

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER:M5-6SS-0201 -X**

SUBSYSTEM NAME: ISS DOCKING SYSTEM

REVISION: 0 02/27/98

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:A6A3 PANEL	V828-730150
SRU	:RESISTOR	RWR80S1211FR

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

RESISTOR, WIRE WOUND, 1.21K, 2W - DEPRESS VENT AND VENT ISOL SYSTEM 1, MN A AND ESS 1BC. DEPRESS VENT AND VENT ISOL SYSTEM 2, MN B AND ESS 2CA

REFERENCE DESIGNATORS: 36V73A7A3A1R1
36V73A7A3A1R2
36V73A7A3A2R1
36V73A7A3A2R2

QUANTITY OF LIKE ITEMS: 4
(FOUR)

FUNCTION:

CURRENT LIMITING RESISTOR. PROTECTS THE OPEN AND CLOSE CIRCUITS FOR THE VESTIBULE DE-PRESSURIZATION AND ISOLATION VALVES ASSEMBLIES.

REFERENCE DOCUMENTS: 1) VS70-953103, INTEGRATED SCHEMATIC - 53AA,
DOCKING BASE VENT VALVES AND ECLSS FANS

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: M5-6SS-0201-02

REVISION#: 1 03/30/00

SUBSYSTEM NAME: ISS DOCKING SYSTEM

LRU: A6A3 PANEL

ITEM NAME: RESISTOR

CRITICALITY OF THIS
FAILURE MODE: 2R3**FAILURE MODE:**

FAILS SHORT (END TO END)

MISSION PHASE: OO ON-ORBIT

	VEHICLE/PAYLOAD/KIT EFFECTIVITY:	102	COLUMBIA
		103	DISCOVERY
		104	ATLANTIS
		105	ENDEAVOUR

CAUSE:

A) STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), B) CONTAMINATION, C) ELECTRICAL STRESS, D) THERMAL STRESS, E) PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

REDUNDANCY SCREEN	A) FAIL
	B) FAIL
	C) PASS

PASS/FAIL RATIONALE:

A)

SCREEN "A" FAILS BECAUSE THERE IS NO PROCEDURE TO DETECT THE RESISTOR FAILING SHORT (END TO END) DURING NORMAL GROUND TURNAROUND WITH NO VEHICLE DESIGN MODIFICATION.

B)

SCREEN "B" FAILS BECAUSE RESISTOR FAILING SHORT (END TO END) IS NOT READILY DETECTABLE IN FLIGHT UNTIL AFTER THE SECOND FAILURE.

C)

METHOD OF FAULT DETECTION:

VISUAL INSPECTION OF PANEL INDICATORS DS3, DS4, DS5, AND DS6

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CORRECTING ACTION: NONE

CORRECTING ACTION DESCRIPTION:

DESIGN FAULT TOLERANCE: DESIGN CAN WITHSTAND RESISTOR FAILING SHORT (END TO END) - REDUNDANT CIRCUITRY REMAINS FOR OPERATION OF THE VENT OR VENT ISO VALVES.

- FAILURE EFFECTS -

(A) SUBSYSTEM:

DEGRADATION OF VENT AND VENT ISOLATION VALVE STATUS CIRCUITS.

(B) INTERFACING SUBSYSTEM(S):

FIRST FAILURE - NO EFFECT

(C) MISSION:

FIRST FAILURE - NO EFFECT

(D) CREW, VEHICLE, AND ELEMENT(S):

NO EFFECT

(E) FUNCTIONAL CRITICALITY EFFECTS:

POSSIBLE LOSS OF MISSION AFTER THREE FAILURES:

- 1) RESISTOR SHORTS (END TO END) - LOSS OF CURRENT LIMITING CAPABILITY TO EVENT INDICATOR CIRCUIT.
- 2) ADDITIONAL SHORT TO GROUND IN SAME CIRCUITRY - CIRCUIT BREAKER TRIPS OPEN RESULTING IN LOSS OF ABILITY TO CLOSE ASSOCIATED VENT OR VENT ISO VALVE.
- 3) CIRCUIT BREAKER OF ASSOCIATED SERIES VENT ISO OR VENT VALVE FAILS OPEN - INABILITY TO PRESSURIZE VESTIBULE, FOLLOWING SECOND VALVE FAILING OPEN, PRIOR TO OPENING UPPER HATCH COULD RESULT IN LOSS OF MISSION.

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: DAYS

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TIME FROM FAILURE OCCURRENCE TO DETECTION: MINUTES

TIME FROM DETECTION TO COMPLETED CORRECTING ACTION: N/A

IS TIME REQUIRED TO IMPLEMENT CORRECTING ACTION LESS THAN TIME TO EFFECT?
N/A

RATIONALE FOR TIME TO CORRECTING ACTION VS TIME TO EFFECT:
REDUNDANT DEPRESS VENT AND VENT ISOLATION VALVE CIRCUITS REMAIN
OPERATIONAL AFTER THE SECOND FAILURE.

-DISPOSITION RATIONALE-

(A) DESIGN:

REFER TO APPENDIX E, ITEM NO. 3 - RWR80 RESISTOR

(B) TEST:

REFER TO APPENDIX E, ITEM NO. 3 - RWR80 RESISTOR

GROUND TURNAROUND TEST

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH
OMRSD.

(C) INSPECTION:

REFER TO APPENDIX E, ITEM NO. 3 - RWR80 RESISTOR

(D) FAILURE HISTORY:

CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND
OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE
FOUND IN THE PRACA DATA BASE.

(E) OPERATIONAL USE:

NONE

- APPROVALS -

S&R ENGINEERING	:	T. K. KIMURA
S&R ENGINEERING ITM	:	P. A. STENGER
DESIGN ENGINEERING	:	W. T. POCKLINGTON
SUBSYSTEM MANAGER	:	K. J. KELLY
EPD&C SUBSYSTEM MANAGER	:	R. L. PHAN
SR&QA	:	
NASA DCE	:	

	:	<i>J. K. Kimura</i> 3/30/00
	:	<i>P. A. Stenger</i> 3/30/00
	:	<i>William T. Pocklington</i> 5/1/00
	:	<i>Kevin Kelly</i> 5/3/00
	:	<i>R. Phan</i> 5/8/00
	:	<i>Thuy Nguyen</i> 5/12/2000
	:	<i>John Harris</i> 5/12/00

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NUMBER: M5-6SS-0201-02

MOD :
USA SAM :
USA ORBITER ELEMENT :

James J. [unclear] / DFB
[unclear] 3/16/00
Suzanne [unclear] 5/14/00