FAILURE MODES EFFECTS ANALYSIS (FMEA) --NON-CIL HARDWARE
NUMBER: MS-6SS-B022-X

SUBSYSTEM NAME: E - Ddocking system
REVISION: D DEC. 1996

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	POWER SWITCHING UNIT (PSU) RSC-E	MC621-0067-1003 33Y.5114.007
SRU	:	CONNECTOR	CHU23-19/27-B-1-B
SRU	:	CONNECTOR	CHU-5C-1-32/22-B1-1-B
SRU	:	CONNECTOR	CHU-5C -1-50/27-B1-1-B
LRU	:	DSCU RSC-E	MC621-0067-1005 33Y.5212.007
SRU	:	CONNECTOR	CHU-5C -1-50/27-B1-1-B

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
1) CONNECTOR, PLUG, 19 PINS: X3, X4 - a) PSU MN A AND MN B SUPPLY POWER - b) APDS LOGIC BUSES (A, B, & C).
2) CONNECTOR, PLUG, 32 PINS: X252: a) PSU -CW1 AND - CW2 APDS ACTUATORS POWER BUSES RETURN - b) APDS LOGIC BUSES (A, B, & C) RETURN.
3) CONNECTOR, PLUG, 50 PINS: X253 a) PSU + CW1 AND + CW2 APDS ACTUATORS POWER BUSES b) APDS LOGIC BUSES (A, B, & C.)
4) CONNECTOR, PLUG, 50 PINS: X218 APDS LOGIC BUSES (A, B, & C) DSCU.

REFERENCE DESIGNATORS: 45V53A2A4X3
45V53A2A4X4
45V53A2A4X252
45V53A2A4X253
45V53A2A4X218

QUANTITY OF LIKE ITEMS: 5
(FIVE)

FUNCTION:
CONNECTOR ITEMS 1) THROUGH 2)PROVIDE MATE/DEMATE CAPABILITY FOR WIRES WHICH PROVIDE THE ORBITER MPCAs MN A AND MN B, THE APDS LOGIC BUSES (A, B & C), AND THE CW1 AND CW2 (SUPPLIES AND RETURNS) TO THE PSU. CONNECTOR ITEMS 3) PROVIDES MATE/DEMATE CAPABILITY FOR WIRES WHICH PROVIDE THE APDS LOGIC BUSES (A, B, & C) TO THE DSCU.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- NON-CIL FAILURE MODE
NUMBER: M5-6SS-B022- 01

REVISION# 0 DEC, 1996

SUBSYSTEM NAME: E - DOCKING SYSTEM
LRU: MC621-0087-1003
ITEM NAME: CONNECTORS

CRITICALITY OF THIS FAILURE MODE: 1R3

FAILURE MODE:
INADVERTENT DEMATE

MISSION PHASE:
OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY:
103 DISCOVERY
104 ATLANTIS
105 ENDEAVOUR

CAUSE:
A) PIECE PART FAILURE, B) CONTAMINATION, C) VIBRATION, D) MECHANICAL SHOCK, E) PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

CRITICALITY 1R2 DURING INTACT ABORT ONLY (AVIONICS ONLY)? NO

REDUNDANCY SCREEN
A) PASS
B) PASS
C) N/A

PASS/FAIL RATIONALE:
A)

B)

C)
N/A

METHOD OF FAULT DETECTION:
TELEMETRY AND PANEL INDICATION CAN BE USED TO MONITOR LOGIC BUSES CONNECTOR STATUS.

MASTER MEAS. LIST NUMBERS:
V53X0790E
V53X0791E
V53X0792E

CORRECTING ACTION:
IFM AND EVA ARE AVAILABLE TO CIRCUMVENT THE WORST CASE "CRITICALITY 1/1" EFFECT.

FAILURE MODES EFFECTS ANALYSIS (FMEA) – NON-CIL FAILURE MODE
NUMBER: M5-6SS-B022-01

- FAILURE EFFECTS -

(A) SUBSYSTEM:
DISABLES CAPABILITY TO PROVIDE MPCAs MN A AND MN B POWER, APDS LOGIC BUSES (A, B, & C.) AND THE CW1 AND CW2 (SUPPLIES AND RETURNS) TO THE PSU AND/OR LOSS OF APDS LOGIC BUSES (A, B, & C) TO THE DSCU.

(B) INTERFACING SUBSYSTEM(S):
LOSS OF CAPABILITY TO EXTEND/RETRACT THE DOCKING RING AND ACTIVATE THE CAPTURE LATCHES.

(C) MISSION:
CONNECTORS ARE NOT REQUIRED TO BE EVALUATED FOR MISSION.

(D) CREW, VEHICLE, AND ELEMENT(S):
FIRST FAILURE - NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF CREW OR VEHICLE AFTER ONE FAILURE.
1) CONNECTOR INADVERTENTLY DEMATES DURING THE DOCKING PROCESS - ALL APDS LOGIC BUSES WOULD BE LOST RESULTING IN THE INABILITY TO RETRACT THE DOCKING RING AND OPEN THE CAPTURE LATCHES.

DESIGN CRITICALITY (PRIOR TO OPERATIONAL DOWNGRADE, DESCRIBED IN F): 1/1

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:
CRITICALITY DOWNGRADED FROM 1/1 TO 1R3 DUE TO ADDITIONAL FAULT TOLERANCE PROVIDED BY WORKAROUNDS ALLOWED PER CR S050107W.

AFTER THE FIRST FAILURE, THE CREW WOULD PERFORM IFM TO DRIVE CAPTURE LATCHES OPEN. IF UNABLE TO DRIVE LATCHES OPEN (SECOND FAILURE) THEN PERFORM EVA TO REMOVE 96 BOLTS TO CIRCUMVENT THE WORST CASE "CRITICALITY 1/1" EFFECT; "IF UNABLE TO PERFORM EVA (THIRD FAILURE), POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF ALL UNDOCKING CAPABILITY.

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: DAYS

TIME FROM FAILURE OCCURRENCE TO DETECTION: SECONDS

TIME FROM DETECTION TO COMPLETED CORRECTIVE ACTION: HOURS

TIME REQUIRED TO IMPLEMENT CORRECTIVE ACTION LESS THAN TIME TO EFFECT?
YES

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RATIONALE FOR TIME TO CORRECTING ACTION VS TIME TO EFFECT:
CREW WOULD HAVE SUFFICIENT TIME TO PERFORM IFM OR EVA.

HAZARDS REPORT NUMBER(S) : ORBI 401A

HAZARD DESCRIPTION:
INABILITY TO SEPARATE ORBITER AND ISS.

- APPROVALS -

PRODUCT ASSURANCE ENGR	: M. NIKOLAYEVA	:
DESIGN ENGINEER	: B. VAKULIN	: