUBSYSTEM: LIFE MDAC ID: 2051	28/87 SUPPORT	IGHEST C	RITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: FAILURE MODE: E	COMMODE OUTLET XTERNAL LEAKAG	L VALVE	anganan tari tari sasaran (1)	
LEAD ANALYST: K.	BARICKMAN	IS LEAD:	M.J. SAIIDI	
3) WASTE COLLE	T SYSTEM EMENT SUBSYSTEP CTION SUBSYSTE AIR LINE INSTAL			
LIFTOFF: ONORBIT: DEORBIT:		ABORT RTLS TAL:	HDW/FUNC : /NA /NA /NA /NA	
REDUNDANCY SCREE	NS: A []	3[]	c []	
LOCATION: EC PART NUMBER: WC	LSS AREA 90 S 80V62A14 (VALV)	≅ 3) [G.E.	DWG 47D264875G4]	
CAUSES: CONTAMI	NATION, PIECE-FA	T FAILURE, C	ORROSION	
EFFECTS/RATIONALE: POSSIBLE LOSS OF CABIN ATMOSPHERE POST GASKET SEALS DURING COMMODE EVACUATION AND REDUCED AIRT OW DURING COMMODE OPERATION. CREW INCONVENIENCE AND DISCOMFORE, REAL TIME DECISION ON MISSION EFFECT.				
REFERENCES: 1) SHUTTLE SYSTEM H	WCS ASSEMBLY [G.]	E. 196 47J232	750G16]; 2) SPACE INTEGRATED SCHEMATIC	
REPORT DATE 10/	23/87	C-20 2	ORIGINAL PAGE IS OF POOR QUALITY	-

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DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 2052 ABORT: /NA ITEM: COMMODE PRESSURIZATION VALVE (1) FAILURE MODE: RESTRICTED FLOW, FAILS TO OPEN
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC
PRELAUNCH: /NA RTLS: /NA
LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA DEORBIT: /NA ATO: /NA
ONORBIT: 3/2R AOA: /NA
DEORBIT: /NA ATO: /NA
LANDING/SAFING: /NA
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: ECLSS AREA 90
PART NUMBER: WCS 80V62A14 (VALVE 5.11A) [G.E. DWG 47A232860P1]
CAUSES: CONTAMINATION, PIECE-PART FAILURE, CHEMICAL REACTION
EFFECTS/RATIONALE:
INABILITY TO REPRESSURIZE THE COMMODE, POSSIBLE BIOWASTE INTO
CREW CABIN. REQUIRES CONTINGENCY BIOWASTE STORAGE METHODS OTHER
THAN COMMODE STORAGE AREA.
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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DATE: SUBSYSTEM: MDAC ID:	LIFE SUPPORT	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R /NA
ITEM: FAILURE MODE	COMMODE PRESSURIZ : FAILS TO CLOSE, I	ATION VALVE (NTERNAL LEAKA	1) Ge	
LEAD ANALYST	: K. BARICKMAN	SUBSYS LEAD:	M.J. SAIID	I
2) WASTE M 3) WASTE C	PPORT SYSTEM ANAGEMENT SUBSYSTEM OLLECTION SUBSYSTEM AND AIR LINE INSTALL			
	CRITI	CALITIES		
FLIGHT P	HASE HDW/FUNC UNCH: /NA FF: /NA IT: 3/2R IT: /NA	ABORT	HDW/FUN	C
PRELA	UNCH: /NA	RTLS	: /NA	
LIFTU	ΓΓ: /NA ΤΜ. 2/2D		/NA /NA	
DEODB	፲፲፡ 3/2R ፕጥ• /N۵	· ATO:	/NA /NA	
LANDI	NG/SAFING: /NA		/	
REDUNDANCY S	CREENS: A [2]	B [P]	С[Р]	
	ECLSS AREA 90 WCS 80V62A14 (VALV	'E 5.11A)[G.E.	DWG A47A23	2860P1]
CAUSES: CON	TAMINATION, PIECE-PA	RT FAILURE, C	HEMICAL REA	CTION
		•		
EFFECTS/RATI				74
	KAGE INTO CREW CABIN	OF NOXIOUS G	AS AND WAST	ES _
THROUGH VALV	E BODY. CONTINGENCY WASTE CO	TTECTION METU		ATTOWS
	OF URINE COLLECTION			ADD0#2
UNDI 5 DIIIO				
SHUTTLE SYST	1) WCS ASSEMBLY [G. EM HANDBOOK, DWG. NO 70-960102, PAGE 60EC	6.5; 3) RI	750G16]; 2) INTEGRATED	SPACE SCHEMATIC

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DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 2054 ABORT: /NA ITEM: COMMODE PRESSURIZATION VALVE (1)		
FAILURE MODE: EXTERNAL LEAKAGE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC		
PRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NA		
LIFTOFF: /NA TAL: /NA		
ONORBIT: 3/2R AOA: /NA		
DEORBIT: /NA ATO: /NA		
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.10) [G.E. DWG 47D264875G4]		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, CHEMICAL REACTION		
EFFECTS/RATIONALE:		
POSSIBLE LOSS OF CABIN ATMOSPHERE OR SEEPAGE OF WASTE		
FLUIDS/SOLIDS INTO THE WCS ENCLOSURE THROUGH VALVE BODY. NEED TO		
USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3		
DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		
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REPORT DATE 10/23/87

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DATE: SUBSYSTEM: MDAC ID:	7/28/87 LIFE SUPPORT 2055	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R /NA
	BALLAST AIR CONTROL RESTRICTED FLOW, FA		: <u>.</u> :	·I
LEAD ANALYST	: K. BARICKMAN S	SUBSYS LEAD:	M.J. SAIID	I
2) WASTE M 3) WASTE C	PPORT SYSTEM ANAGEMENT SUBSYSTEM OLLECTION SUBSYSTEM AND AIR LINE INSTALLAT	LION		
	CRITIC	ALITIES		
PRELA LIFTO ONORB DEORB	HASE HDW/FUNC UNCH: /NA FF: /NA		: /NA /NA /NA	c
REDUNDANCY S	CREENS: A [2]	B [P]	C [P]	

LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.11B)[G/E/ DWG 47A232860P1]

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESTRICTED AIR FLOW TO SEPARATORS, POSSIBLE WASTE FLUIDS DUMPED INTO CABIN AIR THROUGH FAN SEPARATOR MUFFLER OUTLET OR THE 5.30 PARTICULATE SCREEN. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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ITEM: BALLAST AIR CONTROL VALVE (1) FAILURE MODE: FAILS TO CLOSE, INTERNAL LEAKAGE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 3/3 AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.11B)[G.E. DWG 47A232860P1]		
CAUSES: CONTAMINATION, PIECE-PART FAILURE		
EFFECTS/RATIONALE: LOWER AIRFLOW FROM COMMODE COULD PRODUCE REDUCED EFFICIENCY BUT WOULD ONLY CAUSE CREW INCONVENIENCE. NO MISSION IMPACT.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2057ABORT:/NA	:
ITEM: BALLAST AIR CONTROL VALVE (1) FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NA	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.11B)[G.E. DWG 47A232860P1]	
CAUSES: CONTAMINATION, PIECE-PART FAILURE, CHEMICAL REACTION	
EFFECTS/RATIONALE: POSSIBLE SEEPAGE OF WASTE GASES INTO WCS ENCLOSURE. CREW INCONVENIENCE, THE ODOR EFFECT MUST BE EVALUATED AS A REAL TIME DECISION.	
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC	, ,

REPORT DATE 10/23/87 C-208

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2058	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: FAN/SEPARATOR VALU FAILURE MODE: FAILS TO OPEN, RES	VE (1) STRICTED FLOW	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALL 5) VALVE ASSEMBLY 6) 7) 8) 9)		
CRITIC	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.28B)[G.E. DWG. 47A232859P1]		
CAUSES: CONTAMINATION, PIECE-PAI	RT FAILURE, VIBRATION	
EFFECTS/RATIONALE: UNABLE TO OPEN VALVE FOR SELECTED FAN/SEPARATOR, REQUIRES USAGE OF CONTINGENCY WASTE COLLECTION METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.] SHUTTLE SYSTEM HANDBOOK, DWG. NO HANDBOOK, VS70-960102, PAGE 60EC	E. DWG 47J232750G16]; 2) SPACE . 6.5; 3) RI INTEGRATED SCHEMATIC	

REPORT DATE 10/23/87

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2059ABORT:/NA
ITEM: FAN/SEPARATOR VALVE (1) FAILURE MODE: FAILS TO CLOSE, INTERNAL LEAKAGE
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NA
LIFTOFF: /NA TAL: /NA
ONORBIT: 3/3 AOA: /NA
DEORBIT: /NA ATO: /NA
LANDING/SAFING: /NA
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.28B)[G.E. DWG 47A232859P1]
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION
EFFECTS/RATIONALE:
UNABLE TO SWITCH TO NEW FAN/SEPARATOR AND EFFECT AND A GOOD SEAL.
NO EFFECT ON MISSION OR LIFE OF VEHICLE.
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2060ABORT:/NA
ITEM: SEPARATOR VALVE (1) FAILURE MODE: EXTERNAL LEAKAGE
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) VALVE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (VALVE 5.28B) [G.E. DWG 47A232859P1] CAUSES: CONTAMINATION, PIECE-PART FAILURE, CHEMICAL REACTION
EFFECTS/RATIONALE: POSSIBLE SEEPAGE OF WASTE FLUIDS INTO WCS ENCLOSURE THROUGH VALVE BODY SEALS AND REDUCED COMMODE VENTILATION EFFICIENCY.
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC
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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2061	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: FAN/SEPARATORS (2) FAILURE MODE: INTERNAL LEAKAGE (W	ATER TO AIR)		
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) FAN/SEPARATOR 6) 7) 8) 9)	ION		
CRITICA			
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (ITEM 5.5) [G.E. DWG. 47E225362G2, G4]			
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, CHEMICAL REACTION		
EFFECTS/RATIONALE: FAILURE OF GASKET SEAL ON FLUID RESERVOIR TO BLOWER HOUSING, ULTIMATELY WASTE FLUID INTO CABIN AIR BY WAY OF MUFFLER. THE IMMEDIATE EFFECT OF THE LEAK WOULDN'T BE VISIBLE UNTIL LEAKAGE AT MUFFLER. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS.			
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	DWG 47J232750G16]; 2) SPACE 6.5; 3) RI INTEGRATED SCHEMATIC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2062	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: FAN/SEPARATORS (2) FAILURE MODE: RESTRICTED WATER FI	JOW	
LEAD ANALYST: K. BARICKMAN	UBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) FAN/SEPARATOR 6) 7) 8) 9)	lon	
CRITICA	TTMTPC	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (ITEM 5	5.5) [G.E. DWG. 47E225362G2, G4]	
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE: DUMPING OF WASTE FLUID INTO CABIN AIR DUE TO BLOCKAGE OF THE PITOT TUBE, EXCESSIVE FLUID DUMP QUANTITY, OR FECAL/EMISIS CONTAMINATION BLOCKAGE OF FAN/SEPARATOR ASSEMBLY. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	DWG 47J232750G16]; 2) SPACE 6.5; 3) RI INTEGRATED SCHEMATIC	

REPORT DATE 10/23/87 C-213

DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2063	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: FAN/SEPARATORS (2) FAILURE MODE: PHYSICAL BINDING/J	AMMING	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLA 5) FAN/SEPARATOR 6) 7) 8) 9)	TION	
CRITIC	ALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA	
ONORBIT: 3/2R	AOA: /NA	
DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (ITEM	5.5) [G.E. DWG. 47E225362G2, G4]	
CAUSES: MECHANICAL SHOCK, PIECE CONTAMINATION,	PART FAILURE, VIBRATION,	
EFFECTS/RATIONALE: BREAKAGE OF PIECE PART STRUCTURE, THUS JAMMING FAN/MOTOR AND HALTING MOTOR OPERATION. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS. IF ALTERNATE FAN/SEPARATOR ALSO DOES NOT FUNCTION THEN CANNOT DO SUBSEQUENT EVA'S BECAUSE EMU DRAIN IS LOST.		
REFERENCES: 1) WCS ASSEMBLY [G.E SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 HIGHEST CRITICALITY HDW/FU SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/21 MDAC ID: 2064 ABORT: /NA ITEM: FAN/SEPARATORS (2) FAILURE MODE: EXTERNAL LEAKAGE	ર		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) 7) 8) 9)	·		
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NA			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (ITEM 5.5) [G.E. DWG. 47E225362G2, 0	34]		
CAUSES: CONTAMINATION, PIECE PART FAILURE, PRESSURE (HIGH), VIBRATION, CHEMICAL REACTION			
EFFECTS/RATIONALE: FAILURE OF GASKET SEALS WOULD ALLOW WASTE FLUIDS INTO CABIN ATMOSPHERE REQUIRING IMPLEMENTATION OF FLIGHT RULE 13-17 FOR FLUID SPILLS. REQUIRES RESORTING TO ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMAT HANDBOOK, VS70-960102, PAGE 60EC	FIC		

REPORT DATE 10/23/87

DATE: 7/28/ SUBSYSTEM: LIFE SU MDAC ID: 2065	'87 IPPORT	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: FAN/ FAILURE MODE: FAIL	SEPARATOR TEST P S TO OPEN, PHYSI	ORTS (4) CAL BINDIN	G/JAMMING	
LEAD ANALYST: K. BA	RICKMAN SU	BSYS LEAD:	M.J. SAIID	Γ
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) 7) 8) 9)				
	CRITICAL	ITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFI	HDW/FUNC 3/3 /NA /NA /NA	ABORT RTLS TAL:	/NA	2
REDUNDANCY SCREENS:	A []	В[]	с[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14				
CAUSES: CONTAMINATION, MISHANDLING/ABUSE				
EFFECTS/RATIONALE: INABILITY TO CHECK WCS FLOW PATHS, NO MISSION EFFECT EXCEPT EXTENDED TURNAROUND TIME.				
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC				

REPORT DATE 10/23/87 C-216

DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2066	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
ITEM: FAN/SEPARATOR TEST FAILURE MODE: RESTRICTED FLOW	PORTS (4)		
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) FAN/SEPARATOR 6) 7) 8) 9)	ION		
CRITICA	LITTES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: /NA DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: REDUCED FLOW RATE FROM SPECIFICATION, ON-GROUND REPAIR. NO MISSION SCHEDULE IMPACT EXCEPT EXTENDED TURNAROUND TIME.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2067	HIGHEST CRITICALI FLIGHT: ABORT:	3/3	
ITEM: FAN/SEPARATOR INLE FAILURE MODE: EXTERNAL LEAKAGE	HOSE FROM COMMODE	(2)	
LEAD ANALYST: K. BARICKMAN	UBSYS LEAD: M.J. SA	IIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLAT 5) FAN/SEPARATOR 6) 7) 8) 9)	ION		
CRITICA	LITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/ RTLS: / TAL: / AOA: / ATO: /	/FUNC /NA /NA /NA /NA	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14			
CAUSES: STRUCTURAL FAILURE, CHEMICAL REACTION			
EFFECTS/RATIONALE: JUST NOXIOUS GAS EMISSIONS AND POSSIBLY INSUFFICIENT FLOW THROUGH COMMODE. THE FAILURE IS DETECTABLE; HOWEVER, THE EXACT CAUSE OF THE FAILURE MAY NOT BE DETERMINED.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUISUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2068ABORT:/NA			
ITEM: FAN/SEPARATOR INLET HOSE FROM URINAL (1) FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA			
ONORBIT: 3/2R AOA: /NA			
DEORBIT: /NA ATO: /NA			
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14			
CAUSES: PIECE-PART FAILURE, CHEMICAL REACTION			
EFFECTS/RATIONALE:			
WASTE FLUID LEAKAGE INTO WCS ENCLOSURE. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS. IF			
ALTERNATE FAN/SEPARATOR DOES NOT FUNCTION, THEN CANNOT PURGE EM	1		
AND NO SUBSEQUENT EVA'S ARE POSSIBLE. MISSION SCHEDULE			
ALTERATION.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATI HANDBOOK, VS70-960102, PAGE 60EC	C		

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2069ABORT:/NA			
ITEM: FAN/SEPARATOR INLET HOSE FROM URINAL (1) FAILURE MODE: FAILS CLOSED, RESTRICTED FLOW			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14			
CAUSES: CONTAMINATION			
EFFECTS/RATIONALE: RESTRICTED INLET FLOW FROM URINAL, POTENTIAL STOPPED FLOW AND LOSS OF URINAL USAGE. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

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DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 2070 ABORT: /NA			
ITEM: DUAL CHECK VALVES (2) FAILURE MODE: FAILS TO REMAIN CLOSED (SINGLE STAGE), INTERNAL LEAKAGE			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:3/3ATO:/NA			
PRELAUNCH: /NA RTLS: /NA			
LIFTOFF: /NA TAL: /NA			
ONORBIT: 3/3 AOA: /NA			
DEORBIT: 3/3 ATO: /NA			
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS AREA 90 PART NUMBER: 80V62A14 (TP120) [G.E. DWG. 47A232884P2]			
CAUSES: CONTAMINATION, PIECE-PART FAILURE, CORROSION			
EFFECTS/RATIONALE: POSSIBLE WASTE FLUID BACKFLOW IN FAN SEPARATORS AND CABIN AIR IF BOTH CHECK VALVES FAIL. VIEWED NOT CRITICAL BECAUSE SECOND STAGE CHECK VALVE PRECLUDES LEAKAGE.			

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2071	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: DUAL CHECK VALVES FAILURE MODE: EXTERNAL LEAKAGE	(2)		
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) 7) 8) 9)			
CRITICA	ALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: 3/3 LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]		
LOCATION: ECLSS AREA 90			
PART NUMBER: WCS 80V62A14 (TP120)) [G.E. DWG. 47A232884P2]		
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, CORROSION		
EFFECTS/RATIONALE: POSSIBLE LEAKAGE OF WASTE FLUIDS INTO WCS ENCLOSURE AND CABIN ATMOSPHERE. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS. IF ALTERNATE FAN/SEPARATOR DOES NOT FUNCTION, THEN CANNOT PURGE EMU AND NO SUBSEQUENT EVA'S ARE POSSIBLE. MISSION SCHEDULE ALTERATION. REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

REPORT DATE 10/23/87

DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 2072 ABORT: /NA ITEM: DUAL CHECK VALVES (2) FAILURE MODE: FAILS TO OPEN, RESTRICTED FLOW			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) 7) 8)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NA			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (TP120) [G.E. DWG. 47A232884P2]			
CAUSES: CONTAMINATION, PIÈCE-PART FAILURE, CHEMICAL REACTION			
EFFECTS/RATIONALE: INEFFECTIVE FAN/SEPARATOR OPERATION REQUIRING USE OF ALTERNATE FAN/SEPARATOR UNIT OR ALTERNATE WASTE COLLECTION METHOD DUE TO WASTE FLUID IN CABIN ATMOSPHERE. IF ALTERNATE FAN/SEPARATOR DOES NOT FUNCTION, THEN CANNOT PURGE EMU AND NO SUBSEQUENT EVA'S ARE POSSIBLE. MISSION SCHEDULE ALTERATION.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

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DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2073ABORT:/NA			
ITEM: HOSE ASSEMBLY, SEPARATOR TO CHECK VALVE (2) FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA			
PRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NA			
LIFTOFF: /NA TAL: /NA			
ONORBIT: 3/2R AOA: /NA			
ONORBIT: 3/2R AOA: /NA DEORBIT: /NA ATO: /NA			
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14			
CAUSES: PIECE-PART FAILURE, CORROSION, STRUCTURAL FAILURE (RUPTURE)			
EFFECTS/RATIONALE: WASTE FLUID CONTAMINATION INTO WCS ENCLOSURE AND CABIN ATMOSPHERE. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS. IF ALTERNATE FAN/SEPARATOR DOES NOT FUNCTION, THEN CANNOT PURGE EMU AND NO SUBSEQUENT EVA'S ARE POSSIBLE. MISSION SCHEDULE ALTERATION.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2074	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
ITEM: MUFFLER HOUSING INLE FAILURE MODE: EXTERNAL LEAKAGE	T DUCT (1)		
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) FAN/SEPARATOR 6) MUFFLER HOUSING INSTALLATION 7) 8) 9)			
CRITICAL	ITIES		
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC		
PRELAUNCH: /NA	RTLS: /NA		
LIFTOFF: /NA	TAL: /NA AOA: /NA		
ONORBIT: 3/3	AOA: /NA		
DEORBIT: /NA	ATO: /NA		
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (5.1)			
CAUSES: CONTAMINATION, PIECE-PART (RUPTURE)	FAILURE, STRUCTURAL FAILURE		
EFFECTS/RATIONALE:	THE DUE TO DUCT OF COURT THE		

LEAK OF NOXIOUS FUMES INTO CREW CABIN DUE TO DUCT OR COUPLING LEAKAGE. CREW INCONVENIENCE, THE ODOR EFFECT MUST BE EVALUATED AS A REAL TIME DECISION.

REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2075	HIGHES	ST CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: BACTERIA FII FAILURE MODE: OPEN, INTERN			
LEAD ANALYST: K. BARICKMAN	SUBSYS LI	EAD: M.J. SAIIC	I
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSY 3) WASTE COLLECTION SUBSY 4) LIQUID AND AIR LINE IN 5) FAN/SEPARATOR 6) MUFFLER HOUSING INSTAN 7) 8) 9)	STEM STALLATION		
FLIGHT PHASE HDW/F PRELAUNCH: /N LIFTOFF: /N ONORBIT: 3/3 DEORBIT: /N LANDING/SAFING: /N	CRITICALITIES FUNC ABOR NA F NA 7 NA 7 NA 7 NA 7 NA 7	RT HDW/FUN RTLS: /NA FAL: /NA AOA: /NA ATO: /NA	C.
REDUNDANCY SCREENS: A [] B[]] c []	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14			
CAUSES: CONTAMINATION, STR	UCTURAL FAILURE	E (RUPTURE)	
EFFECTS/RATIONALE: LEAKAGE OF NOXIOUS FUMES INTO CABIN AIR, REPLACE FILTER. CREW INCONVENIENCE, THE ODOR EFFECT MUST BE EVALUATED AS A REAL TIME DECISION.			
REFERENCES: 1) WCS ASSEMBI SHUTTLE SYSTEM HANDBOOK, DW HANDBOOK, VS70-960102, PAGE	IG. NO. 6.5; 3)	J232750G16]; 2) RI INTEGRATED	SPACE SCHEMATIC

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DATE: 7/28/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 2076	IGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: BALLAST VALVE SCREEN (FAILURE MODE: RESTRICTED FLOW, CLOSE	1) 2D	
LEAD ANALYST: K. BARICKMAN SUBS	YS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) BALLAST VALVE 6) 7) 8) 9)		
CRITICALII	TEC	
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/3	AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [] B	[] c[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG. 199C3110P2]		
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE: INSUFFICIENT AIRFLOW TO URINAL, EXCESSIVE DRAG ON FAN/SEPARATOR MOTORS. CLEAN SCREEN. IF FLOW IS BLOCKED, CANNOT USE URINAL OR EMU DRAIN WITHOUT COMMODE BEING OPEN.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2077	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: BALLAST VALVE ASSI FAILURE MODE: FAILS MID-TRAVEL, RESTRICTED FLOW	EMBLY (1) PHYSICAL BINDING/JAMMING,	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) BALLAST VALVE 6) 7) 8) 9)		
CRITIC	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO; /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG. 47C265767G2] CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE,		
VIBRATION, INADVERTENT OPERATION/		
EFFECTS/RATIONALE: INSUFFICIENT AIRFLOW TO URINAL, EXCESSIVE DRAG ON FAN/SEPARATOR MOTORS. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

REPORT DATE 10/23/87

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DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 2078 ABORT: /NA ITEM: BALLAST VALVE ASSEMBLY (1) FAILURE MODE: FAILS TO OPEN, RESTRICTED FLOW		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) LIQUID AND AIR LINE INSTALLATION 5) BALLAST VALVE 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NA		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E. DWG. 47C265767G2]		
CAUSES: CONTAMINATION, PIECE-PART FAILURE		
EFFECTS/RATIONALE: POTENTIAL FOR NOT SWITCHING BALLAST VALVE POSITION REQUIRING MAINTENANCE OF VALVE POSITION. THERE IS A POSSIBLE OUTGASSING FROM THE AUXILLIARY WET TRASH OR WASTE TISSUE CONTAINERS. CREW INCONVENIENCE, THE ODOR EFFECT MUST BE EVALUATED AS A REAL TIME DECISION.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2079 ITEM: COMMODE SEAT (1)	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
FAILURE MODE: STRUCTURAL FAILURE	·	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)		
CRITIC	ALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 [G.E.	DWG. 47E232800G2]	
CAUSES: STRUCTURAL FAILURE, VIBR	ATION, CHEMICAL REACTION	
EFFECTS/RATIONALE: LOOSE COMMODE SEAT IN WCS ENCLOSURE, REQUIRES USE OF TAPE TO MAINTAIN FUNCTIONAL POSITION.		
REFERENCES: 1) WCS ASSEMBLY [G.E SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	. DWG 47J232750G16]; 2) SPACE	

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DATE: 7/28/87 HIG SUBSYSTEM: LIFE SUPPORT MDAC ID: 2080	HEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: COMMODE SEAT (1) FAILURE MODE: PHYSICAL BINDING/JAMMING	;	
LEAD ANALYST: K. BARICKMAN SUBSYS	LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALITIE	29	
FITCHT DHASE HOW/FUNC A	ABORT HDW/FUNC	
FLIGHT PHASE HDW/FUNC A PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/2R	AOA: /NA	
ONORBIT: 3/2R DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B [P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: 80V62A14 [G.E. DWG. 47E232800G2]		
CAUSES: PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: FAILURE OF SEAT TO REMAIN IN A STABLE POSITION WHEN CREWMEMBER IS STRAPPED DOWN COULD YIELD INEFFECTIVE OPERATION. WORST CASE DOES NOT ALLOW USE OF SEAT, MUST USE CONTINGENCY WASTE COLLECTION METHODS, BUT CAN STILL USE COMMODE FOR STORAGE.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2081	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: SEAT BASE (1) FAILURE MODE: RESTRICTED FLOW	·	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)		
CRITIC	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/3	AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: 80V62A14 [G.E. DRAW	VING 47E232751G1]	
CAUSES: CONTAMINATION		
EFFECTS/RATIONALE: LOSS OF EFFECTIVE AIRFLOW THROUGH SEAT BASE PASSAGES, CREW INCONVENIENCE AND INEFFECTIVE COMMODE USAGE.		
REFERENCES: 1) WCS ASSEMBLY [G.E SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	6.5; 3) RI INTEGRATED SCHEMATIC	
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ORBITER SUBSYSTEM ANALYSIS WORKSHEET		
DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2082	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: THIGH BAR RESTRAINT FAILURE MODE: FAILS TO CLOSE	(2)	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)		
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/3		
DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A []	в[] С[]	
LOCATION: ECLSS AREA 90 PART NUMBER: G.E. DWG. 63E905736G1		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE		
EFFECTS/RATIONALE: REQUIRES USE OF ALTERNATE THIGH RESTRAINT SYSTEM.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2083	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: VELCRO RESTRAINT FAILURE MODE: CLIP FAILURE	HARNESS (THIGH)(4)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)	· · ·	
CRIT	ICALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: G.E. DWG. 63E90573	36G1	
CAUSES: MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: INABILITY TO USE VELCO HARNESS ASSEMBLY, MUST RELY ON ALTERNATE RESTRAINT METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		
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DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 2084 ABORT: /NA		
ITEM: FOOT RESTRAINT (1) FAILURE MODE: FAILED STOWED POSITION		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: ECLSS AREA 90 PART NUMBER: G.E. DWG. 63E905736G1		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, VIBRATION.		
EFFECTS/RATIONALE: INABILITY TO USE COMMODE DUE TO ACCESS PROBLEM, MUST USE CONTINGENCY WASTE COLLECTION METHODS FOR FECAL/EMISSIS BIOWASTE.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		
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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2085	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: FOOT RESTRAINT (1) FAILURE MODE: FAILED DEPLOYED PO	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)	
CRITIC	ALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 3/3 DEORBIT: 3/3	AOA: /NA
DEORBIT: 3/3	ATO: /NA
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: G.E. DWG. 63E905736	Gl
CAUSES: CONTAMINATION, MISHANDLI VIBRATION.	NG/ABUSE, PIECE-PART FAILURE,
EFFECTS/RATIONALE:	
CREW INCONVENIENCE AT EGRESS, NO	MISSION IMPACT.
REFERENCES: 1) WCS ASSEMBLY [G.E SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	
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GHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
ABLE POSITION, FAILS CLOSED		
S LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)		
ES		
ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
] C[]		
LOCATION: ECLSS AREA 90 PART NUMBER: G.E. DWG. 47D265876G1		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: INABILITY TO EFFECTIVELY RESTRAIN FEET DURING STAND-UP URINATION, REQUIRES ALTERNATE RESTRAINT SYSTEM WHICH MAY BE INCONVENIENT TO CREW USAGE.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 HIGHEST CH SUBSYSTEM: LIFE SUPPORT MDAC ID: 2087	RITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: TOE BAR RESTRAINT (1) FAILURE MODE: FAILED DEPLOYED POSITION		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) CREW RESTRAINT ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT	HDW/FUNC /NA	
PRELAUNCH: /NA RTLS: LIFTOFF: /NA TAL:	/NA /NA	
ONORBIT: 3/3 AOA:	/NA	
LIFTOFF: /NA TAL: ONORBIT: 3/3 AOA: DEORBIT: 3/3 ATO:	/NA	
LANDING/SAFING: 3/3	·	
REDUNDANCY SCREENS: A [] B []	С[].	
LOCATION: ECLSS AREA 90 PART NUMBER: G.E. DWG. 47D265876G1		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: INABILITY TO PROPERLY STOW TOE BAR RESTRAINT. INCONVENIENCE FOR CREW AT EGRESS, BUT NO MISSION IMPACT		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 HIGHEST CRITICALITY SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 2088 ABORT:	HDW/FUNC 3/2R /NA
ITEM: APOLLO FECAL BAG (MISSION LIFE SUPPLY) FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIID	I
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ALTERNATE WASTE COLLECTION SYSTEM 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NA	
REDUNDANCY SCREENS: A [2] B [P] C [P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14	
CAUSES: MISHANDLING/ABUSE, STRUCTURAL FAILURE, CHEMICAL	REACTION
EFFECTS/RATIONALE: PRODUCES WASTE SPILL TO CABIN ATMOSPHERE THAT REQUIRES U FLIGHT RULE 13-17. SEE GROUND RULE 1.	SE OF
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED HANDBOOK, VS70-960102, PAGE 60EC	SPACE SCHEMATIC

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2089	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: URINE COLLECTION	DEVICE (3 DAYS SUPPLY PER
CREWMEMBER) FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ALTERNATE WASTE COLLECTION S 5) 6) 7) 8) 9)	SYSTEM
CRITT	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 3/2R	AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14	
CAUSES: MISHANDLING/ABUSE, PIEC	E-PART FAILURE, CHEMICAL REACTION
EFFECTS/RATIONALE: PRODUCES WASTE FLUID IN CABIN ATT FLIGHT RULE 13-17. SEE GROUND RU	
REFERENCES: 1) WCS ASSEMBLY [G.1 SHUTTLE SYSTEM HANDBOOK, DWG. NO HANDBOOK, VS70-960102, PAGE 60EC	. 6.5; 3) RI INTEGRATED SCHEMATIC

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2090 ITEM: COMMODE PRESSURE TRANSDUCER (1) FAILURE MODE: FAILS OUT OF TOLERANCE LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9) CRITICALITIES	ORBITER SUBSISTEM ANALISIS WORKSHELT
FAILURE MODE: FAILS OUT OF TOLERANCE LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	7/28/87HIGHEST CRITICALITY HDW/FUNCEM: LIFE SUPPORTFLIGHT: 3/32090ABORT: /NA
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	COMMODE PRESSURE TRANSDUCER (1) MODE: FAILS OUT OF TOLERANCE
1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	ALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
CRITICALITIES	TE SUPPORT SYSTEM STE MANAGEMENT SUBSYSTEM STE COLLECTION SUBSYSTEM
	COTUTCALITYTES
FLIGHT PHASEHDW/FONCABORTHDW/FONCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA	THT PHASE HOW/FIINC ABORT HOW/FIINC
REDUNDANCY SCREENS: A [] B [] C []	NCY SCREENS: A [] B [] C []
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (V62P0505A)	
CAUSES: CONTAMINATION, PIECE-PART FAILURE	
EFFECTS/RATIONALE: INEFFECTIVE INDICATION OF MANIFOLD VALVE HOUSING PRESSURE, REQUIRED TO USE SPECIFIED REPRESSURIZATION TIME (10-30 SECONDS) BEFORE COMMODE ACTUATION.	
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC	SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2091	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: WCS FAN/SEPARATOR FAILURE MODE: FAILS MID-TRAVEL,	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SUBSYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	
CRITI	ICALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 3/2R	AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: ECLSS AREA 90	
PART NUMBER: WCS 80V62A14 (WCS	S4)
CAUSES: CONTAMINATION, OVERLOAD	D, PIECE-PART FAILURE, VIBRATION
EFFECTS/RATIONALE:	
	CAUSING RESTRICTED FLOW. RESULTS
IN LOSS OF ABILITY TO USE REDUNI	DANT FAN/SEPARATOR, REQUIRES USE
OF CONTINGENCY WASTE COLLECTION	METHODS IF FAN/SEPARATOR FAILS.
	· ·
REFERENCES: 1) WCS ASSEMBLY [G.	E. DWG 47J232750G16]; 2) SPACE
SHUTTLE SYSTEM HANDBOOK, DWG. NO	0. 6.5; 3) RI INTEGRATED SCHEMATIC
HANDBOOK, VS70-960102, PAGE 60EC	

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2092	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: WCS FAN/SEPARATOR FAILURE MODE: SHORTED CONTACT	SWITCH (1)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITI	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A [2]	B[NA] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (D&C	PANEL WCS, S4)	
CAUSES: CONTAMINATION, PIECE-PA	RT FAILURE	
EFFECTS/RATIONALE: TWO FAILURE MODES: (1) IF SHORTED TO GROUND IT "POPS" CIRCUIT BREAKER OF SELECTED FAN/SEPARATOR AND MUST ACTIVATE ALTERNATE FAN/SEPARATOR. (2) IF ALTERNATE FAN/SEPARATOR CONTACTS ARE SHORT CLOSED, THEN DRIVING BOTH FAN/SEPARATORS AT ONCE CAUSING NO IMPACT, BECAUSE IF SECOND FAN OVERHEATS THE THERMOSTAT WILL OPEN CONTACTS UNTIL COOL-DOWN IS PRECIPITATED.		
REFERENCES: 1) WCS ASSEMBLY [G. SHUTTLE SYSTEM HANDBOOK, DWG. NO HANDBOOK, VS70-960102, PAGE 60EC	. 6.5; 3) RI INTEGRATED SCHEMATIC	
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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2093	HIGHEST (CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: WCS FAN/SEPARATOR SW FAILURE MODE: FAILS OPEN (SINGLE C		ingen hann hann an	na statura
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD:	M.J. SAIID	I
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)			
CRITICAL			
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	ABORT RTLS TAL: AOA: ATO:	5: /NA : /NA : /NA	2
REDUNDANCY SCREENS: A []	B []	c []	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (D&C PAN	EL WCS, S4	!)	
CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE, VIBRATION	MISHANDLIN	NG/ABUSE, OVI	ERLOAD,
EFFECTS/RATIONALE: INABILITY TO ACTUATE FAN/SEPARATOR BYPASS SWITCH.	MOTORS WIT	THOUT USING S	SEPARATOR
	yayı danış da		
REFERENCES: 1) WCS ASSEMBLY [G.E. SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6 HANDBOOK, VS70-960102, PAGE 60EC			

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ORDITER SUBSISIEM ANALISIS WORRSHEET			
DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2094	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
ITEM: WCS MODE SWITCH (1) FAILURE MODE: FAILS MID-TRAVEL, H			
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)			
CRITICA	AT.TTTTTS		
FLIGHT PHÀSE HDW/FUNC			
PRELAUNCH: /NA	RTLS: /NA		
LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA	TAL: /NA		
ONORBIT: 3/3	AOA: /NA		
DEORBIT: /NA	ATO: /NA		
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (D&C PANEL WCS, S1)			
CAUSES: CONTAMINATION, MISHANDLIN FAILURE	IG/ABUSE, OVERLOAD, PIECE-PART		
EFFECTS/RATIONALE: INABILITY TO COMPLETE FAN/SEPARATOR ENERGIZING CIRCUIT WITHOUT USING SEPARATOR BYPASS SWITCH.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE			
SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	6.5; 3) RI INTEGRATED SCHEMATIC		

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EFFECTS/RATIONALE: 2 FAILURE MODES: (1) IN THE CASE OF SHORTED TO GROUND, THE ASSOCIATED CIRCUIT BREAKER "POPS" AND THE ALTERNATE FAN/SEPARATOR CIRCUIT BREAKER AND SWITCH MUST BE ACTIVATED (3/2R) TO THE ALTERNATE FAN/SEP. (2) THE OTHER CASE IS SHORTED ACROSS TERMINALS TO WHERE THE FAN/SEPARATOR MUST BE CONTROLLED BY THE CIRCUIT BREAKER (3/3).		

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ORDITER SUDSISIEM ANALISIS WORKSHEET			
DATE:7/28/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2096ABORT:/NA			
ITEM: WCS MODE SWITCH (1) FAILURE MODE: OPEN			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)			
CRITICALITIES			
FLICHT PHASE HOW/FUNC ABORT HOW/FUNC			
PRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/3AOA:/NADEORBIT:/NAATO:/NA			
LIFTOFF: /NA TAL: /NA			
ONORBIT: 3/3 AOA: /NA			
DEORBIT: /NA ATO: /NA			
LANDING/SAFING: /NA			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS AREA 90			
PART NUMBER: WCS 80V62A14 (D&C PANEL WCS, S1)			
CAUSES: ACOUSTICS, CONTAMINATION, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, VIBRATION			
EFFECTS/RATIONALE: INABILITY TO MAINTAIN FAN/SEPARATOR RELAY ENERGIZING CIRCUIT WITHOUT USING SEPARATOR BYPASS SWITCH.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2097	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: WCS FAN/SEPARATOR REI FAILURE MODE: OPEN (ELECTRICAL)	LAY (2)
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA	ABORT HDW/FUNC
PRELAUNCH: /NA LIFTOFF: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 3/2R	AOA: /NA
ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [2] H	3 [P] C [P]
LOCATION: WCS 80V62A14 PART NUMBER: RELAY K1 AND K2	
CAUSES: CONTAMINATION, MECHANICAL S VIBRATION	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE:	
INOPERABLE RELAY FOR ANY SINGLE LOSS	S OF CONTACT OR RELAY COIL
CIRCUIT OPEN, MUST SWITCH TO ALTERNA	
BREAKER OR CONTINGENCY WASTE COLLECT	
REFERENCES: 1) RI DRAWING VS70-6232	201; 2) SPACE SHUTTLE SYSTEM
HANDBOOK, DRAWING NO. 6.5; 3) RI INT	
VS70-960102, PAGE 60ED	

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DATE: 8/14/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 2098	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: WCS FAN/SEPARATOR RELA FAILURE MODE: SHORTED	VY (2)	
LEAD ANALYST: K. BARICKMAN SUBS	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITICALIJ	TTC	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA	
DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA	
REDUNDANCY SCREENS: A [2] B	[P] C[P]	
LOCATION: WCS 80V62A14 PART NUMBER: RELAY K1 AND K2		
CAUSES: CONTAMINATION, PIECE-PART FA	ILURE, VIBRATION	
EFFECTS/RATIONALE: WORST CASE IS SHORT TO GROUND, ACTIVATING CIRCUIT BREAKER AND REQUIRING USE OF ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS. SHORT ACROSS SINGLE CONTACT WOULD CAUSE CONTINUAL (SINGLE PHASE) POWER TO MOTOR, AND EVENTUALLY CAUSING MAJOR BURN-OUT AND NEED FOR USE OF ALTERNATE FAN/SEPARATORS.		
REFERENCES: 1) RI DRAWING VS70-62320 HANDBOOK, DRAWING NO. 6.5; 3) RI INTE VS70-960102, PAGE 60ED		

REPORT DATE 10/23/87

	ALITY HDW/FUNC HT: 3/3 T: /NA
ITEM: FAN/SEPARATOR NOISE SUPPRESSION CIR FAILURE MODE: OPEN (ELECTRICAL)	CUIT (4)
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J.	SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	
CRITICALITIES	
REDUNDANCY SCREENS: A [] B [] C	[]
LOCATION: WCS 80V62A14 PART NUMBER: G.E. DWG 47C238872	
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PA TEMPERATURE, VIBRATION	RT FAILURE,
EFFECTS/RATIONALE: UNFILTER AC VOLTAGE, NO MISSION EFFECT.	
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE S HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMA VS70-960102, PAGE 60ED	HUTTLE SYSTEM TIC HANDBOOK,

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ORBITER SUBSISTEM ANALISIS WORRSHEET		
DATE:8/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2100ABORT:/NA		
ITEM: FAN/SEPARATOR NOISE SUPPRESSION CIRCUIT(4) FAILURE MODE: SHORTED		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: WCS 80V62A14 PART NUMBER: G.E. DWG 47C238872 (FAN/SEP 1 & 2)		
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION		
EFFECTS/RATIONALE: UNABLE TO SWITCH OFF FAN/SEPARATOR MOTOR FOR SINGLE PHASE LINE, THUS CAUSING EXCESSIVE HEATING OF MOTOR WINDINGS AND EVENTUAL FAILURE AND NEED FOR ALTERNATE FAN/SEPARATOR SYSTEM. IF SHORTED TO GROUND, THIS CAUSES THE CIRCUIT BREAKER TO POP, THUS REQUIRING USE OF ALTERNATE FAN/SEPARATOR.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,		

REPORT DATE 10/23/87

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VS70-960102, PAGE 60ED

MDAC ID:		HIGHEST CRITICALITY FLIGHT: ABORT:	3/2R /NA
ITEM: FAILURE MODE	FAN/SEPARATOR MOTOR FAILS TO OPEN	R THERMOSTATIC SWITCH	(2)
LEAD ANALYST	: K. BARICKMAN	SUBSYS LEAD: M.J. SAII	DI
2) WASTE M	PPORT SYSTEM ANAGEMENT SUBSYSTEM OLLECTION SUBSYSTEM		
		ALITIES	
PRELA LIFTO ONORB DEORB	HASE HDW/FUNC UNCH: /NA FF: /NA IT: 3/2R IT: /NA NG/SAFING: /NA	ABORT HDW/FU RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (ITEM 5.5) [FAN/SEP 1 & 2]			
CAUSES: CON	TAMINATION, PIECE-PART	FAILURE	
EFFECTS/RATIONALE: POSSIBLE MOTOR BURNOUT DUE TO EXCESSIVE TEMPERATURE. SWITCH TO ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION DEVICES.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2102	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: FAN/SEPARATOR MOTOR FAILURE MODE: FAILS TO REMAIN CLOS	THERMOSTATIC SWITCH (2) SED, FAILS TO CLOSE	
LEAD ANALYST: K. BARICKMAN SU	JBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITICAL	THIER	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
	202 · /NA	
UNORBIT: 5/2R		
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2]	B [P] C [P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (ITEM 5.5) [FAN/SEP 1 & 2]		
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: INABILITY TO USE THE FAN/SEPARATOR BECAUSE OF DEACTIVATED SOLENOID SWITCH. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

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DATE: 7/28/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 2103 ABORT: /NA		
ITEM: FAN/SEPARATOR BYPASS SWITCH (2) FAILURE MODE: FAILS TO CLOSE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NA		
ONORBIT: 3/3 AOA: /NA		
DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (SWITCH S6 AND S7)		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: INABILITY TO USE FAN/SEPARATOR BYPASS SWITCH AND NO ACTIVATION OF FAN/SEPARATOR IN THE EVENT OF WCS CONTROL SWITCH FAILURE.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		
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REPORT DATE 10/23/87

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DATE: 7/28/87 HIGHEST CRITICALIT SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 2104 ABORT:	3/3	
ITEM: FAN/SEPARATOR BYPASS SWITCH (2) FAILURE MODE: FAILS TO OPEN		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAI	IDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITICALITIES	`	
FLIGHT PHASEHDW/FUNCABORTHDW/FPRELAUNCH:/NARTLS:/NLIFTOFF:/NATAL:/NONORBIT:3/3AOA:/NDEORBIT:/NAATO:/NLANDING/SAFING:/NAATO:/N	A	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (SWITCH S6 AND S7)		
CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION, INADVERTENT OPERATION/ACTIVATION		
EFFECTS/RATIONALE: MUST USE CIRCUIT BREAKER TO REMOVE POWER FROM CIRCUIT. IF ALTERNATE BYPASS SWITCH IS SHORTED CLOSED THEN COULD RUN ALTERNATE MOTOR WITHOUT PROPER COOLING AND ACTIVATE THERMOSTATIC SWITCHPRODUCING AN INTERMITTENT OPERATION PROBLEM UNLESS THE ASSOCIATED CIRCUIT BREAKER IS OPENED.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATE HANDBOOK, VS70-960102, PAGE 60EC	2) SPACE) SCHEMATIC	

REPORT DATE 10/23/87

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2105	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: CIRCUIT BREAKER, WCS FAILURE MODE: FAILS TO REMAIN CLOS	CNTLR (2) ED	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITICAL		
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC RTLS: /NA	
PRELAUNCH: /NA LIFTOFF: /NA	RTLS: /NA TAL: /NA	
ONORBIT: 3/2R	TAL: /NA AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: D&C PANEL ML86B PART NUMBER: 80V73A130, WCS CNTLR, CB19 AND CB22		
CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: INOPERATIVE FAN/SEPARATOR CONTROLLER, INABILITY TO USE THE FAN/SEPARATOR. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS.		
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC		

REPORT DATE 10/23/87 C-256

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_	DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2106	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: /NA
	ITEM: CIRCUIT BREAKER, FAILURE MODE: FAILS TO OPEN	WCS CNTLR (2)
	LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
_	BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM	
_	 WASTE MANAGEMENT SUBSYSTEM WASTE COLLECTION SUBSYSTEM ELECTRICAL PARTS 5) 	
-	6) 7) 8) 9)	
	CRITI FLIGHT PHASE HDW/FUNC	CALITIES ABORT HDW/FUNC
	PRELAUNCH: /NA	RTLS: /NA
	LIFTOFF: /NA	TAL: /NA
	ONORBIT: 3/1R DEORBIT: /NA	AOA: /NA
	DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA
	,	
	REDUNDANCY SCREENS: A [2]	B[P] C[P].
_	LOCATION: D&C PANEL ML86B PART NUMBER: 80V73A130, WCS CNT	LR, CB10 AND 22
	CAUSES: CONTAMINATION, PIECE-PA	RT FAILURE
	EFFECTS/RATIONALE: LOSS OF OVERLOAD PROTECTION, OTH SHORT TO GROUND OCCURS IN EITHER FAN/SEPARATOR SWITCH, IN WHICH C	THE BYPASS SWITCH OR
<u>-</u>	DUE TO OVERHEATING OF THE WIRES.	
-	REFERENCES: 1) WCS ASSEMBLY [G. SHUTTLE SYSTEM HANDBOOK, DWG. NO HANDBOOK, VS70-960102, PAGE 60EC	. 6.5; 3) RI INTEGRATED SCHEMATIC
	REPORT DATE 10/23/87	C-257

SUBSYSTEM: LIFE SUPPORT MDAC ID: 2107	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: FAN/SEPARATOR MOTO FAILURE MODE: OPEN (ELECTRICAL)	DR (2)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITIC	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: 3/2R	AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2]	B[P]. C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (ITEM 5.5) [G.E. DRAWINGS 47E225363P2]		
CAUSES: PIECE-PART FAILURE, THERMAL SHOCK.		
EFFECTS/RATIONALE: ELECTRIC MOTOR FAILURE, CAUSES USE OF REDUNDANT SYSTEMS. MOTOR WILL NOT START WITH A SINGLE PHASE FAILURE. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS. IF ALTERNATE FAN/SEPARATOR DOES NOT FUNCTION, THEN CANNOT PURGE EMU AND NO SUBSEQUENT EVA'S ARE POSSIBLE. MISSION SCHEDULE ALTERATION.		
REFERENCES: 1) WCS ASSEMBLY [G.E SHUTTLE SYSTEM HANDBOOK, DWG. NO. HANDBOOK, VS70-960102, PAGE 60EC	. DWG 47J232750G16]; 2) SPACE 6.5; 3) RI INTEGRATED SCHEMATIC	

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DATE: 7/28/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2108	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: FAN/SEPARATOR MOTOR FAILURE MODE: SHORT	(2)	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITICAL	T T T T T	
FLIGHT PHASE HDW/FUNC	RTLS: /NA	
PRELAUNCH: /NA		
LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	TAL: /NA	
ONORBIT: 3/2R DEORBIT: /NA	AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: WCS 80V62A14 (ITEM 5.5) [G.E. DRAWINGS 47E225363P2]		
CAUSES: STRUCTURAL FAILURE, CONTAM	INATION	
EFFECTS/RATIONALE:		
INSUFFICIENT CURRENT/VOLTAGE TO ELEC	CTRIC MOTOR DUE TO POPPED	
CIRCUIT BREAKER OR EXCESSIVE CURRENT		
OVERHEATING AND BURN-OUT REQUIRES US		
ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS.		
IF ALTERNATE FAN/SEPARATOR DOES NOT FUNCTION, THEN CANNOT PURGE		
EMU AND NO SUBSEQUENT EVA'S ARE POSSIBLE. MISSION SCHEDULE		
ALTERATION.		
REFERENCES: 1) WCS ASSEMBLY [G.E.]	NG 47.1232750G161: 2) SPACE	
SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6	5: 3) RT INTEGRATED SCHEMATIC	
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REPORT DATE 10/23/87

HANDBOOK, VS70-960102, PAGE 60EC

DATE: 7/28/87 HIGHEST C SUBSYSTEM: LIFE SUPPORT MDAC ID: 2109	CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA		
ITEM: CIRCUIT BREAKER, WCS FAN/SEPAN PHASE (6) FAILURE MODE: FAILS TO REMAIN CLOSED	RATOR, AC BUS, SINGLE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD:	: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SUBSYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASE HDW/FUNC ABORT	HDW/FUNC		
PRELAUNCH: /NA RTLS	5: /NA		
LIFTOFF: /NA TAL:	/NA		
ONORBIT: 3/2R AOA:	/NA		
DEORBIT: /NA ATO: LANDING/SAFING: /NA	/NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: D & C PANEL 85V73A129 PART NUMBER: CB47 AND CB50			
CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, VIBRATION			
EFFECTS/RATIONALE: LOSS OF SINGLE PHASE POWER TO FAN/SEPARATOR AND LOSS OF TOTAL FAN/SEPARATOR OPERATION. USE ALTERNATE FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS.			
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16]; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

REPORT DATE 10/23/87 C-260

DATE: 7/28/87 HIGHEST CRITICALI SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 2110 ABORT:	3/2R	
ITEM: CIRCUIT BREAKER, WCS FAN/SEPARATOR, AC PHASE (6)	BUS, SINGLE	
FAILURE MODE: FAILS TO OPEN		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SA	IIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SUBSYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE COLLECTION SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)		
CRITICALITIES		
	FUNC	
PRELAUNCH: /NA RTLS: /	'NA	
LIFTOFF: /NA TAL: /	'NA	
ONORBIT: 3/2R AOA: /	'NA ·	
DEORBIT: /NA ATO: /	'NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B [P] C [F	']	
LOCATION: D & C PANEL 85V73A129 PART NUMBER: CB47 AND CB50		
CAUSES: CONTAMINATION, PIECE-PART FAILURE		
EFFECTS/RATIONALE:		
INDICATED POPPING OF OTHER ASSOCIATED FAN/SEPARATOR CIRCUIT		
BREAKERS AND LOSS OF OVER-CURRENT PROTECTION, REQUIRES		
DEACTIVATION OF CURRENT FAN/SEPARATOR AND ACTIVATION		
FAN/SEPARATOR OR CONTINGENCY WASTE COLLECTION METHODS) •	
REFERENCES: 1) WCS ASSEMBLY [G.E. DWG 47J232750G16];		
SHUTTLE SYSTEM HANDBOOK, DWG. NO. 6.5; 3) RI INTEGRAT HANDBOOK, VS70-960102, PAGE 60EC	ED SCHEMATIC	
THE BOOK, ADIG-DUCIDE, LEGE OVEC		

REPORT DATE 10/23/87 C-261

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2111	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3	
ITEM: WWS LINE, UNIONS, A FAILURE MODE: EXTERNAL LEAKAGE	AND JUNCTIONS	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) 5) 6) 7) 8) 9)		
CRITIC	ALITIES	
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:2/2DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER:		
CAUSES: CONTAMINATION, PIECE-PART REACTION	FAILURE, VIBRATION, CHEMICAL	
EFFECTS/RATIONALE: WASTE FLUID LEAK INTO CABIN ATMOSPHERE AND CABIN PRESSURE LOSS DURING WASTE FLUID DUMP. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREWMEMBER. PRODUCES ARS CONDENSATE SPILL BECAUSE THE WASTE TANK 1 IS PRESSURIZED TO 30 PSIA AND FLUID WILL TRAVEL OUT LEAK POINT. THIS IS A MISSION IMPACT BECAUSE THE ARS CONDENSATION UNIT WOULD HAVE TO BE SHUT-DOWN AT THE SEPARATOR IF		
THE LEAK IS TO BE CONTROLLED OR ELIMINATED. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM		
HANDBOOK, DRAWING NO. 6.5; 3) RI 1 VS70-960102, PAGE 60ED		

REPORT DATE 10/23/87 C-262

DATE:7/31/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:2112ABORT:3/3
ITEM: WWS LINE, UNIONS, AND JUNCTIONS FAILURE MODE: RESTRICTED FLOW, CLOSED
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3
LIFTOFF: 3/3 TAL: 3/3
ONORBIT: 2/2 AOA: 3/3
DEORBIT: 3/3 ATO: 3/3
LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS AREA 90 PART NUMBER:
CAUSES: CONTAMINATION
EFFECTS/RATIONALE: EXCESSIVE LOAD ON FAN/SEPARATOR. POSSIBLE PLUGGING OF LINES. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREWMEMBER.

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

REPORT DATE 10/23/87

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2113	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3
ITEM: ARS CONDENSATE SUP FAILURE MODE: EXTERNAL LEAKAGE	PLY TUBE (1)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) 5) 6) 7) 8) 9)	
CRITIC	ALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A []	В[] С[]
LOCATION: ECLSS AREA 90 PART NUMBER:	
CAUSES: PIECE-PART FAILURE, VIBR	ATION, CHEMICAL REACTION
EFFECTS/RATIONALE: PRODUCES LEAKAGE OF ARS CONDENSAT ATMOSPHERE, REQUIRES IMPLEMENTATION OF MISSION, NO METHOD FOR ARS CON	ON OF FLIGHT RULE 13-17. LOSS

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REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

REPORT DATE 10/23/87

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DATE: 9/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2114	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3
ITEM: ARS CONDENSATE SUI FAILURE MODE: RESTRICTED FLOW, (PPLY TUBE (1) CLOSED
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) 5) 6) 7) 8) 9)	
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A [] LOCATION: ECLSS AREA 90 PART NUMBER:	B[] C[]
CAUSES: CONTAMINATION	
EFFECTS/RATIONALE: NO METHOD OF ARS CONDENSATE DUMP CABIN ATMOSPHERE AND POTENTIAL FO SYSTEM.	
REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960120, PAGE 60ED, 60EF AND	INTEGRATED SCHEMATIC HANDBOOK,

REPORT DATE 10/23/87

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2115	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: CONTINGENCY WATER FAILURE MODE: EXTERNAL LEAKAGE,	CONTAINER (1) STRUCTURAL FAILURE (RUPTURE)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) 5) 6) 7) 8) 9)	· · · · · · · · · · · · · · · · · · ·
CRITI	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: ECLSS AREA 90 PART NUMBER: USED AS BACKUP WAS	TE FLUID TANK (UNTESTED APPROACH)
CAUSES: CONTAMINATION, MISHANDL FAILURE, PRESSURE (HIGH), CHEMICA	
EFFECTS/RATIONALE: LEAKAGE OF WASTE FLUIDS INTO CAB RUPTURES OR IF CONTAINER PRESSUR BACKPRESSURE IN THE FAN/SEPARATO INTO THE CABIN THROUGH THE WCS M	E GETS TOO GREAT THEN THE R CAUSES DUMPING OF WASTE FLUIDS
REFERENCES: 1) RI DRAWING VS70-	623201; 2) SPÀCE SHUTTLE SYSTEM

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

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DATE: 7/31/87 I SUBSYSTEM: LIFE SUPPORT MDAC ID: 2116 ITEM: WASTE TANK 1 INLET VAN FAILURE MODE: EXTERNAL LEAKAGE	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3 LVE (1)
LEAD ANALYST: K. BARICKMAN SUB	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)	
CRITICALI	TIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A [] B	[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV16	
CAUSES: CONTAMINATION, PIECE-PART FA	AILURE, VIBRATION, CHEMICAL
EFFECTS/RATIONALE: FAILURE OF VALVE SEALS PRODUCES WASTI AND ARS CONDENSATE DUMP LINE INTO CAN TO COLLECT ARS CONDENSATE, THE MISSIC WELL AS EMU DUMP CAPABILITY.	SIN ATMOSPHERE. IF NO METHOD
REFERENCES: 1) RI DRAWING VS70-62320 HANDBOOK, DRAWING NO. 6.5; 3) RI INTH VS70-960102, PAGE 60ED	

REPORT DATE 10/23/87

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2117	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: WASTE TANK 1 INLET FAILURE MODE: FAILS TO CLOSE	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)	
CRITICA	ALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA TAL: /NA
LIFTOFF: /NA	TAL: /NA AOA: /NA
ONORBIT: 3/3 DEORBIT: /NA	ATO: /NA
LANDING/SAFING: /NA	,,
REDUNDANCY SCREENS: A []	В[] С[]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV16	·····
CAUSES: CONTAMINATION, OVERLOAD, CHEMICAL REACTION	PIECE-PART FAILURE, VIBRATION,
EFFECTS/RATIONALE: INABILITY TO SEAL VALVE AND POSSIN ORBIT IF CHECK VALVES FAIL. INAB IN THE EVENT OF A SUBSEQUENT FAIL MISSION LOSS OR SCHEDULE IMPACT.	ILITY TO ISOLATE THE WASTE TANK
· · · · · · · · · · · · · · · · · · ·	· ••• ·
REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED	23201; 2) SPACE SHUTTLE SYSTEM

REPORT DATE 10/23/87

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2118	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/3
ITEM: WAIST TANK 1 INLET FAILURE MODE: RESTRICTED FLOW.	F VALVE (1) INADVERTANT OPERATION (CLOSURE)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)	
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: 3/3
LIFTOFF: 3/3	TAL: 3/3
ONORBIT: 3/2R-	AOA: 3/3
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/2R DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO: 3/3
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV16	
CAUSES: CONTAMINATION, PIECE-PAN VIBRATION, CHEMICAL REACTION	RT FAILURE, LOSS OF INPUT,
EFFECTS/RATIONALE: THE RESTRICTED FLOW COULD CAUSE H	VORCETUR BACKDDRCCUDE ON MUR
FAN/SEPARATORS, THUS CAUSING OVER	
INADVERTENT CLOSURE REQUIRES HOOF	
CONTAINER, WHICH IF THAT FAILS TH	
MUST BE USED. IN EITHER CASE A H	
DUMP CAPABILITY WILL CAUSE BACKUP	PINTO CABIN. BECAUSE OF SHORT
DURATION OF ASCENT/ENTRY PHASE IT	
CRITICAL IF IT OCCURRED DURING TH	IESE MISSION PHASES.
REFERENCES: 1) RI DRAWING VS70- ϵ	523201: 2) SPACE SHUTTLE SYSTEM
HANDBOOK, DRAWING NO. 6.5; 3) RI	
VS70-960102, PAGE 60ED	
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REPORT DATE 10/23/87 C-269

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DATE: SU <u>BS</u> YSTEM: MDAC ID:	7/31/87 LIFE SUPPORT 2119	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R 3/3
	WASTE TANK 1 (1) E: INTERNAL LEAKAGE TURE		TO BLADDER S	EAL),
LEAD ANALYS	T: K. BARICKMAN	SUBSYS LEAD	D: M.J. SAIID	I
2) WASTE 3) WASTE	IERARCHY: UPPORT SYSTEM MANAGEMENT SUBSYSTEM WATER SUBSYSTEM E ASSEMBLY	[•
	CRIT	ICALITIES		
PREL LIFT ONOR DEOR	PHASEHDW/FUNCAUNCH:3/3OFF:3/3BIT:3/2RBIT:3/3ING/SAFING:3/3	ABORT RTI TAJ AO2 ATC	A: 3/3	
REDUNDANCY	SCREENS: A [2]	B [P]	C[P]	
LOCATION: PART NUMBER	ECLSS AREA 90			
CAUSES: CO REACTION	NTAMINATION, PIECE-P	ART FAILURE,	VIBRATION, C	HEMICAL
FLUID AND G WASTE TANK. GN2 HYDROPH NEED TO USE	O DETERMINE FLUID LE N2 AND CONTAMINATION THIS SCENARIO IS B OBIC FILTER PRECLUDE CONTINGENCY WATER C	OF N2 LINES, ASED ON THE A S WASTE FLUII	, REQUIRES SE ASSUMPTION TH D IN THE GN2 C).	ALING OF AT THE
REFERENCES: HANDBOOK, D	1) RI DRAWING VS70 RAWING NO. 6.5; 3) R , PAGE 60ED	-623201; 2) 5	SPACE SHUTTLE	SYSTEM NDBOOK,

C-270 REPORT DATE 10/23/87

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2120	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: 3/1R
ITEM: WASTE TANK 1 (1) FAILURE MODE: EXTERNAL LEAKAGE	(WASTE TANK TO BLADDER SEAL)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)	
CRITI	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/1R ONORBIT: 3/1R DEORBIT: 3/1R	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: 3/1R
LIFTOFF: 3/1R	TAL: 3/1R
ONORBIT: 3/1R	AOA: 3/1R
DEORBIT: 3/1R	ATO: 3/1R
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: ECLSS AREA 90 PART NUMBER:	
CAUSES: CONTAMINATION, PIECE-PA REACTION	RT FAILURE, VIBRATION, CHEMICAL
EFFECTS/RATIONALE: LEAKAGE OF WASTE FLUIDS INTO MID LEAKAGE OF GN2 INTO CABIN ATMOSP CONDITION IF NOT CORRECTED BY CR PRESSURIZATION SYSTEM BECAUSE OF THE CABIN ATMOSPHERE. NEED TO US (CWC).	HERE. POTENTIALLY FATAL EW BY SHUTTING DOWN GN2 UNREGULATED RELEASE OF GN2 INTO
REFERENCES: 1) RI DRAWING VS70- HANDBOOK, DRAWING NO. 6.5; 3) RI	

REPORT DATE 10/23/87 C-271

VS70-960102, PAGE 60ED

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DATE: 9/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2121	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/3	
ITEM: WASTE TANK 1 LINER (B FAILURE MODE: PHYSICAL BINDING/JAMM		
LEAD ANALYST: K. BARICKMAN SUB	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)		
CRITICALI	TIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/2R DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3	
REDUNDANCY SCREENS: A [2] B	[P] C [P]	
LOCATION: ECLSS AREA 90 PART NUMBER: RI DWG. V070-623022		
CAUSES: CONTAMINATION, PIECE-PART F	AILURE, VIBRATION	
EFFECTS/RATIONALE: JAMMING OF METAL BELLOWS RESTRICTS OPERATION OF WASTE WATER TANK. NEED TO CLOSE INLET VALVE AND USE THE CONTINGENCY WATER CONTAINER (CWC).		
REFERENCES: 1) RI DRAWING VS70-6232 HANDBOOK, DRAWING NO. 6.5; 3) RI INT VS70-960120, PAGE 60ED, 60EF AND 60E	EGRATED SCHEMATIC HANDBOOK,	

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REPORT DATE 10/23/87

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ORDITER SUDSISIEM ANALISIS WORKSHEET			
DATE:7/31/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2122ABORT:3/3			
ITEM: WASTE TANK 1 INLET LINES AND COUPLINGS FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/2RAOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: ECLSS AREA 90 PART NUMBER: V62Q0540A CAUSES: CONTAMINATION, OVERLOAD, PIECE-PART FAILURE, VIBRATION,			
CHEMICAL REACTION			
EFFECTS/RATIONALE: WASTE FLUID LEAK INTO MIDDECK FLOOR STORAGE AREA, REQUIRES CONTINGENCY WASTE COLLECTION METHOD, MORE CRITICAL CONDITION IS THE CABIN PRESSURE LOSS DURING DUMP PROCESS.			
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED			
REPORT DATE 10/23/87 C-273			

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2123	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: WASTE TANK 1 OUTLET FAILURE MODE: EXTERNAL LEAKAGE	LINES AND COUPLINGS
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: /NA	AOA: /NA
DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: V62Q0540A	
CAUSES: CONTAMINATION, OVERLOAD, CHEMICAL REACTION	PIECE-PART FAILURE, VIBRATION,
EFFECTS/RATIONALE: WASTE FLUID LEAK INTO MIDDECK LOWE LANDING/PRELAUNCH). REQUIRES SPIL	
REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI I VS70-960102, PAGE 60ED	3201; 2) SPACE SHUTTLE SYSTEM NTEGRATED SCHEMATIC HANDBOOK,
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SUBSYSTEM: LIFE SUPPORT MDAC ID: 2124	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
ITEM: WASTE TANK FLUID LE FAILURE MODE: PHYSICAL BINDING/JA	VEL TRANSDUCER (1) MMING, LOSS OF OUTPUT		
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)			
	LITTES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA	ABORT HDW/FUNC RTLS: /NA		
LIFTOFF: /NA			
LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: 3/3	AOA: /NA		
DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO: /NA		
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: ECLSS AREA 90 PART NUMBER: V62Q0540A			
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, VIBRATION		
EFFECTS/RATIONALE: INABILITY TO DETERMINE TANK FLUID LEVEL, REQUIRES USE OF CONSOLE CHART TIMELINES FOR DUMP SCHEDULE. CREW WOULD PERFORM SYSTEMATIC DUMPS BASED ON GROUND SUPPORT PREFLIGHT PREDICTIONS ON CONSOLE CHARTS.			
REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI I VS70-960102, PAGE 60ED	3201; 2) SPACE SHUTTLE SYSTEM NTEGRATED SCHEMATIC HANDBOOK,		

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2125	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: 3/1R		
ITEM: WASTE TANK N2 LINE AND COUPLINGS FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: K. BARICKMAN	UBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)			
CRITTCA	ALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/1R ONORBIT: 3/1R DEORBIT: 3/1R			
PRELAUNCH: /NA	RTLS: 3/1R		
LIFTOFF: 3/1R	$\frac{1}{2}$		
ONORBIT: 3/1R	$\lambda O \lambda$: $3/1R$		
DEORBIT: 3/1R	ATO: 3/1R		
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [2]	B[P] C[P]		
LOCATION: ECLSS AREA 90 PART NUMBER:			
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, VIBRATION		
EFFECTS/RATIONALE: LOSS OF N2 PRESSURIZATION CAPABILI TANK BLADDER, UNABLE TO EFFECTIVEL UNRESTRICTED RELEASE OF N2 INTO CA	Y DUMP TANK OVERBOARD.		

TANK BLADDER, UNABLE TO EFFECTIVELY DUMP TANK OVERBOARD. UNRESTRICTED RELEASE OF N2 INTO CABIN ATMOSPHERE - INABILITY OF ATMOSPHERE REGULATOR TO CONTROL 02/N2 PARTIAL PRESSURES YIELDS A POTENTIALLY LETHAL CONDITION DUE TO GAS DEPLETION.

REFERENCES: 1) <u>RI</u> DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

REPORT DATE 10/23/87

C-276

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 2126 ABORT: 3/3 ITEM: WASTE TANK N2 HYDROPHOBIC FILTER (1) FAILURE MODE: INTERNAL LEAKAGE LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA 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			
FAILURE MODE: INTERNAL LEAKAGE LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC			
PRELAUNCH:/NARTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3			
LIFTOFF: 3/3 TAL: 3/3 ONORBIT: 3/3 AOA: 3/3			
ONORBIT: 3/3 AOA: 3/3			
DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3			
LANDING/SAFING: 5/5			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62FL1			
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION			
EFFECTS/RATIONALE: NO EFFECT ON WASTE FLUID DISPOSAL UNLESS THE WASTE TANK 1 BLADDER HAS RUPTURED ALSO. WHEN THE WASTE TANK BLADDER RUPTURES, THE SUPPLY WATER GN2 SUPPLY VALVES MUST BE CLOSED THUS ELIMINATING SUPPLY TANK B, C AND D FROM USE AND EFFECTING MISSION LIFE.			
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED			

REPORT DATE 10/23/87

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2127	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: WASTE TANK 1 DRAIN FAILURE MODE: EXTERNAL LEAKAGE	VALVE (1)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)	· · ·	
CRITIC	ALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/2R DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3	
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV17		
CAUSES: CONTAMINATION, PIECE-PAR REACTION	T FAILURE, VIBRATION, CHEMICAL	
EFFECTS/RATIONALE: LEAKAGE OF WASTE FLUID INTO CABIN ATMOSPHERE, REQUIRES USE OF FLIGHT RULES 13-17 FOR CLEAN-UP. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER. DUE TO SHORT DURATION OF ASCENT, DESCENT AND ABORT CASES, THE EFFECTS WERE CONSIDERED INSIGNIFICANT. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		
REPORT DATE 10/23/87 C	-278	

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2128 ITEM: WASTE TANK 1 DRAIN	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3 VALVE (1)		
FAILURE MODE: INTERNAL LEAKAGE, F			
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER STORAGE ASSEMBLY 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)	· · ·		
CRITICA	LITIES		
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3		
	B[] C[]		
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV17			
CAUSES: CONTAMINATION, PIECE-PART REACTION	FAILURE, VIBRATION, CHEMICAL		
EFFECTS/RATIONALE: POSSIBLE LEAK AT GSE DRAIN, OR VACUUM LEAK (LOSS OF CABIN PRESSURE) IF DOUBLE FAILURE OCCURS, OTHERWISE NO EFFECT			
REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI I VS70-960102, PAGE 60ED			

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2129	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: WASTE TANK 1 DRAIN FAILURE MODE: RESTRICTED FLOW, FA	VALVE (1) AILS TO OPEN	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)		
CRITICA	ALITIES	
FLIGHT PHASE HDW/FUNC		
PRELAUNCH: 3/3	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: /NA DEORBIT: /NA	AOA: /NA	
DEORBIT: /NA LANDING/SAFING: 3/3	ATO: /NA	
LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV17		
CAUSES: CONTAMINATION, PIECE-PART FAILURE		
EFFECTS/RATIONALE: POSSIBLE INABILITY TO DO GROUND SERVICE MAINTENANCE.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

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DATE: 7/31/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 2130	IIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
ITEM: GSE FILL QD AND PLUG (FAILURE MODE: FAILS TO OPEN, RESTRIC	1) TED FLOW		
LEAD ANALYST: K. BARICKMAN SUBS	YS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)			
CRITICALIT	lies		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: /NA DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A [] B	[] c[]		
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62TP101			
CAUSES: CONTAMINATION, PIECE-PART FA	ILURE, CHEMICAL REACTION		
EFFECTS/RATIONALE: INABILITY TO PERFORM GROUND SERVICE MAINTENANCE.			
REFERENCES: 1) RI DRAWING VS70-62320 HANDBOOK, DRAWING NO. 6.5; 3) RI INTE VS70-960102, PAGE 60ED)1; 2) SPACE SHUTTLE SYSTEM GRATED SCHEMATIC HANDBOOK,		

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2131	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: GSE FILL AND PLUG FAILURE MODE: FAILS TO CLOSE	(1)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SUBSYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)	
CDIMI	CALITIES
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: 3/3	·
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62TP101	
CAUSES: CONTAMINATION, PIECE-PAR	RT FAILURE, CHEMICAL REACTION
EFFECTS/RATIONALE: INABILITY TO SEAL LINE WITHOUT PI MISSION IMPACT.	LUG DURING GROUND SERVICING, NO
REFERENCES: 1) RI DRAWING VS70-6	23201; 2) SPACE SHUTTLE SYSTEM
HANDBOOK, DRAWING NO. 6.5; 3) RI	
VS70-960102, PAGE 60ED	
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REPORT DATE 10/23/87 C-282

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ORBITER SUBSISTEM ANALISIS WORKSHEET			
DATE: 9/14/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 2132 ABORT: /NA			
ITEM: GSE FILL QD AND PLUG (1) FAILURE MODE: EXTERNAL LEAKAGE, FAILURE TO MATE OR DEMATE			
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 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			
PRELAUNCH: 3/3 RTLS: /NA			
LIFTOFF: /NA TAL: /NA			
ONORBIT: /NA AOA: /NA			
DEORBIT: /NA ATO: /NA			
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62TP101			
CAUSES: CONTAMINATION, PIECE-PART FAILURE			
EFFECTS/RATIONALE:			
LEAKAGE DURING GROUND SERVICING, NO MISSION EFFECT.			
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM			
HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,			
VS70-960102, PAGE 60ED, 60EF AND 60EM			

DATE: 9/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2133	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: GSE DRAIN QD AND PLU FAILURE MODE: FAILS TO OPEN, RESTR			
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD:	M.J. SAIID	E Contraction of the second seco
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)			
CRITICAL	ITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: /NA DEORBIT: /NA LANDING/SAFING: 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC : /NA /NA /NA /NA	2
REDUNDANCY SCREENS: A []	B[]	C []	
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62TP100			
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, CH	HEMICAL REAG	CTION
EFFECTS/RATIONALE: INABILITY TO PERFORM GROUND SERVICE MAINTENANCE.			
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF AND 60EM			

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DATE: 9/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2134	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
ITEM: GSE DRAIN QD AND PI FAILURE MODE: FAILS TO CLOSE, INT	ERNAL LEAKAGE		
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)			
CRITICA			
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: /NA DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62TP100			
CAUSES: CONTAMINATION, PIECE-PART	FAILURE		
EFFECTS/RATIONALE: INABILITY TO SEAL LINE WITHOUT PLUS DURING GROUND SERVICING, NO MISSION IMPACT.			
REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI I VS70-960102, PAGE 60ED, 60EF AND 6	NTEGRATED SCHEMATIC HANDBOOK,		

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DATE: 9/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2135 ITEM: GSE DRAIN QD AND PLU	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA		
FAILURE MODE: EXTERNAL LEAKAGE, FA			
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) STORAGE ASSEMBLY 5) 6) 7) 8) 9)			
CRITICAL	ITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: /NA DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA		
REDUNDANCY SCREENS: A []	в[] С[]		
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62TP100			
CAUSES: CONTAMINATION, PIECE-PART FAILURE			
EFFECTS/RATIONALE: LEAKAGE DURING GROUND SERVICING, NO MISSION EFFECT.			
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED, 60EF AND 601	TEGRATED SCHEMATIC HANDBOOK,		

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DATE: 7/31/97	HIGHEST CRITICALITY HDW/FUNC
DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2136	FLIGHT: 2/2 ABORT: /NA
ITEM: DUMP LINES, FITTINGS FAILURE MODE: EXTERNAL LEAKAGE	3, JOINTS AND UNIONS
LEAD ANALYST: K. BARICKMAN SU	JBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)	
	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	В[] С[]
LOCATION: ECLSS AREA 90, AND M PART NUMBER:	.D. BODY AREA 40
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, VIBRATION
EFFECTS/RATIONALE: LEAKAGE OF WASTE FLUIDS INTO BELOW LEVEL LOSS IN WASTE TANK 1, OR CAB WASTE TANK DUMP. THE DUMP ISOLATION PRECLUDE EITHER WASTE FLUID IN THE FREEZING OF FLUIDS IF THE RUPTURE OF THE RESULTANT ARS CONDENSATE STORAG REMAINING SPACE IN THE WASTE TANK ON NEED TO USE CONTINGENCY WASTE COLLI ALLOWS ONLY 3 DAYS OF URINE COLLECT REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED, 60EF AND 60	IN ATMOSPHERE PRESSURE DURING N VALVE MUST BE SHUT TO CABIN, CABIN PRESSURE LOSS OR OCCURS OUTSIDE OF THE CABIN. GE CAPACITY RESTRICTION TO THE COULD EFFECT MISSION SCHEDULE. ECTION METHODS. THIS TION DEVICES PER CREW MEMBER. 3201; 2) SPACE SHUTTLE SYSTEM NTEGRATED SCHEMATIC HANDBOOK,

REPORT DATE 10/23/87

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DATE SUBS MDAC	: YSTEM: ID:	7/3 LIFE 2137	1/87 SUPPORT		HIGH	iest ci	RÍTICAI FLIGHI ABORT:	C:	HDW/FUNC 2/2 /NA
ITEM FAIL	URE MODI	DU E: RE	MP LINE STRICTE	S, FITTI D FLOW,	NGS AND BLOCKED	CONNEC	CTIONS		
LEAD	ANALYST	C: K.	BARICKM	IAN	SUBSYS	LEAD:	M.J. 5	SAIIDI	
1) 2) 3)	KDOWN HI LIFE SU WASTE N WASTE V DUMP LI	JPPORT MANAGE WATER	SYSTEM MENT SU SUBSYST	BSYSTEM	. 10 . 10				
				CRITI	CALITIES	5			
	PRELA LIFTO ONORI DEORI	AUNCH: DFF: BIT: BIT:		W/FUNC /NA /NA 2/2 /NA /NA		RTLS:	:	/NA	
REDU	NDANCY S	CREEN	S: A	[]	В []	с (]	
	TION: NUMBER:		SS AREA	90 AND	MID BODY	AREA	40		
CAUS FAIL		ITAMIN	ATION,	PIECE-PA	RT FAILU	RE, LI	INE/NOZ	ZLE HE	TATER
REST USE OF C CONT CONT REMA	OF CONTI ONNECTIC INGENCY INGENCY	OUMP F INGENC ON OR WASTE CROSS	LOW. T Y CROSS USE OF COLLEC -TIE.	HE WORST -TIE CON CONTINGE TION MET ARS COND TANK 1	NECTION, NCY WATE HODS BLO ENSATE S	BLOCK R CONT CKAGE TORAGE	AGE IS AINER, IS UPS IS LI	DOWNS OR TREAM MITED	OF
HAND	BOOK, DF	RAWING	NO. 6.	NG VS70- 5; 3) RI 60EF, AN	INTEGRA				

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2138	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: WASTE TANK 1 DUMP FAILURE MODE: EXTERNAL LEAKAGE	ISOLATION VALVE (1)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER STORAGE ASSEMBLY 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)	ž
	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV15	
CAUSES: CONTAMINATION, PIECE-PAU REACTION	RT FAILURE, VIBRATION, CHEMICAL
EFFECTS/RATIONALE: LOSS OF CABIN PRESSURE DURING WAS WASTE FLUIDS INTO CREW MODULE DU POTENTIAL MISSION LOSS BECAUSE OF CONDENSATE AND THEY MUST BE SHUT CABIN. NEED TO USE CONTINGENCY W ALLOWS ONLY 3 DAYS OF URINE COLL	RING WASTE FLUID STORAGE. F NO WAY TO DISPOSE OF ARS DOWN TO ELIMINATE LEAKAGE INTO WASTE COLLECTION METHODS. THIS
REFERENCES: 1) RI DRAWING VS70-0 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED	
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DATE: 7/31/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 2139	IIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 2/2
ITEM: WASTE TANK 1 DUMP ISOI FAILURE MODE: RESTRICTED FLOW, FAILS	
LEAD ANALYST: K. BARICKMAN SUBS	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)	
CRITICALII	TIES
	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: 2/2
REDUNDANCY SCREENS: A [] B	[] C[]
LOCATION: ECLSS AREA 90	

PART NUMBER: 90V62LV15

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, CHEMICAL REACTION

EFFECTS/RATIONALE:

LOSS OF EFFECTIVE BACKUP TO WASTE TANK DUMP VALVE; POSSIBLE REDUCTION OR LOSS OF MISSION IF VALVE FAILS CLOSED, IMPOSSIBLE TO DO WASTE FLUID TANK DUMP, REQUIRES CONTINGENCY WASTE COLLECTION METHODS, NO MEANS OF DUMPING ARS CONDENSATE FORCING LOSS OF MISSION DUE TO LIMITED CAPACITY OF WASTE TANK 1 CAPACITY.

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

ORBITER SUBSYSTEM ANALYSIS WORKSHEET
DATE:9/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2140ABORT:/NA
ITEM: WASTE TANK 1 DUMP ISOLATION VALVE (1) FAILURE MODE: FAILS TO CLOSE, INTERNAL LEAKAGE
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA DEORBIT: 3/3 ATO: /NA LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV15
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, CHEMICAL REACTION
EFFECTS/RATIONALE: IN THE EVENT OF THE LOSS OF THE DUMP VALVE OR DURING RE-ENTRY WHEN THE VALVE IS CLOSED THIS IS THE SINGLE ITEM TO PROTECT FROM UNRESTRICTED CABIN PRESSURE LOSS.
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960120, PAGE 60ED, 60EF AND 60EM

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2141	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: QD AND TP @ HIGH CA FAILURE MODE: EXTERNAL LEAKAGE	AP. FILTER (2)
LEAD ANALYST: K. BARICKMAN S	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA LANDING (SAFING: /NA	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 2/2	AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62TP130, 90V62TP1	131
CAUSES: CONTAMINATION, PIECE-PART	FAILURE
EFFECTS/RATIONALE:	
WASTE FLUID LEAKAGE INTO CREW MODU	ILE AND/OR CABIN PRESSURE LOSS
DURING WASTE TANK DUMP OR IF DUMP	TSOLATION VALVE FAILS
REQUIRES CLOSURE OF THE DUMP ISOLA	TOURIER THE AND PESTRECTION OF
THE ARS CONDENSATE TO THE REMAINING	IC SDACE IN THE WASTE TANK 1
WHICH COULD EFFECT THE MISSION SCH	
WASTE COLLECTION METHODS. THIS AI	
COLLECTION DEVICES PER CREW MEMBER	
CODECTION DEVICES PER CREW MEMDER	\•
and the second	
REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI I VS70-960102, PAGE 60ED	23201; 2) SPACE SHUTTLE SYSTEM INTEGRATED SCHEMATIC HANDBOOK,

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MDAC ID: ITEM:	7/31/87 LIFE SUPPORT 2142 HIGH CAPACITY E: RESTRICTED FLO	FILTER (1)	ABOR	
	T: K. BARICKMAN	·		SAIIDI
2) WASTE 3) WASTE	IERARCHY: UPPORT SYSTEM MANAGEMENT SUBSYST WATER STORAGE ASSE INE ASSEMBLY			
	CR	ITICALITIES		
FLIGHT PREL LIFT ONOR DEOR LAND	PHASE HDW/FUN AUNCH: /NA OFF: /NA BIT: 2/2 BIT: /NA ING/SAFING: /NA	C AB	ORT H RTLS: TAL: AOA: ATO:	DW/FUNC /NA /NA /NA /NA
REDUNDANCY	SCREENS: A []	В [] c	Ċ]
LOCATION: PART NUMBER	ECLSS AREA 90 : 90V62FL3		-	
CAUSES: CO	NTAMINATION, PIECE	-PART FAILU	RE	
EFFECTS/RAT WASTE TANK COLLECTION		KED FLOW. STE TANK 1	USE OF CON FOR ARS CO	
	1) RI DRAWING VS RAWING NO. 6.5; 3) , PAGE 60ED			

REPORT DATE 10/23/87

DATE: 9/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2143	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: HIGH CAPACITY FILTER FAILURE MODE: FAILS OPEN, RUPTURE	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)	···· - · · · · · · · · · · · · · · · ·
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA AOA: /NA
ONORBIT: 3/3	AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62FL3	
CAUSES: CONTAMINATION, PIECE-PART REACTION	FAILURE, VIBRATION, CHEMICAL
EFFECTS/RATIONALE: NO IMMEDIATE EFFECTS, POTENTIAL FOR OR VALVES DOWNSTREAM.	CORROSION OR BLOCKAGE OF QD'S
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960120, PAGE 60ED, 60EF AND 60	TEGRATED SCHEMATIC HANDBOOK,

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2144	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: CONTINGENCY H2O CRO FAILURE MODE: INABILITY TO MATE O RESTRICTED FLOW	SS-TIE QD AND PLUG (1) R DE-MATE, FAILS TO OPEN,
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 2/2	AOA: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90	
PART NUMBER: 80V62TP103 (MC276-00)20-1101)
•	·
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, BURRING
EFFECTS/RATIONALE:	
LOSS OF WASTE FLUID DUMP OR WASTE	
CONTINGENCY WASTE COLLECTION METHO	DS. MISSION SCHEDULE IMPACT
DUE TO USE OF CONTINGENCY WASTE CO	LLECTION METHODS AND LOSS OF
ARS CONDENSATE DUMP CAPABILITY.	

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2145	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: 2/1R
ITEM: WASTE TANK 1 DUMP FAILURE MODE: EXTERNAL LEAKAGE	VALVE (1)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7)	ing to the constraint of the c
8) 9)	
· · · · · · · · · · · · · · · · · · ·	
CRITIC FLIGHT PHASE HDW/FUNC	CALITIES
	RTLS: /NA
PRELAUNCH: /NA LIFTOFF: /NA	TAL: /NA
ONORBIT: 2/1R	AOA: /NA
DEORBIT: /NA	ATO: $2/1R$
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14	
CAUSES: PIECE-PART FAILURE, IONI	ZING RADIATION, VIBRATION
EFFECTS/RATIONALE: WASTE FLUID LEAK INTO MIDFUSELAGE ISOLATION VALVE AS PRIMARY DUMP V FAILS COULD SUFFER CABIN PRESSURE THE DUMP ISOLATION VALVE RESTRICT CONDENSATE DUMP AND USE OF CONTIN	ALVE. IF DUMP ISOLATION VALVE LOSS. THE REQUIRED CLOSURE OF S WASTE TANK 1 USAGE TO ARS
REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED, 60EF, AND	INTEGRATED SCHEMATIC HANDBOOK,

REPORT DATE 10/23/87

ORBITER SUBSISTEM ANALI	ISTE MORVEUE	ET.
DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2146	HIGHEST CR	ITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: WASTE TANK 1 DUMP VA FAILURE MODE: FAILS TO OPEN	ALVE (1)	
LEAD ANALYST: K. BARICKMAN SU	JBSYS LEAD:	M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)		
CRITICAL	LITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA		/NA /NA
REDUNDANCY SCREENS: A [2]	B [P]	С[Р]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14		
CAUSES: CONTAMINATION, PIECE-PART VIBRATION, LOSS OF SOLENOID INPUT	FAILURE, IO	NIZING RADIATION,
EFFECTS/RATIONALE: UNABLE TO DO STANDARD WASTE FLUID I MEASURES, EITHER CONTINGENCY CROSS- WATER CONTAINER USAGE.	OUMP, REQUIR -TIE HOOKUP	ES CONTINGENCY OR CONTINGENCY
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED, 60EF, AND 6	NTEGRATED SC	

C-297 REPORT DATE 10/23/87

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/1R MDAC ID: 2147 ABORT: /NA
ITEM: WASTE TANK 1 DUMP VALVE (1) FAILURE MODE: FAILS TO CLOSE
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:2/1RAOA:/NADEORBIT:3/3ATO:/NALANDING/SAFING:/NA
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, LOSS OF SOLENOID INPUT
EFFECTS/RATIONALE: UNABLE TO CLOSE VALVE AT END OF DUMP, REQUIRES USE OF DUMP ISOLATION VALVE AS PRIMARY VALVE AGAINST CABIN PRESSURE LOSS, OR USE OF CONTINGENCY WASTE FLUID COLLECTION METHODS. THE CLOSURE OF THE DUMP ISOLATION VALVE RESTRICTS ARS CONDENSATE DUMP TO WASTE TANK 1 QUANTITY. WASTE WATER DUMP IS STILL POSSIBLE.
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87 C-298

ORBITER SUBSISTEM ANALISIS WORKSHELT
DATE:7/31/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2148ABORT:/NA
ITEM: DUMP NOZZLE (1) FAILURE MODE: RESTRICTED FLOW, BLOCKED
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA
PRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NA
ONORBIT: 3/2R AOA: /NA
DEORBIT: /NA ATO: /NA
LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA
REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40
PART NUMBER: 40V62TP102
CAUSES: CONTAMINATION, THERMAL SHOCK, FROZEN WASTE FLUIDS
EFFECTS/RATIONALE: IMPOSSIBLE TO DO WASTE FLUID DUMP FROM THIS LINE IF LINE IS BLOCKED, REQUIRES RECYCLING OF NOZZLE HEATERS OR ALTERNATE DUMP METHODS.
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87 C-299

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2149	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: TANK FLUID QUANTIT FAILURE MODE: ERRONEOUS OUTPUT,	Y LEVEL SENSOR (1) OUT OF TOLERANCE OUTPUT
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	·
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [] LOCATION: ECLSS AREA 90 PART NUMBER: 90V62MT5	B[] C[]
CAUSES: CONTAMINATION, PIECE-PAR VIBRATION, IMPROPER VOLTAGE INPUT	
EFFECTS/RATIONALE: ERRONEOUS FLUID LEVEL INDICATION, TRANSDUCER OR CONSOLE CHART FOR F SCHEDULE. SYSTEMICALLY DUMP TAN	MUST RELY ON PRESSURE LUID LEVEL INDICATION AND DUMP K TO PRECLUDE EXCESSIVE FILLING.
REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED	23201; 2) SPACE SHUTTLE SYSTEM INTEGRATED SCHEMATIC HANDBOOK,

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DATE:8/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2150ABORT:3/3
ITEM: TANK FLUID LEVEL SIGNAL CONDITIONER (1) FAILURE MODE: IMPROPER VOLTAGE LEVEL
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3
DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: FORWARD AVIONICS BAY 1, AREA 81 PART NUMBER: 81V75A16, 5 VOLT DC POWER SUPPLY
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION
EFFECTS/RATIONALE: INACCURATE WASTE TANK FLUID LEVEL INDICATION, MUST RELY ON PRESSURE TRANSDUCER FOR FLUID LEVEL INDICATION AND CONSOLE CHARTS FOR DUMP SCHEDULE
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

REPORT DATE 10/23/87

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2151	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: TANK INLET VALVE CIR FAILURE MODE: FAILS TO REMAIN CLOS (ELECTRICAL)	CUIT BREAKER (1) ED, PREMATURE OPERATION, OPEN
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	TAL: 3/3
ONORBIT: 3/3	AOA: 3/3
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: PANEL ML86B, CB16 PART NUMBER:	
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, VIBRATION
EFFECTS/RATIONALE: NO POWER TO VALVE FOR FLUID DUMP, N IS NORMALLY CONFIGURED OPEN, THUS N SUBSEQUENT FAILURE OCCURS IN THE WA LINES, IN WHICH CASE TANK ISOLATION	O MISSION EFFECT UNLESS A STE FLUID STORAGE TANK AND
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED	201; 2) SPACE SHUTTLE SYSTEM TEGRATED SCHEMATIC HANDBOOK,

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2152	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3	
ITEM: TANK INLET VALVE CIRC FAILURE MODE: FAILS TO OPEN, DELAYE		
LEAD ANALYST: K. BARICKMAN SUB	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	· · · · · · · · · · · · · · · · · · ·	
CRITICALI	TIES	
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3	
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 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 [] B	(] C []	
LOCATION: PANEL ML86B, CB16 PART NUMBER:		
CAUSES: CONTAMINATION, PIECE-PART F	AILURE, VIBRATION	
EFFECTS/RATIONALE: THE VALVE STATUS IS NOT NORMALLY CHANGED FROM PRELAUNCH TO LANDING, EXCEPT FOR GROUND SERVICING AND CHECKOUT. IN THE CASE OF FAILURE DURING SERVICING IT IS A DELAY, BUT NOT CRITICAL. IF THE FAILURE IS DUE TO SHORTING ACROSS OPEN AND CLOSE SOLENOID CONTACTS BETWEEN ASCENT THRU DEORBIT IT IS POSSIBLE THAT THE VALVE COULD CLOSE, THUS LIMITING MISSION LIFE BUT THAT IS ONLY IF A SECOND FAILURE OCCURS.		
REFERENCES: 1) RI DRAWING VS70-6232 HANDBOOK, DRAWING NO. 6.5; 3) RI INT VS70-960102, PAGE 60ED		

REPORT DATE 10/23/87 C-303

DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2153	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3	
ITEM: TANK INLET VALVE SWI FAILURE MODE: SINGLE CONTACT OPEN BINDING/JAMMING	TCH (1) (ELECTRICAL), PHYSICAL	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3	ABORT HDW/FUNC	
PRELAUNCH: 3/3	RTLS: 3/3	
LIFTOFF: 3/3	TAL: 3/3	
ONORBIT: 3/3 DEORBIT: 3/3	AOA: 3/3	
DEORBIT: 3/3	ATO: 3/3	
LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A []	в[] С[]	
LOCATION: D&C PANEL ML31C, 80V7 PART NUMBER: V62K0710E	3A127	
CAUSES: CONTAMINATION, PIECE-PART VIBRATION	FAILURE, THERMAL SHOCK,	
EFFECTS/RATIONALE: UNABLE TO OPEN VALVE (FOR OPEN CONTACT) DURING GROUND SERVICING. IF CLOSE VALVE CONTACT IS OPEN, IT IS NOT POSSIBLE TO CLOSE VALVE IN THE EVENT OF A TANK FAILURE. DUE TO SHORT DURATION OF ASCENT, DESCENT AND ABOART CASES, THE EFFECTS WERE CONSIDERED INSIGNIFICANT.		
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED	201; 2) SPACE SHUTTLE SYSTEM TEGRATED SCHEMATIC HANDBOOK,	

REPORT DATE 10/23/87

DATE:8/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2154ABORT:3/3	
ITEM: TANK INLET VALVE SWITCH (1) FAILURE MODE: SHORTED SINGLE CONTACT	
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/2RAOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3	
REDUNDANCY SCREENS: A [2] B [P] C [P]	
LOCATION: D&C PANEL ML31C, 80V73A127 PART NUMBER: V62K0710E	
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION	
EFFECTS/RATIONALE: WORST CASE IS SHORT ACROSS CLOSE CONTACT, THUS UNABLE TO OPEN VALVE AND INABILITY TO DO ARS CONDENSATE OR WASTE FLUID STORAGE IN WASTE TANK, MUST USE CONTINGENCY METHODS. DUE TO SHORT DURATION OF ASCENT, DESCENT AND ABORT CASES, THE EFFECTS WERE CONSIDERED INSIGNIFICANT.	
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED	
REPORT DATE 10/23/87 C-305	

DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2155	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: TANK INLET VALVE, SOI FAILURE MODE: SHORTED	LENOID (2)
LEAD ANALYST: K. BARICKMAN SU	JBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	· · · · · · · · · · · · · · · · · · ·
CRITICAI	LITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: /NA
LIFTOFF: 3/3	TAL: /NA
ONORBIT: 3/3	AOA: /NA
DEORBIT: 3/3	ATO: /NA
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV16	
CAUSES: CONTAMINATION, PIECE-PART VIBRATION	FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE:	

NO EFFECT UNLESS ANOTHER FAILURE OCCURS. UNABLE TO CLOSE TANK VALVE, REQUIRES USAGE OF CONTINGENCY WASTE COLLECTION METHODS. LOSS OF ARS CONDENSATE STORAGE IF ATTEMPT TO CLOSE VALVE IS DUE TO LOSS OF WASTE TANK 1 STORAGE CAPABILITY.

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

REPORT DATE 10/23/87

ONDITER BOBBIBIEN	
DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2156	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: TANK INLET VALV FAILURE MODE: OPEN (ELECTRICA	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTE 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
CDT	TICALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV16	
CAUSES: CONTAMINATION, PIECE- VIBRATION	PART FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: UNABLE TO CLOSE VALVE IN THE E EFFECT NORMALLY.	EVENT OF ADDITIONAL FAILURE, BUT NOT
	0-623201; 2) SPACE SHUTTLE SYSTEM RI INTEGRATED SCHEMATIC HANDBOOK,

REPORT DATE 10/23/87 C-307

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DATE:8/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2157ABORT:3/3
ITEM: WASTE WATER TANK INLET VALVE OPEN INDICATOR (2) FAILURE MODE: ERRONEOUS INDICATION
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3
PRELAUNCH: 3/3 RTLS: 3/3
LIFTOFF: 3/3 TAL: 3/3
ONORBIT: 3/3 AOA: 3/3
LANDING/SAFING: 3/3 ATO: 3/3 LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV16
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION
EFFECTS/RATIONALE: UNABLE TO CHANGE INDICATOR VALUE, MUST RELY ON MULTIPLE TRANSDUCERS FOR VALVE POSITION INDICATION OR VISUAL OBSERVATION OF DUMP.
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

REPORT DATE 10/23/87

DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2158	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: TANK INLET VALVE I FAILURE MODE: OPEN (ELECTRICAL),	NICATOR DIODE (1) SHORTED, EXCESSIVE RESISTANCE
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
	ALITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: D&C PANEL ML31C, 80 PART NUMBER: A7CR1	V73A127
CAUSES: CONTAMINATION, PIECE-PAR VIBRATION	FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: UNABLE TO DETERMINE VALVE POSITION MULTIPLE TRANSDUCERS FOR VALVE ST ASCENT, DESCENT AND ABORT CASES, T INSIGNIFICANT.	ATUS. DUE TO SHORT DURATION OF
REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED	23201; 2) SPACE SHUTTLE SYSTEM INTEGRATED SCHEMATIC HANDBOOK,
REPORT DATE 10/23/87 C-	-309

DATE:8/14/87HIGHEST CRITICALITYHDW/FUNSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2159ABORT:3/3	IC	
ITEM: TANK INLET VALVE INICATOR RESISTOR TO MDM OF1 (1) FAILURE MODE: OPEN (ELECTRICAL), SHORTED, EXCESSIVE RESISTANCE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: D&C PANEL ML31C, 80V73A127 PART NUMBER: V62X0583E (A1R2), 5.1 KOHM		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: UNABLE TO DETERMINE VALVE POSITION BY INDICATOR, MUST RELY ON MULTIPLE TRANSDUCERS FOR VALVE STATUS.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2160	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: TANK OUTLET VALVE CIRCUIT BREAKER (1) FAILURE MODE: FAILS TO REMAIN CLOSED, PREMATURE OPERATION, OPEN (ELECTRICAL)		
LEAD ANALYST: K. BARICKMAN SUE	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITICALI	TIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3	ABORT HDW/FUNC	
PRELAUNCH: 3/3	RTLS: /NA	
LIFTOFF: /NA	TAL: /NA AOA: /NA ATO: /NA	
ONORBIT: /NA	AOA: /NA ATO: /NA	
DEORBIT: /NA LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A [] E	; [] C []	
LOCATION: PANEL ML86B, CB23 PART NUMBER:		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: NO POWER TO VALVE FOR FLUID DUMP LINE CLEANING DURING GSE.		
REFERENCES: 1) RI DRAWING VS70-6232	201; 2) SPACE SHUTTLE SYSTEM	

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2161	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: TANK OUTLET VALVE FAILURE MODE: FAILS TO OPEN, DEL	CIRCUIT BREAKER (1) AYED OPERATION	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
	ALITIES	
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:/NAONORBIT:/NADEORBIT:/NALANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: PANEL ML868, CB23 PART NUMBER:		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: PERMANENT DAMAGE TO VALVE MOTORS, EFFECTS GROUND SERVICING ACTIVITIES.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

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URBITER SUBSISTEM ANALISIS WORRSHEET		
DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2162	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: TANK OUTLET VALVE FAILURE MODE: OPEN (ELECTRICAL)	SWITCH (2)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITIC	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: /NA DEORBIT: /NA LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: D&C PANEL ML31C, 80 PART NUMBER: V62K0715E	DV73A127	
CAUSES: CONTAMINATION, PIECE-PAR VIBRATION	RT FAILURE, THERMAL SHOCK,	
EFFECTS/RATIONALE: NO EFFECT EXCEPT DURING GROUND SE	ERVICING FOR SYSTEM FLUSHING.	
REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED		

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2163	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: TANK OUTLET VALVE FAILURE MODE: SHORTED	SWITCH (2)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITI	CALITIES	
FLIGHT PHASE HDW/FUNC		
PRELAUNCH: 3/3	RTLS: /NA TAL: /NA AOA: /NA	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: /NA DEORBIT: /NA	AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: 3/3		
LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: D&C PANEL ML31C, 80 PART NUMBER: V62K0714E	0V73A127	
CAUSES: CONTAMINATION, PIECE-PAU VIBRATION	RT FAILURE, THERMAL SHOCK,	
EFFECTS/RATIONALE: NO EFFECT EXCEPT DURING GROUND SI	ERVICING FOR SYSTEM FLUSHING.	
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

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ORBITER SUBSYSTEM ANALYSIS WORKSHEET		
DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 2164 ABORT: /NA		
ITEM: TANK OUTLET VALVE, SOLENOID (1) FAILURE MODE: OPEN (ELECTRICAL)		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 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: 3/3		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV17 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: NO EFFECT DURING GROUND SERVICING FOR SYSTEM FLUSHING.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2165	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: TANK OUTLET VALVE, FAILURE MODE: SHORTED	SOLENOID (1)	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITIC	ALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: /NA ONORBIT: /NA DEORBIT: /NA	ABORT HDW/FUNC	
LIFTOFF: /NA	TAL: /NA	
ONORBIT: /NA	AOA: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV17		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: NO EFFECT EXCEPT DURING GROUND SEE	RVICING FOR SYSTEM FLUSHING.	
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

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ORDITER SUBSISTEM AM	REISIS WORKSHEET	
DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2166	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3	
ITEM: TANK OUTLET VALVE FAILURE MODE: ERRONEOUS OUTPUT	SWITCH INDICATOR	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITT	CALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]	
LOCATION: CREW MODULE, MIDDECK, AREA 80 PART NUMBER: PANEL ML31C, DS2		
CAUSES: CONTAMINATION, PIECE-PA	RT FAILURE	
EFFECTS/RATIONALE: NO "TELL-TALE" INDICATION OF VALVE POSITION DURING GROUND SERVICING. SHOULD INDICATE "BARBER-POLE" AT ALL TIMES BECAUSE CIRCUIT BREAKER IS OPEN.		
REFERENCES: 1) RI DRAWING VS70- HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED	623201; 2) SPACE SHUTTLE SYSTEM INTEGRATED SCHEMATIC HANDBOOK,	

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DATE:8/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2167ABORT:3/3		
ITEM: TANK OUTLET VALVE DIODE (1) FAILURE MODE: OPEN (ELECTRICAL), SHORTED, EXCESSIVE RESISTANCE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3		
LIFTOFF: 3/3 TAL: 3/3		
DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: D&C PANEL ML31C, 80V73A127 PART NUMBER: A7CR1		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: NO EFFECT EXCEPT DURING GROUND SERVICING FOR SYSTEM FLUSHING.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

DATE:8/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2168ABORT:3/3		
ITEM: TANK OUTLET VALVE RESISTOR TO MDM OF2 (1) FAILURE MODE: OPEN (ELECTRICAL), SHORTED, EXCESSIVE RESISTANCE		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: D&C PANEL ML31C, 80V73A127 PART NUMBER: V62X0580E (A1R1), 5.1 KOHM		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: NO EFFECT EXCEPT DURING GROUND SERVICING FOR SYSTEM FLUSHING.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2169	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA	
ITEM: PRESSURE SENSOR (VAR FAILURE MODE: ERRONEOUS OUTPUT	IABLE RESISTANCE BRIDGE) (1)	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITICAL		
FLIGHT PHASEHDW/FUNCPRELAUNCH:/NALIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A []	в[] С[]	
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62MT21 (V26P0500A TRANSDUCER)		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION, IMPROPER VOLTAGE INPUT		
EFFECTS/RATIONALE: INEFFECTIVE PRESSURE INDICATION, POSSIBLE UNTRACEABLE CABIN PRESSURE LOSS SOURCE IF OTHER MULTIPLE FAILURES OCCUR.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2170 ITEM: PRESSURE SENSOR SIG FAILURE MODE: ERRONEOUS OUTPUT	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA NAL CONDITIONER (1)	
LEAD ANALYST: K. BARICKMAN SI	UBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)		
CRITICA	LINIES	
	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3	
REDUNDANCY SCREENS: A []	В[] С[]	
LOCATION: MID DECK AREA 40 PART NUMBER: 40V62A23 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: IMPROPER PRESSURE INDICATION, POSSILOSS SOURCE.	IBLE UNTRACEABLE CABIN PRESSURE	
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED		

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2171	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: WASTE H20 DUMP ISOL. FAILURE MODE: FAILS TO REMAIN CLOS	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC	
PRELAUNCH: /NA	RTLS: /NA
PRELAUNCH: /NA LIFTOFF: /NA	TAL: /NA
PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2	RTLS: /NA TAL: /NA AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: D&C PANEL ML86B PART NUMBER: CB17 (80V73A130)	

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

INABILITY TO POWER DUMP ISOLATION VALVE OPEN. LOSS OF ARS CONDENSATE STORAGE, PRODUCES CHANGE IN MISSION SCHEDULE. NEED TO USE CONTINGENCY WASTE COLLECTION METHODS. THIS ALLOWS ONLY 3 DAYS OF URINE COLLECTION DEVICES PER CREW MEMBER.

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2172	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: WASTE H2O DUMP ISOL. FAILURE MODE: FAILS TO OPEN	VALVE CIRCUIT BREAKER (1)
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	· · · ·
CRITICAL	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: D&C PANEL ML86B PART NUMBER: CB17 (80V73A130)	····· · · · · · · · · · · · · · · · ·
CAUSES: CONTAMINATION, PIECE-PART	FAILURE
EFFECTS/RATIONALE: POSSIBLE BURN-UP OF VALVE SOLENOID CURRENT, THEREBY PRODUCING NEED TO COLLECTION METHODS OR OTHER BACKUP OCCUR.	USE CONTINGENCY WASTE
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED	201; 2) SPACE SHUTTLE SYSTEM TEGRATED SCHEMATIC HANDBOOK,

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2173	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: WASTE H20 DUMP ISOL. FAILURE MODE: SINGLE CONTACT OPEN	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
CRITICAL	ITIES
CRITICAL FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	
LOCATION: D&C PANEL ML31C, 80V7 PART NUMBER: V62K0530E	3A127
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: IMPOSSIBLE TO OPEN DUMP ISOLATION V WASTE FLUID DUMP OR ARS CONDENSATE S TANK. NEED TO USE CONTINGENCY WAST ALLOWS ONLY 3 DAYS OF URINE COLLECT	STORAGE METHOD BEYOND WASTE E COLLECTION METHODS. THIS
REFERENCES: 1) RI DRAWING VS70-6232 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED	201; 2) SPACE SHUTTLE SYSTEM FEGRATED SCHEMATIC HANDBOOK,

DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT	HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: LIFE SUPPORT	FLIGHT: 2/2
MDAC ID: 2174	ABORT: /NA
ITEM: WASTE H20 DUMP ISOL.	WALVE CIDCULT BDEAKED (1)
FAILURE MODE: SINGLE CONTACT SHORT	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY:	
1) LIFE SUPPORT SYSTEM	
2) WASTE MANAGEMENT SUBSYSTEM	
3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS	
5) WATER STORAGE ASSEMBLY	
6)	
7)	
8)	
9)	
CRITICAL	TUTES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 2/2	AOA: /NA
DEORBIT: 3/3	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: D&C PANEL ML31C, 80V7	3A127
PART NUMBER: V62K0530E	
CAUSES: CONTAMINATION. PIECE-PART	FALLURE. THERMAL SHUCK.

CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION

EFFECTS/RATIONALE:

IMPOSSIBLE TO OPEN VALVE IF OCCURS DURING ASCENT BECAUSE OF BURN-UP OF SOLENOID. NO METHOD OF ARS CONDENSATE STORAGE BEYOND WASTE TANK, CHANGE IN MISSION SCHEDULE.

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2175	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: /NA
ITEM: WASTE H2O DUMP ISOL. FAILURE MODE: PHYSICAL BINDING JAMM	VALVE CIRCUIT BREAKER (1) HING
LEAD ANALYST: K. BARICKMAN SUE	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
CRITICALI	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/2 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A [] E	9[] C[]
LOCATION: D&C PANEL ML31C, 80V73 PART NUMBER: V62K0531E	A127
CAUSES: CONTAMINATION, PIECE-PART F VIBRATION	AILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: IMPOSSIBLE TO OPEN VALVE, NO METHOD OR ARS CONDENSATE STORAGE METHOD BEY	OF ALTERNATE WASTE FLUID DUMP OND WASTE TANK CAPACITY.
REFERENCES: 1) RI DRAWING VS70-6232 HANDBOOK, DRAWING NO. 6.5; 3) RI INT VS70-960102, PAGE 60ED	01; 2) SPACE SHUTTLE SYSTEM EGRATED SCHEMATIC HANDBOOK,

REPORT DATE 10/23/87 C-326

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DATE:7/31/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:2176ABORT:/NA
ITEM: WASTE H2O DUMP ISOL. VALVE CIRCUIT BREAKER (1) FAILURE MODE: OPEN (ELECTRICAL)
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 2/2 AOA: /NA DEORBIT: /NA ATO: /NA
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
LANDING/SAFING: /NA AIO. /NA
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV15
CAUSES: CONTAMINATION, PIECE-PART FAILURE, ELECTROMAGNETIC FIELDS
EFFECTS/RATIONALE:
WORST CASE IS FAILURE OF OPEN ACTUATION IN WHICH CASE CANNOT DO
WASTE FLUID DUMPS. MISSION SCHEDULE IMPACT BECAUSE NO ARS
CONDENSATE STORAGE OTHER THAN WASTE TANK AND MUST USE CONTINGENCY
WASTE COLLECTION METHODS.
DEPENDED. 1) DI DIMING MOTO (00001. 0) ODIOR CHUMMIR CHOMPY
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,
VS70-960102, PAGE 60ED
ARIA-RARE OVER

REPORT DATE 10/23/87 C-327

DATE: SUBSYSTEM: MDAC ID:	LIFE SUPPOR	T	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 /NA
ITEM: FAILURE MOD		O DUMP ISOL.	VALVE CIR	CUIT BREAKE	R (1)
LEAD ANALYS	T: K. BARICK	MAN SUI	BSYS LEAD:	M.J. SAIID	I
2) WASTE 3) WASTE 4) ELECTR	UPPORT SYSTE MANAGEMENT S WATER SUBSYS	UBSYSTEM TEM			
		CRITICAL			
		IDW/FUNC	ABORT		C
the second se	AUNCH:	/NA	RTLS		
	OFF:	/NA	TAL:	•	
	BIT:	2/2	AOA:		
	BIT:	/NA	ATO:	/NA	
LAND	ING/SAFING:	/NA			

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: ECLSS AREA 90 PART NUMBER: 90V62LV15

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

WORST CASE IS A SHORTED SOLENOID BEFORE ON-ORBIT, THEN WHEN THE CIRCUIT BREAKER IS CLOSED ON-ORBIT TO OPEN THE VALVE - THE CIRCUIT BREAKER "POPS" AND THE VALVE CANNOT BE OPENED. THIS CREATES A LIMITATION OF ARS CONDENSATE AND WASTE FLUID COLLECTION CAPACITY TO THE WASTE TANK 1, THUS LIMITING MISSION LIFE.

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

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ORDITER SUBSISTEM ANALIS.	15 WORKBHEET
DATE: 8/14/87 I SUBSYSTEM: LIFE SUPPORT MDAC ID: 2178	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: DUMP ISOLATION VALVE T FAILURE MODE: OPEN (ELECTRICAL), SHO	
LEAD ANALYST: K. BARICKMAN SUB	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER STORAGE ASSEMBLY 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
	7.7.7
CRITICALI	
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	ABORT HDW/FUNC
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 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 [] B	[] C[]
LOCATION: D&C PANEL ML31C, 80V73 PART NUMBER: A6CR1	A127
CAUSES: CONTAMINATION, PIECE-PART FA	AILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: ONLY MDM OF2 DISPLAY AVAILABLE FOR VA	ALVE STATUS.
REFERENCES: 1) RI DRAWING VS70-62320 HANDBOOK, DRAWING NO. 6.5; 3) RI INTI VS70-960102, PAGE 60ED	

REPORT DATE 10/23/87

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2179	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: DUMP ISOLATION VALVE FAILURE MODE: OPEN (ELECTRICAL), S	RESISTOR TO MDM OF2 (1) HORTED, EXCESSIVE RESISTANCE
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER STORAGE ASSEMBLY 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)	
	ITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3
LIFTOFF: 3/3 ONORBIT: 3/3	TAL: $3/3$
DEORBIT: 3/3	AOA: 3/3 ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: D&C PANEL ML31C, 80V7 PART NUMBER: V62X0534E (A2R1), 5.1	3A127 KOHM
CAUSES: CONTAMINATION, PIECE-PART VIBRATION	FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: MDM OF2 VALVE STATUS NON-EXISTENT;	MUST RELY ON INDICATOR WINDOW.
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED	

DATE:7/31/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2180ABORT:3/3
ITEM: WASTE H2O DUMP ISOL. SWITCH INDICATOR (1) FAILURE MODE: ERRONEOUS OUTPUT
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SUBSYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER STORAGE ASSEMBLY 4) ELECTRICAL PARTS 5) WATER STORAGE ASSEMBLY 6) 7) 8) 9)
CDITICALITY
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
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 [] B [] C []
LOCATION: D&C PANEL ML86B PART NUMBER: 80V73A127, INDICATOR DS3
CAUSES: CONTAMINATION, PIECE-PART FAILURE, ELECTROMAGNETIC FIELDS, VIBRATION
EFFECTS/RATIONALE: INACCURATE INFORMATION ON VALVE STATUS. MUST RELY ON MDM OF2 FOR VALVE STATUS.
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2181	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: 3/3
ITEM: DUMP LINE HEATER CI FAILURE MODE: FAILS TO REMAIN CLOSE	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SUBSYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/1R DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A [2]	В[Р] С[Р.]
LOCATION: D&C PANEL ML86B PART NUMBER: 80V73A130, CB4 AND CB3	10
CAUSES: CONTAMINATION, MECHANICAL S	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE: IMPOSSIBLE TO USE ONE OF THE LINE HI WASTE FLUID DUMP AND VACUUM VENT DU SECOND HEATER FOR SYSTEMS INVOLVED. MUST GO TO CONTINGENCY WASTE COLLEC CROSS-TIE USAGE. IF SECOND HEATER O THERE IS A POSSIBILITY OF FREEZING T CREATING A POTENTIALLY EXPLOSIVE HY VACUUM VENT LINE.	MP, REQUIRES RELIANCE ON IF SECOND HEATER FAILS THEN FION METHODS OR CONTINGENCY CIRCUIT BREAKER FAILS THEN THE VACUUM VENT DUMP LINE AND

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87 C-332

DATE: SUBSYSTEM: MDAC ID:	7/31/87 LIFE SUPPOR 2182	Г	HIGH	F	TICALITY LIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: FAILURE MODE			CIRCUIT	BREAKEF	R (2)	
LEAD ANALYST	: K. BARICK	MAN	SUBSYS	LEAD: N	I.J. SAIID	I
2) WASTE M 3) WASTE W 4) ELECTRI	PPORT SYSTEM ANAGEMENT S ATER SUBSYS	UBSYSTEM TEM				
		CRITI	CALITIES	5		_
FLIGHT F	PHASE H NUNCH: DFF: DIT:	DW/FUNC	AE	BORT	HDW/FUN	2
LIFTO	FF:	3/3 3/3 3/3 3/3		TAL:	· 3/3	
ONORE	NIT:	3/3		AOA: ATO:	3/3	
DEORE	SIT:	3/3		ATO:	3/3	
LANDI	NG/SAFING:	3/3				
REDUNDANCY S	CREENS: A	[]	в []	с[]	
LOCATION: PART NUMBER:			CB10			
CAUSES: CON FIELDS	TAMINATION,	PIECE-PA	RT FAILU	JRE, ELH	ECTROMAGNE	ric
EFFECTS/RATI FOR THE CIRC MISSION OR V	UIT BREAKER		O OPEN"	FAILURI	E THERE IS	NO
REFERENCES: HANDBOOK, DF VS70-960102,	AWING NO. 6	.5; 3) RI	INTEGRA			
REPORT DATE	10/23/87 C - S		C-333			

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DATE:7/31/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:2183ABORT:3/3
ITEM: DUMP LINE HEATER (2) FAILURE MODE: OPEN (ELECTRICAL)
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/2RAOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:/NAADA:3/3
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62HR107, 40V62HR207
CAUSES: ACOUSTICS, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, IONIZING RADIATION, VIBRATION
EFFECTS/RATIONALE: WITH LOSS OF HEATER, AND IF REDUNDANCY FAILS (SECOND LINE HEATER), THEN MUST USE WASTE WATER CROSS-TIE TO CWC TO DUMP WATER OR USE CONTINGENCY WASTE COLLECTION METHODS. IF THERE IS LINE FREEZING THERE IS POTENTIAL RUPTURE OF LINE, REQUIRING CLOSURE OF DUMP ISOLATION VALVE WHICH HAS A DIRECT IMPACT ON MISSION LIFE DUE TO ARS CONDENSATE STORAGE LIMITATIONS. THERE IS A MISSION IMPACT IF THE CONTINGENCY WASTE COLLECTION METHODS ARE USED, RESTRICTED TO 3 DAYS' SUPPLY.
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,

VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87 C-334

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HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R ABORT: /NA 2184 MDAC ID: ITEM: DUMP LINE HEATER (2) FAILURE MODE: SHORTED SUBSYS LEAD: M.J. SAIIDI LEAD ANALYST: K. BARICKMAN BREAKDOWN HIERARCHY: LIFE SUPPORT SYSTEM 1) 2) WASTE MANAGEMENT SUBSYSTEM WASTE WATER SUBSYSTEM 3) ELECTRICAL PARTS 4) DUMP LINE ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT /NA /NA PRELAUNCH: RTLS: TAL: /NA LIFTOFF: 3/3 AOA: /NA **ONORBIT:** 3/2R /NA **DEORBIT:** 3/3 ATO: LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62HR107, 40V62HR207 CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: THE CIRCUIT BREAKER "POPS" AND MUST RELY ON THE ALTERNATE HEATER TO PRECLUDE LINE FREEZING. IF THE LINE FREEZES WILL HAVE MISSION LOSS DUE TO EXTERNAL CABIN PRESSURE LEAK. 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM **REFERENCES:** HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2185	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3	
ITEM: WASTE H20 DUMP HEATE FAILURE MODE: FAILS TO OPEN	R LINE THERMOSTAT (4)	
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)		
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3	
REDUNDANCY SCREENS: A []	в[] С[]	
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62S107 AND 40V62S207		
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, THERMAL SHOCK, ELECTROMAGNETIC FIELDS, VIBRATION		
EFFECTS/RATIONALE: POSSIBLE EXCESSIVE HEATING OF HEATER LINE IF BACKUP THERMOSTAT FAILS TO OPEN. THE UNCONTROLLED HEATER WOULD NORMALLY SET OFF AN FDA ALARM AND IN THE EVENT THE RUNAWAY HEATER WAS NOT ANUNICATED, THE POTENTIAL FOR LINE BOILING OR RUPTURE IS NOT CREDIBLE. THE HEATER CAN STILL BE CONTROLLED BY THE CIRCUIT BREAKER ALSO.		
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED, 60EF, AND 60	TEGRATED SCHEMATIC HANDBOOK,	

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2186	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/3
ITEM: WASTE H2O DUMP HEA FAILURE MODE: FAILS TO REMAIN CLA	
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
CRITIC	ALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 3/2R DEORBIT: 3/3 LANDING (CARTING)	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: 3/3
LIFTOFF: 3/3	TAL: 3/3
ONORBIT: 3/2R	AOA: 3/3
DEORBIT: 3/3 LANDING/SAFING: /NA	ATO: 3/3
REDUNDANCY SCREENS: A [2]	В[Р] С[Р]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62S107 AND 40V63	25207
CAUSES: CONTAMINATION, PIECE-PARY	FAILURE, IONIZING RADIATION,
EFFECTS/RATIONALE: INABILITY TO USE LINE HEATER AND I HEATER. THERE IS POTENTIAL FOR LI HEATERS ARE INOPERATIVE AND RUPTUI MISSION DUE TO ARS CONDENSATE STOP	INE FREEZING IF BOTH LINE RE OF LINE, THUS RESTRICTION OF
REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED, 60EF, AND	INTEGRATED SCHEMATIC HANDBOOK,

REPORT DATE 10/23/87

DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2187	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: WASTE H20 DUMP LINE (POTENTIAL COMPARATOR) FAILURE MODE: OUT OF TOLERANCE	TEMPERATURE TRANSDUCER (1)
LEAD ANALYST: K. BARICKMAN S	JBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	TAL: /NA AOA: /NA ATO: /NA
ONORBIT: 3/2R	AOA: /NA ATO: /NA
DEORBIT: /NA LANDING/SAFING: /NA	AIO. /MA
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62MT20	
CAUSES: CONTAMINATION, PIECE-PART VIBRATION, IMPROPER VOLTAGE INPUT	FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: INACCURATE WASTE WATER DUMP LINE TH LINE FREEZING IF HEATERS ARE INOPEN CONTINGENCY WATER OR CROSS-TIE CONT PROTECT FROM LINE FREEZING.	RATIVE. REQUIRES USE OF

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REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87

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-	DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2188	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
<u> </u>	ITEM: WASTE H20 DUMP LINE FAILURE MODE: ERRONEOUS OUTPUT	TEMPERATURE SIGNAL CONDITIONER
1.	LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
	BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
-	PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
J	LANDING/SAFING: /NA	· · ·
	REDUNDANCY SCREENS: A [2]	В[Р] С[Р]
•	LOCATION: FORWARD AVIONICS BAY PART NUMBER: 81V754A16	1, AREA 81
-	CAUSES: CONTAMINATION, PIECE-PART	FAILURE, THERMAL SHOCK,
	EFFECTS/RATIONALE: INACCURATE INPUT TO LINE TEMPERATUR TEMPERATURE INDICATION. REQUIRES US	E SENSOR, INACCURATE SE OF CONTINGENCY FLUID
	CONTAINER OR CONTINGENCY CROSS-TIE	
	REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED, 60EF, AND 60	TEGRATED SCHEMATIC HANDBOOK,
- · ·	REPORT DATE 10/23/87 C-33	39

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2189	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: DUMP VALVE/NOZZLE HEA FAILURE MODE: FAILS TO REMAIN CLOSE	TER CIRCUIT BREAKER (1)
LEAD ANALYST: K. BARICKMAN SUE	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
CRITICALI	TIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A [2] E	C[P] C[P]
LOCATION: D&C PANEL ML86B, MIDDE PART NUMBER: 80V73A130, CB65	CK AREA 80
CAUSES: CONTAMINATION, PIECE-PART F	AILURE, VIBRATION
EFFECTS/RATIONALE: IMPOSSIBLE TO COMPLETE FLUID DUMP. CONTAINER (CWC). USE CONTINGENCY CF	OSS-TIE FOR FLUID DUMPS.
REFERENCES: 1) RI DRAWING VS70-6232 HANDBOOK, DRAWING NO. 6.5; 3) RI INT VS70-960102, PAGE 60ED, 60EF, AND 60	01; 2) SPACE SHUTTLE SYSTEM EGRATED SCHEMATIC HANDBOOK,

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ORDITER BODDIDIER ARALIDID "ORROHDER		
DATE:7/31/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2190ABORT:/NA		
ITEM: DUMP VALVE/NOZZLE HEATER CIRCUIT BREAKER (1) FAILURE MODE: FAILS TO OPEN		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 3/3 AOA: /NA DEORBIT: /NA ATO: /NA		
PRELAUNCH: /NA RTLS: /NA		
LIFTOFF: /NA TAL: /NA		
ONORBIT: 3/3 AOA: /NA		
DEORBIT: /NA ATO: /NA		
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: D&C PANEL ML86B, MIDDECK AREA 80		
PART NUMBER: 80V73A130, CB65		
CAUSES: CONTAMINATION, PIECE-PART FAILURE		
EFFECTS/RATIONALE:		
NO EFFECT ON MISSION OR VEHICLE UNLESS A SECOND FAILURE; E.G.,		
HEATER OR VALVE SHORT OCCURS, IN WHICH CASE EXCEEDANCE OF SHUTTLE		
WIRING CAPABILITY IS A POTENTIAL.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM		
HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,		
VS70-960102, PAGE 60ED, 60EF, AND 60EM		

REPORT DATE 10/23/87

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DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2191	HIGHEST CRITICALITY FLIGHT: ABORT:	3/2R
ITEM: DUMP VALVE ENABLE/NO: FAILURE MODE: SINGLE CONTACT SHORT	ZZLE HEATER SWITCH (1) ED	
LEAD ANALYST: K. BARICKMAN SUI	BSYS LEAD: M.J. SAIID	C
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)		
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNG RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	2
REDUNDANCY SCREENS: A [2]	B[P] C[P]	· • ·
LOCATION: MIDDECK AREA 80, D&C H PART NUMBER: 80V73A127, S8	PANEL ML31C	
CAUSES: CONTAMINATION, PIECE-PART H	FAILURE	
EFFECTS/RATIONALE: UNABLE TO POWER OFF DUMP VALVE ENABLE/NOZZLE HEATER CIRCUIT IF SHORTED GROUND. THAT "POPS" CIRCUIT BREAKER AND LOSS OF WASTE WATER DUMP CAPABILITY. NEED TO USE CONTINGENCY WATER CONTAINER (CWC). USE CONTINGENCY CROSS-TIE FOR DUMPS, PROBABLY MISSION CONTROL DECISION OF "LOSS OF MISSION".		
REFERENCES: 1) RI DRAWING VS70-6232 HANDBOOK, DRAWING NO. 6.5; 3) RI INT VS70-960102, PAGE 60ED, 60EF, AND 60	TEGRATED SCHEMATIC HAN	

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2192	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA	
ITEM: DUMP VALVE ENABLE/NO FAILURE MODE: PHYSICAL BINDING/JAM		
LEAD ANALYST: K. BARICKMAN SU	JBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	·	
CRITICAL		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA	RTLS: /NA	
LIFTOFF: /NA ONORBIT: 3/2R	TAL: /NA AOA: /NA ATO: /NA	
DEORBIT: /NA	ATO: /NA	
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2]	B [P] C [P]	
LOCATION: MIDDECK AREA 80, D&C PART NUMBER: 80V73A127, S8	PANEL ML31C	
CAUSES: CONTAMINATION, MECHANICAL VIBRATION	SHOCK, PIECE-PART FAILURE,	
EFFECTS/RATIONALE: LOSS OF WASTE WATER DUMP CAPABILITY IF SWITCH HANDLE FAILS IN THE OFF POSITION. USE CONTINGENCY WATER CONTAINER OR CONTINGENCY CROSS-TIE FOR DUMPS.		
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED, 60EF, AND 6	TEGRATED SCHEMATIC HANDBOOK,	

REPORT DATE 10/23/87 C-343

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2193	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: DUMP VALVE EN FAILURE MODE: SINGLE CONTACT	ABLE/NOZZLE HEATER SWITCH (1) T OPEN (ELECTRICAL)
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYST 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	TEM
C	RITICALITIES
FLIGHT PHASE HDW/FU	NC ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
PRELAUNCH: /NA	RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 3/2R	AOA: /NA
DEORBIT: /NA	ATO: /NA
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [2] B[P] C[P]
LOCATION: MIDDECK AREA 80 PART NUMBER: 80V73A127, S8	0, D&C PANEL ML31C
CAUSES: CONTAMINATION, PIECH	E-PART FAILURE

EFFECTS/RATIONALE:

UNABLE TO POWER UP DUMP VALVE OR TURN NOZZLE HEATERS ON, MUST USE CONTINGENCY DUMP METHOD.

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

C-344

ORDITER SUBSISTEM ANALISIS	WORRDHELT
DATE: 7/31/87 HIC SUBSYSTEM: LIFE SUPPORT MDAC ID: 2194	GHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: DUMP VALVE ENABLE/NOZZLE FAILURE MODE: ERRONEOUS OUTPUT	E HEATER INDICATOR (1)
LEAD ANALYST: K. BARICKMAN SUBSYS	S LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
CRITICALITI	RS
FLIGHT PHASE HDW/FUNC A PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A [2] B [P] C[P]
LOCATION: MIDDECK AREA 80, D&C PAN PART NUMBER: V62S0541E	EL ML31C
CAUSES: MECHANICAL SHOCK, PIECE-PART D	FAILURE, LOSS OF INPUT,
EFFECTS/RATIONALE: UNABLE TO DETERMINE IF DUMP VALVE/NOZZI EXCEPT BY THE NOZZLE TEMPERATURE INDICA FAILS THEN LOSS OF DUMP CAPABILITY AND COLLECTION METHODS MUST BE USED.	ATORS. IF ALL REDUNDANCY
REFERENCES: 1) RI DRAWING VS70-623201 HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGH VS70-960102, PAGE 60ED, 60EF, AND 60EM	RATED SCHEMATIC HANDBOOK,

REPORT DATE 10/23/87 C-345

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HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/1R ABORT: /NA MDAC ID: 2195 WASTE H20 DUMP VALVE SWITCH (1) ITEM: FAILURE MODE: SINGLE CONTACT OPEN (ELECTRICAL) LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM WASTE MANAGEMENT SUBSYSTEM 2) 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS DUMP LINE ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: /NA PRELAUNCH: /NA LIFTOFF: /NA TAL: /NA AOA: /NA 2/1R ONORBIT: /NA ATO: /NA DEORBIT: LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: D&C PANEL ML31C, 80V73A127 PART NUMBER: S4 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: UNABLE TO OPEN VALVE OR USE WASTE FLUID DUMP, MUST USE CONTINGENCY WATER CONTAINER OR CONTINGENCY CROSS-TIE CONNECTION TO POTABLE WATER DUMP FOR WASTE WATER DUMP. IF FAILURE OCCURS AT CLOSURE OF VALVE THEN THE DUMP ISOLATION VALVE MUST BE USED TO TERMINATE THE DUMP AND ONLY A SINGLE FAILURE BEYOND THAT WOULD BE REQUIRED TO SUFFER LOSS OF VEHICLE OR LIFE DUE TO CABIN DEPRESSURIZATION. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

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ORBITER SUBSYSTEM ANALYSIS WORKSHEET		
DATE: HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/1R MDAC ID: 2196 ABORT: /NA		
ITEM: WASTE H2O DUMP VALVE SWITCH (1) FAILURE MODE: SINGLE CONTACT SHORTED		
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:2/1RAOA:/NADEORBIT:/NAATO:/NA		
PRELAUNCH: /NA RTLS: /NA		
LIFTOFF: /NA TAL: /NA		
ONORBIT: 2/1R AOA: /NA		
DEORBIT: /NA ATO: /NA		
LANDING/SAFING: /NA		
REDUNDANCY SCREENS: A [2] B [P] C [P]		
LOCATION: D&C PANEL ML31C, 80V73A127 PART NUMBER: S4		
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: UNABLE TO CLOSE DUMP VALVE WHEN S8 SWITCH IS TURNED ON. CABIN PRESSURE LEAK DUMP ISOLATION VALVE FAILS. REQUIRES CONTINGENCY WATER CONTAINER USAGE FOR WASTE FLUID DUMP AND END OF MISSION BECAUSE OF LIMITED ARS CONDENSATE STORAGE CAPABILITY.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM		

REPORT DATE 10/23/87

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2197	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: /NA	
ITEM: WASTE H2O DUMP VALVE FAILURE MODE: PHYSICAL BINDING/JAMM	SWITCH (1) MING	
LEAD ANALYST: K. BARICKMAN SUB	BSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)		
CRITICALI	ITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/1R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA	
REDUNDANCY SCREENS: A [2] E	3 [P] C [P]	
LOCATION: D&C PANEL ML31C, 80V73 PART NUMBER: S4	3A127	
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION		
EFFECTS/RATIONALE: WORST CASE IF FAILS WHEN VALVE IS OPEN, THEN CANNOT CLOSE AND DUMP ISOLATION VALVE IS SOLE REDUNDANCY BEFORE CABIN PRESSURE LOSS AND POTENTIAL LOSS OF LIFE.		
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM		

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DATE: HIGHEST CRITICALITY HDW/FUI SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/1R MDAC ID: 2198 ABORT: /NA ITEM: WASTE H2O DUMP VALVE SOLENOID (1) FAILURE MODE: OPEN (ELECTRICAL) LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 3) WASTE WANAEGMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HOW/FUNC ABORT HDW/FUNC FRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 2/1R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP FROM SOLESS CONTAMINATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	SUBSYSTEM: MDAC ID:	LIFF CUDE				
<pre>FAILURE MODE: OPEN (ELECTRICAL) LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 2/1R AOA: /NA DEORBIT: 2/1R AOA: /NA DEORBIT: 2/1R AOA: /NA LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, </pre>		2198	PORT	HIGHEST	FLIGHT:	2/1R
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 2/1R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE.) (1)	
<pre>1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA RTL: /NA ONORBIT: 2/1R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,</pre>	LEAD ANALYST	F: K. BARI	CKMAN	SUBSYS LEAD	: M.J. SAII	DI
CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA ONORBIT: 2/1R AOA: /NA DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	1) LIFE SU 2) WASTE M 3) WASTE W 4) ELECTRI 5) DUMP LI 6) 7) 8)	UPPORT SYS MANAGEMENT WATER SUBS	SUBSYSTEM			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:2/1RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NAREDUNDANCY SCREENS:A [2]B [P]C [P]LOCATION:MID BODY AREA 40PART NUMBER:40V62LV14CAUSES:CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK,VIBRATIONEFFECTS/RATIONALE:WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOTCLOSE VALVE.ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROMCABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE.REFERENCES:1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEMHANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,			CRTT	CALITTES		
LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	FLIGHT I	PHASE	HDW/FUNC	ABORT	HDW/FU	NC
REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	PREL	AUNCH:	/NA	RTI	S: /NA	
REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	LIFT	OFF:	/NA	TAI	L: /NA	
LANDING/SAFING: /NA REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	ONORI	BIT:	2/1R		A: /NA	
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	LAND	ING/SAFING	: /NA	AIC): /NA	
PART NUMBER: 40V62LV14 CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	REDUNDANCY S	SCREENS:	A [2]	B [P]	С[Р]	
VIBRATION EFFECTS/RATIONALE: WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,						
WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,		NTAMINATIO	N, PIECE-PA	ART FAILURE,	THERMAL SHO	СК,
WORST CASE IS IF FAILURE OCCURS DURING DUMP PROCESS AND CANNOT CLOSE VALVE. ONLY SINGLE FAILURE (DUMP ISOLATION VALVE) FROM CABIN DEPRESSURIZATION AND POTENTIAL LOSS OF LIFE. REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,		TONALE.				
HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	WORST CASE D CLOSE VALVE	IS IF FAIL . ONLY SI	NGLE FAILU	RE (DUMP ISOI	LATION VALVE	
HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,	CADIN DEFRE	JUNILATIO			DITE.	
VS70-960102, PAGE 60ED, 60EF, AND 60EM	REFERENCES:		6.5; 3) R	I INTEGRATED		

REPORT DATE 10/23/87

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2199	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: /NA
ITEM: WASTE H2O DUMP VALVE FAILURE MODE: SHORTED	SOLENOID (1)
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA	ABORT HDW/FUNC RTLS: /NA
LIFTOFF: /NA	TAL: /NA
ONORBIT: 2/1R	AOA: /NA
PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/1R DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62LV14	
CAUSES: CONTAMINATION, PIECE-PART VIBRATION	FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: UNABLE TO ACTUATE VALVE CLOSURE, CA POSSIBLE VEHICLE LOSS IF DUMP ISOLA SINGLE FAILURE (DUMP ISOLATION VALV POTENTIAL LOSS OF LIFE.	TION VALVE FAILS. WITH ONLY A
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED, 60EF, AND 6	TEGRATED SCHEMATIC HANDBOOK,

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SU	ATE: UBSYST DAC ID			SUPPO	RT			HIGH	EST C	CRITIC FLIG ABOR	HT:	HDW/FUNC 3/3 /NA
I) FZ	TEM: AILURE	MODE	WA: ERI	STE H RONEO	20 DU US OU	JMP V. JTPUT	ALVE	SOLE	NOID	(1)		
L	EAD AN	ALYST	: к.	BARIĆ	KMAN		SUI	BSYS	LEAD:	. M.J.	SAII	DI
	REAKDO 1) LI 2) WA 3) WA 4) EL 5) DU 6) 7) 8) 9)	FE SU STE M STE W ECTRI	PPORT ANAGEI ATER CAL P	SYST MENT SUBSY ARTS	em Subsy Stem	STEM						
						CRIT	ICALI	TIES				
		GHT PI PRELAU LIFTO ONORB DEORB LANDII	UNCH: FF: IT: IT:		/\ /\ 3/3 /\	IA IA B IA			ORT RTLS TAL: AOA: ATO:	:	DW/FU /NA /NA /NA /NA	
RE	EDUNDA	NCY SO	CREENS	5: 2	A []	E	3 []	С.	[]	
PA CA	OCATIO ART NU AUSES:	MBER:	40V(52LV1	4	-	ART F	AILU	RE, I	HERMA	L SHO	ск,
EF IN CI	IBRATI FFECTS NDICAT LOSED. F VALV	/RATIO	F VALY	VE OP	en on Dump	I MDM LINE	OF3, PRES	"TE SURE	LL-TA SENS	LE" I OR FO	NDICA' R VER	TES IFICATION
HA	EFEREN ANDBOO S70-96	K, DRA	AWING	NO.	6.5;	3) RI	I INT	'EGRA'	2) SF TED S	PACE S	HUTTLI TIC HI	E SYSTEM ANDBOOK,
RE	EPORT	DATE	10/2:	3/87			C-35	1			·	·

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DATE: SUBSYSTEM: LIFE SUPPORT MDAC ID: 2201	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: DUMP VALVE INDICATOR FAILURE MODE: LOSS OF OUTPUT (OPE EXCESSIVE RESISTANCE)	RESISTOR TO MDM OF3 (1) N (ELECTRICAL), SHORTED,
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: D&C PANEL ML31C, 80V7 PART NUMBER: V62X0539E (A2R2) 5.1	ЗА127 КОНМ
CAUSES: CONTAMINATION, PIECE-PART VIBRATION	FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: OUT OF RANGE INDICATION ON MDM OF3, VALVE STATUS INDICATION.	MUST RELY ON "TELL-TALE" FOR
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60ED, 60EF, AND 6	TEGRATED SCHEMATIC HANDBOOK,

			SUPPORT	F	IGHEST	FLI	CALITY GHT: RT:	HDW/FUNC 3/3 /NA
FAIL		: LO	MP VALVE IND SS OF OUTPUT NCE)				SHORTE	D,
LEAD	ANALYSI	: K.	BARICKMAN	SUBS	YS LEA	D: M.J	. SAIID	I
1) 2) 3) 4)		IPPORT	SYSTEM MENT SUBSYST SUBSYSTEM ARTS	em				
			- CR	ITICALIT	IES			
	FLIGHT F	HASE	HDW/FUN	с	ABORT		HDW/FUN	С
	PRELA	UNCH:	/NA	•	RT	LS:	/NA	
	LIFTC	FF:	/NA			L:	/NA	
	ONORE	SIT:	/NA 3/3		AO	A:	/NA	
	DEORE	SIT:	/NA		AT	0:	/NA	
	LANDI	NG/SA	FING: /NA					
DEDIN	NDANOV C	ODEEN	с. з г з	P	<i>د</i> ۲	~	ر م	

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: D&C PANEL ML31C, 80V73A127 PART NUMBER: A6CR2

CAUSES:

-----14---- EFFECTS/RATIONALE: FALSE MDM OF3 READING REGARDING VALVE STATUS. MUST RELY ON PRESSURE SENSOR FOR VALVE STATUS.

REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 2203 ABORT: /NA
ITEM: DUMP NOZZLE HEATER (1) FAILURE MODE: OPEN (ELECTRICAL), SHORTED
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NA
LIFTOFF: /NA TAL: /NA ONORBIT: 3/2R AOA: /NA
DEORBIT: /NA ATO: /NA
LANDING/SAFING: /NA
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62HRI
CAUSES: CONTAMINATION, PIECE-PART FAILURE
EFFECTS/RATIONALE: NO HEATING OF DUMP NOZZLE, REQUIRES ALTERNATE WASTE COLLECTION/DUMP METHOD.
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

REPORT DATE 10/23/87

DATE: 7/31/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2204	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /NA
ITEM: WASTE H2O DUMP NOZZ FAILURE MODE: ERRONEOUS OUTPUT, O	LE TEMP. TRANSDUCER (2) PEN (ELECTRICAL), SHORTED
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/2R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62MT18 AND 40V62M	T23
CAUSES: CONTAMINATION, PIECE-PART VIBRATION	FAILURE, THERMAL SHOCK,
EFFECTS/RATIONALE: ERRONEOUS NOZZLE TEMPERATURE INDIC COMPARATOR FOR NOZZLE TEMPERATURE. MUST USE CONTINGENCY WASTE DUMP/CO	IF ALTERNATE COMPARATOR FAILS
REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI I VS70-960102, PAGE 60ED, 60EF, AND	NTEGRATED SCHEMATIC HANDBOOK,
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REPORT DATE 10/23/87 C-	·355 ·

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DATE: HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 2205 ABORT: /NA
ITEM: WASTE H20 DUMP NOZZLE SIGNAL CONDITIONER (2) FAILURE MODE: ERRONEOUS OUTPUT, OPEN (ELECTRICAL), SHORTED
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:3/2RAOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: MID BODY AREA 40 AND FWD. AVIONICS BAY 3, AREA 83 PART NUMBER: 40V75A23 AND 83V75A18
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION
EFFECTS/RATIONALE: LOSS OF NOZZLE TEMPERATURE READING, MUST RELY ON ALTERNATE GAUGE
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM

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ORDITER SUBSTSTEM ANALISIS WORRDHELT	
DATE: HIGHEST CRITICALITY HDW/FU SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 2206 ABORT: /NA	
ITEM: DUMP NOZZLE RESISTOR TO MDM OF4 (HEATER STATUS) (FAILURE MODE: OPEN (ELECTRICAL), SHORTED	(1)
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) WASTE WATER SUBSYSTEM 4) ELECTRICAL PARTS 5) DUMP LINE ASSEMBLY 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NA	
LIFTOFF: /NA TAL: /NA ONORBIT: 3/3 AOA: /NA DEORBIT: /NA ATO: /NA	
ONORBIT: 3/3 AOA: /NA	
DEORBIT: /NA ATO: /NA LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: MID DECK AREA 80, 80V73A127, PANEL ML31C PART NUMBER: A3R1 (5.1 KOHM)	
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION	
EFFECTS/RATIONALE:	
LOSS OF SIGNAL TO MDM OF4 FOR NOZZLE HEATER STATUS. MUST RELY	ON
THERMAL TRANSDUCERS FOR NOZZLE HEATER OPERATION VERIFICATION.	
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM	ſ
HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF, AND 60EM	,

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DATE: 8/03/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2207	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1
ITEM: CREW MODULE INTERNAL FAILURE MODE: EXTERNAL LEAKAGE	LINE AND FITTINGS
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) HARDWARE 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 1/1 ONORBIT: 1/1 DEORBIT: 1/1 LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: 1/1 TAL: 1/1 AOA: 1/1 ATO: 1/1
REDUNDANCY SCREENS: A []	В[] С[]
LOCATION: ECLSS AREA 90 PART NUMBER:	
CAUSES: CONTAMINATION, PIECE-PART	FAILURE, VIBRATION
EFFECTS/RATIONALE: HYDROGEN GAS RELEASE INTO CABIN ATM THREATENING CONDITION AND CABIN PRE:	
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60EC	TEGRATED SCHEMATIC HANDBOOK,
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DATE: 9/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2208	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1
ITEM: INTERNAL LINE AND FAILURE MODE: EXTERNAL LEAKAGE	FITTINGS
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) HARDWARE 5) 6) 7) 8) 9)	
CRITIC	CALITIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:1/1LIFTOFF:1/1ONORBIT:1/1DEORBIT:1/1LANDING/SAFING:1/1	ABORT HDW/FUNC RTLS: 1/1 TAL: 1/1 AOA: 1/1 ATO: 1/1
	в[] С[]
LOCATION: ECLSS AREA 90 (DOWN VALVE) PART NUMBER:	STREAM OF VACUUM VENT ISOLATION
CAUSES: CONTAMINATION, PIECE-PAR	•
EFFECTS/RATIONALE: UNCONTROLLED CABIN PRESSURE LOSS, CONDITION.	LIFE AND VEHICLE THREATENING
REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60ED, 60EF AND	23201; 2) SPACE SHUTTLE SYSTEM INTEGRATED SCHEMATIC HANDBOOK, 60EM

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DATE:9/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:1/1MDAC ID:2209ABORT:1/1
ITEM: EXTERNAL LINE AND FITTINGS FAILURE MODE: EXTERNAL LEAKAGE
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) HARDWARE 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: 1/1 AOA: 1/1 DEORBIT: 1/1 ATO: 1/1 LANDING/SAFING: 1/1
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: MID BODY AREA 40 PART NUMBER:
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION
EFFECTS/RATIONALE: POTENTIAL GASEOUS HYDROGEN LEAK INTO CARGO BAY FROM HYDROGEN SEPARATORS. POSSIBLE EXPLOSIVE ATMOSPHERE DURING ASCENT AND DESCENT PRODUCING LOSS OF LIFE AND VEHICLE.
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60ED, 60EF AND 60EM

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URBITER SUBSISTEM ANALISIS WORKSHEET				
DATE: 8/03/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2210	HIGHEST C	RITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1		
ITEM: DYNATUBE FITTING AT FAILURE MODE: EXTERNAL LEAKAGE	CREW CABIN	WALL (1)		
LEAD ANALYST: K. BARICKMAN ST	JBSYS LEAD:	M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) HARDWARE 5) 6) 7) 8) 9)		. .		
CRITICA	LITIES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 1/1 ONORBIT: 1/1 DEORBIT: 1/1 LANDING/SAFING: /NA	ABORT RTLS TAL: AOA: ATO:	HDW/FUNC : 1/1 1/1 1/1 1/1		
REDUNDANCY SCREENS: A []	B []	C []		
LOCATION: ECLSS AREA 90 PART NUMBER: CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: CABIN PRESSURE LOSS, PRODUCES LOSS OF MISSION, POSSIBLY LOSS OF LIFE IF DEVELOPED CATASTROPHICALLY.				
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REFERENCES: 1) RI DRAWING VS70-62 HANDBOOK, DRAWING NO. 6.5; 3) RI II VS70-960102, PAGE 60EC				

REPORT DATE 10/23/87

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DATE: 8/03/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2211 ITEM: VACUUM VENT NOZZLE FAILURE MODE: RESTRICTED FLOW	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 3/3 (1)			
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) VACUUM VENT NOZZLE 5) HARDWARE 6) 7) 8) 9)				
CRITIC	ALITIES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: 3/3 ONORBIT: 1/1 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3			
REDUNDANCY SCREENS: A []	B[] C[]			
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62TP125				
CAUSES: CONTAMINATION, ICE BUILD	UP			
EFFECTS/RATIONALE: LOSS OF VACUUM VENT DUMP CAPABILITY, CREATES FES SHUTDOWN DUE TO HYDROGEN GAS CONCENTRATION THUS LIMITING MISSION LIFE. (POTENTIAL EXPLOSIVE HYDROGEN GAS ENVIRONMENT). DUE TO SHORT DURATION OF ASCENT, DESCENT AND ABORT CASES, THE EFFECTS WERE CONSIDERED INSIGNIFICANT.				
REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60				

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DATE: 8/03/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2212	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3			
ITEM: VACUUM VENT LINE HI FAILURE MODE: FAILS TO OPEN	EATER THERMOSTAT (2)			
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)				
	ALITIES			
DEFLAINCH · 3/3				
LIFTOFF: 3/3	TAL: 3/3			
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	AOA: 3/3			
DEORBIT: 3/3	ATO: 3/3			
LANDING/SAFING: 3/3				
REDUNDANCY SCREENS: A []	B[] C[]			
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62S109 AND 40V62S209				
CAUSES: CONTAMINATION, PIECE-PAR	I FAILURE			
FFFFORS /DAMIONALE.				
EFFECTS/RATIONALE: NO PROBLEM LEAVING HEATERS ON 100	9			
NO FRODER ERVING MERIERS ON 100	9 •			
REFERENCES: 1) RI DRAWING VS70-62	23201; 2) SPACE SHUTTLE SYSTEM			
HANDBOOK, DRAWING NO. 6.5; 3) RI	INTEGRATED SCHEMATIC HANDBOOK,			
VS70-960102, PAGE 60EC				

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DATE: 8/03/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2213	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: /NA			
ITEM: VACUUM VENT LINE HEA FAILURE MODE: FAILS TO REMAIN CLOS				
LEAD ANALYST: K. BARICKMAN SU	BSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)				
CRITICAL	ITIES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/1R DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA			
REDUNDANCY SCREENS: A [2]	B[P] C[P]			
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62S109 AND 40V62S209				
CAUSES: ACOUSTICS, CONTAMINATION,	PIECE-PART FAILURE, VIBRATION			
EFFECTS/RATIONALE: IMPOSSIBLE TO ACTUATE HEATER, SWITCH TO ALTERNATE HEATER LINE. UNABLE TO VACUUM VENT DUMP IF BOTH HEATERS FAIL, WOULD CREATE HYDROGEN SEPARATORS SHUTDOWN BECAUSE OF HYDROGEN GAS CONCENTRATION IN SUPPLY WATER THUS LIMITING MISSION LIFE DUE TO POSSIBLE LINE FREEZING (POSSIBLE EXPLOSIVE HYDROGEN GAS ENVIRONMENT).				
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC				
REPORT DATE 10/23/87 C-3	64			

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DATE: 8/03/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2214	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: /NA			
ITEM: VACUUM VENT LINE H FAILURE MODE: OPEN (ELECTRICAL),	IEATER (2) SHORTED			
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)				
CDITIC	CALITIES			
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC			
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 2/1R DEORBIT: /NA	RTLS: /NA			
LIFTOFF: /NA	TAL: /NA			
ONORBIT: 2/1R	AOA: /NA			
DEORBIT: /NA	ATO: /NA			
LANDING/SAFING: /NA				
REDUNDANCY SCREENS: A [2]	B[P] C[P]			
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62HR109, 115, 20	LOCATION: MID BODY AREA 40 PART NUMBER: 40V62HR109, 115, 209			
CAUSES: CONTAMINATION, PIECE-PAR	T FAILURE			
EFFECTS/RATIONALE: REQUIRES SWITCHING TO ALTERNATE HEATER. UNABLE TO VACUUM VENT DUMP IF BOTH HEATERS FAIL, WOULD CREATE HYDROGEN SEPARATOR SHUTDOWN BECAUSE OF HYDROGEN GAS CONCENTRATION IN SUPPLY WATER, THUS LIMITING MISSION LIFE. POTENTIAL LINE FREEZING WITHOUT HEATERS. FOR SHORTED FAILURE OF THE SUPPLY AND WASTE DUMP HEATERS CAN ALSO BE TURNED OFF BY CIRCIUT BREAKER "POPPNG" OR POTENTIAL EXPLOSIVE HYDROGEN GAS ENVIRONMENT IN VACUUM VENT LINE.				
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REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60EC				

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DATE: SUBSYSTEM: MDAC ID:	8/14/87 LIFE SUPPORT 2215	C	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: FAILURE MOD	LINE TEMP E: ERRONEOUS	PERATURE SIG S OUTPUT, OP	NAL CONDIT EN (ELECTR	TIONER (1) RICAL), SHOR	TED
LEAD ANALYS	T: K. BARICKM	ian su	BSYS LEAD:	M.J. SAIID	I
BREAKDOWN H 1) LIFE S 2) WASTE 3) VACUUM 4) ELECTR 5) 6) 7) 8) 9)	IERARCHY: UPPORT SYSTEM MANAGEMENT SU VENT SUBSYST ICAL PARTS	4 JBSYSTEM Tem			
			ITIES		
FLIGHT	PHASE HI	W/FUNC	ABORT	HDW/FUN	C
LIFT	AUNCH: OFF: BIT: BIT:	3/3	TAL:	: /NA /NA	
ONOR	BIT:	3/3	AOA: ATO:	/NA	
DEOR	BIT:	3/3	ATO:	/NA	
LAND	ING/SAFING:	3/3			
REDUNDANCY	SCREENS: A	[]	В[]	с[]	
LOCATION: PART NUMBER	FORWARD AV : 82V75A17	VIONICS BAY	2, AREA 82	:	
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, VIBRATION					
EFFECTS/RATIONALE: LOSS OF VACUUM VENT DUMP TEMPERATURE GAUGE, NO EFFECT ON MISSION.					
POTENTIAL HYDROGEN SEPARATOR SHUTDOWN AND CONTAMINATION OF SUPPLY WATER BY HYROGEN GAS IF HEATERS FAIL DUE TO LINE FREEZING, BUT THAT IS SECOND NON-REDUNDANT FAILURE.					
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC					

DATE:8/14/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:2216ABORT:3/3				
ITEM: LINE TEMPERATURE SENSOR (1) FAILURE MODE: ERRONEOUS OUTPUT, OPEN (ELECTRICAL), SHORTED				
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3				
FRELAUNCH: 3/3 RILS: 3/3 TEMORE: 2/2 MAT: 3/3				
LANDING/SAFING: 3/3 AIO: 3/3				
LANDING/SATING. 5/5				
REDUNDANCY SCREENS: A [] B [] C []				
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62MT22A				
CAUSES: CONTAMINATION, PIECE-PART FAILURE, THERMAL SHOCK, LOSS OF INPUT, VIBRATION				
EFFECTS/RATIONALE:				
LOSS OF VACUUM VENT DUMP CAPABILITY BECAUSE OF THERMAL GAUGE				
LOSS, NO EFFECT ON MISSION. POTENTIAL HYDROGEN SEPARATOR				
CONTAMINATION BY HYDROGEN GAS, ONLY IF HEATERS FAIL AND CAUSING				
REDUCTION OF MISSION LIFE.				
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM				
HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK,				
VS70-960102, PAGE 60EC				
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DATE: 8/03/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2217	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA			
ITEM: NOZZLE HEATER CIRCU FAILURE MODE: FAILS TO OPEN	IT BREAKER (1)			
LEAD ANALYST: K. BARICKMAN S	UBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)				
CRITICA	LITIES			
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC			
PRELAUNCH: /NA	RTLS: /NA TAL: /NA			
LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA	TAL: /NA AOA: /NA			
DEORBIT: /NA	ATO: /NA			
LANDING/SAFING: /NA				
REDUNDANCY SCREENS: A []	B[] C[]			
LOCATION: MID DECK AREA 80, D&C PANEL ML86B PART NUMBER: CB66				
CAUSES: CONTAMINATION, PIECE-PART FAILURE				
EFFECTS/RATIONALE: NO PROBLEM WITH HEATER ON 100% OF TIME.				
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC				

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ORBITER SUBSISTEM ANALISIS WORKSHEET				
DATE:8/03/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:1/1MDAC ID:2218ABORT:/NA				
ITEM: NOZZLE HEATER CIRCUIT BREAKER (1) FAILURE MODE: FAILS TO REMAIN CLOSED				
LEAD ANALYST: K. BARICKMAN SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:/NARTLS:/NALIFTOFF:/NATAL:/NAONORBIT:1/1AOA:/NADEORBIT:/NAATO:/NALANDING/SAFING:/NAATO:/NA				
REDUNDANCY SCREENS: A [] B [] C []				
LOCATION: MID DECK AREA 80, D&C PANEL ML86B PART NUMBER: CB66				
CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION				
EFFECTS/RATIONALE:				
IMPOSSIBLE TO MAINTAIN NOZZLE TEMPERATURE. POTENTIAL RESTRICTION OF VACCUM VENT DUMPS AND HYDROGEN SEPARATOR SHUTDOWN BECAUSE OF HYDROGEN GAS CONCENTRATION IN SUPPLY WATER, THUS LIMITING MISSION LIFE. (POTENTIAL EXPLOSIVE HYDROGEN GAS ENVIRONMENT)				
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC				
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DATE: 8/03/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2219	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: /NA		
ITEM: NOZZLE HEATER SWITCH FAILURE MODE: OPEN (ELECTRICAL)	(1)		
LEAD ANALYST: K. BARICKMAN SUE	SYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)			
CRITICALI	TIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 1/1 DEORBIT: /NA	ABORT HDW/FUNC RTLS: /NA		
LIFTOFF: /NA	TAL: /NA		
ONORBIT: 1/1	AOA: /NA		
DEORBIT: /NA LANDING/SAFING: /NA	ATO: /NA		
REDUNDANCY SCREENS: A [] E	8 [] C []		
LOCATION: MID DECK AREA 80, D&C PANEL ML31C PART NUMBER: S9			
CAUSES: CONTAMINATION, PIECE-PART F	AILURE		
EFFECTS/RATIONALE: INABILITY TO ACTIVATE NOZZLE HEATERS, NO DUMPS PERMITTED. RESTRICTION OF VACUUM VENT DUMPS CREATES HYDROGEN SEPARATOR SHUTDOWN DUE TO HYDROGEN GAS CONCENTRATION IN SUPPLY WATER, THUS LIMITING MISSION LIFE. (POTENTIAL EXPLOSIVE HYDROGEN GAS ENVIRONMENT)			
REFERENCES: 1) RI DRAWING VS70-623201; 2) SPACE SHUTTLE SYSTEM HANDBOOK, DRAWING NO. 6.5; 3) RI INTEGRATED SCHEMATIC HANDBOOK, VS70-960102, PAGE 60EC			

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DATE: 8/03/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 2220 ITEM: NOZZLE HEATER SWITCH (HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: /NA
FAILURE MODE: SHORTED CLOSED	· -
LEAD ANALYST: K. BARICKMAN SUBS	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	
CRITICALIT	TIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 1/1 DEORBIT: /NA LANDING/SAFING: /	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A [] . B	[] C[]
LOCATION: MID DECK AREA 80, D&C F PART NUMBER: S9	PANEL ML31C
CAUSES: ND	
EFFECTS/RATIONALE: REQUIRED TO OPERATE HEATER WITH CIRCU GROUND AND THUS NO POWER TO NOZZLE HE FAILS, WOULD LIMIT VACUUM VENT DUMPS HYDROGEN SEPARATOR SHUTDOWN DUE TO HY IN SUPPLY WATER, THUS LIMITING MISSIC EXPLOSIVE HYDROGEN GAS ENVIRONMENT IN	EÀTER. IF CIRCUÎT BREAKER AND CREATE POTENTIAL NDROGEN GAS CONCENTRATION DN LIFE. (POTENTIAL
REFERENCES: 1) RI DRAWING VS70-62320 HANDBOOK, DRAWING NO. 6.5; 3) RI INTE VS70-960102, PAGE 60EC	

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2221	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: RESISTOR TO MDM OF4 FAILURE MODE: LOSS OF OUTPUT (OPEN	(HEATER INDICATOR)(1) (, SHORT)
LEAD ANALYST: K. BARICKMAN SU	UBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	
CRITICAI	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	RTLS: /NA TAL: /NA
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: MID DECK AREA 80, 800 PART NUMBER: A3R2 (5.1 KOHM)	73A127, PANEL ML31C
CAUSES: CONTAMINATION, MECHANICAL THERMAL SHOCK, VIBRATION	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE: NO "HEATER ON/OFF" INDICATION. USE VERIFICATION OF HEATER STATUS.	TEMPERATURE TRANSDUCER AS
REFERENCES: 1) RI DRAWING VS70-623 HANDBOOK, DRAWING NO. 6.5; 3) RI IN VS70-960102, PAGE 60EC	201; 2) SPACE SHUTTLE SYSTEM TEGRATED SCHEMATIC HANDBOOK,
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UNDI II	LR SUBSISTEM ANAL	IDID WORKDI		
DATE: 8/03 SUBSYSTEM: LIFE S MDAC ID: 2222	8/87 SUPPORT	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 /NA
ITEM: VAC FAILURE MODE: OPH	CUUM VENT NOZZLE EN (ELECTRICAL),	HEATER (1) SHORT		
LEAD ANALYST: K. H	BARICKMAN SI	UBSYS LEAD:	M.J. SAIID	Γ
BREAKDOWN HIERARCH 1) LIFE SUPPORT 2) WASTE MANAGEN 3) VACUUM VENT S 4) ELECTRICAL PA 5) 6) 7) 8) 9)	SYSTEM MENT SUBSYSTEM SUBSYSTEM			
	CRITICA	LTTTES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAN	HDW/FUNC /NA /NA 1/1 /NA		: /NA /NA /NA	
REDUNDANCY SCREENS	S: A []	B[]	с[]	
LOCATION: MID PART NUMBER: 40V6				
CAUSES: CONTAMINA	TION, PIECE-PART	FAILURE		
EFFECTS/RATIONALES LOSS OF DUMP CAPAN ENVIRONMENT FOR HY GAS CONCENTRATION POTENTIAL EXPLOSIV LINE. IN CASE OF POTENTIAL LOSS OF	BILITY, RESTRICTED DROGEN SEPARATOR IN SUPPLY WATER, VE HYDROGEN GAS ED SHORT TO GROUND,	SHUTDOWN B THUS LIMIT NVIRONMENT	ECAUSE OF HY ING MISSION IN VACUUM VI	IDROGEN LIFE. ENT
REFERENCES: 1) RI HANDBOOK, DRAWING VS70-960102, PAGE	NO. 6.5; 3) RI II	3201; 2) SP NTEGRATED S	ACE SHUTTLE CHEMATIC HAN	SYSTEM Idbook,

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DATE: 8/14/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 2223	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /NA
ITEM: NOZZLE TEMPERATURE FAILURE MODE: ERRONEOUS OUTPUT,	SENSOR (1) OPEN (ELECTRICAL), SHORTED
LEAD ANALYST: K. BARICKMAN	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) WASTE MANAGEMENT SUBSYSTEM 3) VACUUM VENT SUBSYSTEM 4) ELECTRICAL PARTS 5) 6) 7) 8) 9)	· · · · · · · · · · · · · · · · · · ·
	ALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: /NA LIFTOFF: /NA ONORBIT: 3/3 DEORBIT: /NA LANDING/SAFING: /NA	ABORT HDW/FUNC RTLS: /NA TAL: /NA AOA: /NA ATO: /NA
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: MID BODY AREA 40 PART NUMBER: 40V62MT19	
CAUSES: CONTAMINATION, PIECE-PAR' OF INPUT, VIBRATION	F FAILURE, THERMAL SHOCK, LOSS
EFFECTS/RATIONALE: LOSS OF SENSOR OUTPUT, NO EFFECT	ON HEATER FUNCTION.
· · · · · · · · · · · · · · · · · · ·	
REFERENCES: 1) RI DRAWING VS70-6 HANDBOOK, DRAWING NO. 6.5; 3) RI VS70-960102, PAGE 60EC	23201; 2) SPACE SHUTTLE SYSTEM INTEGRATED SCHEMATIC HANDBOOK,
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DATE: SUBSYSTEM: I MDAC ID: 2	8/14/87 LIFE SUPPORT 2224	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: FAILURE MODE:	NOZZLE TEMPERATU ERRONEOUS OUTPUT	JRE SENSOR COND 5, OPEN (ELECTR	ITIONER (1) ICAL), SHOR	TED
LEAD ANALYST	: K. BARICKMAN	SUBSYS LEAD:	M.J. SAIID	I
2) WASTE MA	PPORT SYSTEM ANAGEMENT SUBSYSTEM VENT SUBSYSTEM	1		
	CRIT	TCALITIES		
FLIGHT PH PRELAU LIFTON ONORBJ DEORBJ LANDIN	HASE HDW/FUNC UNCH: /NA FF: /NA IT: 3/3 IT: /NA NG/SAFING: /NA	ABORT RTLS TAL: AOA: ATO:	HDW/FUN : /NA /NA /NA /NA	c
	CREENS: A []	B[]	с[]	
LOCATION: PART NUMBER:	MID BODY AREA 40 40V62A23			
CAUSES: CONT VIBRATION	TAMINATION, PIECE-F	PART FAILURE, T	HERMAL SHOC	K,
EFFECTS/RATIO LOSS OF TEMPI	ONALE: ERATURE SENSOR, NO	EFFECT ON MISS	ION OR LIFE	
	1) RI DRAWING VS70 AWING NO. 6.5; 3) F PAGE 60EC			
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SMOKE DETECTION/FIRE SUPPRESSION SUBSYSTEM

Analysis Worksheets

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SMOKE DETECTION AND FIRE SUPPRESSION SUBSYSTEMS

-				EDUNDANCY	
			ABORT		
	MDAC-ID	H/F	•	ABC	ITEM NAME
	2001 (+)	 2/1D	2/1R	PNP	CB, SMOKE DETN (3)
	3001 (*) 3002	2/1R 3/3	•	FNF	CB, SMOKE DETN (3)
	3002 (*)		3/3 2/1R	PNP	CB, SMOKE DETN (3) CB, SMOKE DETN (1)
				FNF	
	3004	3/3	3/3	PNP	CB, SMOKE DETN (1)
	3005 (*)		2/1R	PNP	CB, SMOKE DETN CABIN (1)
	3006	3/3	3/3		CB, SMOKE DETN CABIN (1)
	3007 (*)		1/1		CB, FIRE SUPPRESSION (3)
	3008	3/3	3/3		CB, FIRE SUPPRESSION (3)
	3009	3/3	•		RESISTOR (3)
	3010	3/3	3/3		RESISTOR (3)
	3011 (*)		/NA		SW, SMOKE DETN SENSOR RESET (1)
	3012 (*)		3/3		SW, SMOKE DETN SENSOR RESET (1)
	3013	3/3	3/3		SW, SMOKE DETN CIRCUIT TEST (1)
	3014 (*)		3/3		SW, SMOKE DETN CIRCUIT TEST (1)
		3/3	3/3		FIRE SUPPR PRESSURE SENSOR (3)
	3016	3/3	3/3		FIRE SUPPR PRESSURE SENSOR (3)
_	3017 (*)		3/3		DIODE (3)
	3018	3/3	3/3		DIODE (3)
	3019	3/3	3/3		DIODE (3)
	3020	3/3	3/3		DIODE (3)
	3021	3/3	3/3		RESISTOR (1)
	3022	3/3	3/3	•	RESISTOR (1)
	3023	3/3	3/3		RESISTOR (9)
_	3024	3/1R	3/1R	PPP	RESISTOR (8)
	3025 (*)	2/1R	2/1R	PPP	RESISTOR (1)
	3026	3/3	3/3		RESISTOR (9)
	3027	3/1R	3/1R	РРР	RESISTOR (9)
-	3028	3/1R	3/1R	PPP	RESISTOR (8)
	3029 (*)	2/1R		PPP	
	3030	3/1R	3/1R	PPP	DIODE (11)
Tear	3031	3/3	3/3		DIODE (11)
	3032	3/1R	3/1R	PPP	DIODE (9)
	3033	3/3	3/3		RESISTOR A6R11, R12 (2)
	3034	3/1R	2/1R	PPP	RESISTOR A6R11, R12 (2)
	3035	3/1R	3/1R	PPP	RESISTOR A6R11, R12 (2)
	3036	3/1R	3/1R	PPP	DIODE A6CR1, CR2 (2)
	3037	3/3	3/3		DIODE A6CR1, CR2 (2)
	3038	3/3	3/3		RESISTOR A1R6, R7 (2)
	3039	3/1R	3/1R	РРР	RESISTOR A1R6, R7 (2)
	3040	3/3	3/3		ANNUNCIATOR CNTRL ASSY (2)
			-/ -		
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(*) Potential Critical Items.

SMOKE DETECTION AND FIRE SUPPRESSION SUBSYSTEMS (concluded)

MDAC-ID	FLIGHT	ALITY R ABORT H/F		ITEM NAME
3041	3/3	3/3		ANNUNCIATOR CNTRL ASSY (2)
3042	3/1R	3/1R	РРР	SMOKE DETN LIGHT MATRIX-LAMPS
3043	3/1R	3/1R	PPP	C&W ELECTRONICS UNIT SIREN (2)
3044 (*)	1/1	1/1	РРР	SWITCH-FIRE SUPPR AV BAY (3)
3045	3/3	3/3		RESISTOR (2.2K) (3)
3046 (*)		1/1	PPP	RESISTOR (2.2K) (3)
3047	3/3	3/3		RESISTOR (1.8K) (3)
3048 (*)		1/1	PPP	SW, FIRE SUPPR AV BAY DISCH (3)
3049		3/3		LIGHT, FIRE SUPPR BAY DISCH (3)
3050		3/3		ANNUNCIATOR CNTRL ASSY (1)
3051				ANNUNCIATOR CNTRL ASSY (1)
			ΡΡΡ	DIODE (3)
3053		3/3		DIODE (3)
3054		3/3		DIODE (3)
3055		3/3		RESISTOR (3)
3056 (*)		1/1	PPP	PYRO CONTROLLER (3)
3057 (*)		2/2		PYRO CONTROLLER (3)
3058 (*)		2/1R	PPP	SMOKE DETECTOR (9)
3059 (*)		2/2		FIRE SUPPRESSANT ASSEMBLY (9)
3060 (*)		1/1	PFP	FIRE SUPPRESSANT ASSEMBLY (9)
3061	3/3	3/3		PORT FIRE SUPPRESSANT ASSY (1)
3062	3/1R	/NA	PPP	PORT FIRE SUPPRESSANT ASSY (1)
3063	3/3	3/3		HYBRID DRIVER (TYPE III) (3)
3064				HYBRID DRIVER (TYPE I) (3)
3065 (*)	1/1	1/1	P P P	HYBRID DRIVER (TYPE II) (3)

(*) Potential Critical Items.

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DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/1RMDAC ID:3001ABORT:2/1R				
ITEM: CB-SMOKE DETN BAY 2A/3B, 1B/3A, 1A/2B (CB8, 7, 7) FAILURE MODE: OPEN (ELECTRICAL), SHORTED				
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI				
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SATIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) POWER 4) CIRCUIT BREAKERS CB8 (MNA), CB7 (MNB), CB7 (MNC) 5) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:2/1RRTLS:2/1RLIFTOFF:2/1RTAL:2/1RONORBIT:2/1RAOA:2/1RDEORBIT:2/1RATO:2/1RLANDING/SAFING:2/1RATO:2/1R				
REDUNDANCY SCREENS: A [2] B [NA] C [P]				
LOCATION: PANEL 014, 015, 016 PART NUMBER: 33V73A14, A15, A16				
CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, VIBRATION				
EFFECTS/RATIONALE: FAILURE OF ONE SMOKE DETN BAY CIRCUIT BREAKER RESULTS IN THE LOSS OF REDUNDANT SENSING WITHIN TWO (2) A/V BAYS. WITH NO OTHER SYSTEM FAILURES THE FIRE WILL BE SENSED BY THE REMAINING (REDUNDANT) SENSOR. THE ABILITY OF THE CREW TO SENSE A FIRE WOULD BE MOST DIFFICULT BECAUSE THE AIR CIRCULATION IS RESTRICTED WITHIN THE BAY AND ONCE IT ESCAPES IT MUST CIRCULATE THROUGHOUT THE CABIN TO BE DETECTED. LOSS OF FUNCTION HAS THE POTENTIAL FOR LOSS OF LIFE. SCREEN B IS NOT APPLICABLE DUE TO RULE 2.3.4.b.2.a (pg 2-12) OF SPECIFICATION NSTS-22206. REFERENCES:				
REFERENCES:				

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DATE: 7/10/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 3002	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3				
ITEM: CB-SMOKE DETN BAY 2A/3 FAILURE MODE: FAILS TO OPEN	DB, 1B/3A, 1A/2B (CB8, 7, 7)				
LEAD ANALYST: J.D. ARBET SUBSYS	S LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) POWER 4) CIRCUIT BREAKERS CB8 (MNA), CB7 (MNB), CB7 (MNC) 5) 6) 7) 8) 9)					
CRITICALIT	IES				
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 [] B	[] C[]				
LOCATION: PANEL 014, 015, 016 PART NUMBER: 33V73A14, A15, A16					
CAUSES: CONTAMINATION, MECHANICAL SH VIBRATION	OCK, PIECE-PART FAILURE,				
EFFECTS/RATIONALE: NO EFFECT SINCE THE NOMINAL POSITION FOR ALL FLIGHT PHASES IS CLOSED.					

REFERENCES:

REPORT DATE 10/23/87

DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/1RMDAC ID:3003ABORT:2/1R	2
ITEM: CB-SMOKE DETN L/R FLT DECK (CB7) FAILURE MODE: OPEN (ELECTRICAL), SHORTED	
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) POWER 4) CIRCUIT BREAKER CB7 (MNA) 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:2/1RRTLS:2/1RLIFTOFF:2/1RTAL:2/1RONORBIT:2/1RAOA:2/1RDEORBIT:2/1RATO:2/1RLANDING/SAFING:2/1R2/1R	
REDUNDANCY SCREENS: A [2] B [NA] C [P]	
LOCATION: PNL 014 PART NUMBER: 33V73A14	
CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, VIBRATION	
EFFECTS/RATIONALE: FAILURE OF THIS CIRCUIT BREAKER RESULTS IN THE LOSS OF REDUNDANT SENSING IN THE CREW COMPARTMENT. LAG IN WITH NO OTHER SYSTEM FAILURES A FIRE WILL BE SENSED BY THE CABIN SENSOR. DETECTION OF THE IGNITION SOURCE REQUIRES THE CREW TO USE SIGHT, TOUCH, AND SMELL. A SIGNIFICANT LAG IN LOCATING THE IGNITION SOURCE COULD BE EXPERIENCED SINCE NO LEFT/RIGHT ISOLATION INDICATION IS AVAILABLE.	ŀ
REFERENCES:	

REPORT DATE 10/23/87

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DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3004	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3					
ITEM: CB-SMOKE DETN L/R FLT DECK (CB7) FAILURE MODE: FAILS TO OPEN								
LEAD ANALYST: J.D. ARBET SUBSY	YS LEAD: M	.J. SAIIDI						
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) POWER 4) CIRCUIT BREAKER CB7 (MNA) 5) 6) 7) 8) 9)								
CRITICAL								
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3	ABORT	HDW/FUN	С					
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	ABORT RTLS TAL: AOA: ATO:	: 3/3 3/3						
ONORBIT: 3/3	AOA:	3/3 3/3	· .					
DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO:							
REDUNDANCY SCREENS: A [] H	3[]	С[]						
LOCATION: PNL 014 PART NUMBER: 33V73A14								
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION								
EFFECTS/RATIONALE: NO EFFECT SINCE THE NOMINAL POSITION FOR ALL FLIGHT PHASES IS CLOSED.								

REFERENCES:

DATE: 7/10/87 SUBSYSTEM: LIFE SUPP MDAC ID: 3005	ORT		TICALITY LIGHT: ABORT:	•
ITEM: CB-SMO FAILURE MODE: OPEN (
LEAD ANALYST: J.D. AR	BET SUBS	SYS LEAD: M.J	J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYS 2) SMOKE DETECTION 3) POWER 4) CIRCUIT BREAKER 5) 6) 7) 8) 9)				
	CRITICAL	LITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	2/1R 2/1R 2/1R 2/1R	ABORT RTLS: TAL: AOA: ATO:	2/1R 2/1R 2/1R	с
REDUNDANCY SCREENS:	A [2]	B [NA]	C[P]	
LOCATION: PNL 016 PART NUMBER: 33V73A1				
CAUSES: CONTAMINATIO	N, MECHÀNICAL	SHOCK, OVER	LOAD, VIBR	ATION

EFFECTS/RATIONALE:

FAILURE OF THIS CIRCUIT BREAKER RESULTS IN THE LOSS OF THE SENSING UNIT IN THE CREW COMPARTMENT. WITH NO OTHER SYSTEM FAILURES A FIRE WOULD BE SENSED BY THE LEFT AND/OR RIGHT FLIGHT DECK SENSORS. DETECTION OF THE IGNITION SOURCE REQUIRES THE CREW TO USE SIGHT, TOUCH AND SMELL. THE ORDER IN WHICH THE SENSORS TRIGGER AND CONCENTRATION LEVELS SHOULD PROVIDE INSIGHT TO LEFT/RIGHT ISOLATION.

REFERENCES:

REPORT DATE 10/23/87

DATE:7/10/87HIGHEST CRITICALITYHDW/3SUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3006ABORT:3/3	3
ITEM: CB-SMOKE DETN CABIN (CB6) FAILURE MODE: FAILS TO OPEN	
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) POWER 4) CIRCUIT BREAKER CB6 (MNC) 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	
ONORBIT: 3/3 AOA: 3/3	
DEORBIT: 3/3 ATO: 3/3	
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: PNL 016 PART NUMBER: 33V73A16	
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION	
EFFECTS/RATIONALE: NO EFFECT SINCE THE NOMINAL POSITION FOR ALL FLIGHT PHASES IS	

CLOSED.

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REFERENCES:

REPORT DATE 10/23/87 C-384

DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:1/1MDAC ID:3007ABORT:1/1			
ITEM: CB-FIRE SUPPR, BAY 1, 2, 3 (CB8, 8, 9) FAILURE MODE: OPEN (ELECTRICAL)			
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) POWER 4) CIRCUIT BREAKER CB8 (MNB), CB8 (MNC), CB9 (MNA) 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:2/1RRTLS:1/1LIFTOFF:1/1TAL:1/1ONORBIT:2/1RAOA:1/1DEORBIT:1/1ATO:1/1LANDING/SAFING:2/1RADA:1/1			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: PANEL 015, 016, 014 PART NUMBER: 33V73A14, A15, A16			
CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, VIBRATION			
EFFECTS/RATIONALE: FAILURE OF A CIRCUIT BREAKER RESULTS IN THE LOSS OF THE CAPABILITY TO DISPENSE THE SUPPRESANT FROM THE PERMANENTLY MOUNTED BOTTLE IN THE ASSOCIATED AVIONICS BAY. IN THE PRELAUNCH, ON ORBIT, AND LANDING/SAFING PHASES BACKUP PORTABLE FIRE EXTINGUISHERS ARE AVAILABLE FOR USE TO EXTINGUISH THE FIRE. IN ALL OTHER PHASES, CREW MOVEMENT IS RESTRICTED THEREFORE THE PORTABLE EXTINGUISHERS ARE INACCESSIBLE, AND THERE IS A POTENTIAL FOR LOSS OF LIFE/VEHICLE.			
REFERENCES:			

REFERENCES:

REPORT DATE 10/23/87

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DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3008 ITEM: CB-FIRE SUPPR BAY 1,	ABORT: 3/3		
FAILURE MODE: FAILS TO OPEN			
LEAD ANALYST: J.D. ARBET SUBS	YS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) POWER 4) CIRCUIT BREAKER CB8 (MNB), CB8 (MNC), CB9 (MNA) 5) 6) 7) 8) 9)			
CRITICAL	ITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3		
REDUNDANCY SCREENS: A []	в́[] С[]		
LOCATION: PANEL 015, 016, 014 PART NUMBER: 33V73A14, A15, A16			
CAUSES: CONTAMINATION, MECHANICAL S	SHOCK, PIECE-PART FAILURE,		
EFFECTS/RATIONALE: NO EFFECT SINCE THE NOMINAL POSITION CLOSED.	I FOR ALL FLIGHT PHASES IS		

REFERENCES:

REPORT DATE 10/23/87

DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3009	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: RESISTOR-A2R FAILURE MODE: OPEN (ELECTR	1, A2R2, A2R3 (5.1K) (ICAL)
LEAD ANALYST: J.D. ARBET	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) POWER 4) FIRE SUPPRESSION-ANNUN 5) RESISTOR-ISOLATION (AG 6) 7) 8) 9)	CIATION ENT DISCH LT)
	CRITICALITIES
FLIGHT PHASE HDW/F	TUNC ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: 3/3	$\begin{array}{ccc} RTLS: & 3/3 \\ TAL: & 3/3 \\ AOA: & 3/3 \\ \end{array}$
ONORBIT: 3/3	RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [] B[] C[]
LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1 CAUSES: MECHANICAL SHOCK.	OVERLOAD, TEMPERATURE, VIBRATION
FAILURE RESULTS IN THE INAE AGENT DISCH LIGHT DURING AN	ON SYSTEM, ALL SENSORS WORK NOMINALLY. BILITY TO ILLUMINATE THE ASSOCIATED ACTUAL ACTIVATION (SUPPRESSANT ST. DISCHARGE OF THE SUPPRESSANT
REFERENCES:	

REPORT DATE 10/23/87

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DATE: 7/10/87 D SUBSYSTEM: LIFE SUPPORT MDAC ID: 3010	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: RESISTOR-A2R1, A2R2, FAILURE MODE: SHORTED	A2R3 (5.1K)
LEAD ANALYST: J.D. ARBET SUBSY:	S LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) POWER 4) FIRE SUPPRESSION-ANNUNCIATION 5) RESISTOR-ISOLATION (AGENT DISCH 6) 7) 8) 9)	LT)
CRITICALI	FIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 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 [] B	[] C[]
LOCATION: PNL L1A1	
PART NUMBER: 31V73A1A1	

CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

DISCHARGE LIGHT FAILS TO OPERATE DURING AN ACTUAL ACTIVATION (FIRE SUPPRESSANT IS DISCHARGED). IN ADDITION, THE CIRCUIT BREAKER WILL OPEN DUE TO THE OVERCURRENT CONDITION (SEE MDAC ID 3001, 3003, 3005 FOR THE EFFECTS OF THE OPEN CIRCUIT BREAKER).

REFERENCES:

DATE: 7/10/87 HIGHEST CRITICALITY HDW/FU SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/2 MDAC ID: 3011 ABORT: /NA	JNC A
ITEM: SW-SMOKE DETECTION SENSOR RESET (S7) FAILURE MODE: PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL), FAI TO SWITCH, JAMMED IN MAINTAINED POSITION	ILS
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) RESET 4) SWITCH 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC	
PRELAUNCH: /NA RTLS: /NA LIFTOFF: /NA TAL: /NA	-
LIFTOFF:/NATAL:/NAONORBIT:2/2AOA:/NA	
ONORBIT: 2/2 AOA: /NA	
DEORBIT: /NA ATO: /NA	
LANDING/SAFING: /NA AIO. /NA	
LANDING/SAFING: /NA	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1	
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION	
EFFECTS/RATIONALE:	
	,
LOSS OF SMOKE DETECTOR RESET CAPABILITY FOR ANY SENSOR THAT HAS	,
BEEN TRIGGERED (L+3HR). THIS RESULTS IN THE LOSS OF THE SENSOR	ł
CAPABILITY TO ANNUNCIATE A FIRE. THIS MEANS REDUNDANT	
ANNUNCIATION IS LOST, BUT THE SMOKE CONCENTRATION INDICATION IS	;
STILL	
AVAILABLE FROM EACH SENSOR. ONE CONTACT FAILING TO CLOSE IS A	
	,
SUBSET WHICH RESULTS IN THE LOSS OF TWO (2), THREE (3), OR FOUR	`~-
(4) SENSORS. THE CONCENTRATION PARAMETER IS A FAULT DETECTION	OF
ANNUNCIATION (FDA) ITEM. IF POSSIBLE, THE CALCULATION OF THE	
RATE OF CHANGE SHOULD ALSO BE DEVELOPED AND INCLUDED IN THE FDA	۱.
REFERENCES:	

REPORT DATE 10/23/87 C-389

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DATE: SUBSYSTEM: LI MDAC ID: 30	IFE SUPPORT	HIGHEST CRITICALI FLIGHT: ABORT:	2/2
	SW-SMOKE DETECTION SHORTED, ONE CONTAC		ER CLOSURE
LEAD ANALYST:	J.D. ARBET SUB	SYS LEAD: M.J. SAII	DI
BREAKDOWN HIEN 1) LIFE SUPN 2) SMOKE DET 3) RESET 4) SWITCH 5) 6) 7) 8) 9)	PORT SYSTEM	• • • • • • • • • • • • • • • • • • •	
	CRITICA	LITIES	

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	2/2	RTLS:	3/3	
LIFTOFF:	3/3	TAL:	3/3-	
ONORBIT:	2/2	AOA:	3/3	
DEORBIT:	3/3	ATO:	3/3	
LANDING/SAFIN	G: 3/3			

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

PROVIDES A CONTINUOUS RESET SIGNAL TO TWO (2), THREE (3), OR FOUR (4) SMOKE DETECTORS, DISABLING THE SENSORS CAPABILITY TO ANNUNCIATE A FIRE. THIS MEAN SOME REDUNDANT ANNUNCIATION IS LOST, BUT THE SMOKE CONCENTRATION INDICATION IS STILL AVAILABLE FROM EACH SENSOR THROUGH THE FDA AND CRT'S. IF POSSIBLE, THE CALCULATION OF THE RATE OF CHANGE SHOULD ALSO BE DEVELOPED AND INCLUDED IN THE FDA.

REFERENCES:

DATE: 7/10/87 SUBSYSTEM: LIFE SUPF MDAC ID: 3013	ORT	HIGHEST C	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: SW-SMC FAILURE MODE: SHORTE	KE DETECTION C D, FAILS TO SW	IRCUIT TES ITCH, JAMM	ST (S8) IED IN OFF P	OSITION
LEAD ANALYST: J.D. AR	BET SUBS	YS LEAD: M	I.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) TEST FUNCTION 4) FIRE SUPPRESSION-ANNUNCIATION 5) SWITCH 6) 7) 8) 9)				
	CRITICAL	ITIES		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUN	С
PRELAUNCH:	3/3 3/3 3/3 3/3	RTLS		
LIFTOFF:	3/3	TAL:		
ONORBIT:	3/3	AOA:		
DEORBIT: LANDING/SAFING	3/3	ATO:	3/3	
REDUNDANCY SCREENS:	A []	в[]	c []	
LOCATION: PNL L1A PART NUMBER: 31V73A1	_			
CAUSES: CONTAMINATIO VIBRATION	N, MECHANICAL	SHOCK, PIE	CE-PART FAI	LURE,

EFFECTS/RATIONALE:

LOSS OF SMOKE DETECTOR TEST CAPABILITY. NOMINALLY ONE IS PERFORMED AT L+3H TO PROVIDE EMERGENCY SYSTEM CONFIDENCE IN THE SENSOR ELECTRONICS. LOSS OF CAPABILITY TO CHECKOUT AGENT DISCH LIGHTS. IN CASE OF A FIRE THE AGENT DISCH FUNCTION IS UNAFFECTED.

REFERENCES:

REPORT DATE 10/23/87

DATE:	7/10/87	HIGHEST CRITICALII	Y HDW/FUNC
SUBSYSTEM:	LIFE SUPPORT	FLIGHT:	2/2
MDAC ID:	3014	ABORT:	3/3
ITEM:	SW-SMOKE DETECTI	ON CIRCUIT TEST (S8)	

FAILURE MODE: PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, SHORTED, FAILED IN A OR B POSITION ONE CONTACT OR ALL

LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:

- 1) LIFE SUPPORT SYSTEM
- 2) SMOKE DETECTION
- 3) TEST FUNCTION
- 4) FIRE SUPPRESSION-ANNUNCIATION
- 5) SWITCH (S8)
- 6)
- 7)
- 8)
- 9)

	CRITICA		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFIN	G: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

LOSS OF ONE LEG OF S/F LEG OF REDUNDANCY. FOUR (4) OR FIVE (5) SENSOR (POSITION B OR A) ARE MAINTAINED IN A TEST CONDITION AND ANY ALARM SIGNAL WILL NOT TRIGGER THE MASTER ALARM OR SIREN. SMOKE CONCENTRATION LEVELS ARE STILL AVAILABLE FOR ALL SENSORS. THE AGENT DISCH LTS WILL BE ILLUMINATED AND THEREFORE WILL NOT PROVIDE AN INDICATION OF SUPPRESSANT DISCHARGE IF COMMANDED.

REFERENCES:

DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3015	HIGHEST	CRITICALITY FLIGHT: ABORT:	
ITEM: FIRE SUPPRESSANT FAILURE MODE: FAILS TO OUTPUT	PRESSURE SEI	ISOR	
LEAD ANALYST: J.D. ARBET S	UBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) ANNUNCIATION 4) FIRE SUPPRESSANT ASSEMBLY 5) PRESSURE SENSOR 6) 7) 8) 9)			
CRITI	CALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT RTI TAI AOA ATC	HDW/FUN LS: 3/3 L: 3/3 A: 3/3 D: 3/3	C
REDUNDANCY SCREENS: A []	B[]	С[]	1
LOCATION: AVIONICS BAY 1, 2, PART NUMBER: CAUSES: CONTAMINATION, MECHANIC VIBRATION			
EFFECTS/RATIONALE: RESULTS IN NO AGENT DISCH LIGHT BOTTLE. THE DETECTOR CONCENTRAT PROVIDE INSIGHT TO AGENT DISCHAR	ION LEVEL AN		
AFFECTED BAY.			
REFERENCES:			
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REPORT DATE 10/23/87

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SUBSYSTEM:LIFE SUPPORTMDAC ID:3016ITEM:FIRE SUPPRESSANT PRES	
FAILURE MODE: PREMATURE OPERATION,	ERRONEOUS OUTPUT
LEAD ANALYST: J.D. ARBET SUBS	YS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) ANNUNCIATION 4) FIRE SUPPRESSANT ASSEMBLY 5) PRESSURE SENSOR 6) 7) 8) 9)	
CRITICAL	TTTES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	RTLS: 3/3 TAL: 3/3 AOA: 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 []	B[] C[]
LOCATION: AVIONICS BAY 1, 2, ANI PART NUMBER:) 3; AREA 81, 82, AND 83
CAUSES: CONTAMINATION, MECHANICAL S	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE: PROVIDES A FALSE INDICATION OF FIRE VERIFICATION OF FALSE INDICATION, A DISCHARGE THE BOTTLE COULD BE MONITO VOLTAGE, CONCENTRATION LEVEL CHANGES	SUBSEQUENT REQUIREMENT TO DRED VIA OTHER MEANS (PIC CAP
REFERENCES:	

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DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:3017ABORT:3/3	2
ITEM: DIODE-A4CR1, A4CR2, A4CR3 FAILURE MODE: OPEN (ELECTRICAL)	
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) RESET 4) DIODE-ISOLATION (PRE FLT BUS RESET) 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1	
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION	
EFFECTS/RATIONALE: LOSS OF SMOKE DETECTOR RESET CAPABILITY FOR TWO (2), THREE (3), OR FOUR (4) SENSORS (A4CR2, CR3, OR CR1), IF THEY HAVE BEEN TRIGGERED. THIS RESULTS IN THE LOSS OF THE SENSOR CAPABILITY TO ANNUNCIATE A FIRE. THIS CASE CAN EXIST AFTER A TEST IS PERFORMED (L+3HR) AND REDUNDANT ANNUNCIATION IS LOST. SMOKE CONCENTRATION IS STILL AVAILABLE AS AN OUTPUT TO THE FDA AND CRT'S. MISSION TERMINATION SHOULD BE CONSIDERED BECAUSE THE NEXT FAILURE HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE DUE TO THE INABILITY TO ANNUNCIATE AN INCIPIENT FIRE. REFERENCES:	C

REPORT DATE 10/23/87

C-395

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DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3018ABORT:3/3		
ITEM: DIODE-A4CR1, A4CR2, A4CR3 FAILURE MODE: SHORTED		
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) RESET 4) DIODE-ISOLATION (PRE FLT BUS RESET) 5) 6) 7) 8) 9)		
CRITICALITIES		
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3		
PRELAUNCH: 3/3 RTLS: 3/3		
LIFTOFF: $3/3$ TAL: $3/3$		
$\frac{1}{1}$		
LANDING/SAFING: 3/3		
REDUNDANCY SCREENS: A [] B [] C []		
LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1		
CAUSES: MECHANICAL SHOCK, TEMPERATURE, OVERLOAD, VIBRATION		
EFFECTS/RATIONALE: NO EFFECT, ISOLATION OF THE THREE SMOKE DETECTOR RESET CIRCUITS IS MAINTAINED.		
REFERENCES:		

REPORT DATE 10/23/87

DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3019	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: DIODE-A3CR1, A3CR2, FAILURE MODE: OPEN (ELECTRICAL)	A3CR3
LEAD ANALYST: J.D. ARBET SUBS	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) PRE FIT BUS RESET 4) DIODE-ISOLATION (ONBOARD RESET 5) 6) 7) 8) 9)	?)
CRITICAL	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1	
CAUSES: MECHANICAL SHOCK, TEMPERAT	URE, OVERLOAD, VIBRATION
EFFECTS/RATIONALE: NO EFFECT, ISOLATION OF THE THREE S IS MAINTAINED. SUBSEQUENT ATTEMPTS BUS DURING VEHICLE TURNAROUND WILL	5 TO RESET FROM THE PREFLIGHT
REFERENCES:	
REPORT DATE 10/23/87 C-3	97

DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3020ABORT:3/3ITEM:DIODE-A3CR1, A3CR2, A3CR3
FAILURE MODE: SHORTED
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) PRE FIT BUS RESET 4) DIODE-ISOLATION (ONBOARD RESET) 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
LIFTOFF: 3/3 TAL: 3/3
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
ONORBIT: 3/3 AOA: 3/3 DEORBIT: 3/3 ATO: 3/3
LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [] B [] C [] LOCATION: PNL L1A1
PART NUMBER: 31V73A1A1
CAUSES: MECHANICAL SHOCK, TEMPERATURE, OVERLOAD, VIBRATION
EFFECTS/RATIONALE: NO EFFECT, IF THE RESET SWITCH IS CLOSED A MOMENTARY CONNECTION OF MAIN BUSES OCCURS BUT EACH CIRCUIT HAS A THREE (3) AMP CIRCUIT BREAKER TO PROTECT THE BUSES IF A SHORT TO GROUND EXISTS.

REFERENCES:

REPORT DATE 10/23/87

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DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3021ABORT:3/3
ITEM: RESISTOR-A1R12 FAILURE MODE: OPEN (ELECTRICAL)
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) TEST POWER 4) DIODE-ISOLATION (CNTL BC3 CURRENT LIMIT) 5) 6) 7) 8) 9)
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CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3
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 [] B [] C []
LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1
CAUSES: MECHANICAL SHOCK, TEMPERATURE, OVERLOAD, VIBRATION
EFFECTS/RATIONALE: LOSS OF SMOKE DETECTOR TEST CAPABILITY, NO OTHER IMPACT. NOMINALLY A TEST IS PERFORMED AT L+3H TO PROVIDE EMERGENCY SYSTEM CONFIDENCE IN THE SENSOR ELECTRONICS. ACTUAL CAPABILITY FOR SMOKE DETECTION AND FIRE SUPPRESSION IS NOT AFFECTED.
REFERENCES:

REPORT DATE 10/23/87

DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3022	HIGHEST CRITICALITY HDW/FUN FLIGHT: 3/3 ABORT: 3/3	NC
ITEM: RESISTOR-A1R12 FAILURE MODE: SHORTED, SHORTED TO	GROUND	
LEAD ANALYST: J.D. ARBET SUB	SYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) TEST POWER 4) DIODE-ISOLATION (CNTL BC3 CUR 5) 6) 7) 8) 9)	RENT LIMIT)	
CRITICA		
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC	
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	RTLS: 3/3 TAL: 3/3 AOA: 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 []	B[] C[]	
LOCATION: PNL L1A1 PART NUMBER: 31V73A1A1		
CAUSES: MECHANICAL SHOCK, TEMPERA	TURE, OVERLOAD, VIBRATION	
EFFECTS/RATIONALE:		

LOSS OF SMOKE DETECTOR TEST CAPABILITY, NO OTHER IMPACTS. NOMINALLY A TEST IS PERFORMED AT L+3H TO PROVIDE EMERGENCY SYSTEM CONFIDENCE IN THE SENSOR ELECTRONICS. ACTUAL CAPABILITY FOR SMOKE DETECTION AND FIRE SUPPRESSION IS NOT AFFECTED. POSSIBLE LOSS OF CNTL BC3 (SEE EPD&C FMEA).

REFERENCES:

REPORT DATE 10/23/87

DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3023ABORT:3/3			
ITEM: RESISTOR A6R2, R4, R6, R8, R10, R14, R16, R18, R20 (5.1K) FAILURE MODE: OPEN (ELECTRICAL)			
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) STATUS INDICATION 4) RESISTOR-ISOLATION (SMOKE DETN TM EXCEPT PAYLOAD) 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: PNL L1A1 PART NUMBER:			
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION			
EFFECTS/RATIONALE:			

EFFECTS/RATIONALE: LOSS OF SMOKE DETECTOR TELEMETRY ALARM DISCRETE SIGNAL. THE ONBOARD SYSTEM IS UNAFFECTED AND ANNUNCIATES NORMALLY ANY FIRE SITUATION.

REFERENCES:

REPORT DATE 10/23/87

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DATE: SUBSYSTEM: MDAC ID:	7/10/87 LIFE SUPPORT 3024		HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/1R 3/1R
ITEM: (5.1K) FAILURE MOD	RESISTOR . E: SHORTED,			R14, R16, R18	3, R20
LEAD ANALYS	T: J.D. ARBET	SUI	BSYS LEAD:	M.J. SAIIDI	
2) SMOKE 3) STATUS	IERARCHY: UPPORT SYSTEM DETECTION INDICATION OR-ISOLATION		IN TM EXCE	PT PAYLOAD)	
		CRITICA	LITIES		
FLIGHT PREL LIFT ONOR DEOR LAND	PHASE HD AUNCH: OFF: BIT: BIT: ING/SAFING:	W/FUNC 3/1R 3/1R 3/1R 3/1R 3/1R 3/1R	ABORT RT TA AO AT	HDW/FUN LS: 3/1R L: 3/1R A: 3/1R O: 3/1R	-
REDUNDANCY	SCREENS: A	[2]	B [P]	С[Р]	
LOCATION: PART NUMBER					
					77017

CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THE GROUNDED RESISTOR WILL DRAW HIGH CURRENTS NOT ALLOWING THE C&W TO ALARM DURING AN INCIPIENT FIRE. THIS RENDERS ONE LEG OF REDUNDANCY INOPERABLE. THE SMOKE CONCENTRATION FDA WILL OPERATE AND THE REDUNDANT SMOKE DETECTOR WORKS. HOWEVER, LOSS OF LIKE AND UNLIKE REDUNDANCIES HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE.

REFERENCES:

DATE:9/22/87HIGHEST CRITICALITY HDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/1RMDAC ID:3025ABORT:2/1R
ITEM: RESISTOR A6R2 (CABIN) FAILURE MODE: SHORTED, SHORTED TO GROUND
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) STATUS INDICATION 4) RESISTOR-ISOLATION (CABIN SMOKE DETECTOR) 5) 6) 7) 8) 9)
CRITICALITIES
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 [2] B [P] C [P]
LOCATION: PNL L1A1 PART NUMBER:
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION
EFFECTS/RATIONALE: LOSS OF CABIN SMOKE DETECTOR C&W. THE FLIGHT DECK DETECTORS HAVE ONLY THE SMOKE CONCENTRATION FDA TO ALERT THEM OF AN INCIPIENT FIRE. LOSS OF REDUNDANCY (UNLIKE) HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE.
REFERENCES:

DATE: 7/10/87 HIGHEST CRITICALITY HDW/FUNC 3/3 SUBSYSTEM: LIFE SUPPORT FLIGHT: ABORT: 3/3 MDAC ID: 3026 RESISTOR A6R1, R3, R5, R7, R9, R13, R15, R17, R19 ITEM: (12K)FAILURE MODE: OPEN (ELECTRICAL), SHORTED, SHORTED TO GROUND LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: LIFE SUPPORT SYSTEM 1) 2) SMOKE DETECTION 3) STATUS INDICATION 4) RESISTOR-ISOLATION (CABIN SMOKE DETECTOR) 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 3/3 **ONORBIT:** AOA: 3/3 DEORBIT: ATO: 3/3 3/3 LANDING/SAFING: 3/3 A [] B [] C [] **REDUNDANCY SCREENS:** LOCATION: PNL L1A1 PART NUMBER: CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION EFFECTS/RATIONALE: THE TELEMETRY ALARM DISCRETE SIGNAL IS EITHER LOST OR BIASED. THE ONBOARD SYSTEM IS UNAFFECTED AND REACTS NORMALLY TO ANY FIRE SITUATION. **REFERENCES:**

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DATE: SUBSYSTEM: MDAC ID:		RT	HIGHEST CI	RITICALITY H FLIGHT: ABORT:	3/1R
ITEM: (1.2K) FAILURE MOD			R3, R4, R5,	R8, R9, R10,	R11
LEAD ANALYS	T: J.D. ARB	et sue	SYS LEAD: M	.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) SIREN INPUT 4) RESISTOR-ISOLATION (SMOKE DETN SIREN) 5) 6) 7) 8) 9)					
		CRITICA	LITTES		
LIFT ONOR DEOR	PHASE AUNCH: OFF: BIT: BIT: ING/SAFING:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R 3/1R	ABORT RTLS TAL:	HDW/FUNC 3/1R 3/1R 3/1R 3/1R 3/1R	•
REDUNDANCY	SCREENS:	A [2]	B [P]	C [P]	
LOCATION: PART NUMBER	PNL L1A1				

CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

LOSS OF ONE SMOKE DETECTOR MASTER ALARM/SIREN INDICATION. THE REDUNDANT STATUS LIGHT INDICATION WILL STILL ILLUMINATE. SMOKE CONCENTRATION ALARM, TELEMETRY INDICATION, AND CABIN DISPLAY ARE STILL AVAILABLE. LOSS OF FUNCTION HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE.

REFERENCES:

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REPORT DATE 10/23/87

SUBSYSTEM: LIFE SUPPORT FL	ICALITY HDW/FUNC IGHT: 3/1R ORT: 3/1R
ITEM: FAILURE MODE: RESISTOR A1R2, R3, R4, R5, R8, R9 SHORTED, SHORTED TO GROUND	, R10, R11 (1.2K)
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J.	SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) SIREN INPUT 4) RESISTOR-ISOLATION (SMOKE DETN SIREN) 5) 6) 7) 8) 9)	- · · · · ·
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTPRELAUNCH:3/1RRTLS:	
REDUNDANCY SCREENS: A [2] B [P] O	С[Р]
LOCATION: PNL L1A1 PART NUMBER:	

CAUSES: MECHANICAL SHOCK, OVERLOAD, VIBRATION

EFFECTS/RATIONALE:

THE GROUNDED RESISTOR WILL DRAW A HIGH CURRENT NOT ALLOWING STATUS LIGHT INDICATION OR THE C&W TO ALARM DURING AN INCIPIENT FIRE. THIS RENDERS ONE LEG OF REDUNDANCY INOPERABLE. THE SMOKE CONCENTRATION FDA WILL OPERATE AND THE REDUNDANT SMOKE DETECTOR WORKS. HOWEVER, LOSS OF LIKE AND UNLIKE REDUNDANCIES HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE.

REFERENCES:

DATE: 9/22/87 SUBSYSTEM: LIFE SUPPO MDAC ID: 3029	H	IGHEST CRIT FL AB	ICALITY H IGHT: ORT:	
ITEM: RESISTO FAILURE MODE: SHORTED		OUND		
LEAD ANALYST: R.E. DUF	FY SUBSYS	LEAD: M.J.	SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYST 2) SMOKE DETECTION 3) SIREN INPUT 4) RESISTOR-CABIN C& 5) 6) 7) 8) 9)				
	CRITICALIT	IES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	HDW/FUNC 2/1R 2/1R 2/1R 2/1R 2/1R	ABORT RTLS: TAL: AOA: ATO:	2/1R 2/1R 2/1R	
REDUNDANCY SCREENS:	A[2] B	[P]	С[Р]	
LOCATION: PNL L1A1 PART NUMBER:				
CAUSES: MECHANICAL SH	OCK, VIBRATION			

EFFECTS/RATIONALE: LOSS OF CABIN SMOKE DETECTOR C&W. THE FLIGHT DECK DETECTORS HAVE ONLY THE SMOKE CONCENTRATION FDA TO ALERT THEM OF AN INCIPIENT FIRE. LOSS OF REDUNDANCY (UNLIKE) HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE.

REFERENCES:

REPORT DATE 10/23/87

DATE: 7/10/87 SUBSYSTEM: LIFE SUP MDAC ID: 3030	7 PORT		TICALITY LIGHT: BORT:	HDW/FUNC 3/1R 3/1R
ITEM: DIODE FAILURE MODE: OPEN	A1CR1, 2, 3, ((ELECTRICAL)	4, 5, 6, 7, 8	, 9, 10, 1	1
LEAD ANALYST: J.D. AN	RBET SUB	SYS LEAD: M.J	. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) SIREN INPUT 4) DIODE-ISOLATION (SMOKE DETN SIREN) 5) 6) 7) 8) 9)				
	CRITICAL	LITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC 3/1R 3/1R 3/1R 3/1R 3/1R	ABORT RTLS : TAL :	3/1R 3/1R 3/1R	
REDUNDANCY SCREENS:	A [2]	B [P]	С[Р]	
LOCATION: PNL LIA	1			

PART NUMBER:

CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

LOSS OF ONE SMOKE DETECTOR MASTER ALARM/SIREN INDICATION. THE ASSOCIATED STATUS LIGHT INDICATION WILL STILL ILLUMINATE AND THE SENSOR CONCENTRATION PARAMETER IS AVAILABLE. LOSS OF FUNCTION HAS THE POTENTIAL FOR LOSS OF LIFE.

REFERENCES:

REPORT DATE 10/23/87

DATE: 7/10/87 HIGHEST CRITICALITY HDW/ SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/ MDAC ID: 3031 ABORT: 3/	3			
ITEM: DIODE A1CR1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 FAILURE MODE: SHORTED				
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) SIREN INPUT 4) DIODE-ISOLATION (SMOKE DETN SIREN) 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 [] B [] C []				
LOCATION: PNL L1A1 PART NUMBER:				
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION				
EFFECTS/RATIONALE: GROUNDED DIODE HAS NO EFFECT. THE ALARM WILL WORK IF A SIGNA SENT.	L IS			
REFERENCES:				

REPORT DATE 10/23/87

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DATE: 9/22/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3032	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: 3/1R
ITEM: DIODE A1CR1, 2 FAILURE MODE: SHORTED TO GRO	, 3, 4, 5, 8, 9, 10, 11 UND
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) STATUS INDICATION 4) DIODE-ISOLATION 5) 6) 7) 8) 9)	
CR	ITICALITIES
FLIGHT PHASE HDW/FUN	
PRELAUNCH: 3/1R	RTLS: 3/1R
LIFTOFF: 3/1R	
ONORBIT: 3/1R	AOA: 3/1R
DEORBIT: 3/1R	ATO: 3/1R
LANDING/SAFING: 3/1R	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION:	

PART NUMBER:

CAUSES: MECHANICAL SHOCK, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

SIREN AND LIGHTS WILL NOT WORK FOR FAILED DIODE SEGMENT OR ANY OTHER SEGMENT IN SERIES WITH THIS ONE (A1CR1, 2, 3, 4, 5, 6 WITH TONE A, AND A1CR7, 8, 9, 10, 11 WITH TONE B). REDUNDANT SENSORS ARE ANNUNCIATED WITH DIFFERENT TONES. LOSS OF FUNCTION MAY LEAD TO LOSS OF LIFE.

REFERENCES:

DATE: 7/10/87 HIGHEST CRITICALITY SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 3033 ABORT: ITEM: RESISTOR A6R11, R12 (1.2K) FAILURE MODE: OPEN (ELECTRICAL)	HDW/FUNC 3/3 3/3				
TEAD ANALYSTS TO APPET SUBSYS LEADS M.T. SATIDI					
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) LIGHT INPUT 4) RESISTOR-ISOLATION (SMOKE DETN LT-PAYLOAD) 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	•				
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 [] B [] C []					
LOCATION: PANEL LIA1 PART NUMBER: 31V73A1A1					
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION					
EFFECTS/RATIONALE: LOSS OF REDUNDANT SIGNAL TO ILLUMINATE THE PAYLOAD LIGHT (PNL L1A1). THE MASTER ALARM/SIREN INDICATION IS UNAFFECTED AND THE REDUNDANT SIGNAL SHOULD ILLUMINATE THE LIGHT. THE PANEL R7 LIGHT AND TELEMETRY SIGNAL ARE UNAFFECTED.					

REFERENCES:

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REPORT DATE 10/23/87

DATE:7/10/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/1RMDAC ID:3034ABORT:2/1R				
ITEM: RESISTOR A6R11, R12 (1.2K) FAILURE MODE: SHORTED				
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) LIGHT INPUT 4) RESISTOR-ISOLATION (SMOKE DETN LIGHT-PAYLOAD) 5) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/1RRTLS:3/1RLIFTOFF:3/1RTAL:3/1RONORBIT:3/1RAOA:3/1RDEORBIT:3/1RATO:3/1RLANDING/SAFING:3/1RATO:3/1R				
REDUNDANCY SCREENS: A [2] B [P] C [P]				
LOCATION: PART NUMBER: 31V73A1A1				
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION				
EFFECTS/RATIONALE: LOSS OF REDUNDANT SIGNAL TO ACTIVATE THE MASTER ALARM AND SIREN CIRCUITS AND TO ILLUMINATE THE PAYLOAD LIGHT. IF EITHER AGR11 OR AGR12 SHORT, THE MOST PROBABLE EFFECT WILL BE THE LOSS OF THE AMPLIFIER 30V73A17 IN ACA NO. 2 AND LOSS OF PAYLOAD ANNUNCIATION IN THE CABIN PANEL (L1A1). LOSS OF LIKE AND UNLIKE REDUNDANCY HAS THE POTENTIAL FOR LOSS OF LIFE.				
REFERENCES:				

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DATE: 9/22/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3035	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: 3/1R
ITEM: RESISTOR A6R11, R12 FAILURE MODE: SHORT TO GROUND	(1.2K)
LEAD ANALYST: R.E. DUFFY SUE	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) LIGHT INPUT 4) RESISTOR 5) 6) 7) 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/1R LIFTOFF: 3/1R	ABORT HDW/FUNC
PRELAUNCH: 3/1R	RTLS: 3/1R TAL: 3/1R AOA: 3/1R
LIFTOFF: 3/1R	TAL: 3/1R
ONORBIT: 3/1R DEORBIT: 3/1R	AOA: 3/1R ATO: 3/1R
LANDING/SAFING: 3/1R	ATO: 3/1R
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: PART NUMBER: CAUSES: MECHANICAL SHOCK, VIBRATI EFFECTS/RATIONALE: NO INDICATION OF FIRE WILL OCCUR. DRAIN THE SYSTEM WHICH IS ACTIVATE REDUNDANT SIGNAL (DIFFERENT LEG) W LOSS OF FUNCTION HAS THE POTENTIAL	THE GROUNDED RESISTOR WILL D BY THE SMOKE ALARM. ILL ACTIVATE THE FIRE ALARM.
REFERENCES:	·
REPORT DATE 10/23/87 C-	413

DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3036	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: 3/1R			
ITEM: DIODE A6CR1, CR2 FAILURE MODE: OPEN (ELECTRICAL)				
LEAD ANALYST: J.D. ARBET SUBSY	S LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) LIGHT INPUT 4) DIODE-ISOLATION (SMOKE DETN LIG 5) 6) 7) 8) 9)	HT-PAYLOAD)			
CRITICALI	TIES			
	ABORT HDW/FUNC RTLS: 3/1R TAL: 3/1R AOA: 3/1R ATO: 3/1R			
REDUNDANCY SCREENS: A [2] B	[P] C[P]			
LOCATION: PART NUMBER:				
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION				

EFFECTS/RATIONALE:

LOSS OF REDUNDANT SIGNAL TO ILLUMINATE THE PAYLOAD LIGHT (PNL L1A1). THE MASTER ALARM/SIREN INDICATION IS UNAFFECTED AND THE REDUNDANT SIGNAL SHOULD ILLUMINATE. LOSS OF LIKE AND UNLIKE REDUNDANCY HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE.

REFERENCES:

DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3037	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3			
ITEM: DIODE A6CR1, CR2 FAILURE MODE: SHORTED				
LEAD ANALYST: J.D. ARBET SUBSY	YS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) LIGHT INPUT 4) DIODE-ISOLATION (SMOKE DETN LIGHT-PAYLOAD) 5) 6) 7) 8) 9)				
CRITICAL	ITIES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3			
REDUNDANCY SCREENS: A []]	B[] C[]			
LOCATION: PART NUMBER:				
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION				
EFFECTS/RATIONALE: NO EFFECT CIRCUIT OPERATES AS IF NO FAILURE EXISTS. CIRCUIT A/B				

ISOLATION IS LOST.

REFERENCES:

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REPORT DATE 10/23/87

DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3038	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: RESISTOR A1R6, R7 (1 FAILURE MODE: OPEN (ELECTRICAL)	2K)		
LEAD ANALYST: J.D. ARBET SUBS	YS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) ALARM INPUT 4) RESISTOR-BLEED (SMOKE DETN LIG 5) 6) 7) 8) 9)	HT AND SI	IREN PAYLOAD)	· · · · · · · · · · · · · · · · · · ·
CRITICAL	ITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT RTI TAI AOZ ATC	HDW/FUN LS: 3/3 L: 3/3 A: 3/3 D: 3/3	IC
REDUNDANCY SCREENS: A []	B []	с[]	
LOCATION: PNL L1A1 PART NUMBER:			
CAUSES: MECHANICAL SHOCK, OVERLOAD	, TEMPERA	ATURE, VIBRAI	NON
EFFECTS/RATIONALE: NO MAJOR EFFECT. THE RESISTOR IS U SIGNALS TO ZERO WHEN THE SENSORS AR POSSIBILITIES COULD EXIST FOR NUISA	SED TO HO E NOT INI	OLD SMALL VOI DICATING FIRE	TAGE
REFERENCES:			

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DATE:7/10/87HIGHEST CRITICALITYHDW/FUSUBSYSTEM:LIFE SUPPORTFLIGHT:3/1RMDAC ID:3039ABORT:3/1R	
ITEM: RESISTOR A1R6, R7 (12K) FAILURE MODE: SHORTED, SHORTED TO GROUND	
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) ALARM INPUT 4) RESISTOR-BLEED (SMOKE DETN LIGHT AND SIREN PAYLOAD) 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	
PRELAUNCH:3/1RRTLS:3/1RLIFTOFF:3/1RTAL:3/1RONORBIT:3/1RAOA:3/1RDEORBIT:3/1RATO:3/1RLANDING/SAFING:3/1RATO:3/1R	
REDUNDANCY SCREENS: A [2] B [P] C [P]	
LOCATION: PNL L1A1 PART NUMBER:	
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION	
EFFECTS/RATIONALE: NO INDICATION OF FIRE WILL OCCUR. THE GROUNDED RESISTOR WILL DRAIN THE SYSTEM WHICH IS ACTIVATED BY THE SMOKE ALARM. THE REDUNDANT SIGNAL (DIFFERENT LEG) WILL ACTIVATE THE FIRE ALARM. LOSS OF FUNCTION MAY LEAD TO A FIRE WITH A POTENTIAL FOR LOSS O LIFE.	F
REFERENCES:	

REPORT DATE 10/23/87

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DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3040	HIGHEST	T CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: ANNUNCIATOR (FAILURE MODE: OPEN (ELECTR)			
LEAD ANALYST: J.D. ARBET	SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) ACA 4) LAMP DRIVER (SMOKE DETE 5) 6) 7) 8) 9)	N LTS)		
	CRITICALITIES		
FLIGHT PHASE HDW/FT PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	JNC ABORT RT TA AC	HDW/FUN TLS: 3/3 AL: 3/3 DA: 3/3 TO: 3/3	
LANDING/SAFING: 3/3	A'I	10: 3/3	
REDUNDANCY SCREENS: A [] ^B []	c []	
LOCATION: AREA 30 PART NUMBER: 36V73A16, 17			
CAUSES: CONTAMINATION, MECH VIBRATION	HANICAL SHOCK, C	VERLOAD, TEMP	ERATURE,
EFFECTS/RATIONALE: LOSS OF FIRE SENSOR LIGHT IN OUTPUT CAN BE VERIFIED BY MO READOUTS ON THE CRT DISPLAY	ONITORING THE CO		

REFERENCES:

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REPORT DATE 10/23/87

MDAC ID: 3041	HIGHEST ORT ATOR CONTROL ASSEMBLY JRE OPERATION	ABORT: 3/3
LEAD ANALYST: J.D. ARI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYST 2) SMOKE DETECTION 3) ACA 4) LAMP DRIVER (SMON 5) 6) 7) 8) 9)	PEM	M.J. SAIIDI
	ODITION LITTES	
	CRITICALITIES	
FLIGHT PHASE	HDW/FUNC ABORT	HDW/FUNC
PRELAUNCH:	3/3 RTI 3/3 TAI 3/3 AOI 3/3 ATO	LS: 3/3 L: 3/3
LIFTOFF:	3/3 TAI	L: 3/3
ONORBIT:	3/3 A07	A: 3/3
	2/2 ATT	D: 3/3
DEORBIT:	3/3 AIC	
LANDING/SAFING	3/3	<u>.</u>
REDUNDANCY SCREENS:		C []
LOCATION: AREA 30		
PART NUMBER: 36V73A1	5, 17	
CAUSES: CONTAMINATION VIBRATION EFFECTS/RATIONALE: FALSE FIRE SENSOR LIGN ACCOMPANIED WITH A TO	N, MECHANICAL SHOCK, EN AT INDICATION. LIGHT N NE AND VERIFICATION CAN TRATION PARAMETER READO	VILL NOT BE N BE OBTAINED BY

REFERENCES:

REPORT DATE 10/23/87

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DATE: 7/10/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3042	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: 3/1R
ITEM: SMOKE DETECTION FAILURE MODE: PARTIAL OUTPUT, SHORTED	LIGHT MATRIX-LAMPS OPEN (ELECTRICAL), LOSS OF OUTPUT,
LEAD ANALYST: J.D. ARBET	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) LIGHT MATRIX 4) LAMP 5) 6) 7) 8) 9)	
CRI	FICALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC RTLS: 3/1R TAL: 3/1R AOA: 3/1R ATO: 3/1R
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 [2]	B[P] C[P]
LOCATION: PNL L1A1 PART NUMBER:	
CAUSES: CONTAMINATION, MECHANI VIBRATION	ICAL SHOCK, OVERLOAD, TEMPERATURE,
	SENSOR LIGHT INDICATION. UPON AN LATE THE PROBLEM. AUDIO ALARM AND LIKE REDUNDANCY. LOSS OF ALL

FUNCTION HAS THE POTENTIAL FOR LOSS OF LIFE DUE TO REACTION TIME DELAY IN APPRAISING FIRE SITUATION.

REFERENCES:

REPORT DATE 10/23/87

DATE: 7/20/87 HI SUBSYSTEM: LIFE SUPPORT MDAC ID: 3043 ITEM: C&W ELECTRONICS UNIT SI FAILURE MODE: PREMATURE, OPERATION, E OUTPUT	ABORT: 3/1R IREN A & B
LEAD ANALYST: J.D. ARBET SUBSYS	LEAD. M.T. SATIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) C&W ELECTRONICS UNIT 4) SIREN 5) 6) 7) 8) 9)	
CRITICALITI	IES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/1R LIFTOFF: 3/1R ONORBIT: 3/1R DEORBIT: 3/1R	ABORT HDW/FUNC
PRELAUNCH: 3/1R	RTLS: 3/1R
LIFTOFF: 3/1R	RTLS: $3/1R$ TAL: $3/1R$ AOA: $3/1R$ ATO: $3/1R$
ONORBIT: 3/1R	AOA: 3/1R
DEORBIT: 3/1R	ATO: 3/1R
LANDING/SAFING: 3/1R	
REDUNDANCY SCREENS: A [2] B [[P] C[P]
LOCATION: AVIONICS BAY 3A AREA 83 PART NUMBER: 83V73A4	
CAUSES: CONTAMINATION, MECHANICAL SHO ELECTROMAGNETIC FIELDS, VIBRATION	OCK, OVERLOAD, TEMPERATURE,
EFFECTS/RATIONALE: LOSS OF EMERGENCY SYSTEM SIRE OUTPUT. SMOKE CONCENTRATION FDA ARE UNLIKE REE HAS THE POTENTIAL FOR LOSS OF LIFE DUE APPRAISING FIRE SITUATION.	OUNDANCY. LOSS OF FUNCTION

REFERENCES:

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REPORT DATE 10/23/87

DATE: SUBSYSTEM: L MDAC ID: 3	7/20/87 JIFE SUPPORT 044	H]		ITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
ITEM: (S1, 2, 3) FAILURE MODE:	SWITCH-FIRE PHYSICAL BIN	· · · · · · · · · · · · · · · · · · ·			· .
TO SWITCH		,			
LEAD ANALYST:	J.D. ARBET	SUBSYS	LEAD: M.	J. SAIIDI	
BREAKDOWN HIE 1) LIFE SUP 2) FIRE SUP 3) SWITCH 4) 5) 6) 7) 8) 9)	PORT SYSTEM				
		CRITICALITI	ES		
FLIGHT PH				HDW/FUN	2
PRELAU		R	RTLS:	· · · · · · · · · · · · · · · · · · ·	-
LIFTOF			TAL:		
ONORBI	T: 2/1	R	AOA: ATO:		
DEORBI LANDIN	G/SAFING: 2/1	R	AIO:	1/1	
REDUNDANCY SC	REENS: A [2] B [[P]	C[P]	
LOCATION: PART NUMBER:					

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF THE COMPONENT RESULTS IN THE LOSS OF THE CAPABILITY TO DISPENSE SUPPRESSANT INTO THE AVIONICS BAY. IN THE PRELAUNCH, ONORBIT, AND LANDING/SAFING PHASES REDUNDANT PORTABLE FIRE BOTTLES ARE AVAILABLE FOR USE TO EXTINGUISH A FIRE. IN THE OTHER PHASES, CREW MOVEMENT IS RESTRICTED THEREFORE THE PORTABLE EXTINGUISHERS ARE INACCESSABLE. LOSS OF REDUNDANCY HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE. <u>i - E</u>

REFERENCES:

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DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3045ABORT:3/3
ITEM: RESISTOR-NO IDENTIFIER (2.2K) FAILURE MODE: OPEN (ELECTRICAL)
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) RESISTOR-ISOLATION (SUPPRESSANT ARM TM) 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
ONORBIT: 3/3 AOA: 3/3 DEORBIT: 3/3 ATO: 3/3
LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: AVIONICS BAY-LCA 2, 3, 1/AREA 82, 83, 81 PART NUMBER: 82V76A17
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION
EFFECTS/RATIONALE:
LOSS OF TELEMETRY DISCRETE FOR ARM FUNCTION STATUS. THE ONBOARD
SYSTEM IS UNAFFECTED AND REACTS NORMALLY AND THE CAPACITOR
VOLTAGE PARAMETER PROVIDES AN INDICATION OF STATUS.
VOLING INVENTION INVITED AN INFINITION OF DIVIDUA
REFERENCES:

REPORT DATE 10/23/87

DATE: 7/20/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 3046	IGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1			
ITEM: RESISTOR-NO IDENTIFIER FAILURE MODE: SHORTED, SHORTED TO GR	(2.2K) OUND			
LEAD ANALYST: J.D. ARBET SUBSYS	LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) RESISTOR-ISOLATION (SUPPRESSANT 4) 5) 6) 7) 8) 9)	ARM TM)			
CRITICALIT	IES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: 2/1R LIFTOFF: 1/1 ONORBIT: 2/1R DEORBIT: 1/1	ABORT HDW/FUNC			
PRELAUNCH: 2/1R	$\begin{array}{ccc} \text{RTLS:} & 1/1 \\ \text{TDL} & 1/1 \end{array}$			
	$\frac{1}{1}$			
	1/1			
LANDING/SAFING: 2/1R	A10. 1/1			
REDUNDANCY SCREENS: A [2] B	[P] C[P]			
LOCATION: AVIONICS BAY-LCA 2, 3, PART NUMBER: 82V76A17	1/AREA 82, 83, 81			
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION				
EFFECTS/RATIONALE: A SHORT TO GROUND CAN RESULT IN THE LOSS OF THE CAPABILITY TO DISPENSE SUPPRESSANT INTO THE AVIONICS BAY. IN THE PRELAUNCH, ON-ORBIT, AND LANDING/SAFING PHASES REDUNDANT PORTABLE FIRE BOTTLES ARE AVAILABLE FOR USE TO SUPPRESS A FIRE. IN THE OTHER PHASES, CREW MOVEMENT IS RESTRICTED THEREFORE THE PORTABLE EXTINGUISHES ARE INACCESSABLE. HOWEVER, LAUNCH/ENTRY ARE SHORT, TRANSITIONAL FLIGHT PHASES. LOSS OF REDUNDANCY HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE.				

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REFERENCES:

DATE: 7/20 SUBSYSTEM: LIFE S MDAC ID: 3047	/87 JPPORT	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: RES FAILURE MODE: OPE	ISTOR-NO IDENTI N (ELECTRICAL),	FIER (1.8K) SHORTED		
LEAD ANALYST: J.D.	ARBET SU	BSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCH 1) LIFE SUPPORT 2) FIRE SUPPRESS 3) RESISTOR-BLEE 4) 5) 6) 7) 8) 9)	SYSTEM			
		ALITIES		
PRELAUNCH: LIFTOFF:	3/3 3/3 3/3	RTI TAI	s: 3/3 : 3/3 : 3/3	
REDUNDANCY SCREENS	: A []	В[]	c []	
LOCATION: AVIO PART NUMBER: 82V7	NICS BAY-LCA 2, 6A17	3, 1/AREA	82, 83, 81	
CAUSES: MECHANICA	L SHOCK, OVERLO	AD, TEMPERA	TURE, VIBRAT	ION
EFFECTS/RATIONALE: THE TELEMETRY ARM ONBOARD FIRE SUPPR AND THE CAPACITOR STATUS.	DISCRETE SIGNAL ESSION SYSTEM I	S UNAFFECTE	D AND REACTS	NORMALLY
REFERENCES:				

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DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:1/1MDAC ID:3048ABORT:1/1
ITEM: SWITCH-FIRE SUPPRESSION AV BAY 1, 2, 3 AGENT DISCH (S4, S5, S6) FAILURE MODE: PHYSICAL BINDING/JAMMING, OPEN (ELECTRICAL), FAILS TO SWITCH
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) SWITCH 4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:2/1RRTLS:1/1LIFTOFF:1/1TAL:1/1ONORBIT:2/1RAOA:1/1DEORBIT:1/1ATO:1/1LANDING/SAFING:2/1RATO:1/1
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: PNL L1A1 PART NUMBER:
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

EFFECTS/RATIONALE:

FAILURE OF THE COMPONENT RESULTS IN THE LOSS OF THE CAPABILITY TO DISPENSE SUPPRESSANT INTO THE AVIONICS BAY. IN THE PRELAUNCH, ONORBIT, AND LANDING/SAFING PHASES REDUNDANT PORTABLE FIRE BOTTLES ARE AVAILABLE FOR USE TO EXTINGUISH A FIRE. LOSS OF REDUNDANCY HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE. IN THE OTHER PHASES, CREW MOVEMENT IS RESTRICTED THEREFORE THE PORTABLE EXTINGUISHERS ARE INACCESSABLE.

REFERENCES:

VIBRATION

DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3049ABORT:3/3			
ITEM: LIGHT-FIRE SUPPRESSION AV BAY 1, 2, 3 AGENT DISCH (S4, S5, S6) FAILURE MODE: PREMATURE OPERATION			
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) PUSH BUTTON INDICATOR 4) LAMP 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: PART NUMBER:			
CAUSES: CONTAMINATION, MECHANICAL SHOCK, TEMPERATURE, VIBRATION			
EFFECTS/RATIONALE: LOSS OF ONE LAMP WITHIN A AGENT DISCH LIGHT INDICATION. UPON DISCHARGE THE SECOND LAMP WILL ANNUNCIATE THE COMPLETION OF THE FUNCTION. IN ADDITION, MONITORING SMOKE DETECTOR CONCENTRATION VARIATIONS OR CREW SENSE OF HALON 1301 IN THE CABIN AIR CAN VERIFY DISCHARGE. REFERENCES:			

REPORT DATE 10/23/87

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3050	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: ANNUNCIATOR (FAILURE MODE: OPEN (ELECTR			D
LEAD ANALYST: J.D. ARBET	SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) ACA 4) LAMP DRIVER (AGENT DISC 5) 6) 7) 8) 9)	CHG LT)	 	
	CRITICALITIES		
FLIGHT PHASE HDW/F	UNC ABORT	HDW/FUN	C
PRELAUNCH: 3/3	RŤ	LS: 3/3	
LIFTOFF: 3/3	TA	L: 3/3	
LIFTOFF: 3/3 ONORBIT: 3/3	AO	A: 3/3	
	ATC): 3/3	
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [] B[]	с[]	
LOCATION: AREA 30 FLT DI PART NUMBER:	ECK		-

CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

LOSS OF THE AGENT DISCH LIGHT INDICATION. MONITORING OF THE SMOKE CONCENTRATION LEVEL VARIATIONS OR CREW SENSE CAN BE USED TO DETECT AGENT DISCHARGE.

REFERENCES:

REPORT DATE 10/23/87

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPOR MDAC ID: 3051		CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: ANNUNCIA FAILURE MODE: PREMATUR	TOR CONTROL ASSEMBLY E OPERATION	(ACA) 3
LEAD ANALYST: J.D. ARBE	T SUBSYS LEAD:	M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) ACA 4) LAMP DRIVER (AGENT 5) 6) 7) 8) 9)		
	CRITICALITIES	
FLIGHT PHASE HI PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	DW/FUNC ABORT 3/3 RT 3/3 TA 3/3 AO 3/3 AT	LS: 3/3 L: 3/3
REDUNDANCY SCREENS: A	[] B[]	c[]
LOCATION: AREA 30 FI	LT DECK	

LOCATION: AREA 30 FLT DECK PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, ELECTROMAGNETIC FIELDS, VIBRATION

EFFECTS/RATIONALE:

FALSE AGENT DISCH INDICATION. VERIFICATION OF SUPPRESSANT STATUS CAN BE VERIFIED (LEVEL OF CONFIDENCE) BY MONITORING SMOKE DETECTOR CONCENTRATION LEVEL OR CREW SENSE.

REFERENCES:

REPORT DATE 10/23/87

DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3052	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1			
ITEM: DIODE-NO IDENTI FAILURE MODE: OPEN (ELECTRICA)	FIER L)			
LEAD ANALYST: J.D. ARBET	SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION-ARM CKT 3) DIODE-ISOLATION (PRE FLT 4) 5) 6) 7) 8) 9)	ARM CKT)			
CRT	TCALITIES			
	TICALITIES ABORT HDW/FUNC RTLS: 1/1			
PRELAUNCH: 2/1R				
LIFTOFF: 1/1				
ONORBIT: 2/1R	AOA: 1/1			
LIFTOFF: 1/1 ONORBIT: 2/1R DEORBIT: 1/1	TAL: 1/1 AOA: 1/1 ATO: 1/1			
LANDING/SAFING: 2/1R				
LANDING/SAFING: 2/IN	· · ·			
REDUNDANCY SCREENS: A [2]				
LOCATION: AVIONICS BAY-LCA PART NUMBER:	2, 3, 1/AREA 82, 83, 81			
CAUSES: MECHANICAL SHOCK, OVE	RLOAD, TEMPERATURE, VIBRATION			
EFFECTS/RATIONALE: THIS DIODE IS ON THE FIRE SUPPRESSION ARMING SWITCH LINE. FAILURE RESULTS IN LOSS OF CAPABILITY TO DISPENSE SUPPRESSANT INTO THE AVIONICS BAY. IN THE PRELAUNCH, ONORBIT, AND LANDING/SAFING PHASES REDUNDANT PORTABLE FIRE SUPPRESSANT BOTTLES ARE AVAILABLE FOR USE TO EXTINGUISH A FIRE. IN ALL OTHER PHASES, CREW MOVEMENT IS RESTRICTED THEREFORE THE PORTABLE EXTINGUISHERS ARE INACCESSABLE.				
REFERENCES:				

REPORT DATE 10/23/87

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DATE: 7/20/87 HIGHEST CRITICAL SUBSYSTEM: LIFE SUPPORT FLIGHT MDAC ID: 3053 ABORT:	C: 3/3
ITEM: DIODE-NO IDENTIFIER FAILURE MODE: SHORTED	
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAI	IDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION-ARM CKT 3) DIODE-ISOLATION (PREFLT ARM CKT) 4) 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDWPRELAUNCH:3/3RTLS:3LIFTOFF:3/3TAL:3ONORBIT:3/3AOA:3	3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: AVIONICS BAY-LCA 2, 3, 1/AREA 82, 83, PART NUMBER:	81
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VI	BRATION
EFFECTS/RATIONALE: THIS DIODE IS ON THE FIRE SUPPRESSION ARMING SWITCH EFFECT ON CIRCUIT, FLIGHT OPERATIONS WORK NOMINALLY. SURE WHY THE DIODE EXISTS IN THE CIRCUIT. IF THE PR USED FOR CHECKOUT, THE CHECKOUT WOULD BE MORE COMPLE THE DIODE.	NOTE: NOT REFLT BUS IS
REFERENCES:	

REPORT DATE 10/23/87

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPOR MDAC ID: 3054		CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3		
ITEM: DIODE-NO FAILURE MODE: OPEN (EI		_		
LEAD ANALYST: J.D. ARBE	SUBSYS LEAD:	M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION-PRE FLT ARM CKT 3) DIODE-ISOLATION (PRE FLT ARM CKT) 4) 5) 6) 7) 8) 9)				
	CRITICALITIES			
FLIGHT PHASE H	IDW/FUNC ABORT	HDW/FUNC		
PRELAUNCH: LIFTOFF:	3/3 RTL 3/3 TAT	LS: 3/3 J: 3/3		
ONORBIT:	3/3 TAL 3/3 AOA	: 3/3		
DEORBIT: LANDING/SAFING:	3/3 AIO): 3/3		
REDUNDANCY SCREENS: A	A[]_B[]	C []		
LOCATION: AVIONICS PART NUMBER:	BAY-LCA 2, 3, 1/AREA	82, 83, 81		
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION				
EFFECTS/RATIONALE: THIS DIODE IS ON THE PRE-FLIGHT TEST ARMING REMOTE SWITCH LINE. NO EFFECT ON FLIGHT_CIRCUIT. ONLY PREFLIGHT ACTIVITIES ARE AFFECTED IF OPEN. A SECOND FAILURE REQUIRED TO AFFECT THE FLIGHT CIRCUIT IF THE COMPONENT IS SHORTED.				

REFERENCES:

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DATE:7/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3055ABORT:3/3				
ITEM: RESISTOR-NO IDENTIFIER (5.11K) FAILURE MODE: OPEN (ELECTRICAL), SHORTED				
LEAD ANALYST: J.D. ARBET SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION-PRE FLT ARM CKT 3) RESISTOR-ISOLATION (ONBOARD ARM CKT) 4) 5) 6) 7) 8) 9)				
CRITICALITIES				
FLICHT PHASE HOW/FUNC ABORT HOW/FUNC				
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3				
ONORBIT: 3/3 AOA: 3/3				
DEORBIT: 3/3 ATO: 3/3				
LANDING/SAFING: 3/3				
REDUNDANCY SCREENS: A [] B [] C []				
LOCATION: AVIONICS BAY-LCA 2, 3, 1/AREA 82, 83, 81 PART NUMBER:				
CAUSES: MECHANICAL SHOCK, OVERLOAD, TEMPERATURE, VIBRATION				
EFFECTS/RATIONALE: THIS RESISTOR IS ON THE PRE-FLIGHT ARMING REMOTE SWITCH LINE. NO EFFECT ON FLIGHT CIRCUIT. ONLY PREFLIGHT ACTIVITIES ARE AFFECTED IF OPEN. A SECOND FAILURE IS REQUIRED TO AFFECT THE FLIGHT CIRCUIT IF THE COMPONENT IS SHORTED.				

REFERENCES:

REPORT DATE 10/23/87

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3056	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1			
ITEM: PYRO CONTROLLER NO FAILURE MODE: LOSS OF OUTPUT	. 1, 2, 3			
LEAD ANALYST: J.D. ARBET SU	BSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) PYRO CONTROLLER 4) 5) 6) 7) 8) 9)				
CRITIC	ALITIES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: 2/1R LIFTOFF: 1/1 ONORBIT: 2/1R DEORBIT: 1/1 LANDING/SAFING: 2/1R	ABORT HDW/FUNC RTLS: 1/1 TAL: 1/1 AOA: 1/1 ATO: 1/1			
REDUNDANCY SCREENS: A [2]	B[P] C[P]			
LOCATION: LCA-2, LCA-3, FLCA-3 PART NUMBER:	L			
CAUSES: CONTAMINATION, MECHANICAL PARTIAL INPUT, VIBRATION	L SHOCK, OVERLOAD, TEMPERATURE,			
EFFECTS/RATIONALE: FAILURE OF THE COMPONENT RESULTS IN THE LOSS OF THE CAPABILITY TO DISPENSE SUPPRESSANT INTO THE AVIONICS BAY. IN THE PRELAUNCH, ONORBIT, AND LANDING/SAFING PHASES REDUNDANT PORTABLE FIRE BOTTLES ARE AVAILABLE FOR USE TO EXTINGUISH A FIRE. IN THE OTHER PHASES, CREW MOVEMENT IS RESTRICTED THEREFORE THE PORTABLE EXTINGUISHERS ARE INACCESSABLE.				
REFERENCES:				
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REPORT DATE 10/23/87 C	-434			

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DATE: 7/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3057		FICALITY LIGHT: BORT:	HDW/FUNC 2/2 2/2
ITEM: PYRO CONTROLLER NO. 1 FAILURE MODE: PREMATURE OPERATION	, 2, 3		
LEAD ANALYST: J.D. ARBET SUBSY	S LEAD: M.J.	. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) PYRO CONTROLLER 4) 5) 6) 7) 8) 9)			
CRITICAL	TIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT	HDW/FUNC	2
PRELAUNCH: 3/3	RTLS:	3/3	
CNOPRIE 2/2	TAL:	3/3	
	AUA:	3/3	
LANDING/SAFING: 3/3	AIO.	2/2	
REDUNDANCY SCREENS: A [] F			
LOCATION: LCA-2, LCA-3, FLCA-1 PART NUMBER:			
CAUSES: MECHANICAL SHOCK, ELECTROM	GNETIC FIELI	DS, VIBRAT	rion
EFFECTS/RATIONALE: INADVERTANT DISCHARGE OR FIRE SUPPRE CAPABILITIES LOSS IN CASE A REAL SMO HALON 1301 IS VERY TOXIC TO THE CREW SUSTAINED.	KE/FIRE SITU	JATION DEV	VELOPS.
REFERENCES:			

REPORT DATE 10/23/87

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DATE: 9/22/87 HIC SUBSYSTEM: LIFE SUPPORT MDAC ID: 3058	GHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: 2/1R			
ITEM: SMOKE DETECTOR (9) FAILURE MODE: LOSS OF ALL OUTPUT				
LEAD ANALYST: R.E. DUFFY SUBSYS 1	LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) DETECTOR 4) 5) 6) 7) 8) 9)				
CRITICALITI	ES			
FLIGHT PHASE HDW/FUNC 2 PRELAUNCH: 2/1R LIFTOFF: 2/1R ONORBIT: 2/1R DEORBIT: 2/1R LANDING/SAFING: 2/1R	ABORTHDW/FUNCRTLS:2/1RTAL:2/1RAOA:2/1RATO:2/1R			
REDUNDANCY SCREENS: A [2] B [P] C[P]			
LOCATION: PART NUMBER:				
CAUSES: FAILURE OF PUMP, POWER SUPPLY ELECTRONICS, VDC, ALARM OUTPUT, INLET FILTER BLOCKED				
EFFECTS/RATIONALE: LOSS OF SMOKE DETECTOR FUNCTION FOR ALARMS AND SMOKE CONCENTRATION DETECTION. THE FIRE CAN BE SENSED AND ALARMED BY THE REDUNDANT DETECTOR. LOSS OF FUNCTION HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE.				
REFERENCES:				

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DATE: 9, SUBSYSTEM: LIF MDAC ID: 305	/22/87 E SUPPORT 9	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 2/2
ITEM: FAILURE MODE:	FIRE SUPPRESSANT ASS EXTERNAL LEAKAGE, PR	EMBLY (9) EMATURE OP	ERATION	
LEAD ANALYST: R	.E. DUFFY SUBS	YS LEAD: M	.J. SAIIDI	
BREAKDOWN HIERAN 1) LIFE SUPPON 2) FIRE SUPPRN 3) FIRE SUPPRN 4) 5) 6) 7) 8) 9)	RT SYSTEM			
	CRITICAL	ITIES		
FLIGHT PHAS	E HDW/FUNC H: 2/2 2/2	ABORT	HDW/FUN	C
PRELAUNCI	d: 2/2	RTLS	: 3/3	
ONORBIT:	2/2	AOA:	3/3	
DEORBIT:	3/3	ATO:	•	
LANDING/S	SAFING: 3/3			
REDUNDANCY SCREE	ENS: A []	В[]	с[]	
LOCATION: A' PART NUMBER:	V BAY 1,2, 3, CREW A	REA		
CAUSES: PIECE-	PART FAILURE OF PYRO	INITIATOR	, SPRING, D	IAPHRAM
EFFECTS/RATIONALE: LOSS OF FIRE SUPPRESSANT WITHOUT THE INDICATION FOR A FIRE. CABIN CONTAMINATION WITH HALON 1301 WILL EXCEED OSHA STANDARDS OF 1000 PPM WITHIN 50 HOURS OF DISCHARGE. THE LIOH CANISTERS DO NOT ABSORB MUCH HALON 1301 (80 gpm & 2.5 kg) AND THE REMAINING SUBSTANCE IS CONSIDERED TOXIC FOR THE CREW IN THE CABIN CLOSED ENVIRONMENT. THE MISSION SHOULD BE TERMINATED AT THE FIRST				
OPPORTUNITY.	1E MISSION SHOULD BE	TERMINATE	D AT THE FI	K5T
REFERENCES:				
2				

REPORT DATE 10/23/87 C-437

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DATE: 9/22/87 SUBSYSTEM: LIFE SUPF MDAC ID: 3060			TICALITY LIGHT: ABORT:	HDW/FUNC 1/1 1/1
ITEM: FIRE S FAILURE MODE: FAILS		SEMBLY (9)		
LEAD ANALYST: R.E. DU	FFY SUB	SYS LEAD: M.J	. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYS 2) FIRE SUPPRESSION 3) FIRE SUPPRESSANT 4) 5) 6) 7) 8) 9)	ſ		• • •	
	CRITICAL	LITIES		
FLIGHT PHASE	HDW/FUNC		,	2
PRELAUNCH:	2/1R	RTLS:	1/1	
LIFTOFF:	1/1 2/1R 1/1	TAL:	1/1	
ONORBIT:	2/1R	AVA.	/ .	
DEORBIT: LANDING/SAFING	1/1 • 2/1P	ATO:	1/1	
LANDING/SAFING	2/1R			
REDUNDANCY SCREENS:	A [2]	B [F]	С[Р]	
LOCATION: PART NUMBER:				

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CAUSES: PYRO FAILS TO IGNITE, KNIFE JAMS, NOZZLE RESTRICTED FLOW, PIECE-PART FAILURE

EFFECTS/RATIONALE:

INABILITY TO SUPPRESS IMMINENT FIRE. FOR PRELAUNCH, ONORBIT, AND LANDING/SAFING, THE CREW CAN REACT AND HAVE THE CABIN MOBILITY TO USE A UNLIKE REDUNDANT PORTABLE BOTTLE. HOWEVER, SCREEN B IS FAILED BECAUSE UPON DETECTION OF THIS FAILURE, THE CREW MAY NOT HAVE ENOUGH TIME FOR CORRECTIVE ACTION. DURING LIFTOFF, DEORBIT, AND ABORT SITUATION, THE CREW HAS THE POTENTIAL FOR LOSS OF LIFE/VEHICLE DUE TO THEIR IMMOBILITY AND INABILITY TO OPERATE THE PORTABLE BOTTLES.

REFERENCES:

SUBSYSTEM: LIFE SUPPORT F	TICALITY HDW/FUNC LIGHT: 3/3 BORT: 3/3			
ITEM: PORTABLE FIRE SUPPRESSANT ASSEMB FAILURE MODE: INTERNAL/EXTERNAL LEAKAGE, STRUC (RUPTURE), PREMATURE OPERATION	ELY TURAL FAILURE			
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J	. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) FIRE SUPPRESSION 3) PORTABLE FIRE SUPPRESSANT ASSSEMBLY 4) BROMO TRIFLOUROMETHANE SUPPRESSANT TANK 5) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASEHDW/FUNCABORTPRELAUNCH:3/3RTLS:LIFTOFF:3/3TAL:ONORBIT:3/3AOA:DEORBIT:3/3ATO:LANDING/SAFING:3/3	HDW/FUNC 3/3 3/3 3/3 3/3			
REDUNDANCY SCREENS: A [] B []	c[]			
LOCATION: CREW COMPARTMENT PART NUMBER:				
CAUSES: PIECE-PART FAILURE				
EFFECTS/RATIONALE: PREMATURE LOSS OF FIRE SUPPRESSANT. THREE OTHER BOTTLES AVAILABLE.				

REFERENCES:

REPORT DATE 10/23/87

DATE: SUBSYSTEM: MDAC ID:	9/22/87 LIFE SUPPORT 3062	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/1R /NA
	PORTABLE FIRE E: FAILS TO RELEA		SEMBLY	
LEAD ANALYS	T: R.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI	
2) FIRE S	IERARCHY: UPPORT SYSTEM UPPRESSION LE FIRE SUPPRESSAN	NT ASSSEMBLY		
	CI	RITICALITIES		
FLIGHT	PHASE HDW/FUI	NC ABORT	HDW/FUN	C
PREL			LS: /NA	
DIFT	OFF: /NA BIT: 3/1R BIT: /NA	AO	$\begin{array}{ccc} \mathbf{L}: & / \mathbf{N} \mathbf{A} \\ \mathbf{A}: & / \mathbf{N} \mathbf{A} \end{array}$	
DÉOR	BIT: /NA	AT	0: /NA	
	ING/SAFING: 3/1R	····	,	
REDUNDANCY	SCREENS: A [2] B[P]	C.[P]	
LOCATION: PART NUMBER	CREW COMPARTMEN	NT	1 2	
CAUSES: MI	SHANDLING/ABUSE, (CHEMICAL REACTION	ON	
EFFECTS/RAT	IONALE:			
	CAPABILITY TO EXT	TINGUISH A FIRE	WITH THE FAI	LED
BOTTLE. DU	RING PRELAUNCH, ON	N-ORBIT, AND LA	NDING/SAFING	THREE
	TINGUISHERS ARE AV	AILABLE. LOSS	OF FUNCTION	CAN LEAD
TO LOSS OF	LIFE/VEHICLE.			
REFERENCES:				

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DATE: 9/22/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 3063	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: HYBRID DRIVER (TYPE) FAILURE MODE: OPEN (ELECTRICAL), LA	III) (3) OSS OF OUTPUT, SHORTED
LEAD ANALYST: R.E. DUFFY SUBS	YS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) GROUND DRIVER 4) ARMING DRIVER (3) 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: PART NUMBER:	
CAUSES: CONTAMINATION, MECHANICAL	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE: NO MISSION IMPACT. PRELAUNCH, WHEN FIXED.	IT IS USED, THE ITEM CAN BE
REFERENCES:	

REPORT DATE 10/23/87 C-441

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DATE:9/22/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:3064ABORT:3/3
ITEM: HYBRID DRIVER (TYPE I) (3) FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) SMOKE DETECTION 3) GROUND DRIVER 4) FIRE DRIVER (3) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: PART NUMBER:
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION
EFFECTS/RATIONALE: NO MISSION IMPACT. PRELAUNCH, WHEN IT IS USED, THE ITEM CAN BE FIXED.
REFERENCES:

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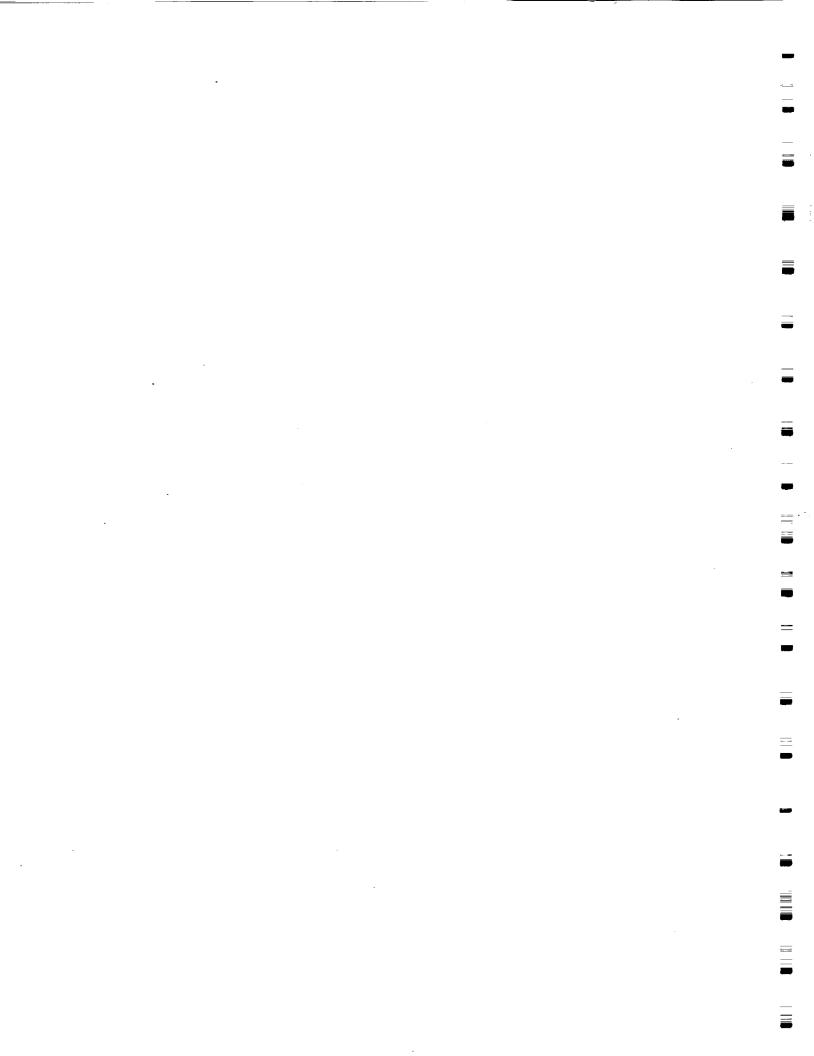
INDEPENDENT ORBITER ASSESSMENT ORBITER SUBSYSTEM ANALYSIS WORKSHEET 9/22/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: LIFE SUPPORT FLIGHT: 1/1ABORT: 1/1MDAC ID: 3065 HYBRID DRIVER (TYPE II) (3) ITEM: FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: LIFE SUPPORT SYSTEM 1) SMOKE DETECTION 2) 3) GROUND DRIVER FIRE DRIVER (3) 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE PRELAUNCH: 2/1R RTLS: 1/1 LIFTOFF: 1/1 TAL: 1/1 2/1R AOA: · 1/1ONORBIT: DEORBIT: 1/1 ATO: 1/1 LANDING/SAFING: 2/1R REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: PART NUMBER: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART CAUSES: FAILURE EFFECTS/RATIONALE: FAILURE PRECLUDES THE DISCHARGE OF HALON INTO THE AVIONICS BAY. FOR PRELAUNCH, ON-ORBIT, AND LANDING/SAFING, THE CREW CAN ACCESS THE PORTABLE SUPPRESSANT BOTTLES. LOSS OF FUNCTION HAS THE POTENTIAL FOR LOSS OF LIFE. DURING LIFT OFF AND DE-ORBIT REDUNDANT SYSTEM IS INACCESSABLE AND THERE IS A POTENTIAL FOR LOSS OF LIFE/VEHICLE. **REFERENCES:**

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AIRLOCK SUPPORT SYSTEM

Analysis Worksheets



AIRLOCK SUPPORT SYSTEM

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MDAC-ID	FLIGHT H/F	ABORT	EDUNDANCY SCREENS A B C	ITEM NAME
5001 5002 5003 (*) 5004	3/3 3/3 2/2 3/2R	3/3 3/3 3/3 3/3	קקק	VISUAL PRESSURE GAUGE (2) SUPPLY H2O PRESS. SENSOR (1) EMU WATER SUPPLY VALVE (2) EMU WATER SUPPLY VALVE (2)
5007 5008 5009 (*) 5010 5011 (*) 5012 5013 5014 (*) 5015	3/3 3/3 2/2 3/3 2/2 3/3 3/2R 2/2 3/3	3/3 3/3 3/3 3/3 3/3 3/3 3/3 3/3 3/3	ррр	EMU WATER SUPPLY VALVE (2) EMU WATER SUPPLY SWITCH (2) POSITION INDICATOR (2) RESISTOR (A1R1 AND A2R1) (2) CB, EMU WATER SUPPLY (1) CB, EMU WATER SUPPLY (1) EMU WASTE WATER VALVE (2) EMU WASTE WATER VALVE (2) EMU WASTE WATER VALVE (2) EMU WASTE WATER VALVE (2) EMU WASTE WATER SWITCH (2) POSITION INDICATOR (2) RESISTOR (A1R2 AND A2R2) (2) CB, EMU WASTE WATER (1) CB, EMU WASTE WATER (1) SUPPLY AND WASTE COUPLINGS (4) SUPPLY LINES AND FITTINGS (1) WASTE LINES AND FITTINGS (1) VISUAL 02 PRESSURE GAUGE (1) O2 SUPPLY PRESSURE SENSOR (2) EMU 02 SUPPLY VALVE (2) EMU 02 SUPPLY VALVE (2)
5016 5017 (*) 5018 5019 (*) 5020 (*) 5021 5022 (*)	3/3 2/2 3/3 2/2 2/2 3/2R 2/1R	3/3 3/3 3/3 3/3 3/3 3/3 3/3 3/3	РРР РРР	RESISTOR (A1R2 AND A2R2) (2) CB, EMU WASTE WATER (1) CB, EMU WASTE WATER (1) SUPPLY AND WASTE COUPLINGS (4) SUPPLY LINES AND FITTINGS (1) WASTE LINES AND FITTINGS (1) O2 LINES AND FITTINGS (1) VISUAL O2 PRESSURE GAUGE (1)
5027 (*) 5028 (*)	2/1R 2/1R	2/1R 3/3	P P P P P P P P P	EMU O2 SUPPLY VALVE (2) EMU O2 SUPPLY COUPLINGS
5031 (*) 5032 5033 (*) 5034 5035 (*)	2/2 3/1R 2/2 3/2R 2/1R	3/3 3/3 3/3 3/3 3/3	P P P P P P P P P	CAP VENT DEBRIS SCREEN (1) DEPRESS VALVE/CAP (1 EACH) DEPRESS VALVE (1) DEPRESS VALVE/CAP (1 EACH) AIRLOCK TO CABIN VENT CAP (2)
5036 5037 (*) 5038 5039 (*) 5040	3/3 2/1R 3/3 2/1R 3/2R	3/3 3/3 3/3 3/3 3/3 3/3	P P P P P P P P P	AIRLOCK TO CABIN VENT CAP (2) AIRLOCK TO CABIN FILTER (2) AIRLOCK TO CABIN FILTER (2) EQUALIZATION VALVE (2) EQUALIZATION VALVE (2)

(*) Potential Critical Items.

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AIRLOCK SUPPORT SYSTEM (concluded)

	CRITICA		EDUNDANCY	
	FLIGHT			
MDAC-ID	-		ABC	ITEM NAME
5041 (*)	2/2	3/3		EQUALIZATION VALVE (2) PRESSURE DIFFERENTIAL (2)
	3/3			PRESSURE DIFFERENTIAL (2)
5043 (*)		3/3		DIFF. PRESSURE SENSOR (1)
5044	3/3	3/3 3/3		WALL TEMPERATURE SENSOR (1)
5045	3/3 2/2D	3/3	PPP	VENT CAP (2)
5046	3/2R 3/3	3/3	FFF	VENT CAP (2)
5047 5048	3/2R	3/3	PPP	FILTER (2)
5048	3/3	3/3	FFF	FILTER (2)
5049	3/2R	3/3	PPP	EQUALIZATION VALVE (2)
	3/2R 3/3	3/3	F F F	EQUALIZATION VALVE (2)
5051 5052 (*)	2/2	3/3	•	EQUALIZATION VALVE (2)
5052 (*)	3/3	3/3		PRESSURE DIFFERENTIAL (2)
5053	3/3	3/3	PPP	PRESSURE DIFFERENTIAL (2)
5054 5055 (*)	3/25	3/3	r r r	BUS SELECT SWITCH (2)
5055 (*)		3/3		REMOTE POWER CONTROLLER (4)
5058 (*)	2/2 3/2R	3/3	PPP	DIODE (4)
5058	3/20	3/3	PPP	DIODE (4)
5059 (*)				POWER SUPPLY (2)
5060 (*)				POWER SUPPLY (2)
5061	3/3	3/3		EMU INPUT SWITCH (1)
5062		3/3		EMU VOLT/CURRENT INDICATOR (1)
5063	3/3	3/3		CURRENT SENSOR (1)
5064	3/3	3/3		VOLTAGE SENSOR (1)
5065			PPP	VACUUM VENT ISOLATION VALVE (1)
5066 (*)	2/1R	3/3	PFP	VACUUM VENT ISOLATION VALVE (1)
5067 (*)	2/10	2/2	סקס	SW, ISOL VLV CNTRL (1)
5068	3/2R	3/3	P P P P F P P P P P P P P P P	SW, ISOL VLV CNTRL (1)
5069 (*)	3/1R	3/3	PFP	SW, ISOL VLV BUS SELECT (1)
5070	3/2R	3/3	PPP	SW, ISOL VLV BUS SELECT (1)
5071	3/2R	3/3	РРР	CB, ISOL VLV (1)
5072	3/2R	3/3	PPP	CB, ISOL VLV (1)
5073	3/3	3/3		DIÓDES, ISOL VLV (2)
5074	3/3	3/3		BUS ISOLATION DIODES (2)
5075	3/3	3/3		BUS ISOLATION DIODES (2)
5076	3/3	3/3		BUS SELECT SENSOR (2)
5077	3/3	3/3		CNTRL VLV SWITCH INDICATOR (1)
5078	3/3	3/3		BARBER POLE INDICATOR (1)
5079	3/3	3/3		RESIS, ISOL VALVE SW SENSOR (2)
5080	3/3	3/3		RESIS, BUS SELECT SW SENSOR (2)
5081	3/3	3/3		RESIS, ISOL VLV SENSOR POWER (1)
5082	3/3			DEDICATED SIG COND (1)
5083		3/3		DEDICATED SIG COND (1)

(*) Potential Critical Items.

C-446

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DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:5001ABORT:3/3
ITEM: VISUAL PRESSURE GAUGE FAILURE MODE: ERRATIC OPERATION, FAILS OUT OF TOLERANCE, INTERMITTENT OPERATION, PHYSICAL BINDING/JAMMING, ERRONEOUS OUTPUT
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: PANEL AW82D PART NUMBER:
CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: NOT MISSION ESSENTIAL. A PRESSURE TRANSDUCER IN THE EMU, DOWNSTREAM OF THE FLOW RESTRICTOR, INDICATES THE FEED WATER PRESSURE.

REFERENCES:

REPORT DATE 10/23/87 C-447

DATE: 8/04/87	HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: LIFE SUPPORT MDAC ID: 5002	FLIGHT: 3/3 ABORT: 3/3
ITEM: ECLSS H2O SUPPLY PRES FAILURE MODE: ERRATIC OPERATION, FA INTERMITTENT OPERATION, PHYSICAL BIN OUTPUT	ILS OUT OF TOLERANCE,
LEAD ANALYST: R.E. DUFFY SUBSY	S LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) PRESSURE SENSOR 5) 6) 7) 8) 9)	· - ·
CRITICALI	TIES
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A [] B	6 [] C []
LOCATION: PART NUMBER:	
CAUSES:	

EFFECTS/RATIONALE: NOT MISSION ESSENTIAL. A PRESSURE TRANSDUCER IN THE EMU DOWNSTREAM OF THE FLOW RESTRICTOR, INDICATES THE FEED WATER PRESSURE.

REFERENCES:

DATE:8/04/87HIGHEST CRITICALITYHDW/FTSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:5003ABORT:3/3						
ITEM: EMU WATER SUPPLY VALVE (2) FAILURE MODE: FAILS TO OPEN						
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI						
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 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						
LIFTOFF: 3/3 TAL: 3/3						
ONORBIT: $2/2$ · AOA: $3/3$						
DEORBIT: 3/3 ATO: 3/3						
LANDING/SAFING: 3/3						
REDUNDANCY SCREENS: A [] B [] C []						
LOCATION: PANEL AW82D PART NUMBER:						
CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION						
EFFECTS/RATIONALE: LOSS OF MISSION DUE TO INABILITY TO TOP OFF WATER TANKS AND PUT THE EMU SYSTEM OF AIR BUBBLES, IN THE EMU. THE CONTINGENCY PL						

THE EMU SYSTEM OF AIR BUBBLES, IN THE EMU. THE CONTINGENCY PLAN CALLS FOR ONE SCU TO BE SHARED BY BOTH EMU'S. (FAILURE ANALYSIS ASSUMES BASELINE MISSION WITH TWO SUITED CREWMEMBERS).

REFERENCES:

1

REPORT DATE 10/23/87

C-449

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5004	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/3
ITEM: EMU WATER SUPPLY FAILURE MODE: FAILS TO CLOSE,	VALVE (2) Internal leakage
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) 5) 6) 7) 8) 9)	
CRIT	ICALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/2R DEORBIT: 3/3	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: 3/3	TAL: 3/3
ONORBIT: 3/2R	AOA: 3/3
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: PART NUMBER:	
CAUSES: MECHANICAL SHOCK, PIEC	E-PART FAILURE, VIBRATION
EFFECTS/RATIONALE: THE SCU SELF SEALING QUICK DISC	NNECT PROVIDES AN UNLIKE

THE SCU SELF SEALING QUICK DISCONNECT PROVIDES AN UNLIKE REDUNDANCY. HOWEVER, LOSS OF FUNCTION CAN LEAD TO LOSS OF MISSION DUE TO A DRASTIC REVALVING OF THE "SUPPLY WATER MANAGEMENT SYSTEM" WHICH WILL HAMPER THE ORBITER WATER SYSTEM'S OPERATION.

REFERENCES:

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5005	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 3/3
ITEM: EMU WATER SUPPLY FAILURE MODE: EXTERNAL LEAKAG			
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) 5) 6) 7) 8) 9)			
			,
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	RTI TAI	HDW/FUN LS: 3/3 L: 3/3 A: 3/3 D: 3/3	
REDUNDANCY SCREENS: A []	B[]	с[]	
LOCATION: PART NUMBER:			
CAUSES: MECHANICAL SHOCK, PIE	CE-PART FAILUI	RE, VIBRATION	r
EFFECTS/RATIONALE: FREE WATER IN THE AIRLOCK AND HAZARDS AND HIGH HUMIDITY FORC WATER LINE. IN ADDITION, THE D	ING THE ISOLAT	TION OF THE E	MU SUPPLY
REFERENCES:			
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REPORT DATE 10/23/87 C-451

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5006	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3								
ITEM: EMU WATER SUPPLY SWITCH (2) FAILURE MODE: OPEN (ELECTRICAL), FAILS TO SWITCH, OPEN, SINGLE CONTACT									
LEAD ANALYST: R.E. DUFFY SUBS	YS LEAD: M.J. SAIIDI								
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) SUPPLY VALVE (S1, S3) 5) 6) 7) 8) 9)									
CRITICAL	ITIES								
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC								
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3	RTLS: 3/3 TAL: 3/3 AOA: 3/3								
LIFTOFF: 3/3	TAT:: 3/3								
ONORBIT: 2/2	AOA: 3/3								
DEORBIT: 3/3	ATO: 3/3								
LANDING/SAFING: 3/3									
, , , , ,									
REDUNDANCY SCREENS: A []	B[] C[]								
LOCATION: PART NUMBER:	·								
CAUSES: ACOUSTICS, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION									
EFFECTS/RATIONALE: THE FAILURE ASSUMES THE VALVE IS LE THE EMU (WORST CASE). SAME SCENARI ID 5003).	FT CLOSED PRIOR TO SERVICING								
REFERENCES:									

DATE: 8/04/87 SUBSYSTEM: LIFE SUPP MDAC ID: 5007	ORT		ITICALITY FLIGHT: ABORT:	3/3				
ITEM: EMU WATER SUPPLY STATUS INDICATOR (2) FAILURE MODE: ERRATIC OPERATION, FAILS TO REMAIN OPEN/CLOSED, FAILS MID-TRAVEL, FAILS OUT OF TOLERANCE, FAILS TO SWITCH								
LEAD ANALYST: R.E. DU	FFY SUBSY	S LEAD: M.J	J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYS 2) AIRLOCK 3) WATER SYSTEM 4) SUPPLY VALVE 5) STATUS INDICATOR 6) 7) 8) 9)								
	CRITICAL	TIES						
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:		ABORT RTLS: TAL: AOA: ATO:	3/3 3/3 3/3	C				

REDUNDANCY SCRE	EENS:	Α	[]	E E	3 []	С	[]
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LOCATION: PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: NOT MISSION ESSENTIAL.

LANDING/SAFING: 3/3

REFERENCES:

REPORT DATE 10/23/87

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5008	HIGHEST C	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: RESISTOR (A1R1 AND A) FAILURE MODE: OPEN (ELECTRICAL)	2R1)		
LEAD ANALYST: R.E. DUFFY SUBSY	YS LEAD: M	I.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) SUPPLY VALVE 5) SENSORS V64X0515E & 535E 6) 7) 8) 9)	- - - - - - - -		
CRITICAL			
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	RTLS TAL: AOA:	HDW/FUNG 3/3 3/3 3/3 3/3	3
REDUNDANCY SCREENS: A []	В[]	C []	
LOCATION: PANEL AW82D PART NUMBER:			
CAUSES: CONTAMINATION, MECHANICAL S	SHOCK, PIE	CE-PART FAII	LURE,
EFFECTS/RATIONALE: SENSORS V64-X0515E AND V64-X0535E AN ESSENTIAL. BARBER POLE INDICATION S			SION
REFERENCES:			

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DATE: 8/04/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/2 MDAC ID: 5009 ABORT: 3/3 ITEM: EMU WATER SUPPLY CIRCUIT BREAKER (2) FAILURE MODE: FAILS TO REMAIN CLOSED				
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) SUPPLY VALVE 5) CIRCUIT BREAKER (CB57, CB58) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3				
PRELAUNCH: 3/3 RTLS: 3/3				
LIFTOFF: 3/3 TAL: 3/3				
ONORBIT: 2/2 AOA: 3/3				
DEORBIT: 3/3 ATO: 3/3				
LANDING/SAFING: 3/3				
REDUNDANCY SCREENS: A [] B [] C []				
LOCATION: PANEL ML86B PART NUMBER:				
CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION				
EFFECTS/RATIONALE: THE FAILURE ASSUMES THE FAILURE OF THE BREAKER LEAVES THE VALVE CLOSED PRIOR TO SERVICING THE EMU (WORST CASE). SAME SCENARIO AS VALVE FAILED CLOSED (MDAC ID 5003).				

REFERENCES:

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REPORT DATE 10/23/87 C-455

DATE: SUBSYSTEM: MDAC ID:	8/04/87 LIFE SUPPORT 5010		HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
	EMU WATER S E: FAILS TO OF		CUIT BREA	KER (2)	
LEAD ANALYS	T: R.E. DUFFY	SUBS	YS LEAD:	M.J. SAIIDI	
2) AIRLOC 3) WATER 4) SUPPLY	UPPORT SYSTEM K SYSTEM	7, CB58)			
		CRITICAI	ITIES		
FLIGHT	PHASE HDW/ AUNCH: 3/ OFF: 3/	FUNC	ABORT	HDW/FUN	С
PREL	AUNCH: 3/	(3)	RTL	S: 3/3	
ONOP	OFF: 3/ BIT: 3/ BIT: 3/ INC/SAFING: 3/	/1		• 3/3	
DEOR	BTT: 3/	· · · · · · · · · · · · · · · · · · ·	АТО	: 3/3	
LAND	ING/SAFING: 3/	/3		• • • • • •	
	SCREENS: A [•	BLI	с[]	
REDORDANCE		L		÷ ()	-
LOCATION: PART NUMBER	PANEL ML86B				
CAUSES: ME	CHANICAL SHOCK,	VIBRATIC	N		
EFFECTS/RATIONALE: LOSS OF OVERLOAD PROTECTION. NO MISSION IMPACT.					
REFERENCES:					

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5011	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 3/3
ITEM: EMU WASTE WATER VAL FAILURE MODE: FAILS TO OPEN	VE (2)		
LEAD ANALYST: R.E. DUFFY SUE	SYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) 5) 6) 7) 8) 9)			
	LITIES		
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:2/2DEORBIT:3/3LANDING/SAFING:3/3	ABORT RT TA AO AT	LS: 3/3 L: 3/3 A: 3/3	
REDUNDANCY SCREENS: A []	В[]	. c[]	
LOCATION: PART NUMBER:			
CAUSES: MECHANICAL SHOCK, PIECE-F	ART FAILU	RE, VIBRATION	1
EFFECTS/RATIONALE: LOSS OF MISSION DUE TO INABILITY T (FAILURE ANALYSIS ASSUMES BASELINE CREWMEMBERS).			
REFERENCES:			

REPORT DATE 10/23/87

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5012	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3			
ITEM: EMU WASTE WATER FAILURE MODE: FAILS TO CLOSE,				
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) 5) 6) 7) 8) 9)				
	ICALITIES			
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/3DEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3			
REDUNDANCY SCREENS: A []	. B [] C []			
LOCATION: PART NUMBER:				
CAUSES: ACOUSTICS, MECHANICAL S	SHOCK, PIECE-PART FAILURE,			
EFFECTS/RATIONALE: THE FAILURE IS INCONSEQUENTIAL ONCE THE SUPPLY VALVE IS CLOSED AND SCU IS DISCONNECTED. IN ADDITION, THE SCU REGULATOR TO THIS LINE WILL BE CLOSED ONCE THE PRESSURE UPSTREAM FALLS BELOW 16.5 PSI.				
REFERENCES :				

REPORT DATE 10/23/87

DATE: 8/04/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 5013 ABORT: 3/3				
ITEM: EMU WASTE WATER VALVE (2) FAILURE MODE: EXTERNAL LEAKAGE				
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 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: 3/2R AOA: 3/3				
DEORBIT: 3/3 ATO: 3/3				
LANDING/SAFING: 3/3				
REDUNDANCY SCREENS: A [2] B [P] C [P]				
LOCATION: PART NUMBER:				
CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION				
EFFECTS/RATIONALE: THE VALVE WILL LEAK WATER OUT TO THE ECLSS DISPLAY AND CONTROL				

THE VALVE WILL LEAK WATER OUT TO THE ECLSS DISPLAY AND CONTROL CABINET WHEN THE EMU MAKES A WATER DUMP. FREE WATER IN THE CABINE CAN CAUSE OTHER FAILURES IN THE ELECTRICAL SYSTEM. THE FAILURE IS NOT READILY NOTICEABLE BECAUSE THE WATER QUANTITIES ARE SMALL. WHEN THE SCU PRESSURE REGULATOR VALVE IS CLOSED, AND THE WASTE MANAGEMENT FAN/SEPARATOR IS ACTIVATED, THIS VALVE WILL LEAK AIR INTO THE WASTE MANAGEMENT SYSTEM.

REFERENCES:

REPORT DATE 10/23/87

DATE:8/04/87HIGHEST CRITICALITYHDW/SUBSYSTEM:LIFE SUPPORTFLIGHT:2/MDAC ID:5014ABORT:3/	2
ITEM: EMU WASTE WATER SWITCH (2) FAILURE MODE: OPEN (ELECTRICAL), FAILS TO SWITCH, OPEN, SING CONTACT	LE
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) WASTE VALVE (S2, S4) 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: PANEL AW82D PART NUMBER:	
CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION	
EFFECTS/RATIONALE: THE FAILURE ASSUMES THE VALVE IS LEFT CLOSED PRIOR TO SERVICI THE EMU (WORST CASE). SAME SCENARIO AS VALVE FAILED CLOSED (1 ID 5011).	
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REFERENCES:

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DATE: 8/04 SUBSYSTEM: LIFE S MDAC ID: 5015	/87 UPPORT		TICALITY LIGHT: BORT:	
ITEM: EMU FAILURE MODE: ERR FAILS MID-TRAVEL,	ATIC OPERATION,	FAILS TO REMA	IN OPEN/CL	
LEAD ANALYST: R.E.	DUFFY SU	BSYS LEAD: M.J	. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) WASTE VALVE 5) INDICATOR STATUS (DS2, DS4) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAF	HDW/FUNC 3/3 3/3 3/3 3/3		3/3 3/3 3/3	
REDUNDANCY SCREENS	: A[]	B[]	с[]	

LOCATION: PANEL AW82D PART NUMBER:

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CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: EMU FUNCTION CAN INDICATE OPERATION. NO MISSION IMPACT.

REFERENCES:

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REPORT DATE 10/23/87

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5016	HIGHEST CRI F A	TICALITY LIGHT: BORT:	3/3	
ITEM: RESISTOR (A1R2 AND A) FAILURE MODE: OPEN (ELECTRICAL)	2R2)			
LEAD ANALYST: R.E. DUFFY SUBS	KS LEAD: M.J	. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) WASTE VALVE 5) SENSORS V64X0505E & 525E 6) 7) 8) 9)				
CRITICAL	ITTES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3	ABORT	HDW/FUN	C	
PRELAUNCH: 3/3	RTLS:	3/3		
LIFTOFF: 3/3	TAL:	3/3		
$\frac{3}{3}$	ΑΟΑ: ΔΤΟ·	3/3		
LANDING/SAFING: 3/3	AIO.	3/3		
REDUNDANCY SCREENS: A []	ar 1	c r l		
KEDONDANCI DEKLENDI A []	5 []	.		
LOCATION: PANEL AW82D PART NUMBER:				
CAUSES: CONTAMINATION, MECHANICAL S	SHOCK, PIECE	-PART FAII	LURE,	
EFFECTS/RATIONALE: SENSORS V640X0505E AND X0525E ARE DISABLED. NOT MISSION				
ESSENTIAL. BARBER POLE OPERATION S	LIDE OPERATIO	ONUT.		
REFERENCES :				

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5017	HIGHEST	CRITICALITY FLIGHT: ABORT:	
ITEM: EMU WASTE WATER FAILURE MODE: FAILS TO REMAIN		KER (2)	
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) WASTE VALVE 5) CIRCUIT BREAKER (CB60, CB6 6) 7) 8) 9)	51)		-
CRIT	TICALITIES		
FLIGHT PHASE HDW/FUNC	ABORT	HDW/FUN	1C
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3	RTI	LS: 3/3	
LIFTOFF: 3/3	TAI	L: 3/3	
ONORBIT: 2/2	AOA	A: 3/3	
DEORBIT: 3/3	ATC	D: 3/3	
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A []	B[]	с[]	
LOCATION: PANEL ML86B PART NUMBER:			
CAUSES: MECHANICAL SHOCK, PIEC	CE-PART FAILU	RE, VIBRATION	ı
EFFECTS/RATIONALE:	DDEAVED EAT		

THE FAILURE ASSUMES THE CIRCUIT BREAKER FAILURE LEAVES THE VALVE CLOSED PRIOR TO SERVICING THE EMU (WORST CASE). SAME SCENARIO AS VALVE FAILED CLOSED (MDAC ID 5011).

REFERENCES:

REPORT DATE 10/23/87

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5018	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: EMU WASTE WATER (FAILURE MODE: FAILS TO OPEN	CIRCUIT BREAKER (2)
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) WASTE VALVE 5) 6) 7) 8) 9)	
CRIT	ICALITIES
	A DODO HOM (FUNC
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	RTLS: 3/3 TAL: 3/3
LIFTOFF: 3/3 ONORBIT: 3/3	AOA: 3/3
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: PANEL ML86B PART NUMBER:	
CAUSES: MECHANICAL SHOCK, VIBRA	ATION
EFFECTS/RATIONALE: LOSS OF OVERLOAD PROTECTION. NO	O MISSION IMPACT.
REFERENCES:	

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REPORT DATE 10/23/87

DATE: 8/04/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/2 MDAC ID: 5019 ABORT: 3/3 ITEM: EMU WATER SUPPLY AND WASTE COUPLINGS FAILURE MODE: EXTERNAL LEAKAGE	
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 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: 2/2 AOA: 3/3 DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [] B [] C [] LOCATION: PART NUMBER: CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: LOSS OF MISSION DUE TO CREWMAN'S INABILITY TO TOP OFF OR CHANGE	
WATER IN THE EMU TANKS. IN ADDITION, FREE WATER IN THE AIRLOCK AND CABIN CREATES ELECTRICAL HAZARDS AND HIGH HUMIDITY. REFERENCES:	

REPORT DATE 10/23/87

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5020		/FUNC /2 /3	
ITEM: EMU WATER SUPPLY L FAILURE MODE: EXTERNAL LEAKAGE	INES AND FITTING		
LEAD ANALYST: R.E. DUFFY SU	BSYS LEAD: M.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) WATER SYSTEM 4) 5) 6) 7) 8) 9)			
CRITIC	ALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3		
REDUNDANCY SCREENS: A []	B[] C[]		
LOCATION: PART NUMBER:			
CAUSES: MECHANICAL SHOCK, PIECE-	PART FAILURE, VIBRATION		
EFFECTS/RATIONALE: NOTE: THE LEAK IS LOCATED BETWEEN THE SUPPLY VALVE AND THE SCU. FOR LEAKS BEYOND THE SUPPLY VALVE SEE THE IOA "SUPPLY WATER MANAGEMENT SUBSYSTEM". THE LINE IS ISOLATED DURING ASCENT AND ENTRY. ON ORBIT, A SEVERE LEAK CAUSES LOSS OF MISSION DUE TO CREWMEN INABILITY TO TOP-OFF WATER TANKS AND PURGE THE EMU. IN ADDITION, FREE WATER IN THE AIRLOCK AND CABIN CREATES ELECTRICAL SHORT HAZARDS AND HIGH HUMIDITY, FORCING THE ISOLATION OF THE EMU			

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REFERENCES:

SUPPLY LINE.

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DATE: 8/ SUBSYSTEM: LIFI MDAC ID: 502:	/20/87 5 SUPPORT L	HIGHEST		HDW/FUNC 3/2R 3/3
ITEM:] FAILURE MODE:]	EMU WASTE WATER External leakage		TINGS	
LEAD ANALYST: R	.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERAL 1) LIFE SUPPON 2) AIRLOCK 3) WATER SYST 4) 5) 6) 7) 8) 9)	RT SYSTEM			-
	CRIT	ICALITIES		
FLIGHT PHAS	E HDW/FUNC H: 3/3 3/3 3/2R	ABORT	HDW/FUN	ic
PRELAUNCI	H: 3/3 3/3 3/2R 3/3	RTI	uS: 3/3 ⊳ 2/2	
	3/3	TAL	3/3	
ONORBIT:	3/2R	AUA	3/3	
DEORBIT: LANDING/3	SAFING: 3/3	ATC): 3/3	
REDUNDANCY SCRED LOCATION: PART NUMBER:	ENS: A [2]	В[Р]	С[Р]	
CAUSES: MECHAN	ICAL SHOCK, PIEC	E-PART FAILUF	RE, VIBRATION	T
EFFECTS/RATIONA NOTE: THE LEAK SCU. FOR LEAKS MANAGEMENT SYST DISPLAY AND CON	LE: IS LOCATED BETW BEYOND THIS VAI EM". THE SYSTEM TROL CABINET WHE HIS AIRLOCK AND	VEEN THE WASTE LVE SEE IOA "S I WILL LEAK WA IN THE EMU MAH	E WATER VALVE SUPPLY WATER ATER OUT TO I KES A WATER D	THE ECLSS
REFERENCES:				

REPORT DATE 10/23/87

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DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/1RMDAC ID:5022ABORT:3/3			
ITEM: O2 SUPPLY LINES AND FITTINGS FAILURE MODE: EXTERNAL LEAKAGE			
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) OXYGEN SYSTEM 4) 5) 6) 7) 8) 9)			
CRITICALITIES			
CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: 3/3 RTLS: 3/3 LIFTOFF: 3/3 TAL: 3/3 ONORBIT: 2/1R AOA: 3/3 DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [2] B [P] C [P]			
LOCATION: PART NUMBER:			
CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION			
EFFECTS/RATIONALE: NOTE: THE LEAK IS LOCATED BETWEEN THE EMU OXYGEN SUPPLY VALVES AND THE SCU. FOR LEAKS BEYOND THIS VALVE SEE IOA "ARPCS" ANALYSIS. DURING LIFTOFF AND ENTRY, THE LEAK IS ISOLATED BECAUSE THE VALVE IS CLOSED. ON ORBIT THE EXCESS OXYGEN IN THE AIRLOCK CREATES A FIRE HAZARD.			
REFERENCES:			

DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:5023ABORT:3/3
ITEM: VISUAL O2 PRESSURE GAUGE (1) FAILURE MODE: ERRATIC OPERATION, FAILS OUT OF TOLERANCE, INTERMITTENT OPERATION, PHYSICAL BINDING/JAMMING, ERRONEOUS OUTPUT
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) OXYGEN SYSTEM 4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC
DDFLAINCH. 3/3 RTLS. 3/3
LIFTOFF: 3/3 TAL: 3/3
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3
DEORBIT: 3/3 ATO: 3/3
LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: PANEL AW82D PART NUMBER:
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

VIBRATION EFFECTS/RATIONALE:

NO MISSION IMPACT.

REFERENCES:

REPORT DATE 10/23/87

C-469

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5024	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: O2 SUPPLY PRESSURE S FAILURE MODE: ERRATIC OPERATION, F INTERMITTENT OPERATION, ERRONEOUS	AILS OUT OF TOLERANCE,
LEAD ANALYST: R.E. DUFFY SUBS	YS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) OXYGEN SYSTEM 4) PRESSURE SENSOR (V64P0202A) 5) 6) 7) 8) 9)	- -
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING (SAFINC: 2/2	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: 3/3	TAL: $3/3$
	AOA: 3/3 ΔΨΟ· 3/3
LANDING/SAFING: 3/3	RIO. 373
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: PART NUMBER:	
CAUSES: CONTAMINATION, MECHANICAL S	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE: NO MISSION IMPACT.	
REFERENCES:	

REPORT DATE 10/23/87

DATE: 8/04/87 HIGHEST CRITICALITY HDW/F SUBSYSTEM: LIFE SUPPORT FLIGHT: 2/2	UNC		
SUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:5025ABORT:3/3			
ITEM: EMU O2 SUPPLY VALVE (2) FAILURE MODE: FAILS TO OPEN			
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) OXYGEN SYSTEM 4) SUPPLY VALVE (2) 5) 6) 7) 8) 9)			
CRITICALITIES			
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3			
PRELAUNCH: 3/3 RTLS: 3/3			
LIFTOFF: 3/3 TAL: 3/3			
ONORBIT: 2/2 AOA: 3/3			
DEORBIT: 3/3 ATO: 3/3			
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3			
REDUNDANCY SCREENS: A [] B [] C []			
LOCATION: PART NUMBER:			
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION			
EFFECTS/RATIONALE: LOSS OF MISSION DUE TO INABILITY TO MAINTAIN OXYGEN CAPACITY IN THE EMU (CRITICALITY ASSUMES BASELINE MISSION WITH TWO SUITED CREWMEMBERS). FAILURE TO PREVENT DEPLETION OF THE PLSS OXYGEN TANKS PRIOR TO EVA.			

REFERENCES:

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REPORT DATE 10/23/87 C-471

DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:5026ABORT:3/3
ITEM: EMU O2 SUPPLY VALVE (2) FAILURE MODE: FAILS TO CLOSE, INTERNAL LEAKAGE
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) OXYGEN SYSTEM 4) SUPPLY VALVE (2) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/2RAOA:3/3DEORBIT:3/2RATO:3/3
PRELAUNCH: 3/3 RTLS: 3/3
LIFTOFF: 3/3 TAL: 3/3
ONORBIT: 3/2R AOA: 3/3
DEORBIT: 3/2R ATO: 3/3
LANDING/SAFING: 3/3
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: PART NUMBER:
CAUSES: ACOUSTICS, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION
EFFECTS/RATIONALE:

INABILITY TO ISOLATE THE AFFECTED SCU LEG. PRESSURE CAN BE MANAGED BY SELF SEALING QUICK COUPLING. LOSS OF REDUNDANCY IS LOSS OF EMU MISSION. THE LEAK MAY BE ISOLATED CLOSING THE CABIN OXYGEN CROSSOVER VALVES LV3 AND LV4 WITH SWITCHES S15 AND S18.

REFERENCES:

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DATE: 8/04/87 H SUBSYSTEM: LIFE SUPPORT MDAC ID: 5027	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: 2/1R
ITEM: EMU O2 SUPPLY VALVE (2 FAILURE MODE: EXTERNAL LEAKAGE	?)
LEAD ANALYST: R.E. DUFFY SUBSYS	S LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) OXYGEN SYSTEM 4) SUPPLY VALVE (2) 5) 6) 7) 8) 9)	
CRITICALI	птре
FLIGHT PHASE HDW/FUNC	
DETAINCH · 3/2D	RTLS: 2/1R
PRELAUNCH: 3/2R LIFTOFF: 2/1R ONORBIT: 2/1R DEORBIT: 2/1R	TAL: $2/1R$
	AOA: 2/1R
	ATO: $2/1R$
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [2] B	[P] C[P]
	14-4-170-17
LOCATION:	
PART NUMBER:	
CAUSES: ACOUSTICS, MECHANICAL SHOCK, VIBRATION	, PIECE-PART FAILURE,
EFFECTS/RATIONALE: DURING LIFT OFF AND ENTRY, THE LEAK W PP02 TRIGGERING THE KLAXON AND CREAT CANNOT BE ISOLATED BECAUSE OXYGEN SU HELMETS IS REQUIRED. ONORBIT THE LEA LV3 AND LV4 WITH SWITCHES S15 AND S18 CANNOT BE ACCOMPLISHED.	ING A FIRE HAZARD. THE LEAK PPLY TO THE LAUNCH/ENTRY AK CAN BE ISOLATED BY CLOSING
REFERENCES:	

REPORT DATE 10/23/87

C-473

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5028	HIGHEST CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/1R 3/3
ITEM: EMU O2 SUPPLY COU FAILURE MODE: EXTERNAL LEAKAGE	PLINGS	
LEAD ANALYST: R.E. DUFFY S	UBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) OXYGEN SYSTEM 4) 5) 6) 7) 8) 9)		·
CRITI	CALITIES	
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:2/1RDEORBIT:3/3LANDING/SAFING:3/3	ABORT HDW/FUNG RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3	2
REDUNDANCY SCREENS: A [2]	B[P] C[P]	
LOCATION: PART NUMBER:		
CAUSES: ACOUSTICS, MECHANICAL S	HOCK, VIBRATION	

EFFECTS/RATIONALE:

DURING ORBIT, WHEN THE OXYGEN SUPPLY VALVES ARE OPENED, THE LEAK WILL RESULT IN HIGH PPO2 IN THE AIRLOCK CREATING A FIRE HAZARD. IN ADDITION, DEPENDING ON THE LEAK'S SEVERITY, THE CREWMEMBER MAY NOT GET ENOUGH FLOW TO PREVENT DEPLETION OF THE PLSS OXYGEN TANKS PRIOR TO EVA.

REFERENCES:

REPORT DATE 10/23/87

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5029	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3
ITEM: DEPRESS CAP VENT (1) FAILURE MODE: FAILS TO OPEN, PHYSIC	CAL BINDING/JAMMING
LEAD ANALYST: R.E. DUFFY SUBS	YS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) DEPRESS SYSTEM 4) 5) 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3 LANDING (CARING: 2/2	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	В[] С[]
LOCATION: PANEL AW82A PART NUMBER:	
CAUSES: CONTAMINATION, MECHANICAL S	SHOCK, MISHANDLING/ABUSE,
EFFECTS/RATIONALE: HATCH CANNOT BE OPENED FOR EVA UNLE: DEPRESSURIZED.	SS THE AIRLOCK IS
REFERENCES:	

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DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:5030ABORT:3/3				
ITEM: CAP VENT DEBRIS SCREEN (1) FAILURE MODE: PHYSICAL BINDING/JAMMING				
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) DEPRESS SYSTEM 4) 5) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC				
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3				
LIFTOFF: 3/3 TAL: 3/3				
ONORBIT: 2/2 AOA: 3/3				
DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3				
LANDING/SATING: 5/5				
REDUNDANCY SCREENS: A [] B [] C []				
LOCATION: PART NUMBER:				
CAUSES: CONTAMINATION, MISHANDLING/ABUSE				
EFFECTS/RATIONALE: IF THE FIRST DEBRIS SCREEN CANNOT BE REMOVED WHEN IT BECOMES BLOCKED WITH FROST, FULL DECOMPRESSION CANNOT BE ATTAINED, THE HATCH CANNOT BE OPENED TO START THE EVA.				

REFERENCES:

REPORT DATE 10/23/87

DATE: SUBSYSTEM: L MDAC ID: 5	8/04/87 IFE SUPPORT 031	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 3/3
	CAP VENT DEBRIS RESTRICTED FLOW	SCREEN (1)		
LEAD ANALYST:	R.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIE 1) LIFE SUP 2) AIRLOCK 3) DEPRESS 4) 5) 6) 7) 8) 9)	PORT SYSTEM		-	
	CRI	TICALITIES		
FLIGHT PH	ASE HDW/FUNC	ABORT		IC
PRELAU		RTI	LS: 3/3	
LIFTOF	F: 3/3	TAI	L: 3/3	
ONORBI	F: 2/2	AOZ		
DEORBI	F: 3/3	ATC	D: 3/3	
	G/SAFING: 3/3			
REDUNDANCY SC	REENS: A []	B[]	с[]	
LOCATION: PART NUMBER:				
CAUSES: CONT	AMINATION, LODGED	DEBRIS		
	DEBRIS SCREEN BEG SSION IS ATTAINED,			
REFERENCES :				

REPORT DATE 10/23/87

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5032	Н	IGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/1R 3/3
ITEM: DEPRESS VAL FAILURE MODE: EXTERNAL LE		ACH)		
LEAD ANALYST: R.E. DUFFY	SUBSYS	LEAD: M	.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) DEPRESS SYSTEM 4) 5) 6) 7) 8) 9)				
	CRITICALIT	IES		
FLIGHT PHASEHDW/1PRELAUNCH:3/1LIFTOFF:3/1			HDW/FUN	С
PRELAUNCH: 3/3	3	RTLS	: 3/3 3/3	
LIFTOFF: 3/	3	TAL:	3/3	
ONORBIT: 3/1	1R .	AOA:	3/3	
DEORBIT: 3/3	3	ATO:	3/3	-
ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	3			
REDUNDANCY SCREENS: A [2] B	[P]	С[Р]	
LOCATION: PART NUMBER:				
CAUSES: CONTAMINATION, ME TEMPERATURE, VIBRATION	CHANICAL SH	OCK, PIE	CE-PART FAI	LURE,
EFFECTS/RATIONALE: AIRLOCK PRESSURE CANNOT BE VACUUM VENT ISOLATION VALVI		FORCING	THE CLOSUR	e of the
REFERENCES :				
REFERENCED.				

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DATE: SUBSYSTEM: MDAC ID:	8/04/87 LIFE SUPPORT 5033	HIGHEST (CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 3/3
ITEM: FAILURE MOD	DEPRESS VALVE (1 DE: FAILS TO OPEN)		
LEAD ANALYS	T: R.E. DUFFY	SUBSYS LEAD: 1	M.J. SAIIDI	
2) AIRLOC	SUPPORT SYSTEM			
FLIGHT PREI LIFT ONOF DEOF LAND	PHASE HDW/FUNC AUNCH: 3/3 COFF: 3/3 BIT: 2/2 BIT: 3/3 DING/SAFING: 3/3	ICALITIES ABORT RTL TAL AOA ATO	HDW/FUN S: 3/3 : 3/3 : 3/3 : 3/3	
REDUNDANCY	SCREENS: A []	B[]	C[]	
LOCATION: PART NUMBER	R:			
	ONTAMINATION, MECHANI E, VIBRATION	CAL SHOCK, PI	ECE-PART FAI	LURE,
EFFECTS/RAT AIRLOCK CAN	TIONALE: NOT BE DEPRESSURIZED	, HATCH CANNO	T BE OPENED	FOR EVA.
REFERENCES:	:			

REPORT DATE 10/23/87

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5034	HIGHEST CRITICAL FLIGHT ABORT:	: 3/2R
ITEM: DEPRESS VALVE/CAP (1 FAILURE MODE: FAILS TO CLOSE	EACH)	
LEAD ANALYST: R.E. DUFFY SUBSY	S LEAD: M.J. SAI	IDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) DEPRESS SYSTEM 4) 5) 6) 7) 8) 9)		
CRITICALI		
FLIGHT PHASEHDW/FUNCPRELAUNCH:3/3LIFTOFF:3/3ONORBIT:3/2RDEORBIT:3/3LANDING/SAFING:3/3	TAL: 3, AOA: 3,	/3
REDUNDANCY SCREENS: A [2] B	[P] C[]	?]
LOCATION: PART NUMBER:		
CAUSES: CONTAMINATION, MECHANICAL S TEMPERATURE, VIBRATION	HOCK, PIECE-PART	FAILURE,
EFFECTS/RATIONALE: AIRLOCK CAN BE REPRESSURIZED AFTER S VALVE SEALING CAP. ALTERNATELY, THE CAN BE CLOSED.		
REFERENCES:		

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DATE: 8/04/ SUBSYSTEM: LIFE SU MDAC ID: 5035	'87 JPPORT		TICALITY FLIGHT: ABORT:	HDW/FUNC 2/1R 3/3
ITEM: AIRI FAILURE MODE: FAII RESTRICTED FLOW			JAMMING,	
LEAD ANALYST: R.E.	DUFFY SUE	SYS LEAD: M.J	. SAIIDI	
BREAKDOWN HIERARCHY 1) LIFE SUPPORT S 2) AIRLOCK 3) PRESSURE EQUAL 4) AIRLOCK TO CAE 5) 6) 7) 8) 9)	SYSTEM LIZATION			·
	CRITICA	LITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFI	HDW/FUNC 3/3 3/3 2/1R 3/3		3/3 3/3	C
REDUNDANCY SCREENS:	A [2]	B [P]	С[Р]	

LOCATION: PART NUMBER:

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CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, VIBRATION

EFFECTS/RATIONALE:

AIRLOCK CAN ONLY BE REPRESSURIZED THROUGH ONE VALVE. LOSS OF REDUNDANCY CAN LEAD TO LOSS OF LIFE.

REFERENCES:

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REPORT DATE 10/23/87 C-481

DATE: SUBSYSTEM: MDAC ID:	8/04/87 LIFE SUPPOR 5036	۲	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: FAILURE MOD		TO CABIN VEN CLOSE	T CAP (2)		
LEAD ANALYS	I: R.E. DUFF	Y SUBS	YS LEAD: M	.J. SAIIDI	
2) AIRLOC 3) PRESSU	UPPORT SYSTE				
		CRITICAI	ITIES		
PREL LIFT ONOR DEOR	AUNCH: OFF: BIT:	IDW/FUNC 3/3 3/3 3/3 3/3	ABORT RTLS TAL: AOA: ATO:	3/3 3/3 3/3	8
REDUNDANCY	SCREENS: A		B[]	с[]	
LOCATION: PART NUMBER	:				

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

WITHOUT THE VENT CAP THE PRESSURE DROP ACROSS THE BUTTERFLY OF THIS EQUALIZATION VALVE WILL BE GREATER. THIS MAY LEAD TO INCREASED LEAK RATES WHILE THE AIRLOCK IS DEPRESSURIZED. HOWEVER, THERE ARE NO OTHER EFFECTS.

REFERENCES:

REPORT DATE 10/23/87

C-482

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5037	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: 3/3
ITEM: AIRLOCK TO CAB FAILURE MODE: RESTRICTED FLO	IN FILTER (2) W
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO CABIN 5) 6) 7) 8) 9)	
CR	ITICALITIES
FLIGHT PHASE HDW/FUN	C ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: $3/3$	TAL: $3/3$
	$\lambda \cap \lambda : 2/2$
UNURBIT: 2/1R	AUA: 5/5
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: PART NUMBER:	
CAUSES: CONTAMINATION, LODGI	NG DEBRIS
EFFECTS/RATIONALE: AIRLOCK CAN ONLY BE REPRESSUR LOSS OF REDUNDANCY CAN LEAD T	IZED THROUGH ONE OF TWO VALVES. O LOSS OF LIFE.
REFERENCES:	

REPORT DATE 10/23/87

	CALITY HDW/FUNC GHT: 3/3 RT: 3/3
ITEM: AIRLOCK TO CABIN FILTER (2) FAILURE MODE: FAILS OPEN	
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J.	SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO CABIN 5) 6) 7) 8) 9)	·
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTPRELAUNCH:3/3RTLS:LIFTOFF:3/3TAL:ONORBIT:3/3AOA:DEORBIT:3/3ATO:LANDING/SAFING:3/3	HDW/FUNC 3/3 3/3 3/3 3/3
REDUNDANCY SCREENS: A [] B [] C	[]
LOCATION: PART NUMBER:	
CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, PIE VIBRATION	CE-PART FAILURE,
EFFECTS/RATIONALE: THE FAILURE IS QUESTIONABLE. HOWEVER, SHOULD IT EFFECTS ARE NOT CONSEQUENTIAL.	OCCUR, THE
REFERENCES:	

REPORT DATE 10/23/87 C-484

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5039	HIGHE	ST CRITICALITY FLIGHT: ABORT:	2/1R
ITEM: AIRLOCK TO FAILURE MODE: FAILS TO O			
LEAD ANALYST: R.E. DUFFY	SUBSYS LEA	D: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO CABIN 5) 6) 7) 8) 9)	N		·
	CRITICALITIES		
FLIGHT PHASE HDW		RT HDW/FU	NC
PRELAUNCH: 3	/3	RTLS: 3/3	
LIFTOFF: 3	/3	TAL: 3/3	•
ONORBIT: 2	/1R	AOA: 3/3	
DEORBIT: 3	/3	ATO: 3/3	
LANDING/SAFING: 3	/3		
REDUNDANCY SCREENS: A [2] B [P] C[P]	
LOCATION: PART NUMBER:			• · · · ·
CAUSES: CONTAMINATION, M PIECE-PART FAILURE, TEMPE			BUSE,
EFFECTS/RATIONALE: AIRLOCK CAN ONLY BE REPRE LOSS OF REDUNDANCY CAN LE			LVES.
REFERENCES:			

REPORT DATE 10/23/87 C-485

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPP MDAC ID: 5040	PORT	HIGHEST (CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R 3/3
ITEM: AIRLOO FAILURE MODE: FAILS				
LEAD ANALYST: R.E. DU	FFY SU	BSYS LEAD: 1	A.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYS 2) AIRLOCK 3) PRESSURE EQUALIZ 4) AIRLOCK TO CABIN 5) 6) 7) 8) 9)	ATION			
	CRITIC	ALITIES		
FLIGHT PHASE			HDW/FUN	с
PRELAUNCH:	3/3	RTLS		
LIFTOFF:	3/3	TAL		
ONORBIT:	3/2R	AOA		
DEORBIT:	3/2R 3/3	ATO		
LANDING/SAFING	: 3/3			
REDUNDANCY SCREENS:	A [2]	B [P]	С[Р]	
LOCATION: PART NUMBER:				
CAUSES: CONTAMINATIO	•	-		USE,

PIECE-PART FAILURE, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

THIS FAILURE WILL PRECLUDE DEPRESSURIZATION OF THE AIRLOCK. LOSS OF A GOOD SEAL WITH THE VENT CAP LEADS TO LOSS OF MISSION.

REFERENCES:

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	ONDITER DODE				
DATE: SUBSYSTEM: MDAC ID:	8/04/87 LIFE SUPPORI 5041		HIGHEST (CRITICALITY FLIGHT: ABORT:	HDW/FUNC 2/2 3/3
	AIRLOCK T E: EXTERNAL		JALIZATION	VALVE (2)	
LEAD ANALYS	T: R.E. DUFFY	SUBS	SYS LEAD:	M.J. SAIIDI	
2) AIRLOC	UPPORT SYSTEN K RE EQUALIZATI				
		CRITICAL	TUTES		
FLIGHT PREL LIFT ONOR DEOR LAND	PHASE HI AUNCH: OFF: BIT: BIT: ING/SAFING:	DW/FUNC 3/3 3/3 2/2 3/3	ABORT RTL TAL AOA ATO	HDW/FUN S: 3/3 : 3/3 : 3/3 : 3/3	IC
REDUNDANCY LOCATION: PART NUMBER	SCREENS: A	[]	B[]	C []	
PIECE-PART	NTAMINATION, FAILURE, TEM	MECHANICAL PERATURE, V	SHOCK, MI IBRATION	SHANDLING/AE	BUSE,
DEPRESSURIZ	IONALE: IS VALVE CAN E THE AIRLOC CREW GOES E	K. LOSS OF	SS OF THE MISSION D	UE TO CONTIN	TUAL CABIN
REFERENCES :	Sentrophilis (* Voltaise Sentr	e a qui ean i Foise i ceil èir	rifination de la companya de la comp		월 28월21 주 5 출 1882년 1993년
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REPORT DATE 10/23/87

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DATE: 8/04/87 HIGHEST CRITICALITY HDW/FUN SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 5042 ABORT: 3/3 ITEM: AIRLOCK TO CABIN PRESSURE DIFFERENTIAL (2) FAILURE MODE: ERRATIC OPERATION, FAILS MID-TRAVEL, FAILS OUT OF TOLERANCE, INTERMITTENT OPERATION, PHYSICAL BINDING/JAMMING, DELAYED OPERATION, ERRONEOUS OUTPUT, PARTIAL OUTPUT, LOSS OF	
OUTPUT	
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO CABIN 5) MEASUREMENT 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3A	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION:	

LOCATION: PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

CREW INCONVENIENCE. IF THE AIRLOCK PRESSURE DROPS BELOW 4.2 PSIA AND THE EMU IS STILL ON VEHICLE POWER, A WARNING TONE IS ISSUED AND THE CREWMEMBER IS INSTRUCTED TO SWITCH TO BATTERY POWER AND TO DISCONNECT THE SCU.

REFERENCES:

DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:5043ABORT:3/3					
ITEM: AIRLOCK TO CABIN PRESSURE DIFFERENTIAL (2) FAILURE MODE: EXTERNAL LEAKAGE					
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO CABIN 5) MEASUREMENT 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: 2/2 AOA: 3/3					
DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3					
REDUNDANCY SCREENS: A [] B [] C [] LOCATION: PART NUMBER:					
CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION					
EFFECTS/RATIONALE:					

LOSS OF MISSION DUE TO CONTINUAL CABIN LEAK IF CREW GOES ON EVA (HATCH DOOR TO PAYLOAD BAY IS LEFT OPEN DURING EVA).

REFERENCES:

REPORT DATE 10/23/87

C-489

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DATE: 8/04/87 HIGHEST CRITICALITY SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 5044 ABORT:	3/3				
ITEM: AIRLOCK DIFFERENTIAL PRESSURE SENSOR FAILURE MODE: ERRATIC OPERATION, FAILS OUT OF TOLERANCE, INTERMITTEN OPERATION, DELAYED OPERATION, ERRONEOUS OUTPUT, PARTIAL OUTPUT, OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED					
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIID	ſ				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO CABIN 5) MEASUREMENT (V64P0101A, P0102A) 6) 7) 8) 9)					
CRITICALITIES					
FLIGHT PHASEHDW/FUNCABORTHDW/FUPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/33/3	JNC				
REDUNDANCY SCREENS: A [] B [] C []]				
LOCATION: PART NUMBER:					

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: CREW INCONVENIENCE. SEE MDAC ID 5042.

REFERENCES:

REPORT DATE 10/23/87

DATE: 8/04/8 SUBSYSTEM: LIFE SUP MDAC ID: 5045	7 PORT	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3	
ITEM: AIRLOCK WALL TEMPERATURE SENSOR FAILURE MODE: ERRATIC OPERATION, FAILS OUT OF TOLERANCE, INTERMITTEN OPERATION, ERRONEOUS OUTPUT, OPEN (ELECTRICAL), LOSS OF OUTPUT					
LEAD ANALYST: R.E. D	UFFY SUBS	SYS LEAD: M	.J. SAIIDI		
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO CABIN 5) MEASUREMENT (V64T0130A, T0131A) 6) 7) 8) 9)					
	CRITICA	LITIES			
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT:	HDW/FUNC	ABORT	HDW/FUN	C	
PRELAUNCH:	3/3 3/3 3/3 3/3 3/3	RTLS	: 3/3		
LIFTOFF:	3/3	TAL:	3/3		
ONORBIT:	3/3	AOA:	3/3		
DEORBIT:	3/3	ATO:	3/3		
LANDING/SAFIN	G: 3/3				
REDUNDANCY SCREENS:	A []	в[]	с[]		
LOCATION: PART NUMBER:					
CAUSES: CONTAMINATI VIBRATION	ON, MECHANICAL	SHOCK, PIE	CE-PART FAI	LURE,	
EFFECTS/RATIONALE:	NO OTHER FFFF	TTS BECOR	DING OF MEA	SURFMENT	

CREW INCONVENIENCE. NO OTHER EFFECTS. RECORDING OF MEASUREMENT AFTER FAILURE IS LOST.

REFERENCES:

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REPORT DATE 10/23/87 C-491

SUBS	: 8/0 YSTEM: LIFE ID: 5046		HIGHEST	CRITICALII FLIGHT: ABORT:	
FAIL		RLOCK TO AMBIE AILS TO OPEN, P			; ,
LEAD	ANALYST: R.E	DUFFY	SUBSYS LEAD:	M.J. SAIID	I
1) 2) 3)	KDOWN HIERARC LIFE SUPPORT AIRLOCK PRESSURE EQU AIRLOCK TO F	SYSTEM			-
			ICALITIES		
	PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT:	3/3 3/2R	RTI	L: 3/3 A: 3/3	

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, VIBRATION

EFFECTS/RATIONALE:

THE FAILURE ASSUMES THE TUNNEL ADAPTER IS ATTACHED AND AFTER LIFT-OFF THE EQUALIZATION VALVE VENT CAP CANNOT BE REMOVED. THIS PREVENTS THE VALVE FROM OPERATING. A SECOND FAILURE WOULD BE LOSS OF SPACELAB MISSION, DUE TO THE INABILITY TO OPEN THE HATCH.

REFERENCES:

DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:5047ABORT:3/3	2
ITEM: AIRLOCK TO AMBIENT VENT CAP (2) FAILURE MODE: FAILS TO CLOSE	
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO PAYLOAD BAY 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 3/3	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: PART NUMBER:	

CAUSES: CONTAMINATION, MISHANDLING/ABUSE, PIECE-PART FAILURE

EFFECTS/RATIONALE:

WITH THE TUNNEL ADAPTER ATTACHED, THIS FAILURE HAS NO EFFECT SINCE THIS DOOR IS ALWAYS OPEN TO THE SPACELAB. WITHOUT THE TUNNEL ADAPTER, THIS FAILURE IS NOT REALISTIC SINCE THE CAP WOULD HAVE NOT BEEN NOMINALLY REMOVED.

REFERENCES:

REPORT DATE 10/23/87

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5048		ICALITY JIGHT: BORT:	HDW/FUNC 3/2R 3/3
ITEM: AIRLOCK TO AMBIENT H FAILURE MODE: RESTRICTED FLOW	FILTER (2)	1. gen - 1. -	
LEAD ANALYST: R.E. DUFFY SUBS	SYS LEAD: M.J.	SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO PAYLOAD BAY 5) 6) 7) 8) 9)			
CRITICAI	LITIES		
FLIGHT PHASE HDW/FUNC	ABORT	HDW/FUN	C
	RTLS:		
PRELAUNCH: 3/3 LIFTOFF: 3/3	TAL:	3/3	
ONORBIT: 3/2R	AOA:	3/3	
ONORBIT: 3/2R DEORBIT: 3/3	ATO:	3/3	
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [2]	B [P]	C[P]	
LOCATION: PART NUMBER:			

CAUSES: CONTAMINATION, LODGED DEBRIS

EFFECTS/RATIONALE:

THE FAILURE ASSUMES THE TUNNEL ADAPTER IS ATTACHED AND AFTER LIFT OFF THE EQUALIZATION VALVE CANNOT FUNCTION DUE TO A SEVERELY CONTAMINATED FILTER. A SECOND FAILURE WOULD BE LOSS OF SPACELAB MISSION, DUE TO THE INABILITY TO OPEN THE HATCH.

REFERENCES:

REPORT DATE 10/23/87

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5049	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: AIRLOCK TO AMBIENT FAILURE MODE: FAILS OPEN	FILTER (2)
LEAD ANALYST: R.E. DUFFY SUP	SYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO PAYLOAD BAY 5) 6) 7) 8) 9)	· · · · · · · · · · · · · · · · · · ·
CRITIC	AT.TTTTES
FLIGHT PHASE HDW/FUNC	
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: 3/3
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: PART NUMBER:	
CAUSES: MECHANICAL SHOCK, MISHANI VIBRATION	DLING/ABUSE, PIECE-PART FAILURE,
EFFECTS/RATIONALE: THIS FAILURE IS QUESTIONABLE. HOW NO FURTHER EFFECTS.	VEVER, SHOULD IT OCCUR, THEY ARE
REFERENCES:	

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DATE: SUBSYSTEM: MDAC ID:	8/04/87 LIFE SUPPORT 5050	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/2R 3/3
	AIRLOCK TO AM E: FAILS TO OPEN			
LEAD ANALYST	C: R.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI	
2) AIRLOCH 3) PRESSUE	JPPORT SYSTEM K RE EQUALIZATION K TO PAYLOAD BAY			
	Č	RITICALITIES		
LIFTC ONORI DEORI	PHASE HDW/FU AUNCH: 3/3	NC ABORT RTI TAI AOZ	LS: 3/3 L: 3/3 L: 3/3	
REDUNDANCY S	SCREENS: A [2] B[P]	С[Р]	

LOCATION: PART NUMBER:

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CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE, TEMPERATURE, VIBRATION

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EFFECTS/RATIONALE:

THE FAILURE ASSUMES THE TUNNEL ADAPTER IS ATTACHED AND AFTER LIFT-OFF THE VALVE CANNOT BE OPENED TO EQUALIZE THE PRESSURE ACROSS THE HATCH AND ACROSS THE SPACELAB. THE SECOND VALVE FAILURE IS LOSS OF MISSION.

REFERENCES:

DATE: 8/04/87 HIGHEST CRITICALIT SUBSYSTEM: LIFE SUPPORT FLIGHT: MDAC ID: 5051 ABORT:	3/3
ITEM: AIRLOCK TO AMBIENT EQUALIZATION VALVE (FAILURE MODE: FAILS TO CLOSE, INTERNAL LEAKAGE	2)
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIID	I
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO PAYLOAD BAY 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC ABORT HDW/F	
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 [] B [] C []
LOCATION: PART NUMBER:	
CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ PIECE-PART FAILURE, TEMPERATURE, VIBRATION	ABUSE,

EFFECTS/RATIONALE:

WITH THE TUNNEL ADAPTER ATTACHED, THIS FAILURE HAS NO EFFECT SINCE THE HATCH FACING THE CABIN CAN BE CLOSED TO ISOLATE THE PAYLOAD BAY EQUIPMENT FROM THE CREW. IN ADDITION, THE HATCH IN THE TUNNEL ADAPTER FACING THE SPACELAB CAN BE CLOSED. FURTHER, THE VENT CAP FOR THE FAILED VALVE CAN BE INSTALLED TO BLOCK THE LEAK.

REFERENCES:

REPORT DATE 10/23/87

C-497

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5052	HIGHEST	CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3	
ITEM: AIRLOCK TO AM FAILURE MODE: EXTERNAL LEAK		[ON VALVE (2)	
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO PAYLOAD BAY 5) 6) 7) 8) 9)			
C	RITICALITIES		
	IC ABORT	HDW/FUNC	
PRELAUNCH: 3/3	RTI		
LIFTOFF: 3/3	ŤAJ	L: 3/3	
LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3	ŤAI AOZ	A: 3/3	
DEORBIT: 3/3	ATC		
LANDING/SAFING: 3/3			
REDUNDANCY SCREENS: A [B[]	с[]	
LOCATION: PART NUMBER:			
CAUSES: CONTAMINATION, MECH PIECE-PART FAILURE, TEMPERATO		SHANDLING/ABUSE,	
EFFECTS/RATIONALE: THIS FAILURE ASSUMES THERE IS NO TUNNEL ADAPTER ATTACHED. THE LEAK CAN DEPRESSURIZE THE AIRLOCK FORCING EVACUATION BY THE AIRLOCK CREW. THE LEAK IS ASSUMED TO BE SMALLER THAN THE FLOW THROUGH THE TWO EQUALIZATION VALVES IN THE HATCH FACING THE CABIN.			

REFERENCES:

DATE:	8/04/87	HIGHEST	CRITICALITY	HDW/FUNC
SUBSYSTEM:	LIFE SUPPORT		FLIGHT:	3/3
MDAC ID:	5053		ABORT:	3/3

AIRLOCK TO AMBIENT PRESSURE DIFFERENTIAL (2) ITEM: FAILURE MODE: ERRATIC OPERATION, FAILS MID-TRAVEL, FAILS OUT OF TOLERANCE, INTERMITTENT OPERATION, PHYSICAL BINDING/JAMMING, DELAYED OPERATION, ERRONEOUS OUTPUT, PARTIAL OUTPUT, LOSS OF OUTPUT

LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI

BREAKDOWN HIERARCHY:

- LIFE SUPPORT SYSTEM 1)
- AIRLOCK 2)

3) PRESSURE EQUALIZATION

- AIRLOCK TO PAYLOAD BAY 4)
- 5)
- 6)
- 7)
- 8) 9)
- CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE 3/3 RTLS: 3/3 **PRELAUNCH:** 3/3 TAL: 3/3 LIFTOFF: 3/3 3/3 AOA: ONORBIT: ATO: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: CREW INCONVENIENCE. SEE MDAC ID 1141.

REFERENCES:

REPORT DATE 10/23/87

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5054	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/3
ITEM: AIRLOCK TO AMBIENT PR FAILURE MODE: EXTERNAL LEAKAGE	ESSURE DIFFERENTIAL (2)
LEAD ANALYST: R.E. DUFFY SUBSY	S LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) PRESSURE EQUALIZATION 4) AIRLOCK TO PAYLOAD BAY 5) 6) 7) 8) 9)	
CRITICALI	TIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3	RTLS: 3/3
LIFTOFF: 3/3	TAL: 3/3
ONORBIT: 3/2R	AOA: 3/3
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A [2] B	[P] C[P]
LOCATION: PART NUMBER:	

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE CRITICALITY ASSUMES THAT THE LEAK THROUGH THE GAUGE CANNOT BE GREATER THAN THE FLOW THROUGH BOTH CABIN HATCH EQUALIZATION VALVES (PER NSTS-22206, 2.3.1.i, CHANGE 2, THE LEAK ASSESSED CAN ONLY OCCUR FROM WITHIN THE INSTRUMENT AND NOT THE PENETRATION. THE CREW CAN WORK AROUND THIS FAILURE IF NECESSARY. FUNCTIONALLY, THE LEAK MAY TERMINATE THE MISSIONS DUE TO OVERTAXING OF THE CONSUMABLES SYSTEM.

REFERENCES:

DATE:8/04/87HIGHEST CRITICALITYHDW/FSUBSYSTEM:LIFE SUPPORTFLIGHT:2/2MDAC ID:5055ABORT:3/3	2			
ITEM: EMU POWER/BATTERY CHARGER BUS SELECT SWITCH (2) FAILURE MODE: OPEN (ELECTRICAL), FAILS TO SWITCH, OPEN, SINGI CONTACT	Æ			
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) EMU POWER/BATTERY CHARGER (S1, S2) 4) 5) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:2/2AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3				
REDUNDANCY SCREENS: A [] B [] C []				
LOCATION: PANEL AW18H PART NUMBER:				

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: FAILURE ASSUMES A NOMINAL MISSION WITH TWO CREWMEN. LOSS OF ABILITY TO PROVIDE SCU POWER TO EMU.

REFERENCES:

REPORT DATE 10/23/87

DATE: 8/04/87 SUBSYSTEM: LIFE SUPP MDAC ID: 5056	PORT		TICALITY LIGHT: BORT:	HDW/FUNC 2/2 3/3
ITEM: EMU PO FAILURE MODE: INTERN OUTPUT, FAILS OPEN	WER/BATTERY CH IITTENT OPERATIO	ARGER RPC (4 ON, ERRONEOU) S OUTPUT,	PARTIAL
LEAD ANALYST: R.E. DU	JFFY SUBS	YS LEAD: M.J	. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYS 2) AIRLOCK 3) EMU POWER/BATTER 4) REMOTE POWER CON 5) 6) 7) 8) 9)	Y CHARGER			
	CRITICAL	ITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC 3/3 3/3 2/2 3/3	ABORT RTLS: TAL: AOA: ATO:	· · · · · · · · · · · · · · · · · · ·	2
REDUNDANCY SCREENS:	A[]]	В[]	с[]	

LOCATION: PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, ACOUSTICS

EFFECTS/RATIONALE:

FAILURE TO PRODUCE THE CORRECT OUTPUT FOR THE EMU WILL CAUSE LOSS OF MISSION. FAILURE ASSUMES A NOMINAL MISSION WITH TWO CREWMEN.

REFERENCES:

REPORT DATE 10/23/87 C-502

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DATE: SUBSYSTEM: L MDAC ID: 50	8/04/87 IFE SUPPORT 057	HIGHEST	CRITICALITY FLIGHT: ABORT:	3/2R
ITEM: FAILURE MODE:	EMU POWER/BATTH SHORTED	ERY CHARGER DIC	DDE (4)	
LEAD ANALYST:	R.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI	
BREAKDOWN HIE 1) LIFE SUP 2) AIRLOCK 3) EMU POWE 4) DIODE (4 5) 6) 7) 8) 9)	PORT SYSTEM R/BATTERY CHARGEN	2	· ·	
	CD	TICALITIES		
FLIGHT PH PRELAU LIFTOF ONORBI DEORBI LANDIN	ASE HDW/FUNG NCH: 3/3 F: 3/3 T: 3/2R T: 3/3 G/SAFING: 3/3	C ABORT RTI TAI AOA ATC	HDW/FUN LS: 3/3 L: 3/3 A: 3/3 D: 3/3	IC
REDUNDANCY SC	REENS: A [2]	B [P]	C [P]	
LOCATION: PART NUMBER:				
CAUSES: ACOU VIBRATION	STICS, MECHANICA	L SHOCK, PIECE-	-PART FAILURE	Ξ,
MAIN B ARE TI IS LOSS OF AB	NALE: MAY BE UNNOTICED ED TOGETHER THROU ILITY TO OPERATE OSS OF MISSION.	UGH THIS LINE.	LOSS OF REI	DUNDANCY

REFERENCES:

REPORT DATE 10/23/87

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DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:5058ABORT:3/3
ITEM: EMU POWER/BATTERY CHARGER DIODE (4) FAILURE MODE: OPEN (ELECTRICAL)
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) EMU POWER/BATTERY CHARGER 4) DIODE (4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/2RAOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3
REDUNDANCY SCREENS: A [2] B [P] C [P]
LOCATION: PART NUMBER:
CAUSES: ACOUSTICS, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION
EFFECTS/RATIONALE: FAILURE TO SUPPLY POWER THROUGH SELECTED BUS. LOSS OF REDUNDANCY CAUSES LOSS OF MISSION.
REFERENCES:

REPORT DATE 10/23/87

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5059	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/2 ABORT: 3/3
ITEM: EMU POWER/BATTERY FAILURE MODE: ERRATIC OPERATION, ERRONEOUS OUTPUT, PARTIAL OUTPUT, OUTPUT, SHORTED	INTERMITTENT OPERATION,
LEAD ANALYST: R.E. DUFFY SU	BSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) EMU POWER/BATTERY CHARGER (2 4) 5) 6) 7) 8) 9))
CRITIC	ALITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 2/2 DEORBIT: 3/3	RTLS: 3/3 TAL: 3/3
LIFTOFF: 3/3	TAL: 3/3
ONORBIT: 2/2	AOA: 3/3
DEORBIT: 3/3	ATO: 3/3
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: PART NUMBER:	
CAUSES: ACOUSTICS, CONTAMINATION	, MECHANICAL SHOCK, VIBRATION
EFFECTS/RATIONALE: FAILURE TO PRODUCE THE CORRECT OU OF MISSION. FAILURE ASSUMES A NO	
REFERENCES:	

REPORT DATE 10/23/87

SUBSYSTEM: LIFE SUPPORT FLI	CALITY HDW/FUNC GHT: 2/2 RT: 3/3 -				
ITEM: EMU POWER/BATTERY CHARGER POWER SU FAILURE MODE: OPEN (ELECTRICAL), FAILS TO SWITCH CONTACT					
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J.	SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) EMU POWER/BATTERY CHARGER 4) MODE SWITCH (S3, S5) 5) 6) 7) 8) 9)					
CRITICALITIES					
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:LIFTOFF:3/3TAL:ONORBIT:2/2AOA:DEORBIT:3/3ATO:LANDING/SAFING:3/3	3/3				
	[]				
LOCATION: PANEL AW18H PART NUMBER:					
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PEICE-PAULINATION	ART FAILURE,				
EFFECTS/RATIONALE: FAILURE TO SWITCH EITHER FROM EMU POWER SUPPLY MOU CHARGE MODE WILL CAUSE LOSS OF MISSION. FAILURE A NOMINAL MISSION WITH TWO CREWMEN.					
REFERENCES:					

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DATE: SUBSYSTEM: MDAC ID:		r T	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: FAILURE MODE CONTACT		T SWITCH (1) ECTRICAL), H		SWITCH, OPEN,	SINGLE
LEAD ANALYST	R.E. DUFF	Y SUBS	SYS LEAD:	M.J. SAIIDI	
2) AIRLOCK 3) EMU POW	PPORT SYSTE				
		CRITICAL	LITIES		
LIFTO ONORE DEORE	UNCH: DFF: BIT:	DW/FUNC 3/3 3/3 3/3 3/3 3/3	ABORT RT TA	HDW/FUN LS: 3/3 AL: 3/3 DA: 3/3 TO: 3/3	IC
REDUNDANCY S	CREENS: A	[]	в[]	с[]	

LOCATION: PANEL AW18H PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PEICE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE TO SWITCH BETWEEN EMU 1 AND 2 FOR VOLTAGE AND CURRENT CHECK. NOT MISSION ESSENTIAL, VOLTAGE CAN BE CHECKED THROUGH THE EMU INDICATOR.

REFERENCES:

REPORT DATE 10/23/87

DATE: SUBSYSTEM: MDAC ID:	8/04/87 LIFE SUPP 5062	ORT	HI	GHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
	E: ERRATI	C OPERATI	ON, FAIL	S OUT O	OF TOLERANCE EN (ELECTRIC	
LEAD ANALYS	T: R.E. DU	FFY	SUBSYS	LEAD: M	.J. SAIIDI	
2) AIRLOC	UPPORT SYS' K WER/BATTER					
		CDT				
			TICALITI			0
	PHASE	HDW/FUNC	4			
	AUNCH:	3/3		RTLS	: 3/3	
	OFF:	3/3 3/3 3/3 3/3		TAL:	3/3	
	BIT:	3/3		AOA: ATO:	3/3 3/3	
	BIT: ING/SAFING	3/3		AIO:	3/3	
LAND	ING/SAFING	: 3/3				
REDUNDANCY	SCREENS:	A []	Β []	c []	
LOCATION: PART NUMBER		W18H				

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CAUSES: CONTAMINATION, MECHANICAL SHOCK, PEICE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

NOT MISSION ESSENTIAL, VOLTAGE CAN BE CHECKED THROUGH THE EMU VOLTAGE INDICATOR, AND THE BATTERIES CAN BE CHARGED FOR A SPECIFIED AMOUNT OF TIME.

REFERENCES:

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5063	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: EMU POWER SUPPLY CUR FAILURE MODE: OPEN (ELECTRICAL), L			
LEAD ANALYST: R.E. DUFFY SUBS	YS LEAD:	M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) EMU POWER/BATTERY CHARGER 4) CURRENT (V64C0211A, C0214A) 5) 6) 7) 8) 9)			
CRITICAL			
FLIGHT PHASE HDW/FUNC	ABORT	HDW/FUN	С
PRELAUNCH: 3/3	RTI	s: 3/3	
LIFTOFF: 3/3		3/3	
ONORBIT: 3/3 DEORBIT: 3/3	. AOA	1: 3/3): 3/3	
DEORBIT: 3/3 LANDING/SAFING: 3/3	ATC	. 3/3	
		a na ang garang na giga ang g	
REDUNDANCY SCREENS: A []	В[]	с[]	
LOCATION: PART NUMBER:			
CAUSES: MECHANICAL SHOCK, PEICE-PA	RT FAILUR	RE, VIBRATION	
EFFECTS/RATIONALE: NOT MISSION ESSENTIAL, SEE MDAC ID	5062.		
REFERENCES:			

REPORT DATE 10/23/87

DATE:8/04/87HIGHEST CRITICALITYHDW/FUNSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:5064ABORT:3/3	С
ITEM: EMU POWER SUPPLY VOLTAGE SENSOR FAILURE MODE: ERRATIC OPERATION, FAILS OUT OF TOLERANCE, INTERMITTENT OPERATION, ERRONEOUS OUTPUT, OPEN (ELECTRICAL), LOS OF OUTPUT, SHORTED	S
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) EMU POWER/BATTERY CHARGER 4) MEASUREMENTS (V64V0210A, V0213A) 5) 6) 7) 8) 9)	
CRITICALITIES	
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3	
REDUNDANCY SCREENS: A [] B [] C []	
LOCATION: PART NUMBER:	

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CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: NOT MISSION ESSENTIAL, SEE MDAC ID 5062.

REFERENCES:

DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/2RMDAC ID:5065ABORT:3/3				
ITEM: VACUUM VENT ISOLATION VALVE (1) FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE OPERATION				
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI				
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) 5) 6) 7) 8) 9)				
CRITICALITIES				
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/2RAOA:3/3DEORBIT:3/3ATO:3/3				
LANDING/SAFING: 3/3				
REDUNDANCY SCREENS: A [2] B [P] C [P]				
LOCATION: PART NUMBER: 90V62LV18				
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PEICE-PART FAILURE, VIBRATION				
EFFECTS/RATIONALE: THIS ISOLATION VALVE IS INSTALLED IN THE DEPRESSURIZATION DUCTS AND IS NORMALLY USED IN THE OPEN POSITION. FAILURE TO REMAIN OPEN PREVENTS DEPRESSURIZATION OF THE AIRLOCK USING THE DEPRESSURIZATION SYSTEM. THE AIRLOCK CAN BE DEPRESSURIZED THROUGH THE PAYLOAD BAY HATCH EQUALIZATION VALVES. LOSS OF FUNCTION LEADS TO LOSS OF MISSION.				
REFERENCES:				

REPORT DATE 10/23/87

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5066	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 2/1R ABORT: 3/3			
ITEM: VACUUM VENT ISO FAILURE MODE: FAILS TO CLOSE	LATION VALVE (1)			
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD: M.J. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VAL 4) 5) 6) 7) 8) 9)	VE			
CRI	TICALITIES			
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC			
PRELAUNCH: 3/3	RTIS: 3/3			
LIFTOFF: 2/1R ONORBIT: 2/1R DEORBIT: 2/1R	TAL: 3/3			
ONORBIT: 2/1R	AOA: 3/3			
DEORBIT: 2/1R	ATO: 3/3			
LANDING/SAFING: 3/3	• •			
REDUNDANCY SCREENS: A [2] B [F] C [P]				
LOCATION: PART NUMBER:				
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION				
EFFECTS/RATIONALE: NOMINALLY THIS FAILURE HAS NO EFFECT BUT THE ORBITER MISSION SHOULD BE TERMINATED DUE TO THE EFFECTS A DUCT LEAK COULD HAVE, SCREEN B HAS BEEN FAILED BECAUSE UPON FAILURE TO CLOSE IT IS NOT KNOWN IF THE CREW WILL HAVE ENOUGH TIME TO CORRECT FOR THE FAILURE. IT IS RECOMMENDED A MANUAL OVERRIDE BE INCLUDED IN THIS VALVE.				
REFERENCES:				

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	DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5067	HIGHEST C	RITICALITY FLIGHT: ABORT:	
	ITEM: VACUUM VENT ISOL. FAILURE MODE: OPEN (ELECTRICAL) CONTACT	VLV. CNTRL. , FAILS TO SW	SWITCH (1) ITCH, OPEN,	SINGLE
	LEAD ANALYST: R.E. DUFFY S	UBSYS LEAD: M	.J. SAIIDI	
	BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) CONTROL SWITCH (S11) 5) 6) 7) 8) 9)			
	CRITI	CALITIES		
	FLIGHT PHASE HDW/FUNC	ABORT		2
	PRELAUNCH: 3/2R	RTLS TAL:		
	LIFTOFF: 3/1R ONORBIT: 3/1R	AOA:		
	DEORBIT: 3/1R	ATO:		
	LANDING/SAFING: 3/3		- / -	•
	REDUNDANCY SCREENS: A [2]	B[F]	С[Р]	
	LOCATION: PANEL ML31C PART NUMBER:			
	CAUSES: MECHANICAL SHOCK, MISHA VIBRATION	NDLING/ABUSE,	PIECE-PART	FAILURE,
	EFFECTS/RATIONALE: THE VACUUM ISOLATION VALVE CANNO			
	ISOLATION VALVE IS DESIGNED TO C EVENT OF AN EXCESSIVE CABIN PRES OXYGEN SYSTEM 1 AND 2 FLOW SENSO	SURE LOSS RAT	E AND VIA TH LOSS OF FUN	HE CABIN NCTION
	COULD LEAD TO LOSS OF LIFE AND W BECAUSE UPON FAILURE TO CLOSE, I HAVE ENOUGH TIME TO CORRECT FOR	T IS NOT KNOW	IN IF THE CRI	EW WILL
	REFERENCES: PAGE 143 OF MOOG'S	COMPONENT SUM	MARY	
•				
	REPORT DATE 10/23/87	C-513		

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ORBITER SUBSY ASSESSMENT JISIS WORKSHEET DATE: 8/04/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 5068 ABORT: 3/3 VACUUM VEN ITEM: CNTRL. SWITCH (1) NTERMITTENT OPERATION, FAILURE MODE: FAILS TO S PREMATURE OPERATION LEAD ANALYST: R.E. DUFFY JYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATICE4) CONTROL SWITCH (S11) 5) 6) 7) 8) 9) ITIES ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 FLIGHT PHASE HDW/F/ PRELAUNCH: 3/2 3/2 3/2 LIFTOFF: ONORBIT: 3/23 AOA: 3/3 3/2 DEORBIT: ATO: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2 B [P] C [P] LOCATION: PART NUMBER: CAUSES: CONTAMINATION, MECH ... "AL SHOCK, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: THE ISOLATION VALVE REMAINS OF J. THE SWITCH CAN BE DISABLED WITH THE BUS SELECT SWITCH OR THE CIRCULT BREAKER AND THE VALVE WILL REMAIN IN ITS OPEN POSITION. **REFERENCES:** ORIGINAL PAGE IS OF POOR QUALITY

REPORT DATE 10/23/87

	8/04/87 LIFE SUPPORT 5069	F	TICALITY HDW/FUN LIGHT: 3/1R BORT: 3/3	с		
ITEM: VACUUM VENT ISOL. VLV. BUS SELECT SWITCH (1) FAILURE MODE: OPEN (ELECTRICAL), FAILS TO SWITCH, OPEN, SINGLE CONTACT						
LEAD ANALYST	C: R.E. DUFFY SU	BSYS LEAD: M.J	. SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) BUS SELECT SWITCH (S10) 5) 6) 7) 8) 9)						
CRITICALITIES						
PRELA LIFTO ONORI DEORI	PHASEHDW/FUNCAUNCH:3/3DFF:3/1RBIT:3/1RBIT:3/1RING/SAFING:3/3	ABORT RTLS: TAL: AOA: ATO:	3/3 3/3 3/3			
REDUNDANCY S	SCREENS: A [2]	B [F]	С[Р]			

LOCATION: PANEL ML31C PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE VACUUM ISOLATION VALVE CANNOT BE CLOSED ON DEMAND. THE ISOLATION VALVE IS DESIGNED TO CLOSE WITHIN 2 SECONDS IN THE EVENT OF AN EXCESSIVE CABIN PRESSURE LOSS RATE AND VIA THE CABIN OXYGEN SYSTEM 1 AND 2 FLOW SENSOR CIRCUITRY. LOSS OF FUNCTION COULD LEAD TO LOSS OF LIFE AND VEHICLE. SCREEN B HAS BEEN FAILED BECAUSE UPON FAILURE TO CLOSE, IT IS NOT KNOWN IF THE CREW WILL HAVE ENOUGH TIME TO CORRECT FOR THE FAILURE.

REFERENCES:

REPORT DATE 10/23/87

DATE: SUBSYSTEM: MDAC ID:	LIFE SUPPORT		TICALITY HDW/FUNC LIGHT: 3/2R BORT: 3/3			
ITEM: VACUUM VENT ISOL. VLV. BUS SELECT SWITCH (1) FAILURE MODE: FAILS TO REMAIN OPEN, INTERMITTENT OPERATION, PREMATURE OPERATION						
LEAD ANALYS	T: R.E. DUFFY SI	BSYS LEAD: M.J.	SAIIDI			
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) BUS SELECT SWITCH (S10) 5) 6) 7) 8) 9)						
CRITICALITIES						
PREL LIFT	PHASEHDW/FUNCAUNCH:3/3OFF:3/3BIT:3/2RBIT:3/3	ABORT RTLS: TAL: AOA: ATO:	3/3 3/3			

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PANEL ML31C PART NUMBER:

LANDING/SAFING: 3/3

CAUSES:

EFFECTS/RATIONALE:

THE ISOLATION VALVE REMAINS OPEN, THE SWITCH FAILURE CANNOT OPERATE THE VALVE UNTIL THE CONTROL SWITCH IS ENGAGED. IN ADDITION THE BREAKERS CAN BE PULLED TO MAINTAIN THE ISOLATION VALVE OPEN.

REFERENCES:

REPORT DATE 10/23/87

DATE: 8/04/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/2R MDAC ID: 5071 ABORT: 3/3 ITEM: VACUUM VENT ISOL. VLV. CIRCUIT BREAKER (2) FAILURE MODE: OPEN (ELECTRICAL), INADVERTENTLY OPENS					
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) CIRCUIT BREAKER (CB7, CB8) 5) 6) 7) 8) 9)					
CRITICALITIES					
FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: 3/3 RTLS: 3/3					
PRELAUNCH: 3/3 RTLS: 3/3 LIFTOFF: 3/3 TAL: 3/3 ONORBIT: 3/2R AOA: 3/3 DEORBIT: 3/3 ATO: 3/3					
LIFTOFF: 3/3 TAL: 3/3					
ONORBIT: 3/2R AOA: 3/3					
DEORBIT: 3/3 ATO: 3/3					
LANDING/SAFING: 3/3					
REDUNDANCY SCREENS: A [2] B [P] C [P]					
LOCATION: PANEL ML86B PART NUMBER:					
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION					
EFFECTS/RATIONALE: THE ISOLATION VALVE REMAINS OPEN, THIS FAILURE WILL NOT ALLOW THE					

THE ISOLATION VALVE REMAINS OPEN, THIS FAILURE WILL NOT ALLOW THE VALVE TO OPERATE ON DEMAND UNLESS THE SYSTEM IS SWITCHED TO THE ALTERNATE MAIN CIRCUIT BREAKER. LOSS OF REDUNDANCY IS LOSS OF MISSION DUE TO THE POTENTIAL LIFE THREATENING SITUATION CREATED BY THE LACK OF ON-DEMAND ABILITY TO CLOSE THE ISOLATION VALVE IF A DUCT LEAK DEVELOPS.

REFERENCES:

REPORT DATE 10/23/87

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DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5072	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: 3/3
ITEM: VACUUM VENT ISOL FAILURE MODE: FAILS TO OPEN	
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVI 4) CIRCUIT BREAKER (CB7, CB8) 5) 6) 7) 8) 9)	
CRTT	ICALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/2R DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3
REDUNDANCY SCREENS: A [2]	B[P] C[P]
LOCATION: PANEL ML86B	

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE ISOLATION VALVE REMAINS OPEN, THIS FAILURE MAY DISABLE THE SWITCHES TO OPERATE THE VACUUM ISOLATION VALVE ON DEMAND. LOSS OF REDUNDANCY OR THE ABILITY TO OPERATE THE VALVE IS LOSS OF MISSION.

REFERENCES:

DATE: 8/04/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5073	HIGHEST CRITICALITY HDW/FUN FLIGHT: 3/3 ABORT: 3/3	1C				
ITEM: VACUUM VENT ISOL. VLV. CONTROL DIODES (2) FAILURE MODE: OPEN (ELECTRICAL), SHORTED						
LEAD ANALYST: R.E. DUFFY SU	UBSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) INDICATOR DIODES (A8CR5 & 6) 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					
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3						
REDUNDANCY SCREENS: A []	B[] C[]					
LOCATION: PART NUMBER:						
CAUSES: ACOUSTICS, MECHANICAL S	HOCK, PIECE-PART FAILURE,					

VIBRATION

EFFECTS/RATIONALE: NO MISSION IMPACT. THE ISOLATION VALVE CONTROL SWITCH HAS BARBER POLE INDICATION. IN ADDITION, SHOULD THE VALVE CLOSE, THE SYSTEM WILL GIVE INDICATION.

REFERENCES:

REPORT DATE 10/23/87

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DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:5074ABORT:3/3					
ITEM: BUS ISOLATION DIODES (2) FAILURE MODE: OPEN (ELECTRICAL)					
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) INDICATOR DIODES (A8CR3 & 4) 5) 6) 7) 8) 9)					
CRITICALITIES					
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3					
REDUNDANCY SCREENS: A [] B [] C []					
LOCATION: PART NUMBER:					
CAUSES: ACOUSTICS, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION					
EFFECTS/RATIONALE: NO MISSION IMPACT. INDICATORS WILL NOT WORK WHEN THIS BUS IS SELECTED.					
REFERENCES:					

DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:5075ABORT:3/3					
ITEM: BUS ISOLATION DIODES (2) FAILURE MODE: SHORTED					
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) INDICATOR DIODES (A8CR3 & 4) 5) 6) 7) 8) 9)					
CRITICALITIES					
FITCHT PHASE HDW/FUNC ABORT HDW/FUNC					
PRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3					
PRELAUNCH: 3/3 RTLS: 3/3 LIFTOFF: 3/3 TAL: 3/3 ONORBIT: 3/3 AOA: 3/3 DEORBIT: 3/3 ATO: 3/3					
ONORBIT: $3/3$ AOA: $3/3$					
DEORBIT: $3/3$ ATO: $3/3$					
LANDING/SAFING: 3/3					
REDUNDANCY SCREENS: A [] B [] C []					
LOCATION: PART NUMBER:					
CAUSES: ACOUSTICS, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION					
EFFECTS/RATIONALE: MAIN A AND B ARE COUPLED, NO OTHER EFFECTS UNLESS THERE IS A SECOND FAILURE.					

REFERENCES:

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REPORT DATE 10/23/87

DATE: SUBSYSTEM: MDÀC ID:	LIFE SUPPO	ORT		HIG	HEST C	RITICALITY FLIGHT: ABORT:	
ITEM: BUS SELECT SENSOR (2) FAILURE MODE: ERRATIC OPERATION, FAILS OUT OF TOLERANCE, INTERMITTENT OPERATION, ERRONEOUS OUTPUT, OPEN (ELECTRICAL), LOSS OF OUTPUT							
LEAD ANALYS	r: R.E. DUI	FFY	SUB	SYS L	EAD: M	.J. SAIIDI	
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) MEASUREMENT (V62S0205E, S0206E) 5) 6) 7) 8) 9)							
CRITICALITIES							
FLIGHT		HDW/FU	JNC	A	BORT		
	AUNCH:	3/3			RTLS	: 3/3	
LIFT)FF:	3/3			TAL:	3/3	
ONORI	BIT:	3/3 3/3 3/3			AOA: ATO:	3/3	
DEORI	BIT:	3/3			ATO:	3/3	
LAND	ING/SAFING:	3/3					
REDUNDANCY S	SCREENS:	A []	В []	c []	

LOCATION: PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE: NOT MISSION ESSENTIAL. CIRCUIT OPERATION CAN BE INDICATED THROUGH THE CONTROL VALVE INDICATORS.

REFERENCES:

REPORT DATE 10/23/87

DATE:8/04/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:5077ABORT:3/3					
ITEM: CONTROL VALVE SWITCH INDICATOR (2) FAILURE MODE: ERRATIC OPERATION, FAILS OUT OF TOLERANCE, INTERMITTENT OPERATION, ERRONEOUS OUTPUT, OPEN (ELECTRICAL), LOSS OF OUTPUT					
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI					
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) MEASUREMENT (V62X0207E, X0208E) 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					
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 [] B [] C []					
LOCATION: PART NUMBER:					
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION					
EFFECTS/RATIONALE: NOT MISSION ESSENTIAL. VALVE OPERATION CAN BE VERIFIED THROUGH BARBER POLE INDICATOR, OR OTHER SYSTEM PERFORMANCE.					
REFERENCES:					

REPORT DATE 10/23/87

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	CRITICALITY FLIGHT: ABORT:	•		
FAILURE MODE: FALS	MID-TRAVEL, FA			SICAL
LEAD ANALYST: R.E. D	UFFY SUI	BSYS LEAD: N	M.J. SAIIDI	
1) LIFE SUPPORT SY 2) AIRLOCK 3) VACUUM VENT ISC 4) INDICATOR (DS7) 5) 6) 7) 8)	STEM			
-	CRITICA	LITIES		
				C
			•	

FLIGHT PHASE	H	DW/FUN	Ċ	AB	ORT	H	DW/	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/SAFIN	G:	3/3						
REDUNDANCY SCREENS:	A	[]	В	[]	С	[]

LOCATION: PANEL ML31C PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

NOT MISSION ESSENTIAL. VALVE OPERATION CAN BE VERIFIED THROUGH V62-X0207E AND X0208E INDICATORS, OR OTHER SYSTEM PERFORMANCE.

REFERENCES:

REPORT DATE 10/23/87

DATE: SUBSYSTEM: MDAC ID:		ORT	HIGH		CICALITY LIGHT: BORT:	HDW/FUNC 3/3 3/3
ITEM: (2) FAILURE MOD		VALVE SWI ELECTRICA	TCH SENSOR L)	RESISTO)R (A8R5	AND A8R6)
LEAD ANALYS	T: R.E. DU	FFY	SUBSYS LE	AD: M.J.	SAIIDI	
2) AIRLOC 3) VACUUM	UPPORT SYS K	ATION VAL	VE			
		CRI	TICALITIES			
PREL LIFT ONOR DEOR	BIT:	HDW/FUNC 3/3 3/3 3/3 3/3 3/3	AE	ORT RTLS: TAL: AOA: ATO:	3/3	4C
REDUNDANCY	SCREENS:	A[]	В []	C []	
LOCATION:	PANEL M	IL31C				

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

SENSORS V62X0207E AND V62X0208E ARE DISABLED. NOT MISSION ESSENTIAL. VALVE OPERATION CAN BE VERIFIED THROUGH BARBER POLE INDICATOR, OR OTHER SYSTEM PERFORMANCE.

REFERENCES:

REPORT DATE 10/23/87

8/20/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: LIFE SUPPORT FLIGHT: 3/3 MDAC ID: 5080 ABORT: 3/3 BUS SELECT SWITCH SENSOR RESISTORS (A8R1 AND A8R2) ITEM: (2) FAILURE MODE: OPEN (ELECTRICAL) LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) SENSORS V62S0205E & 6E 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: · 3/3 3/3 PRELAUNCH: 3/3____ TAL: 3/3 LIFTOFF: 3/3 AOA: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: PANEL ML31C PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: SENSORS V62S0205E AND V62S0206E ARE DISABLED. NOT MISSION ESSENTIAL. VALVE OPERATION CAN BE VERIFIED THROUGH THE ISOLATION CONTROL SWITCH SENSORS OR OTHER SYSTEM PERFORMANCE. **REFERENCES:**

C-526

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DATE:8/20/87HIGHEST CRITICALITYHDW/FUNCSUBSYSTEM:LIFE SUPPORTFLIGHT:3/3MDAC ID:5081ABORT:3/3
ITEM: ISOL. VALVE SENSOR POWER RESISTOR (A8R3 & 4) FAILURE MODE: OPEN (ELECTRICAL)
LEAD ANALYST: R.E. DUFFY SUBSYS LEAD: M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) VACUUM VENT ISOLATION VALVE 4) 5) 6) 7) 8) 9)
CRITICALITIES
FLIGHT PHASEHDW/FUNCABORTHDW/FUNCPRELAUNCH:3/3RTLS:3/3LIFTOFF:3/3TAL:3/3ONORBIT:3/3AOA:3/3DEORBIT:3/3ATO:3/3LANDING/SAFING:3/3ATO:3/3
REDUNDANCY SCREENS: A [] B [] C []
LOCATION: PANEL ML31C PART NUMBER:
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

A8R3 AND A8R4 ARE USED TO LIMIT THE CURRENT TO THE ISOLATION VALVE POSITION INDICATORS, THEY ARE REDUNDANT. SHOULD BOTH RESISTORS FAIL, POWER TO ACTUATE THE BARBER POLE INDICATOR AND TELEMETRY SENSORS IS LOST. NOT MISSION ESSENTIAL. VALVE OPERATION CAN BE VERIFIED THROUGH OTHER SYSTEM PERFORMANCE.

REFERENCES:

REPORT DATE 10/23/87

C-527

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DATE: 8/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5082	HIGHEST CRITICA FLIGH ABORT	I: 3/3
ITEM: DEDICATED SIGNAL CONI FAILURE MODE: LOSS OF OUTPUT	ITIONER (83V75A	18)
LEAD ANALYST: R.E. DUFFY SUBSY	S LEAD: M.J. SA	IIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) SIGNAL CONDITIONER 4) 5) 6) 7) 8) 9)		
CRITICALI	FIES	
FLICHT DHASE HOW/FUNC	ABORT HDV	V/FUNC
ILIFTOFF: 3/3	RTLS:	3/3 3/3
ONORBIT: 3/3	AOA:	3/3
PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO:	3/3
	[]] C[]
LOCATION: PART NUMBER:		
CAUSES: CONTAMINATION, MECHANICAL S	HOCK, PIECE-PART	FAILURE,
EFFECTS/RATIONALE: POSSIBLE LOSS OF SENSORS V64P0101A A IMPACT.	ND V63P0202A. N	O MISSION
REFERENCES :		

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DATE: 8/20/87 SUBSYSTEM: LIFE SUPPORT MDAC ID: 5083	HIGHEST	CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: DEDICATEN FAILURE MODE: LOSS OF () SIGNAL CONDITIONER DUTPUT	(83V75A16)
LEAD ANALYST: R.E. DUFFY	SUBSYS LEAD:	M.J. SAIIDI
BREAKDOWN HIERARCHY: 1) LIFE SUPPORT SYSTEM 2) AIRLOCK 3) SIGNAL CONDITIONER 4) 5) 6) 7) 8) 9)	1	
	CRITICALITIES	
FLIGHT PHASE H PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	DW/FUNC ABORT 3/3 RT 3/3 TA 3/3 AO 3/3 AT	HDW/FUNC LS: 3/3 L: 3/3 A: 3/3 O: 3/3
REDUNDANCY SCREENS: A	[] B[]	C []
LOCATION: PART NUMBER:		
CAUSES: CONTAMINATION, VIBRATION	MECHANICAL SHOCK, P	IECE-PART FAILURE,
EFFECTS/RATIONALE: POSSIBLE LOSS OF SENSOR NO MISSION IMPACT.	V64P0102A & 201A, A	ND V64T0131A & 130A.
REFERENCES:		

REPORT DATE 10/23/87

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APPENDIX D POTENTIAL CRITICAL ITEMS

IDAC-ID	FLIGHT	ITEM	FAILURE MODE
Supply Wa	ter Subsy	ystem	
1100	2/2		RESTRICTED FLOW
1101	2/2	H2 SEPARATORS (2)	INTERNAL LEAKAGE
	2/2		INTERMITTENT OPERATION PARTIAL OUTPUT
1103	2/2	H2 SEPARATORS	EXTERNAL LEAKAGE
	2/2		EXTERNAL LEAKAGE
	2/2		EXTERNAL LEAKAGE
1110	2/2		EXTERNAL LEAKAGE
1112	2/2		EXTERNAL LEAKAGE
1125	2/2	RELIEF VALVE, 1.5 PSID (2)	FAILS TO OPEN,
1135	2/2	REDIER VALVE, 1.5 1015 (0)	RESTRICTED FLOW
	2 / 2	RELIEF VALVE, 1.5 PSID (2)	EXTERNAL LEAKAGE
1137	2/2 2/2 2/2 2/2 2/2 2/2 2/2	QD, GSE FILL/DRAIN (2)	EXTERNAL LEAKAGE
1141	2/2	QD, GSE FILL/DRAIN (2)	
1145	2/2	TANK A PRESS CNTL VLV (1)	PHYSICAL BINDING
1147	2/2	TANK A PRESS CNTRL VALVE (1)	PHISICAL BINDING
1148	2/2	TANK A PRESS CNTL VLV (1)	EXTERNAL LEAKAGE
1149	2/2	TANK A VENT VALVE (1)	FAILS TO CLOSE,
			INTERNAL LEAKAGE,
			PHYSICAL BINDING
1151	2/2	TANK A VENT VALVE (1)	EXTERNAL LEAKAGE
1154	2/2	CROSSOVER VALVE (1)	EXTERNAL LEAKAGE
1167	$\frac{2}{2}$	ISOL VLV. FES B LINE (1)	EXTERNAL LEAKAGE
1179	2/2	TANK A VENT VALVE (1) CROSSOVER VALVE (1) ISOL VLV, FES B LINE (1) GALLEY SUPPLY VALVE (1)	FAILS TO REMAIN
TT 1 O			CLOSED, FAILS TO
			CLOSE, INTERNAL
			LEAKAGE
	- <u>-</u>	GALLEY SUPPLY VALVE (1)	FAILS TO REMAIN
1179	2/2	GALLEI SUPPLI VALVE (1)	OPEN, FAILS TO OPEN
			EXTERNAL LEAKAGE
1180	2/2	GALLEY SUPPLY VALVE (1) SOLENOID, GALLEY VLV (1)	
1181	2/2	SOLENOID, GALLEY VLV (1)	FAILS TO CLOSE,
			OPEN (ELECTRICAL),
		· · · · · · · · · · · · · · · · · · ·	SHORTED
1182	2/2	SOLENOID, GALLEY VALVE (1)	FAILS TO OPEN,
	-		OPEN (ELECTRICAL),
			SHORTED
1183	2/2	SWITCH, GALLEY VALVE (1)	PHYSICAL BINDING
1184	2/2	SWITCH, GALLEY VALVE (1)	OPEN (ELECTRICAL),
TT04	e j e	······································	ANY SINGLE CONTACT, FAILS TO SWITCH
	· n / n	CHIMON CALLEY VALVE (1)	SHORTED, ANY
1185	2/2	SWITCH, GALLEY VALVE (1)	SINGLE CONTACT

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MDAC-ID	FLIGHT	ITEM	FAILURE MODE	
Supply Wa	ater Subsy	ystem (cont'd)		-
1189	2/2	CB, GALLEY VALVE (1)	FAILS TO REMAIN CLOSED, OPEN (ELECTRICAL)	
1191	3/2R	DUMP ISOL VALVE (1)	FAILS TO REMAIN OPEN, FAILS TO OPEN, RESTRICTED FLOW	
1193 1204	2/1R 3/2R	DUMP ISOL VALVE (1) DUMP VALVE (1)	EXTERNAL LEAKAGE FAILS TO REMAIN OPEN, FAILS TO OPEN, RESTRICTED FLOW	
1205	3/2R	DUMP VALVE (1)	FAILS TO REMAIN CLOSED, FAILS TO CLOSE, INTERNAL	
1206 1210	3/2R 2/1R	SWITCH, DUMP VALVE (1)	LEAKAGE External leakage	
1221 1222 1223	2/2 2/2 2/2	NOZZLE HEATER (1) NOZZLE HEATER (1) DUMP NOZZLE QD, CONT X-TIE (1)	OPEN (ELECTRICAL) SHORTED RESTRICTED FLOW	
1228	2/2		FAILS TO REMAIN CLOSED, FAILS TO CLOSE, INTERNAL	
1229	2/2	QD, CONT X-TIE (1)	LEAKAGE FAILS TO REMAIN OPEN, FAILS TO OPEN	-
1231 1232 1233	3/2R	QD, ECLSS BAY (2) QD, GALLEY/DISPENSER (2)	RESTRICTED FLOW	
1234	2/2	LINES AND FITTINGS	(RÜPTURE) EXTERNAL LEAKAGE, STRUCTURAL FAILURE (RUPTURE)	
1235	2/2	LINES AND FITTINGS	EXTERNAL LEAKAGE, STRUCTURAL FAILURE	-
1236	2/2	LINES AND FITTINGS	(RUPTURE) EXTERNAL LEAKAGE, STRUCTURAL FAILURE (RUPTURE)	
	-	WATER CHILLER (1)	INTERNAL LEAKAGE, WCL-H2O	-
1238	3/2R	WATER CHILLER (1)	RESTRICTED FLOW, POTABLE WATER	

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MDAC-ID FLIGHT

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ITEM

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FAILURE MODE

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MDAC-ID	rLIGHI		
Waste Wa	ter Subsys	stem	=;
			MICALLCAMENT
2008	2/2	URINAL ADAPTER QR (1)	MISALIGNMENI DECEDICED ELOW
2013	2/2	TUBE, EMU EXTENSION (1)	RESTRICTED FLOW
2014	2/2	TUBE, EMU EXTENSION (1)	EXTERNAL LEARAGE
2015	2/2	EMU QD (1)	EXTERNAL LEARAGE
2041	2/2	WCS TO WWS QD (1)	EXTERNAL LEAKAGE
2042	2/2	WCS TO WWS LINE (1)	EXTERNAL LEAKAGE
2043	2/2	WCS TO WWS DYNATUBE (1)	EXTERNAL LEAKAGE
2111	2/2	WWS LINE AND JUNCTIONS	EXTERNAL LEAKAGE
2112	2/2	URINAL ADAPTER QR (1) TUBE, EMU EXTENSION (1) TUBE, EMU EXTENSION (1) EMU QD (1) WCS TO WWS QD (1) WCS TO WWS LINE (1) WCS TO WWS DYNATUBE (1) WWS LINE AND JUNCTIONS WWS LINE AND JUNCTIONS	CLOSED
2113	2/2	ARS CONDENSATE SPLY TUBE (1)	EXTERNAL LEAKAGE
2114	2/2	ARS CONDENSATE SPLY TUBE (1) ARS CONDENSATE SPLY TUBE (1)	RESTRICTED FLOW,
2116	2/2	WASTE TANK INLET VALVE (1)	EXTERNAL LEAKAGE
2136	$\frac{2}{2}$	WASTE TANK INLET VALVE (1) DUMP LINES AND FITTINGS DUMP LINES AND FITTINGS	EXTERNAL LEAKAGE
2137	$\frac{1}{2}/2$	DUMP LINES AND FITTINGS	RESTRICTED FLOW,
220,	-, -		BLOCKED FLOW
2138	2/2	WTNK DUMP ISOL VLV (1) WTNK DUMP ISOL VLV (1)	EXTERNAL LEAKAGE
2139	$\frac{2}{2}$	WTNK DUMP ISOL VLV (1)	RESTRICTED FLOW,
2141	2/2	QD/TP @ HIGH CAP. FILTER (2) HIGH CAP FILTER (1)	EXTERNAL LEAKAGE
2142	$\frac{2}{2}$	HIGH CAP FILTER (1)	RESTRICTED FLOW,
04.0	-, -		BLOCKED FLOW
2144	2/2	CONT H2O X-TIE QD/PLUG (1)	INABILITY TO MATE
~~··	-, -		OR DE-MATE, FAILS
			TO OPEN, RESTRICTED
			FLOW
2145	2/1R	WASTE TANK 1 DUMP VLV (1) WASTE TANK 1 DUMP VLV (1) CB, WWS DMP ISOL VLV (1) CB, WWS DMP ISOL VLV (1)	EXTERNAL LEAKAGE
2147	2/1R	WASTE TANK 1 DUMP VLV (1)	FAILS TO CLOSE
2171	$\frac{2}{2}$	CB. WWS DMP ISOL VLV (1)	FAILS TO REMAIN CLOSED
2173	$\frac{2}{2}$	CB. WWS DMP ISOL VLV (1)	SINGLE CONTACT OPEN
01.0	-/ -		(ELECTRICAL)
2174	2/2	CB, WWS DMP ISOL VLV (1)	SINGLE CONTACT
41/3	2/2		SHORTED
2175	2/2	CB, WWS DMP ISOL VLV (1)	PHYSICAL BINDING
21/5	2/2	62) MHS 2111 2002 (2) (2)	JAMMING
2176	2/2	CB, WWS DMP ISOL VLV (1)	OPEN (ELECTRICAL)
2170	2/2	CB, WWS DMP ISOL VLV (1)	SHORTED
2181	2/1R	· · · · · · · · · · · · · · · · · · ·	FAILS TO REMAIN CLOSED
2195		· · · · ·	SINGLE CONTACT OPEN
2130	6/ IR		(ELECTRICAL)
2104	2/1R	SW, WWS DMP VLV (1)	SINGLE CONTACT SHORTED
2196	2/1R 2/1R	SW, WWS DMP VLV (1)	PHYSICAL BINDING
2197	2/1R 2/1R		
2198	2/1R 2/1R	SOLENOID WWS DMP VLV (1)	SHORTED
2199	2/1R 1/1	CREW MODULE LINE (1)	EXTERNAL LEAKAGE
2207		INTERNAL LINE AND	EXTERNAL LEAKAGE
2208	1/1	FITTINGS	
		LTTTTRO	

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AC-ID	FLIGHT		FAILURE MODE	
Baste Wat	ter Subsy	stem (cont		
3209	1/1	EXTERNAL MD FITTING	EXTERNAL LEAKAGE	
° ≏⊒o	1/1	DYNATU	EXTERNAL LEAKAGE	
11	1/1		RESTRICTED FLOW	
13	2/1R		FAILS TO REMAIN CLOSED	
. 14	2/1R	VACUUM VERT CATER (2)		
1218	1/1		FAILS TO REMAIN CLOSED	
2219	1/1	SW, NOZZLE HER (1)		
2220	1/1	SW, NOZZLE 1)	OPEN (ELECTRICAL) SHORTED CLOSED	
2	1/1	SW, NOZZLE HERE (1) SW, NOZZLE HERE (1) VACUUM VENT IC R (1)	OPEN (ELECTRICAL), SHORTED	
	na i se	n na	• · · · ·	
	.e			
	cection an	nd Fire S bsystem		
	2/1R	CB, SMC	OPEN (ELECTRICAL), SHORTED	
3003	2/1R	TCB, SMOF	OPEN (ELECTRICAL), SHORTED	
3005	2/1R	CB, SMOKE DETN CABIN (1)		
3007	1/1	CB-FIRE SUPPION N (3)		
3012	2/2	SW, SMK DET 32. SESET (1)	PHYSICAL BINDING/ JAMMING, OPEN (ELECTRICAL), FAILS	-
			TO SWITCH, JAMMED IN MAINTAINED	-
3012	2/2	SW, SMF ESET (1)		
			CLOSURE	
3014	2/2	SSW, SMC	PHYSICAL BINDING/	
	•	CIRCUIT IST (-)	JAMMING, FAILS TO	
			SWITCH, SHORTED,	
			FAILED IN A OR B	
			POSITION ONE C	
3017	2/2	DIDDE (3)	OPEN (ELECTRICAL)	
3025	2/1R		SHORTED, SHORTED TO GROUND	-
3629	2/1R	RESISTOR ALL	SHORTED, SHORTED TO GROUND	-
3044	1/1	SSW, FIRE AV BAY (3)	PHYSICAL BINDING/ JAMMING, OPEN (ELECTRICAL), FAILS	
			TO SWITCH	

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MDAC-1	D FLIGHT	ITEM	FAILURE MODE
Smoke	Detection a	and Fire Suppression Subsystem	m (cont'd)
3046	1/1	RESISTOR (2.2K)	SHORTED, SHORTED TO GROUND
3048	1/1	SW, FIRE SUPPR AV BAY DISCH (3)	PHYSICAL BINDING/ JAMMING, OPEN (ELECTRICAL), FAILS TO SWITCH
3052	1/1	DIODE	OPEN (ELECTRICAL)
3056	1/1	PYRO CONTROLLER (3) PYRO CONTROLLER NO. (3)	LOSS OF OUTPUT
3057	2/2	PYRO CONTROLLER NO. (3)	PREMATURE OPERATION
3058	2/1R	SMOKE DETECTOR (9)	LOSS OF ALL OUTPUT
3059	2/2	FIRE SUPPRESSANT ASSY (9)	
3060	1/1	FIRE SUPPRESSANT ASSY (9)	
3065		HYBRID DRIVER (TYPE II) (3	
Airloo	ck Support S	System	
5003	2/2	EMU WATER SUPPLY VLV (2)	FAILS TO OPEN
5005	2/2	EMU WATER SUPPLY VLV (2)	EXTERNAL LEAKAGE
5006	2/2	SW, EMU WATER SUPPLY (2)	OPEN (ELECTRICAL),
		, , , , , , , , , , , , , , , , , , , ,	FAILS TO SWITCH,
			OPEN, SINGLE CONTACT
5009	2/2	CB, EMU WATER SUPPLY (1)	FAILS TO REMAIN CLOSED
5011	2/2	EMU WASTE WATER VLV (2)	FAILS TO OPEN
5014	2/2	SW, EMU WASTE WATER (2)	OPEN (ELECTRICAL),
	-, -		FAILS TO SWITCH, OPEN, SINGLE CONTACT
5017	2/2	CB, EMU WASTE WATER (1)	FAILS TO REMAIN CLOSED
5017	2/2 2/2	SUPPLY AND	EXTERNAL LEAKAGE
2013	6/6	WASTE COUPLINGS (4)	BAIBANAD DEANAGE
5020	n /n	SUPPLY LINES AND FITTING	EXTERNAL LEAKAGE
5020	2/2 2/18		EXTERNAL LEARAGE EXTERNAL LEAKAGE
5022	2/1R		
5025		EMU O2 SUPPLY VALVE (2)	
		EMU O2 SUPPLY VALVE (2)	
5028			EXTERNAL LEAKAGE
5029	2/2	DEPRESS CAP VENT (1)	FAILS TO OPEN,
			PHYSICAL BINDING/ JAMMING
5030	2/2	CAP VENT DEBRIS SCREEN (1)	PHYSICAL BINDING/ JAMMING
5031	2/2	CAP VENT DEBRIS SCREEN (1)	
5033		DEPRESS VALVE (1)	FAILS TO OPEN
5035	2/1R	AIRLOCK TO CABÌN	FAILS TO OPEN,
	,	VENT CAP (2)	PHYSICAL BINDING/
			JAMMING, RESTRICTED FLOW

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MDAC-ID	FLIGHT	ITEM	FAILURE MODE	
Airlock	Support Sy	ystem (cont'd)	· · · · · · · · · · · · · · · · · · ·	Ī
5037	2/1R	AIRLOCK TO CABIN FILTER (2)	RESTRICTED FLOW	=
5039	2/1R	EQUALIZATION VALVE (2)	FAILS TO OPEN, RESTRICTED FLOW	į
5041	2/2	EQUALIZATION VALVE (2)	EXTERNAL LEAKAGE	_
5043	2/2	PRESSURE DIFFERENTIAL (2)	EXTERNAL LEAKAGE	
5052	$\frac{1}{2}/2$	EQUALIZATION VALVE (2)	EXTERNAL LEAKAGE	i
5055	2/2	BUS SELECT SWITCH (2)	OPEN (ELECTRICAL),	
3033	2/2		FAILS TO SWITCH,	_
		· · · · · · · · · · · · · · · · · · ·	OPEN, SINGLE CONTACT	
5056	2/2	REMOTE POWER CNTLR (4)	INTERMITTENT OPERATION,	
5056	2/2	REMOTE FOWER CRIER (4)	ERRONEOUS OUTPUT,	
			PARTIAL OUTPUT,	i
			FAILS OPEN	
5050	<u>.</u>	POWER SUPPLY (2)	ERRATIC OPERATION,	
5059	2/2	POWER SUPPLI (2)	INTERMITTENT OPERATION,	, =
			ERRONEOUS OUTPUT;	
			PARTIAL OUTPUT, OPEN	ł
			•	
			(ELECTRICAL)	
5060	2/2	POWER SUPPLY (2)	OPEN (ELECTRICAL),	Ì
			FAILS TO SWITCH, OPEN,	
			SINGLE CONTACT	
5066	2/1R	VACUUM VENT ISOL VLV (1)	FAILS TO CLOSE	-
5067	3/1R	SW, ISOL VLV CNTRL (1)	OPEN (ELECTRICAL),	
			FAILS TO SWITCH, OPEN,	
			SINGLE CONTACT	-
5069	3/1R	SW, ISOL VLV BUS	OPEN (ELECTRICAL),	ī
		SELECT (1)	FAILS TO SWITCH, OPEN,	
			SINGLE CONTACT	
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