

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE

NUMBER: MB-1MR-BM006-X

SUBSYSTEM NAME: MECHANICAL - EDS

REVISION: 2 9/1/95

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	: GUIDE RING ASSEMBLY NPO-ENERGIA	33U.6271.011-05 33U.6271.011-05
SRU	: ASSEMBLY, CAPTURE LATCH NPO-ENERGIA	33U.6322.025 33U.6322.025

PART DATA**EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
CAPTURE LATCH ASSEMBLY****REFERENCE DESIGNATORS:****QUANTITY OF LIKE ITEMS: 3**
THREE (ONE PER GUIDE PEDAL)**FUNCTION:**

THREE ACTIVE (CAPTURE) LATCHES, ONE ON EACH GUIDE PEDAL OF THE ORBITER DOCKING RING, PROVIDES POSITIVE CAPTURE TO THREE PASSIVE (BODY MOUNTED) LATCHES LOCATED ON THE MIR DOCKING MECHANISM. CAPTURE LATCH ROLLER MECHANISMS MOVE ASIDE DURING CLOSING CONTACT WITH THEIR OPPOSING BODY MOUNTED LATCHES AND ARE SPRING DRIVEN TO LOCK AFTER PASSING THE THREE PASSIVE BODY LATCHES (LUGS). TWO ROLLER MECHANISMS LOCATED ON EACH CAPTURE LATCH ASSEMBLY PROVIDE A REDUNDANT MEANS OF CAPTURE.

UPON RECEIPT OF A "CLOSE CAPTURE LATCH" COMMAND, POWER IS APPLIED THROUGH REDUNDANT "LATCH MOTOR OPEN" SENSOR CONTACT SETS TO A SINGLE ACTUATOR MOTOR TO EXTEND BOTH ROLLERS OF ONE CAPTURE LATCH ASSEMBLY. A "LATCH INDICATION CLOSED" SENSOR ON EACH ACTUATOR SENSES THE CLOSED POSITION OF THE LATCH AND SENDS REDUNDANT SIGNALS TO THE DOCKING CONTROL PANEL VIA THE DSCU TO ILLUMINATE THE "LATCHES CLOSED" LIGHT WHEN ALL THREE CAPTURE LATCHES ARE CLOSED.

UPON RECEIPT OF AN "OPEN CAPTURE LATCH" COMMAND (FOLLOWING COMPLETION OF THE DOCKING PROCESS), POWER IS APPLIED THROUGH REDUNDANT "LATCH MOTOR CLOSED" SENSOR CONTACT SETS TO A SINGLE ACTUATOR MOTOR TO RETRACT BOTH ROLLERS OF THE CAPTURE LATCH ASSEMBLY FOR UNDOCKING OF THE MIR AND ORBITER. A "LATCH INDICATION OPEN" SENSOR LOCATED ON EACH CAPTURE LATCH ACTUATOR SENSES THE OPEN POSITION OF THE LATCH AND SENDS REDUNDANT SIGNALS TO THE DSCU TO ILLUMINATE THE "LATCHES OPEN" INDICATOR LIGHT ON THE DOCKING CONTROL PANEL AND COMMAND RING TO RETRACT WHEN THE SENSOR ON ALL THREE CAPTURE LATCH ACTUATORS IS CLOSED.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE
NUMBER: M8-1MR-BM006-X**

THE THIRD CONTACT SET OF EACH "LATCH INDICATION OPEN" AND "LATCH INDICATION CLOSED" SENSOR IS UTILIZED FOR GROUND MONITORING OF CAPTURE LATCH POSITION. CAPTURE LATCH "INITIAL POSITION" IS ALSO DOWNLINKED FOR GROUND MONITORING.

IN THE EVENT A CAPTURE LATCH FAILS TO OPEN, THE MANUAL LATCH/UNBLOCKING DEVICE CONTAINED BEHIND THE CAPTURE LATCH ASSEMBLY WILL PROVIDE MANUAL RELEASE OF THE LATCH. A BUTTON ON EACH SIDE OF THE DEVICE, WHEN DEPRESSED SIMULTANEOUSLY, WILL RELEASE LATCH CONTROL BY THE LATCH ACTUATOR, THUS ALLOWING BOTH CAPTURE LATCH ROLLERS TO RETRACT TO THEIR OPEN POSITION.

SERVICE IN BETWEEN FLIGHT AND MAINTENANCE CONTROL:
VISUAL INSPECTION, SERVICEABILITY CONTROL, DOCKING WITH CALIBRATING DOCKING MECHANISM.

MAINTAINABILITY
REPAIR METHOD - REPLACEMENT.

REFERENCE DOCUMENTS: 33U.6322.025
33U.6271.011-05

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE

NUMBER: M8-1MR-BM008-10

REVISION# 1 9/1/95

SUBSYSTEM NAME: MECHANICAL - EDS
 LRU: GUIDE RING ASSEMBLY
 ITEM NAME: ASSEMBLY, CAPTURE LATCH

CRITICALITY OF THIS
 FAILURE MODE: 2R3

FAILURE MODE:

ONE CAPTURE LATCH MOTOR 'OPEN' SENSOR CONTACT SET FAILS OPEN

MISSION PHASE:

OO ON-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 104 ATLANTIS

CAUSE:CONTAMINATION, STRUCTURAL FAILURE DUE TO MECHANICAL/THERMAL SHOCK OR
MANUFACTURE/MATERIAL DEFECT

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

REDUNDANCY SCREEN

- A) PASS
- B) FAIL
- C) FAIL

PASS/FAIL RATIONALE:

A)

B)

FAILS REDUNDANCY SCREEN "B" SINCE A FAILS OPEN CONDITION ON A SINGLE
CONTACT SET IS NOT DETECTABLE IN FLIGHT.

C)

FAILS REDUNDANCY SCREEN "C" SINCE NON-CONDUCTIVE CONTAMINATION CAN
RESULT IN A FAILS OPEN CONDITION ON ALL CONTACT SETS.**METHOD OF FAULT DETECTION:**NO EFFECT FIRST CONTACT SET FAILURE. SECOND CONTACT SET FAILURE WOULD BE
DETECTED THROUGH VISUAL OBSERVATION - LOSS OF 'LATCHES CLOSED' INDICATION
WHEN REQUIRED. IF FAILURE OF SWITCH DOESN'T AFFECT THIRD CONTACT SET
GROUND PERSONNEL CAN DETERMINE "CLOSED" POSITION OF CAPTURE LATCHES
THROUGH TELEMETRY DATA.**- FAILURE EFFECTS -****(A) SUBSYSTEM:**FIRST CONTACT SET FAILURE - NO EFFECT. SECOND CONTACT SET FAILURE - 'CLOSE
LATCH' POWER TO AFFECTED CAPTURE LATCH ACTUATOR MOTOR IS INTERRUPTED.
ABILITY TO POWER AFFECT CAPTURE LATCH CLOSED IS LOST. NO EFFECT ON INITIAL
DOCKING SINCE CAPTURE LATCHES ARE IN THEIR CLOSED POSITION PRIOR TO FIRSTRSC
Energia

Proprietary Data

PAGE: 114

PRINT DATE: 08/25/95

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE
NUMBER: MS-1MR-BM005-10.

CAPTURE. HOWEVER, SUBSEQUENT DOCKINGS WOULD BE LOST SINCE ONLY TWO OF THREE CAPTURES WOULD BE CLOSED.

(B) INTERFACING SUBSYSTEM(S):
 NO EFFECT ON INTERFACING ORBITER SUBSYSTEMS.

(C) MISSION:
 NO EFFECT ON CURRENT DOCKING. A FAILURE TO CLOSE A CAPTURE LATCH WOULD AFFECT THE CAPABILITY TO PERFORM SUBSEQUENT DOCKINGS.

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

(E) FUNCTIONAL CRITICALITY EFFECTS:
 INITIAL DOCKING - NO EFFECT SINCE CAPTURE LATCHES ARE IN THEIR CLOSED POSITION PRIOR TO CAPTURE. CRITICALITY 3/3 CONDITION.
 SUBSEQUENT DOCKINGS - A FAILED OPEN CONDITION ON BOTH CONTACT SETS ON ONE CAPTURE LATCH MOTOR "OPEN" SENSOR WOULD PREVENT CLOSING OF AFFECTED CAPTURE LATCH. WITH ONLY TWO CAPTURE LATCHES CLOSED SECOND CAPTURE MAY BE POSSIBLE BUT MATING OF BOTH DOCKING MECHANISMS FOR STRUCTURAL LATCHING WOULD BE LOST, SINCE RING WOULD NOT BE ALIGNED. CRITICALITY 2R3 CONDITION.

DESIGN CRITICALITY (PRIOR TO OPERATIONAL DOWNGRADE, DESCRIBED IN F): 2R3

(F) RATIONALE FOR CRITICALITY CATEGORY DOWNGRADE:
 N/A (THERE ARE NO WORKAROUNDS TO CIRCUMVENT THIS FAILURE.)

-DISPOSITION RATIONALE-

(A) DESIGN:
 REDUNDANT CONTACT SETS PROVIDE POWER TO A SINGLE ACTUATOR MOTOR TO CLOSE ONE CAPTURE LATCH ASSEMBLY. ONLY ONE CONTACT SET IS REQUIRED TO ENABLE POWER TO THE MOTOR. CAPTURE LATCHES ARE CLOSED DURING GROUND OPERATIONS PRIOR TO FLIGHT AND REMAIN CLOSED THROUGHOUT THE DOCKING RING CAPTURE PROCESS. CAPTURE LATCH ASSEMBLY IS COMPLETELY ENCASED TO PREVENT INTRODUCING CONTAMINATION THAT COULD CAUSE A FAILED OPEN CONDITION ON ALL CONTACT SETS.

(B) TEST:
DOCKING MECHANISM ACCEPTANCE TESTS:

1. ELECTRICAL SCHEMATIC CHECKOUT - CONTACT RESISTANCE ON EACH PIN OF THE CONNECTOR, WHICH IS ELECTRICALLY TIED TO EACH CAPTURE LATCH ACTUATOR MOTOR CIRCUIT, IS CHECKED. THIS TEST VERIFIES CONTINUITY THROUGH THE MOTOR "CLOSED" SENSOR.
2. INSULATION ELECTRICAL RESISTANCE TEST - THE INSULATION RESISTANCE AND ELECTRICAL STRENGTH OF INSULATION CHECKOUT OF EACH PIN OF EACH CAPTURE LATCH ACTUATOR CONNECTOR TO THE APDA HOUSING WILL VERIFY THAT THE CAPTURE LATCH ACTUATOR MOTOR CIRCUIT IS NOT ELECTRICALLY SHORTED TO GROUND. THE MOTOR "CLOSED" SENSOR IS LOCATED IN THE ACTUATOR MOTOR CIRCUIT.



RSC
Energia

Proprietary Data

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE

NUMBER: M8-1MR-BM006-10

3. INSPECTION SERVICEABILITY TEST - PROPER CLOSING OF CAPTURE LATCHES VERIFIED DURING CAPTURE LATCH FUNCTIONING PERFORMANCE TEST. INDIVIDUAL REDUNDANT ROLLERS ARE RETRACTED AND ALL THREE CAPTURE LATCHES ARE CLOSED.

4. VIBRORESISTENT TEST - APDS SUBJECTED TO THE FOLLOWING VIBRATION LEVELS FOR 2 MINUTES PER AXIS:

FREQUENCY (HZ)	SPECTORAL DENSITY ACCELERATION
FROM 20 TO 80	INCREASING, 30DB OCTAVE TO 0.04G ² /HZ
FROM 80 TO 350	PERMANENT 0.04G ² /HZ
FROM 350 TO 2000	DECREASING 30DB OCTAVE WITH 0.04G ² /HZ

SUBSEQUENT TO THIS TEST AN INSPECTION IS PERFORMED TO IDENTIFY BROKEN OR LOOSE HARDWARE; AND AN ELECTRICAL CIRCUIT TEST, AN INSULATION RESISTANCE TEST, AND INSPECTION SERVICEABILITY TEST ARE PERFORMED AS DEFINED IN ATP TESTS #1, #2, AND #3 ABOVE.

5. DOCKING MECHANISM CHECKOUT (STATIC) TEST - CLOSING OF CAPTURE LATCHES IS VERIFIED. CAPTURE LATCHES ARE CLOSED PER STEP 11 OF INSTRUCTION 33U.6201.008-05 PM-3.

6. THERMO VACUUM TEST - DOCKING OF THE MECHANISM IS THERMALLY CYCLED, UNDER LOAD CONDITIONS, FROM +20°C TO -50/-55°C TO +50/+55°C TO +20°C IN A VACUUM AT 10⁻⁴ TO 10⁻⁵ TORR. DWELL AT EACH TEMPERATURE AND BETWEEN OPERATIONS AT EACH TEMPERATURE IS A MINIMUM OF 60 MINUTES AFTER STABILIZATION. OPERATIONS INCLUDES PERFORMING DOCKING/CAPTURE WHICH IS ACCOMPLISHED AT A SPEED OF 0.15M/SEC BETWEEN THE SIMULATOR AND MOVEABLE PLATFORM (CONTAINING THE DOCKING MECHANISM). PROPER CLOSING OF CAPTURE LATCHES IS VERIFIED FOR A TEMPERATURE RANGE OF -50°C/-55°C TO 50°C/55°C.

7. CONTROLLED DOCKING TEST - CONTROLLED DOCKING IS PERFORMED UNDER LOAD. CAPTURE LATCHES ARE VERIFIED CLOSED PRIOR TO CAPTURE.

DOCKING MECHANISM QUALIFICATION TESTS:

1. ELECTRICAL CIRCUIT TEST - CONTACT RESISTANCE ON EACH PIN OF THE CONNECTOR, WHICH IS ELECTRICALLY TIED TO EACH CAPTURE LATCH ACTUATOR MOTOR CIRCUIT, IS CHECKED. THIS TEST VERIFIES CONTINUITY THROUGH THE MOTOR "CLOSED" SENSOR.
2. INSULATION ELECTRICAL RESISTANCE TEST - THE INSULATION RESISTANCE AND ELECTRICAL STRENGTH OF INSULATION CHECKOUT OF EACH PIN OF EACH CAPTURE LATCH ACTUATOR CONNECTOR TO THE APDA HOUSING WILL VERIFY THAT THE CAPTURE LATCH ACTUATOR MOTOR CIRCUIT IS NOT ELECTRICALLY SHORTED TO GROUND. THE MOTOR "CLOSED" SENSOR IS LOCATED IN THE ACTUATOR MOTOR CIRCUIT.
3. OPERATIONAL CAPABILITY TEST - OPERATION OF CAPTURE LATCHES IS VERIFIED DURING THE OPERATIONAL CAPABILITY CHECK.
4. VIBRATION STRENGTH TEST - APDS SUBJECTED TO THE FOLLOWING VIBRATION LEVELS IN EACH AXIS FOR A 400 SECOND DURATION.

RSC
Energie

Proprietary Data

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE

NUMBER: M8-1MR-BM006-10

FREQUENCY (HZ)	SPECTRAL DENSITY ACCELERATION
FROM 20 TO 80	INCREASING, 3DB OCTAVE TO 0.067G ² /HZ
FROM 80 TO 350	CONSTANT 0.057G ² /HZ
FROM 350 TO 2000	DECREASING 3DB OCTAVE WITH 0.067G ² /HZ

SUBSEQUENT TO THIS TEST AN INSPECTION IS PERFORMED TO IDENTIFY BROKEN OR LOOSE HARDWARE; AND AN ELECTRICAL CIRCUIT CHECK TEST, INSULATION RESISTANCE TEST, AND OPERATIONAL CAPABILITY TEST ARE PERFORMED, AS DEFINED IN QTP TESTS #1, #2, AND #3 ABOVE, TO VERIFY PROPER CLOSING OF CAPTURE LATCHES.

5. TRANSPORTABILITY STRENGTH TEST - SHIPPING LOADS ARE SIMULATED ON A VIBRATING TABLE TO VERIFY THAT THE DOCKING MECHANISM WILL NOT BE DAMAGED DURING SHIPMENT. THIS TEST IS CONDUCTED UNDER THE CONDITIONS CONTAINED IN THE FOLLOWING TABLE.

VIBRATION ACCELER DIRECTION	VIBRATION ACCELER AMPLITUDE	FREQUENCY SUBBAND, HZ					TOTAL TEST DURATION	
		5-7	7-15	15-30	30-40	40-60	HR	MIN
		TEST DURATION, MIN						
ALONG X-AXIS	1.4	-	4	-	-	-	-	4
	1.2	76	83	32	61	39	5	7
ALONG Y-AXIS	1.1	-	4	-	-	-	-	4
	1.0	13	16	7	10	7	-	53
ALONG Z-AXIS	1.1	-	4	-	-	-	-	4
	1.0	32	40	18	28	16	2	10

SUBSEQUENT TO THIS TEST AN INSPECTION IS PERFORMED TO IDENTIFY BROKEN OR LOOSE HARDWARE; AND AN ELECTRICAL CIRCUIT CHECK TEST, INSULATION RESISTANCE TEST, AND OPERATIONAL CAPABILITY TEST ARE PERFORMED, AS DEFINED IN QTP TESTS #1, #2, AND #3 ABOVE, TO VERIFY PROPER CLOSING OF CAPTURE LATCHES.

6. SHOCK AND SAWTOOTH LOADING STRENGTH TEST - DOCKING MECHANISM IS SUBJECTED TO 20G TERMINAL SAWTOOTH SHOCK PULSES IN EACH AXIS, 3 PULSES IN EACH DIRECTION FOR A TOTAL OF 6 PULSES/AXIS. AFTER COMPLETION AN INSPECTION IS PERFORMED TO IDENTIFY BROKEN OR LOOSE HARDWARE; AND AN ELECTRICAL CIRCUIT CHECK TEST, INSULATION RESISTANCE TEST, AND AN OPERATIONAL CAPABILITY TEST ARE CONDUCTED, AS DEFINED PREVIOUSLY IN QTP TESTS #1, #2, & #3, TO VERIFY PROPER CAPTURE LATCH CLOSING PERFORMANCE.

7. APDS SERVICEABILITY TEST IN A SIX-DEGREE-OF-FREEDOM DYNAMIC TEST - THE SIX-DEGREE-OF-FREEDOM DYNAMIC TEST VERIFIES APDS DOCKING AND UNDOCKING OPERATIONS UNDER CLOSE-TO-FULL-SCALE CONDITIONS. STATIC MOTION OF ENTITIES IS SIMULATED UNDER SPECIFIC INERTIAL AND GEOMETRICAL PARAMETERS FOR VARIOUS INITIAL CONDITIONS FOR MIR/SHUTTLE DOCKING. A TOTAL OF 20 DOCKINGS IS PERFORMED. CLOSING OF CAPTURE LATCHES IS VERIFIED PRIOR TO EACH DOCKING. SUBSEQUENT TO THIS TEST AN ENGINEERING INSPECTION IS PERFORMED TO IDENTIFY BROKEN OR LOOSE HARDWARE; AND AN ELECTRICAL CIRCUIT CHECK TEST, INSULATION RESISTANCE TEST, AND AN OPERATIONAL CAPABILITY TEST ARE CONDUCTED, AS DEFINED PREVIOUSLY IN QTP TESTS #1, #2, & #3, TO VERIFY PROPER CAPTURE LATCH PERFORMANCE.



Proprietary Data

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE

NUMBER: MB-1MR-8M006-10

8. COLD AND HEAT RESISTANCE TEST - DOCKING OF THE MECHANISM IS THERMALLY CYCLED FROM +20°C TO -50/-55°C TO +50/+55°C TO +20°C IN A VACUUM AT 10^{-4} TO 10^{-5} TORR. DWELL AT EACH TEMPERATURE AND BETWEEN OPERATIONS AT EACH TEMPERATURE IS A MINIMUM OF 60 MINUTES AFTER STABILIZATION. PRIOR TO EACH DOCKING, AS SHOWN IN THE FOLLOWING TABLE, CAPTURE LATCH CLOSING IS VERIFIED.

SEQ NO.	DOCKING RATE, M/S	SIMULATOR ROTATIONAL ANGLE		TEMP °C	VOLTAGE VOLTS	PRESS INTEGRITY CHECKOUT
		PITCH	ROLL			
1	0.10	0°	0°	25 +/-10	23	YES
2	0.10	0°	4°	25 +/-10	34	NO
3	0.12	4°	4°	25 +/-10	27	NO
4*	---	---	---	+60+/-5	---	YES
4	0.10	4°	0°	+50+/-5	27	YES
5*	---	---	---	-(60+/-5)	---	YES
5	0.10	4°	0°	-(30+/-5)	27	YES
6*	---	---	---	+60+/-5	---	YES
6	0.12	0°	4°	+50+/-5	23	YES
7*	---	---	---	-(60+/-5)	---	YES
7	0.10	0°	4°	-(30 +/-5)	23	YES
8*	---	---	---	+60+/-5	---	YES
8	0.12	4°	4°	50 +/-5	34	YES
9*	---	---	---	-(60+/-5)	---	YES
9	0.12	4°	4°	-(30 +/-5)	34	YES
10*	---	---	---	+60+/-5	---	YES
10	0.10	4°	0°	+50+/-5	27	YES
11*	---	---	---	-(60+/-5)	---	YES
11	0.10	0°	4°	-(30 +/-5)	27	YES
12*	---	---	---	+60+/-5	---	YES
12	0.10	0°	4°	+50+/-5	27	YES
13*	---	---	---	-(60+/-5)	---	YES
13	0.12	4°	4°	-(30 +/-5)	27	YES
14*	---	---	---	+60+/-5	---	YES
14	0.12	4°	4°	+50+/-5	27	YES
15*	0.12	4°	4°	+25+/-10	23	YES

*MC821-0087-2001, -4001, & -5001 ONLY

AFTER COMPLETION AN INSPECTION IS PERFORMED TO IDENTIFY BROKEN OR LOOSE HARDWARE; AND AN ELECTRICAL CIRCUIT CHECK TEST, INSULATION RESISTANCE TEST, AND AN OPERATIONAL CAPABILITY TEST ARE CONDUCTED, AS DEFINED PREVIOUSLY IN QTP TESTS #1, #2, & #3, TO VERIFY PROPER CAPTURE LATCH PERFORMANCE.

9. TARGET SERVICE LIFE TEST - TESTS ARE PERFORMED TO VERIFY PROPER DOCKING AND UNDOCKING OPERATIONS OVER ITS LIFE OF 100 DOCKINGS. PROPER CLOSING OF THE CAPTURE LATCHES IS VERIFIED PRIOR TO 100 DOCKING AND UNMATING CYCLES (FOR MC821-0087-1001/3001 UNITS ONLY). FOR MC821-0087-2001, -4001, & -5001 UNITS PROPER OPERATION VERIFIED



Proprietary Data

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE
NUMBER: M6-1MR-BM006-1D**

DURING 358 CYCLES (44 VACUUM/LOAD CYCLES, 16 LOAD CYCLES, & 324 NO-LOAD CYCLES). AFTER COMPLETION AN INSPECTION IS PERFORMED TO IDENTIFY BROKEN OR LOOSE HARDWARE; AND AN ELECTRICAL CIRCUIT CHECK TEST, INSULATION RESISTANCE TEST, AND AN OPERATIONAL CAPABILITY TEST ARE CONDUCTED, AS DEFINED PREVIOUSLY IN QTP TESTS #1, #2, & #3, TO VERIFY PROPER CAPTURE LATCH PERFORMANCE.

10. CONTROL DISASSEMBLY - UPON COMPLETION OF ALL QUAL TESTING THE DOCKING MECHANISM IS DISMANTLED AND CAPTURE LATCH ASSEMBLIES ARE CHECKED FOR EVIDENCE OF WEAR OR FAILURE.

OMRSD - TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:**RECEIVING INSPECTION**

COMPONENTS ARE SUBJECTED TO A 100% RECEIVING INSPECTION PRIOR TO INSTALLATION.

CONTAMINATION CONTROL

CORROSION PROTECTION PROVISIONS AND CONTAMINATION CONTROL VERIFIED BY INSPECTION. CHECK OF ROOM CLEANLINESS; PARTS WASHING AND OTHER OPERATIONS OF THE TECHNOLOGICAL PROCESS WHICH PROVIDES CLEANLINESS ARE VERIFIED BY INSPECTION.

CRITICAL PROCESSES

ANODIZING, HEAT TREATING, SOLDERING, CHEMICAL PLATING, AND CURING VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

TORQUE, ADJUSTMENTS AND TOLERANCES ACCORDING TO TECHNICAL REQUIREMENTS OF THE DRAWINGS ARE VERIFIED BY INSPECTION.

TESTING

ATP/QTP/OMRSD TESTING VERIFIED BY INSPECTION.

HANDLING/PACKAGING

HANDLING/PACKAGING PROCEDURES AND REQUIREMENT FOR SHIPMENT VERIFIED BY INSPECTION.

(D) FAILURE HISTORY:

DATA ON TEST FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING OF ODS DOCKING MECHANISMS CAN BE FOUND IN PRACA DATA BASE.

(E) OPERATIONAL USE:

NONE. CAPTURE LATCHES ARE NORMALLY CLOSED PRIOR TO CAPTURE.

**RSC
Energia****Proprietary Data**

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE
NUMBER: M8-1MR-BM006-10

- APPROVALS -

DESIGN ENGINEER
DESIGN MANAGER
NASA SS/MA
NASA SUBSYSTEM MANAGER

M. NIKOLAYEVA
A. SOUBCHEV

[Handwritten signatures and initials over horizontal lines]



RSC
Energie

Proprietary Data