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Information Rich Event

On 3-27-2012 around 1330 hours, facility workers smelled smoke

- Stopped work and called the Emergency Service Dispatch Center
- Using a Sitewide standard operating procedure, Dispatchers informed the occupants to activate the pull box and evacuate the facility.

Information Rich Event

- The only pull box in the bay was a manual deluge release.
- After manual deluge release was activated the Deluge system did not release water.
- Fire alarm functioned and transmitted alarm to dispatch.

Information Rich Event

- Reported as a system failure of an SSC when required to be operable
- Uncovered more than a failed SSC

Manual Electric Pull Box

National Nuclear Security Administration

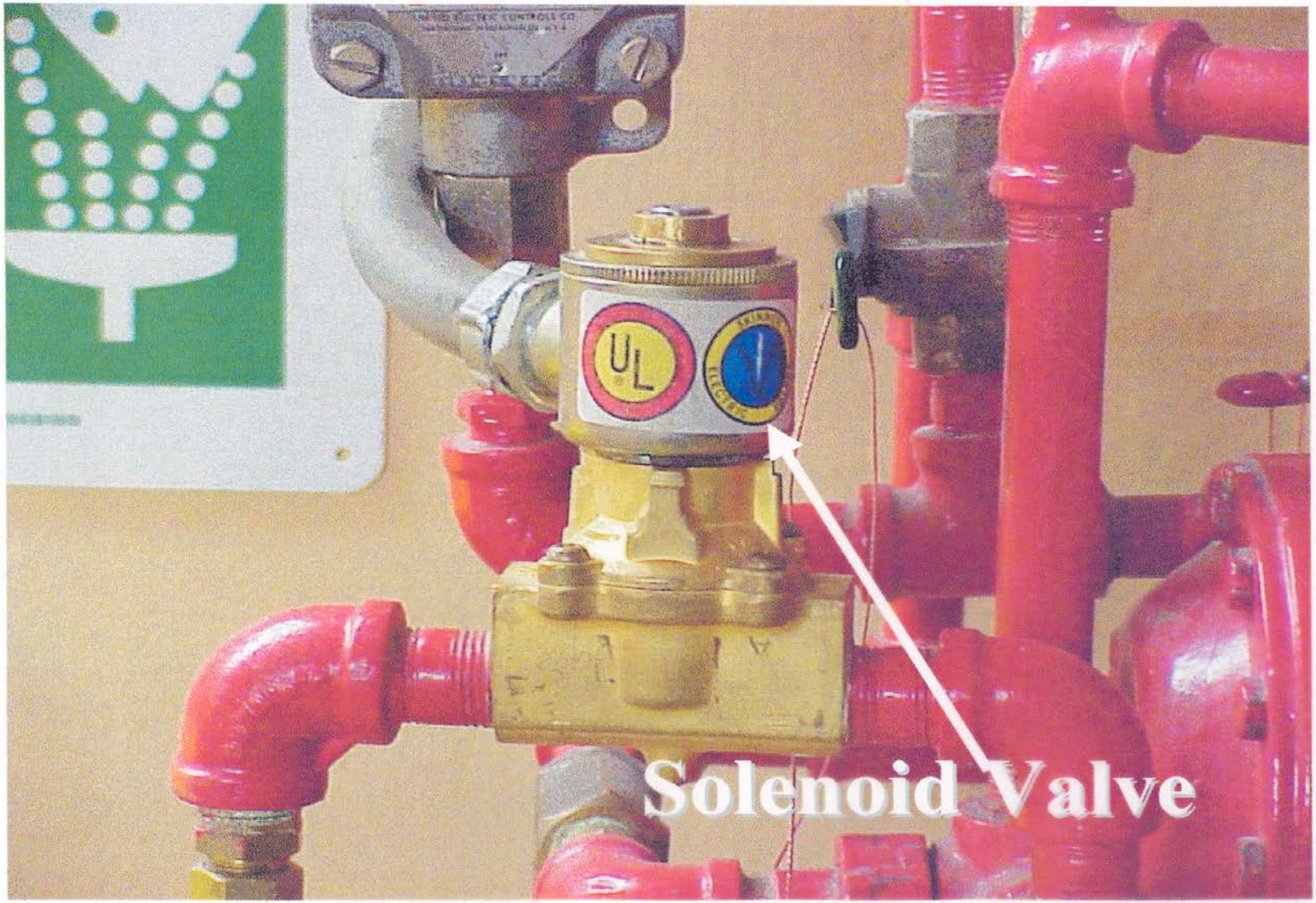
Pantex SITE OFFICE

Deluge System
Activation Failure

- The Fire Department was sent to the facility on the smell of smoke
- They were told by dispatch that the manual pull station was activated
- Upon arriving and sweeping the facility for signs of a fire, hot work was discovered as the issue of the smoke

Troubleshooting

- Fire Protection Engineering lead the effort of troubleshooting the failure.
- It was determined to be the solenoid valve was obstructing flow and preventing system activation.
- Solenoid has a torturous path for water flow



National Nuclear Security Administration

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Inside, Top of the Solenoid

Inside, Bottom of Solenoid

National Nuclear Security Administration

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Solenoid Diaphragm and Pin (Suspect one on the left)

Solenoid Diaphragm and Pin

National Nuclear Security Administration

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Troubleshooting

- **Troubleshooting included:**
  - Strainer inspections
  - Electrical checks at the solenoid and releasing module
  - Suspect solenoid was removed and tried in another facility with similar results
  - Suspect solenoid diaphragm and pin were successfully tested in a different valve body

Investigation Information

- Solenoid valve model no longer sold by manufacture since 1991
- Solenoid had an operating pressure of 150 psi. System pressure normally higher approximately 155-165 psi
- Valve still designed to operate with higher pressure, but might lead to premature diaphragm failure
- Problem identified in the NRC Information Notice 99-07

Investigation Information

- First failure of a Deluge system solenoid valve at Pantex
- During system impairment for underground water main upgrade the system was out of service for 2 months in January 2012.
- Discovered corrosion on inside of solenoid valve which was the assumed failure of the valve.

Lessons Learned

- Fire system restoration procedures should provide assurance of system operability
- Vendor testing information has changed (periodically to quarterly)
- Personnel should have questioning attitudes.