NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		120BFM02		
DUAL MODE RELIEF VALVE, ITEM 120B ---------- SV785844-17 (1)	2/1R	Internal gas leakage, fails to close (low mode relief). Seat contamination, piece part structural spring fractures, failure due to plunger sticking, housing seal bypass leakage.	END ITEM: Primary oxygen delivery to the suit greater than the metabolic consumption rate. GFE INTERFACE: Increase in suit pressure and venting through the positive pressure valve (Item 146). MISSION: Terminate EVA. Loss of use of one EMU. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of Item 146 or SOP. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: Minutes. TIME REQUIRED: Minutes. REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	A. Design - Internal leakage is prevented by elastomeric diaphragms on the high and low mode end of the valve and by a radial "0"-seal on the low mode end. The diaphragm seats are protected from most contaminants by a 140 Micron filter made from inconel 625 or nickel 201 with an inconel 625 housing. The valve springs are designed for 10E+8 cyclic life to prevent fracture. The high mode plunger is protected by a 38 Micron filter. The low mode plunger is protected by a 25 micron filter during normal operation. Test Port "F" does not have filtration but the rig does, thereby minimizing contaminants. B. Test - Component Acceptance Test - A performance test is run per AT-E-120-1 in which the low mode relief valve must crack at 0.26 - 0.80 psid. Crack is defined as a rapid change in flow when water tank pressure is increased. A failed open low mode relief valve would also be detected during the high mode relief valve crack and reseat test. In this test the high mode relief valve must crack at a minimum pressure of 16.25 psig. Cracking is defined as a minimum flow of 297 scc/min N2. The relief valve must also reseat at a pressure of 16.25 psid. Reseat is defined as a maximum flow of 297 scc/min N2. A failed open low mode valve would cause this test to fail. To prevent contamination from entering the item, all rig lines and test fixtures are cleaned to HS3150 EM50A. In addition, a 2 Micron filter is installed in the test setup just upstream of the item. PDA Test - A failed open low mode RV would be detected during the high mode RV reseat pressure test per SEMU-60-010. With the inlet at 16.0 psig and the outlet at 4.2-4.4 psig, the high mode RV must flow a maximum flow of 284 scc/min 02. A failed open low mode RV would allow a much greater flow. Certification Test - Certified for a useful life of 25 years (ref EMUM-1418). C. Inspection - A cleanliness level of HS3150 EM50A is maintained during assembly and testing of the valve. This cleanliness level requires a mandatory inspection for verification. The spring is 100% inspected to meet dimensional and force - displacement requirements. A cleanliness level of HS3150 EM50A is maintained during assembly and testing of the valve. This cleanliness level requires a mandatory inspection for verification. The plunger (low mode) and housing are 100% inspected to meet dimensional and surface finish requirements. The plunger is 100% inspected for being properly teflon coated. The interfacing surfaces between the housing and the valve seat are 100% inspected to meet dimensional and surface finish requirements. The "0"-seals are inspected for surface characteristics per SVHS3432; 100% for Class I and II, at least a 1.5 AQL for Class III. D. Failure History - None. E. Ground Turnaround -

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		120BFM02		Tested for non-EET processing per FEMU-R-001, Item 120A Orifice Flow and Item 120B Relief Valve/Relief and Reseat Check. None for EET processing. F. Operational Use - Crew Response - PreEVA: Trouble shoot problem, if no success consider EMU 3 if available. EMU go to remain on SCU. PostEVA: N/A EVA: When CWS data confirms loss of suit P regulation coupled with an accelerated primary 02 use rate, terminate EVA. Training - Standard EMU training cover this failure mode. Crew trained for one man EVA scenario. Operational Considerations - Flight rules go/no go criteria related to EMU suit pressure regulation. Flight rules define EMU as go to remain on SCU (available for rescue if required). EVA checklist and FDF procedures verify hardware integrity and operational status prior to EVA. Real Time data systems allows ground monitoring of EMU systems.

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-120 DUAL MODE RELIEF VALVE

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____ 3/27/02
HS - Project Engineering

Approved by: _____
NASA - SR&QA/SSM

_____
HS - Reliability

_____
NASA - EMU/SSM

_____
HS - Engineering Manager

_____
NASA - S&MA

_____
NASA - MOD

_____
NASA - Crew

_____
NASA - Program Manager