

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
WATER SHUTOFF VALVE, ITEM 137 ----- SV767660-10 (1)	2/1R	137FM01A Fails closed. Contamination, clogging of the inlet filter. Electrical open in the solenoid coil or electrical connector; poppet jams due to contamination. Contamination between poppet and magnet; failure of electronic switch (diode resistor, capacitor or transistor opens or shorts).	END ITEM: Unable to flow feedwater into the sublimator. GFE INTERFACE: Loss of EMU cooling capability. Possible helmet fogging. MISSION: Terminate EVA. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of SOP. TIME TO EFFECT /ACTIONS: Minutes. For cooling or helmet defog, open purge valve and terminate EVA. TIME AVAILABLE: Minutes. TIME REQUIRED: Seconds. REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	A. Design - The valve is protected from particulates with a 140 micron nominal inlet filter. The item 136, located upstream, has a 38 micron filter which prevents particles from reaching the Item 137 filter and clogging it. The electronics drive module is fabricated using "S" level established reliability passive components and JANTXV level semi-conductors. B. Test - Vendor Acceptance Test (Kaiser-Eckel Valve Co.) An actuation test is performed with 47 psig applied to the inlet and with the valve closed 12.5 VDC (max) is applied. PDA Test - Flow thru the shutoff valve is verified during the feedwater circuit pressure regulation test per SEMU-60-010. A flow of 36.25-37.75 cc/minute must flow through the valve at an inlet pressure of 2.08-2.96 psig. Certification Test - Certified for a useful life of 20 years (ref. EMUM-1030). C. Inspection - Clogging of the inlet filter, poppet jams due to contamination, contamination between poppet and magnet. The valve is protected by a 140 micron inlet filter. A cleanliness level of SVHS3150 EM150 is maintained on both the filter and valve during assembly and test. Electrical related failures. All external lead wires associated with the item are inspected during source inspection and again during PLSS assembly. D. Failure History - J-EMU-137-C001 (9/8/80) The valve would not open because of foreign particles. Corrective action revised the test procedures and added a filter to the valves. H-EMU-137-D004 (10/27/83) No flow through valve due to faulty power supply. Corrective action added note to check power supply if failure occurs during test. E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, Item 137 Feedwater Shutoff Valve Functional Verification. None for EET processing. F. Operational Use - Crew Response EVA : When CWS data confirms loss of sublimator water pressure trouble-shoot problem, if no joy and cooling is insufficient, terminate EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - Flight rules define go/no go criteria related to EMU thermal control. EVA

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
--------------------	------	-----------------------------	----------------	--------------------------

137FM01A

checklist procedures verify hardware integrity and systems operational status prior to EVA. Real time Data System allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-137 FEEDWATER SHUTOFF VALVE
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: *J. Auman, 3/27/02*
HS - Project Engineering

Approved by: *228 [Signature]*
SSM

M. Smyke
HS - Reliability

[Signature]
SSM

Alan Plough for Koen
HS - Engineering Manager

[Signature]
SSM

[Signature]
NASA MOD

[Signature]
NASA - Crew

[Signature]
Program Manager