FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE
NUMBER: 07-2D-ES6 -X

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

PART DATA

	PART NAME **VENDOR NAME**	**PART NUMBER** **VENDOR NUMBER**
LRU	: SLIDE ASSEMBLY	MC623-0015-0007
SRU	. ASPIRATOR	119000-103 PICO/SGNT

QUANTITY OF LIKE ITEMS: 1

FUNCTION:
ASPIRATOR IS PART OF SLIDE ASSEMBLY. ASPIRATOR INCORPORATES INJECTOR AND VENTURI TO INFLATE SLIDE WITH ENTRAINED AMBIENT AIR AND PRESSURANT GAS FROM RESERVOIR. PRESSURANT GAS ENTERS ASPIRATOR THROUGH INTERCONNECTING HOSE. NOMINAL INFLATION TIME IS 3 SECONDS. AFTER INFLATION, ASPIRATOR AMBIENT AIR INTAKE VALVE CLOSES/SEALS. ASPIRATOR IS MOUNTED DIRECTLY ON SLIDE CHAMBER.

REFERENCE DOCUMENTS: D102910 ISI

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NUMBER: 07-2D-ES6- 01

REVISION#: 1 09/02/98

SUBSYSTEM NAME: CREW ESCAPE - EMERGENCY EGRESS SLIDE
LRU: SLIDE ASSEMBLY **CRITICALITY OF THIS**
ITEM NAME: ASPIRATOR **FAILURE MODE:** 1R2

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

FAILURE MODE:
REDUCED OR NO FLOW INTO SLIDE/BACKFLOW OUT OF SLIDE.

MISSION PHASE:
LS LANDING SEQUENCE

VEHICLE/PAYLOAD/KIT EFFECTIVITY:
102 COLUMBIA
103 DISCOVERY
104 ATLANTIS
105 ENDEAVOUR

CAUSE:
INGESTION OF DEBRIS, CONTAMINATION, CORROSION, ASPIRATOR CHECK VALVE FAILS TO OPEN/CLOSE.

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 OF SLIDE DEPLOYMENT.

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CORRECTING ACTION: MANUAL

CORRECTING ACTION DESCRIPTION:
USE DESCENT DEVICE (SKY GENIE) THROUGH SIDE HATCH OPENING OR OVERHEAD WINDOW. THE FIRST TWO CREWMEMBERS SAFELY ON GROUND CAN HOLD SLIDE.

REMARKS/RECOMMENDATIONS:
SEVENTY-FIVE PERCENT OF VOLUME TO INFLATE SLIDE IS ENTRAINED AIR SUPPLIED THROUGH ASPIRATOR. PRESSURANT GAS FROM RESERVIOR PROVIDES 25 PERCENT VOLUME.

- FAILURE EFFECTS -

(A) SUBSYSTEM:
SLIDE DOES NOT INFLATE OR DEFLATES RAPIDLY

(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 CREW IF RAPID EMERGENCY EGRESS IS REQUIRED.

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

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- TIME FRAME -

TIME FROM FAILURE TO CRITICAL EFFECT: SECONDS

TIME FROM FAILURE OCCURRENCE TO DETECTION: SECONDS

TIME FROM DETECTION TO COMPLETED CORRECTING ACTION: N/A

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 60 SECONDS.

-DISPOSITION RATIONALE-

(A) DESIGN:
TECHNOLOGY BASE ESTABLISHED IN COMMERCIAL AIRLINE HARDWARE. PROVEN COMPONENTS IN INFLATION SYSTEM. CHECK VALVE LUBRICATED WITH KRYTOX FLUORINATED OIL.

(B) TEST:
ACCEPTANCE TESTS OF SLIDE ASSEMBLY INCLUDE LEAK TEST, TWO DEPLOYMENT TESTS AND PROOF PRESSURE TEST. ACCEPTANCE TESTS OF ASPIRATOR INCLUDE PROOF PRESSURE TEST OF JET PLATE AND HOUSING TO 900 PSI FOR 5 MINUTES.

QUALIFICATION TESTS OF SLIDE ASSEMBLY INCLUDE 40 DEPLOYMENT CYCLES AND BURST TEST.

PERIODIC MAINTENANCE INCLUDES REPLACING ASPIRATOR 0-RINGS AND RELUBRICATING AFTER TEN CYCLES OR THREE YEARS, AND INFLATION TEST OF SLIDE ASSEMBLY EVERY 18 MONTHS PER ISI DOCUMENT 35-D102900 AND OMRSD FILE II, VOLUME 3.

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 TREAT AND CORROSION PROTECTION ARE VERIFIED BY INSPECTION.

CONTAMINATION CONTROL

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CLEANLINESS OF SIGNIFICANT SURFACES TO LEVEL GC (GENERALLY CLEAN) OF MA0110-301 IS VERIFIED BY INSPECTION

ASSEMBLY/INSTALLATION
CONFORMANCE OF DETAIL PARTS AND ASSEMBLY TO DRAWING REQUIREMENTS ARE VERIFIED BY INSPECTION. PARTS PROTECTION AND HANDLING PROVISIONS ARE VERIFIED BY INSPECTION.

TESTING
IN PROCESS AND ATP TESTS ARE VERIFIED 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 INDICATES APPROXIMATELY 6 FAILURES IN THIS MODE FOR APPROXIMATELY 3000 DEPLOYMENTS.

(E) OPERATIONAL USE:
OPERATION EFFECT OF FAILURE: POSSIBLE LOSS OF LIFE.

CREW ACTION: BRING SKY GENIE DOWN FROM FLIGHT DECK AND EGRESS USING CARABINERS; FIRST TWO CREWMEN COULD HOLD SLIDE FOR REMAINING CREW

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