

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE
NUMBER: 07-2D-ES3 -X**

**SUBSYSTEM NAME: CREW ESCAPE - EMERGENCY EGRESS SLIDE
REVISION: 0 08/01/88**

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: SLIDE ASSEMBLY	MC623-0015-0007
SRU	: SUPPORT ASSEMBLY	MC623-0015-0009

QUANTITY OF LIKE ITEMS: 1

FUNCTION:

SLIDE SUPPORT ASSEMBLY - RETAINS SLIDE PACK IN STOWED POSITION BY PROVIDING ATTACH POINT FOR COVER ASSEMBLY, ROTATES WITH PACK FROM STOWED POSITION TO HATCH TUNNEL, ATTACHES UPPER END OF INFLATED SLIDE TO CREW MODULE STRUCTURE OR SIDE HATCH COVER AND REACTS LOADS ON UPPER END OF SLIDE. SECONDARY HINGE LOCKS AFTER FIRST 70 DEGREE ROTATION.

REFERENCE DOCUMENTS: D102930 ISI

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: 07-2D-ES3- 03

REVISION#: 1 09/02/98

SUBSYSTEM NAME: CREW ESCAPE - EMERGENCY EGRESS SLIDE

LRU: SLIDE ASSEMBLY

CRITICALITY OF THIS

ITEM NAME: SUPPORT ASSEMBLY

FAILURE MODE: 1R2

FUNCTIONAL CRITICALITY:

REQUIRED FAULT TOLERANCE/ACHIEVED FAULT TOLERANCE: 1R/2/1

FAILURE MODE:

FAILS TO ROTATE INTO HATCH TUNNEL

MISSION PHASE:

LS LANDING SEQUENCE

VEHICLE/PAYLOAD/KIT EFFECTIVITY:

- 102 COLUMBIA
- 103 DISCOVERY
- 104 ATLANTIS
- 105 ENDEAVOUR

CAUSE:

DETACHED OR BROKEN SECONDARY HINGE

CRITICALITY 1/1 DURING INTACT ABORT ONLY? YES

LS LANDING SEQUENCE

REDUNDANCY SCREEN

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

PASS/FAIL RATIONALE:

A)

B)

"B" SCREEN FAILS BECAUSE THERE IS NO TEST AVAILABLE TO DETECT FOR THIS FAILURE IN FLIGHT.

C)

METHOD OF FAULT DETECTION:

CREW OBSERVATION

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CORRECTING ACTION: MANUAL

CORRECTING ACTION DESCRIPTION:
USE DESCENT DEVICE (SKY GENIE) THROUGH SIDE HATCH OPENING OR OVERHEAD WINDOW.

- FAILURE EFFECTS -

(A) SUBSYSTEM:
IF HATCH IS JETTISONED, SLIDE CANNOT BE USED.

(B) INTERFACING SUBSYSTEM(S):
NONE

(C) MISSION:
NONE

(D) CREW, VEHICLE, AND ELEMENT(S):
OTHER SUBSYSTEM FAILURES MUST OCCUR BEFORE USE OF THE EMERGENCY SYSTEM IS REQUIRED. POSSIBLE LOSS OF CREWMEMBERS IF RAPID EGRESS IS REQUIRED.

(E) FUNCTIONAL CRITICALITY EFFECTS:
AFTER OTHER SUBSYSTEM FAILURES OCCUR REQUIRING THE USE OF THE EMERGENCY SYSTEM, A SINGLE FAILURE OF THE SLIDE SUPPORT ASSEMBLY CAN RESULT IN POSSIBLE INJURY/LOSS OF CREW.

- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: IMMEDIATE

TIME FROM FAILURE OCCURRENCE TO DETECTION: IMMEDIATE

TIME FROM DETECTION TO COMPLETED CORRECTING ACTION: N/A

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IS TIME REQUIRED TO IMPLEMENT CORRECTING ACTION LESS THAN TIME TO EFFECT?
NO

RATIONALE FOR TIME TO CORRECTING ACTION VS TIME TO EFFECT:
EMERGENCY EGRESS USING SKY GENIE WOULD EXCEED MAXIMUM ALLOWABLE TIME OF 1 MINUTE.

-DISPOSITION RATIONALE-

(A) DESIGN:

GIRT PANEL HINGED ON TWO QUICK-DISCONNECT PINS, CREW CAPABILITY FOR MANUAL ROTATION OF GIRT PANEL WITH SLIDE PACK VERIFIED ON MOCKUP, CLEARANCES VERIFIED ON OV103. FACTOR OF SAFETY 1.4 MINIMUM WITH POSITIVE MARGINS ON ALL COMPONENTS.

(B) TEST:

ACCEPTANCE TESTS INCLUDE TWO DEPLOYMENT TESTS, ONE IN EACH MODE.

QUALIFICATION TESTS INCLUDE A TOTAL OF 40 DEPLOYMENT CYCLES FROM SIMULATED ORBITER IN HATCH OPEN AND HATCH JETTISONED MODES. CERTIFICATION IS BASED ON QUALIFICATION TESTS SUPPORTED BY ANALYSIS FOR VIBRATION/SHOCK ENVIRONMENTS AND STRUCTURAL STRENGTH.

PERIODIC MAINTENANCE INCLUDES INFLATION TEST OF SLIDE AND REPACKING EVERY 18 MONTHS PER ISI DOCUMENT 35-D102900.

GROUND TURNAROUND TEST

ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:

RECEIVING INSPECTION

CERTIFICATION OF PROCESSES AND MATERIALS INCLUDING STRENGTH, COMPOSITION, HEAT TREATING AND ANODIZING ARE VERIFIED BY INSPECTION.

CONTAMINATION CONTROL

CLEANLINESS OF SIGNIFICANT SURFACE TO LEVEL OF GENERALLY CLEAN (GC) AS PER MA0110-301 IS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

GIRT ASSEMBLY PIECE PARTS VERIFIED BY INSPECTION. GIRT BAR INSPECTED PRIOR TO SLIDE SUPPORT ASSEMBLY INSTALLATION.

PARTS PROTECTION AND HANDLING PROVISIONS ARE VERIFIED BY INSPECTION.

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CRITICAL PROCESSES

ANODIZATION OF GIRT SUPPORT, GIRT BAR, HINGE SUPPORT, END CAP, AND BRACKET AS PER MIL-A-8625 TYPE II, CLASS 2 CLEAR IS VERIFIED BY INSPECTION.

TESTING

ATP'S WITNESSED BY INSPECTION.

HANDLING/PACKAGING

PROPER PACKAGING TO LEVEL A OF MIL-STD-794 IS VERIFIED BY INSPECTION.

(D) FAILURE HISTORY:

CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND PROCESSING ACTIVITY CAN BE FOUND IN THE PRACA DATA BASE. FAA GENERIC FAILURE DATA DOES NOT APPLY TO THIS FAILURE MODE.

(E) OPERATIONAL USE:

OPERATIONAL EFFECT OF FAILURE: POSSIBLE LOSS OF LIFE

CREW ACTION: BRING SKY GENIE DOWN FROM FLIGHT DECK AND EGRESS USING CARABINERS

CREW TRAINING: CREW IS TRAINED IN ABOVE PROCEDURE

MISSION CONSTRAINTS: NONE. MISSION WOULD BE TERMINATED PRIOR TO USE OF SLIDE

INFLIGHT CHECKOUT: NONE

- APPROVALS -

EDITORIALLY APPROVED

: BNA

: *J. Kimura 9-3-98*

TECHNICAL APPROVAL

: VIA APPROVAL FORM

: 96-CIL-032_07-2D