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WET PIPE NITROGEN INERTING

Project Case Study - Arizona Home Improvement Center

Project Type:	**"Big Box" Home Improvement Store**
Location:	**Arizona, USA**
Sprinkler Systems:	**100,000 sq. ft. of coverage area, 5 wet pipe risers, average size 1,500 gallons**
Nitrogen Introduced:	**March, 2011**

Corroded Branch Line

History and Background

Specifics on subject building

- Large "big box" home improvement retail store
- 100,000 sq. ft. of fire sprinkler system coverage area
- 5 wet pipe risers serving the building – average system volume 1,500 gallons
- In-rack fire sprinkler system

Corrosion related leak history

- Frequent leak history across all zones
- High risk due to business continuity disruption and product damage

Water supply – municipal drinking water

Corrosion from Trapped Air

Fire sprinkler system design configuration

- Large gridded systems with 6' of rise from the back of the building to the front
- Feed main was located at the back of the building and floating main was located at the front of the building
- Single in-rack system protecting paint department

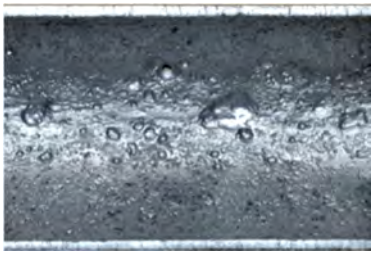
Fire sprinkler piping materials

- Rolled groove schedule 10 black steel piping for the mains and schedule 40 black steel piping for the branch lines
- Repair and replacements of piping over multi-year period

Preliminary Assessment Work

In order to determine the root cause for the corrosion related leaks within the fire sprinkler system a corrosion profile study was performed. The profile included:

- Leak frequency and locations
- Pipe replacement history
- Service history of the fire sprinkler systems
- Analysis of the topography of the fire sprinkler systems



Under Deposit Oxygen Corrosion

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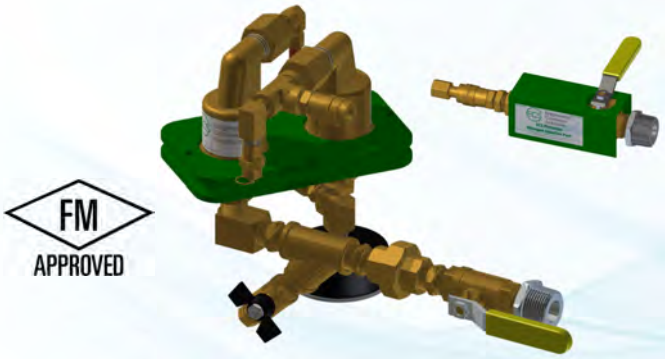
The profile determined that the root cause for corrosion within the systems was oxygen attack of the black steel piping. The majority of the damaged piping was found at the air/water interface adjacent to trapped pockets of air within the piping at the front of the building. Because of the system design, there were areas within the fire sprinkler piping network which trapped large amounts of air after filling the systems with water.



ECS Nitrogen Inerting Vent

Recommendations

- Install ECS Protector Nitrogen Inerting Vents on each of the wet pipe zones
- Install ECS Protector Nitrogen Injection Ports on each of the wet pipe risers
- Perform nitrogen inerting of the fire sprinkler systems using the ECS nitrogen inerting protocol for wet pipe fire sprinkler systems
- Use the nitrogen cylinders to supply the necessary nitrogen gas for the inerting procedure on the fire sprinkler systems

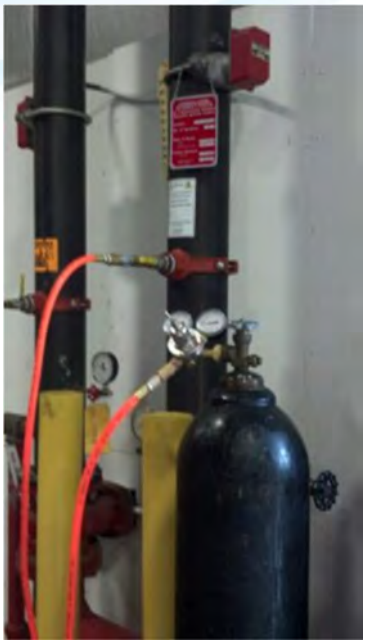
Results and Conclusions

During the month of March 2011 all 5 of the wet pipe fire sprinkler zones were inerted with nitrogen gas using the ECS nitrogen inerting protocol. About 3 years later there **has not been one recorded corrosion related leak** in any of the 5 fire sprinkler zones that were treated with the nitrogen gas.

Because the fire sprinkler contractor has been trained and certified in the ECS Nitrogen inerting protocol they are capable of performing any future service on the systems. If remodels require the modification of a sprinkler zone the contractor can maintain the nitrogen inerted atmosphere within the drained system while performing modifications to the system.

Fire Sprinkler Contractor Feedback

Fire sprinkler contractors who have performed the wet pipe nitrogen inerting procedures report that the entire process is very manageable and significantly easier than applying chemical corrosion control agents. The entire wet pipe nitrogen inerting procedure can easily be performed on a typical 1,000 gallon sprinkler system within 2 – 3 hours. It is also possible to perform the procedure on several zones at the same time. Once the fire sprinkler contractor has been certified by the ECS Nitrogen Inerting Team, the contractor does not require on-site support or supervision.



Pressurized cylinders provide nitrogen gas through injection ports at risers