

**CRITICAL ITEMS LIST**

PROJECT: RMS  
 ASS'Y NOMENCLATURE: D&C PANEL

SYSTEM: DEC SUBSYSTEM  
 ASS'Y P/N: 21106101

SHEET: 1

INER REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	WDM / FUNC. 3/IRAD CRITICALITY	RATIONALE FOR ACCEPTANCE
60	0	ENTER SWITCH QTY 1 P/N CAE 06024 MC 452-0060 ED 92020 SHEET 3	MODE: PARTIAL LOSS OF OUTPUT.  CAUSE(S): (1) CONTACT FAILURE O/C  (2) 1 POLE FAIL IN OFF POSITION.	NONE. SWITCH HAS A DOUBLE CONTACT.  WORST CASE ----- NO EFFECT ON CREW/VEHICLE OR MISSION.  REDUNDANT PATHS REMAINING ----- SINGLE ( OTHER SET OF SWITCH CONTACTS) DIRECT AND BACKUP		DESIGN FEATURES ----- SWITCH HAS TWO SETS OF CONTACTS WIRED IN PARALLEL.  PUSH BUTTON SWITCHES ARE PROCURED TO THE REQUIREMENTS OF ROCKWELL INTERNATIONAL SPECIFICATION MC452-0060. SWITCHES OF THIS DESIGN HAVE BEEN QUALIFIED FOR ORBITER USE. FOR SWITCH OPERATIONAL CYCLES REFER TO TABLE 13.  WIRING TO SWITCH TERMINALS UTILIZES NICKEL PLATED CONDUCTORS WITH A POLYANIDE INSULATION. SOLDERING OF THE NICKEL PLATED WIRE IS CONTROLLED BY CAE PROCESS SPECIFICATION PD 91059.  THE ASSOCIATED WIRING HARNESS IS DESIGNED TO BE CAPABLE OF SEPARATE TESTING (FOR INSULATION RESISTANCE, DIELECTRIC STRENGTH, AND CONTINUITY). WIRING TO THE SWITCH IS STRAPPED TO THE SWITCH BODY TO AFFORD STRAIN RELIEF.  AFTER FORGING, SWITCH-TO-PANEL FASTENERS ARE STAKED USING A GLOB OF EPOXY ADHESIVE.

PREPARED BY: HMG

SUPERSEDING DATE: 11 SEP 86

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**CRITICAL ITEMS LIST**

PROJECT: SRM  
ASS'Y NOMENCLATURE: D&C PANEL

SYSTEM: D&C SUBSYSTEM  
ASS'Y P/N: 51150E101

SHEET: 2

PNR REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	NOFN / FUNC. 3/IRAD CRITICALITY	RATIONALE FOR ACCEPTANCE
60	0	ENTER SWITCH QTY 1 P/N CAE 86024 MC 452-0060 ED 92020 SHEET 3	MODE: PARTIAL LOSS OF OUTPUT.  CAUSE(S): (1) CONTACT FAILURE O/C  (2) 1 POLE FAIL IN OFF POSITION.	NONE. SWITCH HAS A DOUBLE CONTACT.  WORST CASE  NO EFFECT ON CREW/VEHICLE OR MISSION.  REDUNDANT PATHS REMAINING  SINGLE ( OTHER SET OF SWITCH CONTACTS) DIRECT AND BACKUP		ACCEPTANCE TESTS ----- THE HARDWARE ITEM IS SUBJECTED TO THE FOLLOWING ACCEPTANCE ENVIRONMENTAL TESTS AS PART OF THE D&C PANEL ASSEMBLY.  O VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 1  O THERMAL: +110 DEGREES F TO PLUS 10 DEGREES F (2 CYCLES - 9.5 HRS/CYCLE.)  THE D&C PANEL ASSEMBLY IS FURTHER TESTED AS PART OF THE RMS SYSTEM TESTS (TP510 RMS STRONGBACK TEST AND TP552 FLAT FLOOR TEST) WHICH VERIFIED THE ABSENCE OF THE FAILURE MODE.  QUALIFICATION TESTS ----- THE SWITCH ITEM HAS BEEN QUALIFIED FOR ORBITER USE. THE D&C PANEL ASSEMBLY HAS BEEN SUBJECTED TO THE FOLLOWING QUALIFICATION TEST ENVIRONMENTS.  O VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 1  O SHOCK: 200/11 MS - 3 AXES (6 DIRECTIONS)  O THERMAL: 130 DEGREES F TO -25 DEGREES F (12 HRS PER CYCLE) (6 CYCLES)  O HUMIDITY: 95% (120 DEGREES F TO 82 DEGREES F CYCLE (W 16 HRS) 10 CYCLES TOTAL.  O EMC: MIL-STD-461 AS MODIFIED BY DL-E-0002 (TEST CE01, CE02, CE03, CS01 (DC/AC), CE01, CS01 (DC/AC), CS02, CS06, RE02 (W/N), RS02, RS03, RS04)  FLIGHT CHECKOUT ----- PDRS OPS CHECKLIST (ALL VEHICLES) JSC 16907

PREPARED BY: NFMG

SUPERCEDING DATE: 11 SEP 86

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**CRITICAL ITEMS LIST**

PROJECT: SRMS  
ASS'Y NOMENCLATURE: D&C PANEL

SYSTEM: D&C SUBSYSTEM  
ASS'Y P/N: 51150E391

SHEET: 3

P/N&A REF.	REV.	NAME, QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	NOMEN / FUNC. 3/1R&S CRITICALITY	RATIONALE FOR ACCEPTANCE
60	0	ENTER SWITCH QTY 1 P/N CAE 84024 MC 452-0040 ED 92020 SHEET 3	MODE: PARTIAL LOSS OF OUTPUT.  CAUSE(S): (1) CONTACT FAILURE O/C  (2) 1 POLE FAIL IN OFF POSITION.	NONE. SWITCH HAS A DOUBLE CONTACT.  WORST CASE ----- NO EFFECT ON CREW/VEHICLE OR MISSION.  REDUNDANT PATHS REMAINING ----- SINGLE ( OTHER SET OF SWITCH CONTACTS) DIRECT AND BACKUP	QA/INSPECTIONS -----	<p>HERMETICALLY SEALED PUSHBUTTON SWITCHES ARE PROCUED TO ROCKWELL SPECIFICATION MC452-0040 AS REQUIRED BY CAE SPEC. PS86024. CAE PART NO. PS86024. QUALIFICATION AND ACCEPTANCE TESTING OF SWITCHES IS PERFORMED TO R.I. SPEC. MC452-0040.</p> <p>RECEIVING INSPECTION VERIFIES THAT SWITCHES RECEIVED ARE AS IDENTIFIED IN THE PROCUREMENT DOCUMENTS, THAT NO PHYSICAL DAMAGE HAS OCCURRED TO SWITCHES DURING SHIPMENT, THAT THE RECEIVING DOCUMENTS PROVIDE ADEQUATE TRACEABILITY INFORMATION AND ACCEPTANCE TEST DATA IDENTIFIES ACCEPTABLE PARTS.</p> <p>PARTS ARE INSPECTED THROUGHOUT MANUFACTURE AND ASSEMBLY AS APPROPRIATE TO THE MANUFACTURING STAGE COMPLETED. THESE INSPECTIONS INCLUDE,</p> <p>COMPONENT MOUNTING TO FRONT PANEL INSPECTION, SOLDERING OF WIRES TO SWITCH CONTACTS, WIRE ROUTING, STRESS RELIEF OF WIRES ETC., OPERATORS AND INSPECTORS ARE TRAINED AND CERTIFIED TO NASA WND 5300.4(3A) STANDARD, AS MODIFIED BY JSC08800A.</p> <p>PRE-TEST INSPECTION OF D&amp;C PANEL ASSY INCLUDES AN AUDIT OF LOWER TIER INSPECTION COMPLETION, AS BUILD CONFIGURATION VERIFICATION TO AS DESIGN ETC. (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT)</p> <p>A TEST READINESS REVIEW (TRR) WHICH INCLUDES VERIFICATION OF TEST PERSONNEL, TEST DOCUMENTS, TEST EQUIPMENT CALIBRATION/ VALIDATION STATUS AND HARDWARE CONFIGURATION IS CONVENED BY QUALITY ASSURANCE IN CONJUNCTION WITH ENGINEERING, RELIABILITY, CONFIGURATION CONTROL, SUPPLIER AS APPLICABLE, AND THE GOVERNMENT REPRESENTATIVE, PRIOR TO THE START OF ANY FORMAL TESTING (ACCEPTANCE OR QUALIFICATION).</p> <p>ACCEPTANCE TESTING (ATP) INCLUDES AMBIENT PERFORMANCE, THERMAL AND VIBRATION TESTING, (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT).</p> <p>INTEGRATION OF D&amp;C PANEL, RHC, IHC AND MCIU, INSPECTIONS ARE PERFORMED AT EACH STAGE OF INTEGRATION, WHICH INCLUDES GROUNDING CHECKS, INTER CONNECT CABLE VERIFICATION, CONNECTOR INSPECTION FOR BENT OR PUSHBACK CONTACTS ETC.</p> <p>SUB-SYSTEM PERFORMANCE TESTING (ATP), INCLUDES AN AMBIENT PERFORMANCE TEST. (MANDATORY INSPECTION POINT).</p> <p>SRMS SYSTEMS INTEGRATION, THE INTEGRATION OF MECHANICAL AIM SUBASSEMBLIES AND THE FLIGHT CABIN EQUIPMENT TO FORM THE SRMS. INSPECTIONS ARE PERFORMED AT EACH PHASE OF INTEGRATION WHICH INCLUDES GROUNDING CHECKS, THRU WIRING CHECKS, WIRING ROUTING, INTERFACE CONNECTORS FOR BENT OR PUSH BACK CONTACTS ETC.</p> <p>SRMS SYSTEMS TESTING - STRONGBACK AND FLAT FLOOR AMBIENT PERFORMANCE TEST. (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT)</p>

PREPARED BY: MFWG \_\_\_\_\_ SUPERSEDING DATE: 11 SEP 86 \_\_\_\_\_ APPROVI

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**CRITICAL ITEMS LIST**

PROJECT: SRMS  
 ASS'Y NOMENCLATURE: D/C PANEL

SYSTEM: D&C SUBSYSTEM  
 ASS'Y P/N: 21140391

SHEET: 4

YMEA REF.	REV.	NAME, QTY & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	RISK / FUNC. 3/18AB CRITICALITY	RATIONALE FOR ACCEPTANCE
60	0	ENTER SWITCH QTY 1 P/N CAE 86024 MC 452-0040 ED 92020 SHEET 3	MODE: PARTIAL LOSS OF OUTPUT.  CAUSE(S): (1) CONTACT FAILURE O/C  (2) 1 POLE FAIL IN OFF POSITION.	NONE. SWITCH HAS A DOUBLE CONTACT.  WORST CASE ----- NO EFFECT ON CREW/VEHICLE OR MISSION.  REDUNDANT PATHS REMAINING ----- SINGLE ( OTHER SET OF SWITCH CONTACTS) DIRECT AND BACKUP	FAILURE HISTORY -----	THERE HAVE BEEN NO FAILURES ASSOCIATED WITH THIS FAILURE MODE ON THE SRMS PROGRAM.

PREPARED BY: HFMG

SUPERCEDING DATE: 11 SEP 84

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**CRITICAL ITEMS LIST**

PROJECT: SRMS  
ASS'Y NOMENCLATURE: DEC PANEL

SYSTEM: D&C SUBSYSTEM  
ASS'Y P/N: 51150291

SHEET: 6

INEX REF.	REV.	NAME, QTY, & DRAWING REF. DESIGNATION	FAILURE MODE AND CAUSE	FAILURE EFFECT ON END ITEM	RDM / FUNC. 3/IRAD CRITICALITY	RATIONALE FOR ACCEPTANCE
60	0	ENTER SWITCH QTY 1 P/N CAE 86024 MC 452-0060 ED 92020 SHEET 3	MODE: PARTIAL LOSS OF OUTPUT.  CAUSE(S): (1) CONTACT FAILURE O/C  (2) 1 POLE FAIL IN OFF POSITION.	NONE. SWITCH HAS A DOUBLE CONTACT.  WORST CASE  NO EFFECT ON CREW/VEHICLE OR MISSION.  REDUNDANT PATHS REMAINING  SINGLE ( OTHER SET OF SWITCH CONTACTS) DIRECT AND BACKUP		OPERATIONAL EFFECTS -----  NONE WITH THIS FAILURE. FOR SUBSEQUENT FAILURE OF THE MODE SWITCH, COMPUTER SUPPORTED MODES WILL BE LOST. DIRECT DRIVE AND BACK-UP AVAILABLE. LOSS OF NEXT REDUNDANT PATH RESULTS IN BEING ONE FAILURE AWAY FROM INABILITY TO CRADLE ARM. FOR SUBSEQUENT FAILURES CAUSING LOSS OF ALL REDUNDANT DRIVE MODES, THE ARM CAN BE JETTISONED.  CREW ACTION -----  NONE  CREW TRAINING -----  NONE  MISSION CONSTRAINTS -----  NONE  SCREEN FAILURES -----  A: AND B: REDUNDANT CONTACTS. INSTRUMENTATION MEASURES OR'ED OUTPUT OF CONTACTS. INDEPENDENT REDUNDANT PATHS NOT INSTRUMENTED.  OHSO OFFLINE -----  NONE  OHSO ONLINE INSTALLATION -----  NONE  OHSO ONLINE TURNAROUND -----  NONE

PREPARED BY: NEWG

SUPERSEDING DATE: 11 SEP 86

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