

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL HARDWARE  
NUMBER: 07-2D-ES7 -X**

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

---

**PART DATA**

---

	<b>PART NAME</b>	<b>PART NUMBER</b>
	<b>VENDOR NAME</b>	<b>VENDOR NUMBER</b>
LRU	: SLIDE ASSEMBLY	MC623-0015-0007
SRU	: VALVE/REGULATOR	30001-1 PICO/SARGENT

---

**QUANTITY OF LIKE ITEMS: 1**

**FUNCTION:**

VALVE/REGULATOR PROVIDES FILL PORT FOR RESERVOIR. RELEASES PRESSURANT GAS FROM 3000 PSI CYLINDER WHEN ACTUATED BY LANYARD AND DELIVERS FLOW AT 400 PSI MAX TO INTERCONNECT HOSE AND ASPIRATOR TO INFLATE SLIDE TO A NOMINAL PRESSURE OF 2.75 PSI.

**REFERENCE DOCUMENTS: D103030 ISI**

**FAILURE MODES EFFECTS ANALYSIS FMEA – CIL FAILURE MODE**

**NUMBER: 07-2D-ES7-04**

**REVISION#: 1 09/02/98**

**SUBSYSTEM NAME: CREW ESCAPE - EMERGENCY EGRESS SLIDE**

**LRU: SLIDE ASSEMBLY**

**CRITICALITY OF THIS**

**ITEM NAME: VALVE/REGULATOR**

**FAILURE MODE: 1R2**

---

**FUNCTIONAL CRITICALITY/**

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

**FAILURE MODE:**

OPENS PREMATURELY (LOSS OF SLIDE CAPABILITY).

**MISSION PHASE:**

LS LANDING SEQUENCE

**VEHICLE/PAYLOAD/KIT EFFECTIVITY:**

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

**CAUSE:**

IMPROPER PACKING, PIECE PART FAILURE

**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

**FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE  
NUMBER: 07-2D-ES7-04**

**CORRECTING ACTION:** MANUAL

**CORRECTING ACTION DESCRIPTION:**

USE DESCENT DEVICE (SKY GENIE) THROUGH SIDE HATCH OPENING OR OVERHEAD WINDOW. FOR PARTIAL INFLATION, FIRST TWO CREWMEMBERS TO EGRESS CAN HOLD SLIDE FOR OTHER CREWMEMBERS.

**REMARKS/RECOMMENDATIONS:**

SLIDE INFLATES SO RAPIDLY (3 SECONDS), CREW WOULD BE UNABLE TO STOP FLOW.

---

**- FAILURE EFFECTS -**

---

**(A) SUBSYSTEM:**

SLIDE UNUSABLE.

**(B) INTERFACING SUBSYSTEM(S):**

BLOCKING OF SIDE HATCH PORT.

**(C) MISSION:**

DELAYED EGRESS.

**(D) CREW, VEHICLE, AND ELEMENT(S):**

OTHER SUBSYSTEM FAILURES MUST OCCUR BEFORE USE OF THE EMERGENCY SYSTEM IS REQUIRED. POSSIBLE LOSS OF CREW DUE TO DELAYED EGRESS IN EMERGENCY. INJURY TO CREWMEMBERS ON LOWER DECK. POSSIBLE DAMAGE TO CREW MODULE SECONDARY STRUCTURE OR EQUIPMENT.

**(E) FUNCTIONAL CRITICALITY EFFECTS:**

AFTER OTHER SUBSYSTEM FAILURES OCCUR REQUIRING THE USE OF THE EMERGENCY SYSTEM, A SINGLE FAILURE OF THE VALVE/REGULATOR CAN RESULT IN POSSIBLE INJURY/LOSS OF CREW.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL FAILURE MODE  
NUMBER: 07-2D-ES7-04**

---

**- 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**

**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:**

BEFORE SLIDE CAN INFLATE, STOWAGE COVER MUST BE REMOVED AND SLIDE ASSEMBLY ROTATED INTO INFLATION-READY CONFIGURATION. BEFORE ACTUATION HANDLE BECOMES ACCESSIBLE, HANDLE COVER MUST BE REMOVED. INFLATION SYSTEM USES PROVEN COMPONENTS. FIRING LANYARD IS CONCEALED UNTIL SLIDE IS IN A POSITION TO BE INFLATED.

**(B) TEST:**

ACCEPTANCE TESTS INCLUDE TWO DEPLOYMENT CYCLES, ONE EACH MODE.

QUALIFICATION TESTS INCLUDE 40 DEPLOYMENT CYCLES FROM SIMULATED ORBITER SIDE HATCH IN HATCH OPEN AND HATCH JETTISONED MODES.

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

INFLATION ACTIVATION SYSTEM IS INSPECTED EVERY FLIGHT PER TECH ORDER INSTALLATION M072-861851.

**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.

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL FAILURE MODE  
NUMBER: 07-2D-ES7-04**

CONTAMINATION CONTROL  
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  
O-RING LUBRICANT AROUND POPPET SHAFT AND ATP 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 PRACTICE DATA BASE. FAA GENERIC FAILURE DATA INDICATES TWO  
INSTANCES OF PREMATURE INFLATION OF SLIDE IN 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, OR EGRESS THROUGH OVERHEAD EMERGENCY ESCAPE PANEL (WS).

CREW TRAINING: CREW IS TRAINED IN ABOVE PROCEDURE.

MISSION CONSTRAINTS: NONE. PREMATURE INFLATION WOULD MAKE SLIDE  
UNAVAILABLE FOR EMERGENCY EGRESS BUT WOULD HAVE NO OTHER EFFECT ON  
MISSION.

INFLIGHT CHECKOUT: NONE.

---

**- APPROVALS -**

---

EDITORIALLY APPROVED  
TECHNICAL APPROVAL

: BNA  
: VIA APPROVAL FORM

: J. Kumura 9-3-98  
: 96-CIL-032\_07-2D