SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - ADP DEPLOY & HTR FMEA NO 05-6EE-2009 -2 REV:12/12/88

ASSEMBLY :PANEL C3A5 CRIT. FUNC: 1R
P/N RI :JANTXV1N4246 CRIT. HDW: 2
P/N VENDOR: VEHICLE 102 103 104
QUANTITY :6 EFFECTIVITY: X X X
: EIGHT PHASE(S): PL LO OO DO X LS X
:

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:		APPROVED BY:		APPROVED BY (NASA):	
DES	J KRAGER	DES		SSM	
REL	T KIMURA	REL		REL	
QE	E GUTIERREZ	QE		QE	

Proc engr

Proc supv

ITEM:
DIODE (1 AMP) - AIR DATA PROBE (ADP) LEFT AND RIGHT DEPLOY/HEATER CIRCUIT

FUNCTION:
PROVIDES ISOLATION BETWEEN PARALLEL DEPLOY/HEAT SWITCH SCAN INPUTS TO THE MDM. 35V73A3A5A3CR2, CR3, A1CR2, CR3; 35V73A3A5A2CR2, CR3, A4CR2, CR3

FAILURE MODE:
SHORT (END TO END)

CAUSE(S):
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

EFFECT(S) ON:
(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE (E)FUNCTIONAL CRITICALITY

(A,B) NO EFFECT - FIRST FAILURE. LOSS OF DEPLOY/HEAT SWITCH SCAN ISOLATION FROM THE "STOW, DEPLOY, DEPLOY/HEAT" TOGGLE SWITCH

(C,D) NO EFFECT - FIRST FAILURE

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER SECOND FAILURE (DEPLOY/HEAT CONTACT SET OF SWITCH FAILS CLOSED) RESULTING IN INADVERTENT DEPLOY OF ADP AND BURN OFF OF ADP AND THERMALLY AFFECTING THE SURROUNDING STRUCTURE. PROPER LIMIT SWITCH INDICATIONS WITH ERRONEOUS DATA TO ADP CAN CAUSE A SIDE-TO-SIDE DILEMMA AND THE SOFTWARE DOWNMODES TO USING DEFAULT GAINS.

FIRST FAILURE NOT DETECTABLE DURING FLIGHT DUE TO PARALLEL REDUNDANCY OF THE SWITCH SCAN CIRCUITS.

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DISPOSITION & RATIONALE:
(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE
REFER TO APPENDIX F, ITEM NO. 3 - DIODE

B) GROUND TURNAROUND TEST
"RH ADP DPLY/STOW/DPLY/HEAT SW CMD CK" INCLUDES BUS DROP TESTS TO CHECK THE INTEGRITY OF THE RIGHT ADP DEPLOY/HEATER CIRCUIT WHICH CONTAINS THIS DIODE.

"LH ADP DEPLOY/STOW SW CMD INTEG CHECK" INCLUDES BUS DROP TESTS TO CHECK THE INTEGRITY OF THE LEFT ADP DEPLOY/HEATER CIRCUIT WHICH CONTAINS THIS DIODE.

TESTS LISTED ABOVE ARE TO BE PERFORMED PRIOR TO RETURN TO FLIGHT OF EACH VEHICLE OR AFTER LRU REPLACEMENT WITH PROBE AT AN INTERMEDIATE POSITION AND ASSOCIATED SWITCH ENABLED.

E) OPERATIONAL USE
THE PROBE FAILURE CAUSES A SIDE-TO-SIDE DILEMMA AND THE SOFTWARE DOWNMODES TO USING DEFAULT GAINS. THE CREW MUST MAINTAIN PITCH ATTITUDE WITHIN THETA LIMITS DISPLAYED ON CRT. CRT DISPLAYS ALPHA, MACH, AND ALTITUDE FROM EACH ADTA TO THE CREW. IF THE NAV DERIVED ALPHA, MACH, AND ALTITUDE DISPLAYED ON DEDICATED DISPLAYS (AMI, AVVI) ARE CORRECT, THE CREW CAN COMPARE THE ADTA DATA WITH THE NAV DERIVED DATA TO RESOLVE THE DILEMMA.