

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : P/L RETEN & DEPLOY-MPM PYRO FMEA NO P2-5A-J07-1 REV:08/12/88

ASSEMBLY : MPM SHOULDER MECHANISM CRIT. FUNC: 1R
 P/N RI : SKD26100105-301 CRIT. HDW: 2
 P/N VENDOR: MC325-0024-0002
 QUANTITY : 2

| | | | | |
|--------------|---------|-----|---------|-----|
| | VEHICLE | 102 | 103 | 104 |
| EFFECTIVITY: | | X | X | X |
| PHASE(S): | PL | LO | OO X DO | LS |

REDUNDANCY SCREEN: A-N/A B-N/A C-PASS

| | | |
|---------------------|--------------------------------------|----------------------------------|
| PREPARED BY: | APPROVED BY: | APPROVED BY (NASA): |
| DES R. H. YEE | DES <i>R.H. Yee for A.L. Ardmore</i> | SSM <i>R.W.H. Thomas</i> 9-12-88 |
| REL M. B. MOSKOWITZ | REL <i>M.B. Moskowitz</i> | REL <i>G.L. ...</i> 9-10-88 |
| QE E. M. GUTIERREZ | QE <i>EMG</i> 9/23/88 | QE <i>...</i> 9-24 |

ITEM:
 PRESSURE CARTRIDGE, MANIPULATOR POSITIONING MECHANISM (MPM) SHOULDER
 JETTISON, UMBILICAL GUILLOTINE, TYPE I

FUNCTION:
 PROVIDES PRESSURE OUTPUT FROM EITHER OR BOTH (REDUNDANT) PRESSURE
 CARTRIDGES TO OPERATE GUILLOTINE ASSEMBLY WHICH SEVERS THE ELECTRICAL
 UMBILICAL AT THE MANIPULATOR POSITIONING MECHANISM (MPM) SHOULDER IF
 REMOTE MANIPULATOR SYSTEM (RMS) CANNOT BE STOWED.

FAILURE MODE:
 FAILS TO FUNCTION OR LOW PRESSURE OUTPUT

CAUSE(S):
 LOSS OF ELECTRICAL INPUT/NASA STANDARD INITIATOR (NSI), CONTAMINATION OR
 IMPROPER LOADING OF PYRO MIX, STRUCTURAL FAILURE OF CARTRIDGE BODY,
 HANDLING DAMAGE

EFFECTS ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) LOSS OF REDUNDANCY.

(B) INABILITY TO CLOSE PAYLOAD DOORS IF BOTH CARTRIDGES FAIL.

(C,D) NO EFFECT FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE, IF BOTH
 CARTRIDGES FAIL, DUE TO INABILITY TO CLOSE PAYLOAD BAY (PLB) DOORS.

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

(A) DESIGN
 DESIGN INCORPORATES DUAL (REDUNDANT) PRESSURE CARTRIDGES, A SINGLE 85%
 LOADED PRESSURE CARTRIDGE IS CAPABLE OF OPERATING THE GUILLOTINE.

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(B) TEST

QUALIFICATION TESTS: SALT FOG, THERMAL CYCLING, PRESSURE CYCLING, SHOCK, TRANSIENT AND RANDOM VIBRATION, HIGH +160 DEG F/LOW -130 DEG F/AMBIENT FIRINGS, SINGLE 85% CARTRIDGE, DUAL 130% CARTRIDGES, 8-FOOT DROP TEST. CR 44-325-0022-0001; QTR (OEA, INC) 2889-10-100, CR 44-325-0025-0001; QTF (OEA, INC) 2956-10/A.

ACCEPTANCE TESTS: CARTRIDGE BODY TENSILE TEST COUPONS, HELIUM LEAK TEST, INTERNAL PROOF PRESSURE, EXAMINATION OF PRODUCT, N-RAY, X-RAY, EXPLOSIVE CHARGE WEIGHT. ATP (OEA, INC) 2956-7.

SYSTEM TESTS: RANDOM VIBRATION, THERMAL CYCLING, AMBIENT FIRING (1). SYSTEM TEST CR 44-000002-001, STS 83-0987.

OMRSD: GROUND TURNAROUND INCLUDES PYRO INITIATOR CONTROLLER (PIC) RESISTANCE TEST (POST HOOK-UP), PIC GO/NO-GO RESISTANCE TEST, POWER ON AND POWER-OFF STRAY VOLTAGE TEST, NSI ELECTRICAL VERIFICATION, RMS JETTISON VERIFICATION, AND RMS JETTISON RESET/DEADFACE VERIFICATION.

(C) INSPECTION

RECEIVING INSPECTION

ALL RAW MATERIALS ARE VERIFIED BY RECEIVING INSPECTION TO ASSURE SPECIFIC SHUTTLE REQUIREMENTS ARE SATISFIED.

CONTAMINATION CONTROL

CONTAMINATION CONTROL AND CORROSION PROTECTION PROCESSES VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

VISUAL INSPECTION, IDENTIFICATION PERFORMED, AND PARTS PROTECTION VERIFIED BY INSPECTION. SELECTED MANUFACTURING/ASSEMBLY STEPS ARE IDENTIFIED BY NASA QUALITY ASSURANCE AND VERIFIED BY GOVERNMENT INSPECTION AS MANDATORY INSPECTION POINTS (MIPS).

NONDESTRUCTIVE EVALUATION

PARTS ARE X-RAYED AND N-RAYED TO VERIFY CORRECT ASSEMBLY AND PRESENCE OF ALL DETAIL PARTS AND EXPLOSIVES. X-RAYS AND N-RAYS ARE REVIEWED BY VENDOR, DCAS, NASA QUALITY, AND ENGINEERING.

CRITICAL PROCESSES

ALL MANUFACTURING PROCESSES, SUCH AS, WELDING, HEAT TREATING, PASSIVATION, AND ANODIZING ARE VERIFIED BY INSPECTION.

TESTING

ATP IS VERIFIED PER PROCEDURE.

HANDLING/PACKAGING

HANDLING, PACKAGING, AND STORAGE ENVIRONMENT ARE VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

THERE HAVE BEEN NO ACCEPTANCE TEST, QUALIFICATION TEST, FIELD OR FLIGHT FAILURES ASSOCIATED WITH THIS FAILURE MODE.

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(E) OPERATIONAL USE
NONE.