

Critical Item: Solenoid Valve
Total Quantity: 4
Find Number: SV-22E, SV-22W (M7-0961)
SV-22E, SV-22W (M7-1212)
Criticality Category: 1S

SAA No:	01FS030-002	System/Area:	Firex Deluge System/ Hypergol Maintenance Facility
NASA Part No:	None	PMN Name:	K61-0841/Firex Deluge M7-0961 K61-0847/Firex Deluge M7-1212
Mfg/ Part No:	ASCO/ EF8344G80	Drawing/ Sheet No:	79K33901/ 2, 4

Function: Controls pneumatic flow to pressurize or vent the open and close sides of the actuator on the water valve.

Critical Failure Mode/Failure Mode No: Fail to Energize Open/01FS030-002.026

Failure Cause: Corrosion, mechanical failure, electrical failure

Failure Effect: Valve ports for pneumatic flow to pressurize the open side and vent the close side of the actuator on the water valve remain closed. The water valve will not open. Loss of firex deluge coverage to the scrubber pad resulting in a possible loss of life during a hazardous condition.
Detection method: indication on the console in bldg. M7-1061. **Time to effect:** immediate.

ACCEPTANCE RATIONALE

Design:

- The use of this valve is specified in KSC-STD-F-0004D, Standard for Fire Protection Design, and is employed throughout KSC
- 4 way - 2 position valve
- Body material: Brass
- Internal parts material: Stainless Steel
- Seals & discs material: Buna "N"
- Rated pressure: 125 psi; Actual pressure: 125 psi
- Nominal ambient temperature range: 32°F to 104°F
- Explosionproof and watertight enclosure
- Continuous duty molded Class F coil.
- The valve is housed in a NEMA 4X waterproof cabinet enclosure, with a GN2 purge.

*Attachment
6050234EM
Sheet 11 of 15*

- Micro-fog lubricant coated in the pneumatic line reduces the likelihood of corrosion in the valve.

Test:

- OMRB File VI requires a wet test water flow validation to demonstrate the proper operation of these fire valves annually (refer to OMI I2060).

Inspection:

- OMI I2060 requires a visual inspection of the valve exterior be performed during system validation.

Failure History:

- Current data on test failures, unexplained anomalies, and other failures experienced during ground processing activities can be found in the PRACA database. The PRACA database was researched and the following failure data was found on similar components in the critical failure mode:
 - Problem Report PV-6-113907, 11/04/88, identified the Firex Deluge System did not activate in OPF HB-2. The problem was discovered during OPF Firex Water System, Bays 1/2, Pre-mission Validation, OMI M2074. All the solenoid valves were disassembled, cleaned, lubricated and bench tested. The valves not passing the bench test were replaced and the system validation verified proper operation.
 - Problem Report PV-6-141571, 10/06/89, identified the LH2 Deluge Valve (V10) at Pad A would not open from the C1 console in the LCO. The problem was discovered during Shuttle Countdown (LPS) operations, OMI S0007. The controlling solenoid valve was found to be faulty, and removal and replacement of the valve corrected the problem. Probable cause of failure: worn out solenoid (electrical failure).
 - Problem Report PV-6-230013, 10/02/92, identified the solenoid valve for water valve V-35 did not transition properly. The problem was discovered during system surveillance. The controlling solenoid valve was found to be faulty, and removal and replacement of the valve corrected the problem. Probable cause of failure: normal wear.
 - Problem Report PV-6-250735, 08/18/93, identified the LH2 Deluge Valve (V10A) at Pad A would not open. The problem was discovered during system operational tests. The controlling solenoid valve was found to be faulty, and removal and replacement of the valve corrected the problem. Probable cause of failure: debris in the valve body.
- The GIDEP failure data interchange was researched and no failure data was found on this component in the critical failure mode.

Operational Use:

- Correcting Action:

There is no action which can be taken to mitigate the failure effect.

- Timeframe:

Since no correcting action is available, timeframe does not apply.

*Attachment
5050234 EM
Sheet 12 of 15*