

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

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

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**PART DATA**

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	<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

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**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- 01**

**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**

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**FUNCTIONAL CRITICALITY/**

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

**FAILURE MODE:**

**LOW/NO OUTPUT, PREMATURE CLOSURE OR LEAKAGE (UNDERINFLATION).**

**MISSION PHASE:**

**LS LANDING SEQUENCE**

**VEHICLE/PAYLOAD/KIT EFFECTIVITY:**

102	COLUMBIA
103	DISCOVERY
104	ATLANTIS
105	ENDEAVOUR

**CAUSE:**

**CONTAMINATION, JAMMED ACTUATION MECHANISM, PIECE PART STRUCTURAL FAILURE, CORROSION**

**CRITICALITY 1/1 DURING INTACT ABORT ONLY? YES**

**LS LANDING SEQUENCE**

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**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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NUMBER: 07-2D-E57-01**

**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:**

USE OF UNINFLATED SLIDE WOULD REQUIRE MANUAL DISCONNECT OF TWO SHEAR PIN FITTINGS.

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**- FAILURE EFFECTS -**

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**(A) SUBSYSTEM:**

SLIDE WILL NOT INFLATE.

**(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 VALVE/REGULATOR CAN RESULT IN POSSIBLE INJURY/LOSS OF CREW.

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**- TIME FRAME -**

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**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  
60 SECONDS.**

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**-DISPOSITION RATIONALE-**

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**(A) DESIGN:**

TECHNOLOGY BASE ESTABLISHED IN COMMERCIAL AIRLINE HARDWARE. PROVEN COMPONENTS IN INFLATION SYSTEM. MATERIALS SELECTED TO PRECLUDE CORROSION. VALVE/REGULATOR DESIGNED TO PRECLUDE JAMMING AND SEALED TO PREVENT CONTAMINATION. MECHANICAL ADVANTAGE FOR VALVE ACTUATION IS HIGH.

**(B) TEST:**

ACCEPTANCE TESTS OF SLIDE ASSEMBLY INCLUDE TWO DEPLOYMENT TESTS. SUPPLIER ACCEPTANCE TESTS OF VALVE/REGULATOR ARE TBS.

QUALIFICATION TESTS OF SLIDE ASSEMBLY INCLUDE 40 DEPLOYMENT TESTS.

PERIODIC MAINTENANCE INCLUDES REPLACING O-RINGS AND RELUBRICATING AFTER 10 CYCLES OR 3 YEARS AND INFLATION TEST OF SLIDE 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

CERTIFICATIONS OF PROCESSES AND MATERIALS INCLUDING STRENGTH, COMPOSITION, HEAT TREAT AND CORROSION AND VERIFIED BY INSPECTION.

CONTAMINATION CONTROL

**FAILURE MODES EFFECTS ANALYSIS (FMEA) – CIL FAILURE MODE  
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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**  
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 PRACA DATA BASE. FAA GENERIC FAILURE DATA INDICATES APPROXIMATELY 5 FAILURES IN THIS FAILURE 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 UNDERINFLATED 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.

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**- APPROVALS -**

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EDITORIALLY APPROVED  
TECHNICAL APPROVAL

: BNA  
: VIA APPROVAL FORM

: *J. Kumura 9-3-98*  
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