CRITICAL ITEMS LIST

Reference Designator:
Name/Quantity: Exhalation Valve
Drawing Reference: 655086

Project: Quick Don Mask Assy.
LRU Name/Quantity: QDMA
LRU Part Number: SED33104528-303

Subsystem: CEE
Effectivity: ALL ORBITERS

Failure Mode Number QDMA-FM-005	Criticality 1R/2	Failure Effect	Retention Rationale
Function Allows exhaled gases to pass from facial cavity to ambient.		**End Item** CO_2 buildup in facial cavity.	1. DESIGN FEATURES TO MINIMIZE FAILURE MODE A. A stainless steel 20 micron screen filter is incorporated into the inlet port to prevent contamination. B. The expiratory diaphragm and packings are fabricated of silastic silicone rubber with a minimum age life of 6 years. C. Regulator designed to withstand a minimum of 250,000 cycles with a peak breathing rate of 30 l/min. for 200,000 cycles and 70 l/min. for 50,000 cycles.
Failure Mode and Cause Fails Closed Cause: 1. Defective valve 2. Contamination		**Mission** None **Crew/Vehicle** Possible loss of crewmember due to loss of oxygen/CO_2 buildup in facial cavity and contaminated atmosphere. **Interface** None.	2. TEST OR ANALYSIS TO DETECT FAILURE MODE A. Acceptance Test (1) Safety pressure test at 60, 70 and 110 psig inlet pressure and 70 slpm flow. Specification: 0.1 to 1.0 in. H_2O. (2) Normal outward leakage test. Specification: less than 0.1 l/min. (3) Emergency outward leakage test. Specification: less than 1.0 l/min. (4) Exhalation valve resistance test at 20 slpm flow. Specification: 0 to 1.0 in. H_2O. Exhalation valve resistance test at 100 slpm flow. Specification: Less than 3.0 in. H_2O. B. Certification (1) Certification in accordance with TSO-C89, FAA Technical Standard Order, Protective Breathing Equipment. (2) Subjected to temperatures of 160° F for 12 hours and -67° F for 2 hours after which a complete functional test is performed. (3) Cycle tested 250,000 cycles with a peak breathing rate of 30 slpm for 200,000 cycles and 70 l/min. for 50,000 cycles. Complete functional test performed after cycling.

Redundancy Screens	Remaining Paths
A-P B-N/A C-P	Requires previous single point Orbiter failure.

Mission Phase	Time to Effect	Time to Correct
Orbiter Emergency	Seconds	N/A

CRITICAL ITEMS LIST

Reference Designator:
Name/Quantity: Exhalation Valve
Drawing Reference: 555066

Project: Quick Don Mask Assy.
LRU Name/Quantity: QDMA
LRU Part Number: SED33104528-303

Subsystem: CEE
Effectivity: ALL ORBITERS

Failure Mode Number QDMA-FM-005	Criticality 1R/2	Failure Effect	Retention Rationale
Function Allows exhaled gases to pass from facial cavity to ambient.		**End Item** CO_2 buildup in facial cavity. **Mission** None **Crew/Vehicle** Possible loss of crewmember due to loss of oxygen/CO_2 buildup in facial cavity and contaminated atmosphere. **Interface** None	C. Turnaround Testing (per PDA/PIA procedure) (1) Complete PDA testing performed every 24 months or before every flight. Testing includes positive pressure, outward leakage and exhalation valve resistance tests. (2) Replacement of regulator softgoods and overhaul every 6 years. Complete PDA testing after overhaul 3. INSPECTION A. Manufacturing (1) Verify all materials, parts and assembly processes meet requirement. (2) Visual inspection of parts for defects. (3) Verify all internal parts cleaned for oxygen service level 100C per JSCM 5322. B. Turnaround Inspection (per PDA/PIA procedure) (1) Visual inspection of parts for defects (2) Visual inspection during regulator assembly/overhaul. (3) Verify regulator operates within leakage, positive pressure and resistance specifications. (4) Verify replacement of regulator softgoods, assembly overhaul every 6 years. (5) Verify internal parts of regulator cleaned for oxygen service per JSCM 5322, level 100C; external system cleanliness level GC per JSCM 5322
Failure Mode and Cause Fails Closed Cause: 1. Defective valve 2. Contamination			
Redundancy Screens A-P B-N/A C-P	**Remaining Paths** Requires previous single point Orbiter failure.		
Mission Phase	**Time to Effect**	**Time to Correct**	
Orbiter Emergency	Seconds	N/A	

CRITICAL ITEMS LIST

Reference Designator:
Name/Quantity: Exhalation Valve
Drawing Reference: 555068

Project: Quick Don Mask Assy.
LRU Name/Quantity: QDMA
LRU Part Number: SED33104528-303

Subsystem: CEE
Effectivity: ALL ORBITERS

Failure Mode Number QDMA-FM-005	Criticality 1R/2	Failure Effect	Retention Rationale
Function Allows exhaled gases to pass from facial cavity to ambient.		**End Item** CO_2 buildup in facial cavity. **Mission** None **Crew/Vehicle** Possible loss of crewmember due to loss of oxygen/CO_2 buildup in facial cavity and contaminated atmosphere. **Interface** None	4. FAILURE HISTORY This regulator/mask is used in commercial applications (Grumman Gulfstream, Boeing 747-400) and military applications (C-130), no service failures reported. 5. OPERATIONAL USE A. **Operational Effect or Failure**: Potential loss of crewmember due to CO_2 buildup in facial cavity and no protection from contaminated atmosphere B. **Crew Action**: Crew could inspect valve and attempt to clear any visual contamination. Crew could not replace or repair defective valve C. **Crew Training**: Crew is trained in correct function and use of QDMA. D. **Mission Constraint**: None E. **Inflight Checkout**: None.
Failure Mode and Cause Fails Closed Cause: 1. Defective valve 2. Contamination			
Redundancy Screens | A-P B-N/A C-P	**Remaining Paths** Requires previous single point Orbiter failure.		
Mission Phase |	**Time to Effect** |	**Time to Correct** |	
Orbiter Emergency	Seconds	N/A	