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EMU CRITICAL ITEM LIST

00/31/90 SUPERSEDES 01/02/88

ANALYST:

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ITEM P/N QTY	CRIT	FAILURE MODE & CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
RESERVE WATER TANK ITEM 140 00200192-20 (1)	2/100	1401002A: Internal water leakage. CAUSE: Seal failure.	EMU ITEM: Depletion of the last 30 minutes of water supply. EMU INTERFACE: Loss of cooling. Possible helmet fogging. MISSION: None for single failure. Terminates SEA during standby water tank operation. May not be capable of completing a 7 hour EVA. Crew/Vehicle: None for single failure. Possible loss of crew with loss of EVA.	<p>A. Design - The perimeter of the floral bladder opening has the O-Ring seated on the bladder and the preformed Neoprene Latex "g-ring" is bonded in place to perform the sealing function. The sealing concept is the same as that of a standard face type O-seal, consisting of an elastomeric ring compressed and retained between smooth flat surfaces. Radial seals (O-rings) and face seals (vitons) are also utilized and their diameters and fit/draw of assembly provide square under all tolerance conditions. The seal lips, bore and O-ring areas of the structure are now coated with an improved corrosion inhibiting coating (MIL-17).</p> <p>B. Test - Component Acceptance Test - Per 07-0-138-2. An external leakage test is performed by pressurizing the item (top side and M20 side) with 15.4 - 15.6 psig nitrogen. The leakage, as measured with a volumetric micrometer for 10 minutes, shall be 0.5 cc/min at 2 mm.</p> <p>PAI Test - With the item installed in the PIST, the M20 side of the item is pressurized with 15.7 - 15.9 psig N₂. The leakage shall be 5 cc/hr max as measured with a volumetric micrometer for a 60 minute period.</p> <p>Qualification Test - 1. Neoprene Seal Bladders: The item's seals were successfully exposed to 10,000 fill/drain cycles and 2,700 hours of pressurized time during 2/84 vs a requirement of 1000 and 875 respectively. 2. Floral Bladders: Completed 5,000 fill/drain cycles during 2/80, 10/80, and 1/89. This is two times the 15 year qualification requirement of 1,070 cycles.</p> <p>C. Inspection - The sealing interfaces between the bladder covers and the master tank, the various hoses and mating tubes, and the tank pressure transducer are 100% inspected in next dimensional and surface finish requirements. The H-1000 area of the bladder is 100% inspected for surface defects per 10700213, 1070024 and 0070023 drawings. The seal strip is also 100%</p>

NAME P/N REV	CRIT	FAILURE MODE & CAUSES	PARTIAL EFFECT	REFERENCE FOR ACCEPTANCE
MEMBRIC WATER TANK 19EN 140 1409902A-24/25 11	2/EN	1409902A: External water leakage. CAUSE: Seal failure.	IMO ITEM: Depletion of the test 30 minutes of water supply. SPE INTERFACE: Loss of coating. Possible helmet fogging. HHS/MSB: None for single failure, catastrophic QYL during standby water tank operation. May not be capable of completing a 7 hour test. CRUI/VENTS: None for single failure. Possible loss of crewman with loss of O ₂ .	A. Design - The perimeter of the flanged bladder opening has the O-ring mated on the bladder and the provided Neoprene later "O-ring" is bonded in place to perform the sealing function. The sealing concept is the same as that of a standard face type O-ring, consisting of an elastomeric ring compressed and retained between smooth flat surfaces. Radial seals in (Nitrile) and face seals (Viton) are also utilized and their dimensions and rigidity of assembly provide assurance under all tolerance conditions. The cavities, between and O-ring areas of the structure are now coated with an improved corrosion inhibiting coating (4012F). B. Test - Component Acceptance Test - Per AR-E-554-E. An external leakage test is performed by pressurizing the tank (top side and H2O side) with 15.1 - 15.6 psig nitrogen. The leakage, as measured with a volumetric micrometer for 10 minutes, shall be 0.5 cc/min or less. PWA Test - With the item installed in the PISA, the H2O side of the tank is pressurized with 15.7 - 15.9 psig H2O. The leakage shall be 6 cc/hr max as measured with a volumetric micrometer for a 60 minute period. Certification Test - 1. Neoprene later bladder: The tank's ends were successfully exposed to 10,000 fill/drain cycles and 2,000 hours of pressurized time during SDA to a requirement of 1002 and 672 respectively. 2. Flanged bladder: Completed 4,000 fill/drain cycles during S/DA, 10/DA, and S/DA. This is two times the 15 year certification requirement of 2,072 cycles. C. Inspection - The sealing interfaces between the bladder covers and the water tank, the viton O-rings and mating tubes, and the tank pressure structures are 100% inspected to meet dimensional and surface finish requirements. The O-ring area of the bladder is 100% inspected for surface defects per 4012F, 4012F, 4012F, and 4012F drawings. The seal wire is also 100%

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EM
EMI CRITICAL ITEM LIST

OP/MI/OP EXPERIENCES / /

ANALYSIS

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NAME P/N QTY	CRIT S/MO	FAILURE MODE & CAUSE SUBSYSTE	FAILURE EFFECT	RAFFIALE FOR ACCEPTANCE
				Inspected to meet dimensional requirements.
				<p>G. Failure History - J-EM-143-001 (0-5-85) A covers undercut in the bladder, where the D-cool is bonded to the bladder surface, caused observed water leakage. A new bladder trimming fixture has been incorporated.</p>
				<p>H. Ground Humaround - Tested per TEM-2-001, under servicing and leakage.</p>
				<p>F. Operational Use - Crew Response. EM: When CPM data indicates loss of primary feedwater and cooling is insufficient, terminate EVM. Reorder vacuum water packages to recover EMI operation. Training - Standard EMI training covers this failure mode. Operational Considerations - Flight rules define go/no go criteria related to EMU thermal control. EVM checkout procedures verify hardware integrity and system operational status prior to EVM. Fuel flow rate system allows ground monitoring of EMI systems.</p>