NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
		108FM01		
EVVA, ITEM 108 --- 0108-10008-21 (1)	2/2	Cracked EVVA shell. Defective material. Impact.	END ITEM: Cracks in support for pivoting visors and shades. GFE INTERFACE: Loss of structural support for visors and shades. Sun visors and shades will not rotate. MISSION: Terminate EVA. Due to impaired vision. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - The EVVA shell is fabricated from polycarbonate trilaminate which has a tensile strength of 15,500 psi and a thickness from 0.090 to 0.125 inches. Polycarbonate was selected because it has the highest impact resistance compared to other plastic materials. The EVVA shell TMG provides protection from contact with on-board chemicals. B. Test - Acceptance: The EVVA assembly is subjected to testing at Airlock per ATP 9833 with ILC source verification. Opertional starting force of side eyeshades is verified to be 1.0 to 2.0 lbs and starting torque of center eyeshade and sun visor is verified to be 4.5 to 10.0 in-lbs. PDA: The following tests are conducted at the EVVA Assembly level in accordance with ILC Document 0111-70028J: Verify starting force required to operate side eyeshades (1.0 - 2.0 lbs). Verify starting torque required to operate center eyeshade and sun visor (4.5 - 10.0 in-lbs). Certification: The EV visor assembly was successfully tested (manned) during SSA certification to duplicate operational usage (Ref. ILC Engineering Memorandum EM-83-1083 and EM 98-0008). The following usage, reflecting requirements of significance to the EVVA was documented during certification testing: Requirement / S/AD / Actual Visor and Shades Actuations / 266 / 778 An orbital shock test was performed on the shell at HSD utilizing a two inch diameter ball with an impact of two ft/sec on the top of the shell. The shell did not incur any damage during this test. C. Inspection - Components and material manufactured to ILC requirements as an approved supplier are documented from procurement through shipping by the supplier. ILC incoming receiving inspection verifies that the materials received are as identified in the procurement documents, that no damage has occurred during shipment and that supplier certifications have been received which provides traceability information. The following MIP's are performed during the EVVA assembly manufacturing process to assure the failure cause is precluded from the fabricted item: Visual inspection for material defects and damage. During PDA, per ILC Document 0111-70028J, MIP's are performed to visually verify no damage or wear has occurred.

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
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D. Failure History -
I-EMU-108-001 (07-29-80). EVVA Shell cracked during fit check. Changed shell material from polysulfone to polycarbonate.

B-EMU-108-A005 (12/15/92) - EVVA shell exhibited a crack at the right side plate subassembly interface when the stainless steel side plate was clamped up against the curved EVVA shell, the tip of the plate created a concentrated load, initiating the crack in the shell. The right side plate height will be shortened by 0.312 inches to eliminate any interference with the EVVA.

E. Ground Turnaround -
Inspected for non-EET processing per FEMU-R-001, Pre-Flight visual inspection. None for EET processing. Additionally, every 4 years from date of orginal EVVA and helmet interface the EVVA is removed from the helmet and completely inspected for structural integrity/material damage.

F. Operational Use -
Crew Response -
Pre/post-EVA:
Troubleshoot problem, if no success and visors required but cannot be positioned, terminate EVA operations.
EVA: If visors required and cannot be positioned, terminate EVA.
Special Training -
No training specifically covers this failure mode.
Operational Considerations -
EVA checklist procedures verify hardware integrity and systems operational status prior to EVA.

EXTRAVEHICULAR MOBILITY UNIT

SYSTEMS SAFETY REVIEW PANEL REVIEW

FOR THE

I-108 EXTRAVEHICULAR VISOR ASSEMBLY (EVVA)

CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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

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Approved by: _____
NASA - SSA/SSM

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