NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		330FM03		
COMMON MULTIPLE CONNECTOR, ITEM 330 ---------- SV778872-26 (1)	2/1R	External water leakage, uncoupled, cooling water (there are two couplings; one inlet and one outlet). Failure, coupling 0-seal bypass leakage, DCM/SCU interface seal bypass leakage, poppet sticks open, return spring fractures contamination, seat.	END ITEM: Water leakage to ambient. GFE INTERFACE: Depletion of the water reservoir. Loss of cooling. Possible helmet fogging. MISSION: Terminate EVA when the water supply drops below CWS limits. CREW/VEHICLE: None for single failure. Possible loss of crewman with loss of SOP. TIME TO EFFECT /ACTIONS: Minutes. TIME AVAILABLE: Minutes. TIME REQUIRED: Seconds. REDUNDANCY SCREENS: A-PASS B-PASS C-PASS	A. Design - There are two static o-rings and one dynamic o-ring preventing external leakage in each uncoupled connector. The o-ring seal design configuration, dimensions and rigidness of assembly provide squeeze under all loading conditions. The dynamic seals slide on Nituff surfaces. The return spring is capable of more than 100,000 cycles. Cooling return is filtered by 140 micron filter in the 330. B. Test - Component Acceptance: An uncoupled external water circuits leakage test is performed per Air-Lock ATP 9619-08. For the leakage test the DCM half is pressurized to 22.5+0.40-0 psig with water. Leakage shall be 0.15 cc/hr maximum for each water connector. PDA: An external leakage test is performed per SEMU-60-015. The cooling water lines are pressurized with water to 15.0-20.0 psig and observed for evidence of external leakage for a 5 minute minimum test period. No visible leakage is allowed. Certification: Certified for a useful life of 15 years. C. Inspection - The O-seals and the metallic sealing components are 100% inspected by Air-Lock, Inc. for dimensional and surface finish requirements. D. Failure History - J-EMU-330-003 (7-6-81) Water leakage at cooling water outlet due to poppet stuck open. Investigation revealed that the poppet would not close after disengagement from the SCU because of jamming caused by a particle of PD George coating. EC 42803-534 implemented a design change to add a 140 micron filter screen in the cooling water loop of the multiple connector. This prevents a migration of particles through the cooling loops. J-EMU-300-003 (1-5-82) "Water leakage from cooling water DCM poppet valve" was found to be caused by a cut O-ring. In addition, no lubrication was found on the O-ring. EC 42803-619 was published to require krytox grease on all O-rings in the DCM water loop, thus preventing O-ring damage during assembly. H-EMU-330-001 (9-24-85) "Cooling water outlet poppet did not close after disengagement from the SCU". Investigation revealed that a deformed poppet housing caused the poppet to become wedged upon engagement and unable to close upon disengagement. Further investigation showed the cause of the deformed housing to be mishandling (dropped on floor). H-EMU-330--003 (1/18/99) - SCU handle binding at SCU/DCM multiple connector interface. DCM poppet on water line port T5 failed to close after connector demate. Friction caused by lack of lubrication on O-Seal would not allow poppet to achieve full closure. Per CCBD

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		330FM03		H6967, O-Seals on the LCG Return T-5 and LCG Supply T-6 Poppet assemblies will be placed on the Limited Life List and will require replacement and lubrication every 4 years. E. Ground Turnaround - Tested per FEMU-R-001, Water Servicing, Leakage, and Gas Removal. F. Operational Use - Crew Response - EVA: Return to airlock, connect DCM plug to stop leak, continue EVA. Special Training - Standard EMU training covers this failure mode. Operational Considerations - Not applicable.

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-330 COMMON MULTIPLE CONNECTOR

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

Prepared by: _____ 5/22/02
HS - Project Engineering

Approved by: _____ 6/26/02
NASA – ~~SSA~~/SSM
455

_____
HS - Reliability

_____
NASA – EMU/SSM

_____
HS - Engineering Manager

_____ 6/26/02
NASA - S &MA

_____ 6/27/02
NASA - MOD

_____ 7/1/02
NASA - Crew

_____ 7-1-02
NASA - Program Manager for Brian Johnson