PRINT DATE: 09/14/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE
NUMBER: MS-6MR-0308-X

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM/MIR-2

REVISION: 0 SEP 30, 1995

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:	STANDARD SWITCH PANEL-3	SED33101201-303
SRU	:	TOGGLE SWITCH	ME452-0102-7201

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH, TOGGLE, 2P2P MAINTAINED ON - ORBITER DOCKING SYSTEM (ODS) CENTERLINE (CL) CAMERA ON/OFF.

REFERENCE DESIGNATORS: 31P73A12A2S8

QUANTITY OF LIKE ITEMS: 1
(ONE)

FUNCTION:
ALLOWS THE CREW TO POWER THE ODS CL CAMERA. THIS AXIAL CAMERA WILL VIEW THE SHUTTLE TARGET ON THE DOCKING MODULE (DM). THIS CAMERA IS BACKED UP BY THE ODS TRUSS CAMERA.

REFERENCE DOCUMENTS: 1) ECN 104-25017. ELECTRICAL CHANGE NOTICE, SHUTTLE/MIR MISSION #2, ORBITER DOCKING SYSTEM.2) VS72-200143. INTEGRATED SCHEMATIC STS-74.3) JSC-26736. STS-74 CARGO SYSTEM MANUAL.4) VS70-953114. INTEGRATED SCHEMATIC - DOCKING SYSTEM, RUSSIAN MIR MISSION 2.

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL FAILURE MODE
NUMBER: M5-6MR-0306-01

REVISION# **SEP 30, 1995**

SUBSYSTEM NAME: ORBITER DOCKING SYSTEM/MIR-2
LRU: ME452-0102-7201 **CRITICALITY OF THIS**
ITEM NAME: TOGGLE SWITCH **FAILURE MODE:** 2R3

FAILURE MODE:
FAILS OPEN IN THE "ON" POSITION, FAILS CLOSED IN THE "OFF" POSITION, POLE-TO-POLE SHORT, SHORT TO CASE, SHORT TO GROUND

MISSION PHASE:
OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 104 ATLANTIS

CAUSE:
A) STRUCTURAL FAILURE, B) CONTAMINATION, C) VIBRATION, D) MECHANICAL SHOCK, E) PROCESSING ANOMALY, F) THERMAL STRESS

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

REDUNDANCY SCREEN **A)** PASS

B) PASS

C) FAIL

PASS/FAIL RATIONALE:
A)

B)

C)
ALL POWER TO STANDARD SWITCH PANELS ROUTED THROUGH A SINGLE MPCA 2 CONNECTOR (J3), AND A SINGLE CABLE CONNECTOR (P310).

METHOD OF FAULT DETECTION:
LOSS OF VIDEO OUTPUT FROM ODS CL CAMERA.

MASTER MEAS. LIST NUMBERS: NONE

CORRECTING ACTION:
USE ODS TRUSS CAMERA.

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL FAILURE MODE
NUMBER: M5-6MR-0308-01

- FAILURE EFFECTS -

(A) SUBSYSTEM:
LOSS OF CONTROL OF ODS CL CAMERA POWER.

(B) INTERFACING SUBSYSTEM(S):
LOSS OF VIDEO OUTPUT FROM ODS CL CAMERA.

(C) MISSION:
FIRST FAILURE - NO EFFECT. USE ODS TRUSS CAMERA TO MATE DOCKING MODULE (DM) TO ODS.

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
POSSIBLE LOSS OF MISSION OBJECTIVES AFTER THREE FAILURES.
1) SWITCH S8 (ODS CL CAMERA POWER) FAILS OPEN. LOSS OF VIDEO OUTPUT FROM ODS CL CAMERA. USE ODS TRUSS CAMERA.
2) SWITCH S7 FAILS OPEN (ODS TRUSS CAMERA POWER). LOSS OF VIDEO OUTPUT FROM ODS TRUSS CAMERA. PERFORM STANDARD SWITCH PANEL CABLE CHANGEOUT USING AN INFLIGHT MAINTENANCE PROCEDURE, AND USE SSP 2-SWITCH TO RECOVER FUNCTION.
3) SWITCH ON SSP 2 FAILS OPEN - UNABLE TO MATE ODS TO DM WITHOUT VIDEO FROM THE ODS CENTERLINE CAMERA OR ODS TRUSS CAMERA.

- 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

PRINT DATE: 09/28/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL FAILURE MODE
NUMBER: M5-6MR-0308-01

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX A, ITEM #1, TOGGLE SWITCH.

(B) TEST:
REFER TO APPENDIX A, ITEM #1, TOGGLE SWITCH.

POWER CONTROL CIRCUIT OPERATION IS VERIFIED DURING GROUND CHECKOUT. ANY TURNAROUND TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:
REFER TO APPENDIX A, ITEM #1, TOGGLE SWITCH.

(D) FAILURE HISTORY:
REFER TO APPENDIX A, ITEM #1, TOGGLE SWITCH.

(E) OPERATIONAL USE:
PERFORM STANDARD SWITCH PANEL CABLE CHANGEOUT USING AN INFLIGHT MAINTENANCE PROCEDURE.

- APPROVALS -

PRODUCT ASSURANCE ENGINEERING	:R. BLACKWELL	:
PRODUCT ASSURANCE MANAGER	:W. MARLOWE	:
DESIGN ENGINEERING	:T. NGUYEN	:
CHIEF ENGINEER	:B. BRANDT	:
NASA SS&MA	:	:
NASA SUBSYSTEM MANAGER	:	:
JSC MOD	:	: