False Sense of Security???

- Fire protection systems are passive in nature.
- They are designed for an occupancy
- They do not operate on a daily basis
- How do you know they will work if needed?

You are ultimately responsible

- Regular inspection
- Regular testing
- Regular maintenance
Are You …

• Checking sprinkler control valves?
• Performing waterflow alarm tests?
• Running your diesel fire pump weekly or electric monthly?
• Performing annual fire pump tests?
• Flowing your hydrants?
• Flushing the underground mains?
• Inspecting your fire water tanks?
• Testing the antifreeze?
• Handling your impairments properly?

Where do I find requirements?

NFPA® 25
Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems

Insurance carrier
Fire department
Corporate standards

NFPA 25

• establishes the **MINIMUM** requirements
  
  – Inspection
    • A visual examination of a system to verify that it appears to be in operating condition and is free of physical damage.
  – Testing
    • a physical trying or operation of a system, or part of a system to ensure or prove that it is functioning properly, as intended, or to an acceptable standard of operation.
  – Maintenance
    • The work performed to repair and/or maintain equipment in operable condition.
NFPA 25 Covers:

- Sprinkler Systems
- Standpipe and Hose Systems
- Private Fire Service Mains
- Fire Pumps
- Water Storage Tanks
- Water Spray Fixed Systems
- Foam-Water Sprinkler Systems
- Water Mist Systems
- Valves, Valve Components, and Trim
- Obstruction Investigation
- Impairments

Setting up an inspection program

- Documented (In writing!!!)
- In-house
- Contracted
- In-house Inspections & Contracted testing & Maintenance
Records, plans, and calculations

- Original as-built installation drawings
- Hydraulic calculations
- Original acceptance test records
- Component data sheets
- Letters regarding the review and acceptance of the system

Before you test

- Notify the alarm supervisory service
- Notify department heads
- Notify operators of critical equipment
- Make a general plant announcement
- Others as needed

Wet Pipe Sprinkler Systems

Weekly Checks
Are the Valves Open?

Are the Valves Open?

Are the Valves Open?
Check the Gauges

Is equipment accessible?
Has the hazard increased?

Wet Pipe Sprinkler Systems

Monthly Checks

Monthly

• Weekly Checks
• Supervised Valves
• Gauges
• Obvious Damage
Wet Pipe Sprinkler Systems

Quarterly Checks

Quarterly Inspections & Tests
Wet Pipe Sprinklers

- Valve Supervisory Devices
- Supervisory Signal Devices
- Hydraulic Nameplate
- Fire Department Connections
- Test Waterflow Devices
  - Mechanical such as Water Motor Gong
- Weekly & Monthly Checks
Valve Tamper Switch

Semi Annual Wet Pipe Sprinklers
- Weekly Checks
- Monthly Checks
- Quarterly Checks
- Test Valve Supervisory Devices

Annual Wet Pipe Sprinklers
- Hangers
- Sprinklers
- Pipe & Fittings
- Spare Sprinklers
- Main Drain Test
- Antifreeze test
5 Year + Wet Pipe Sprinklers

- Obstructions

5 Year + Wet Pipe Sprinklers

- Gauges
Testing of Sprinklers

- Submit to Recognized Testing Laboratory
- Fast Response elements – 20 years & 10 year interval
- Sprinklers 50 Years – 10 year interval
- Sprinklers 75 Years – 5 year interval
- Extra high temp - 325°F+ every five years
- Dry sprinklers – test 10 year intervals
- Harsh Environment 5 Years + 5 Years
- Heads prior to 1920 - REPLACE

Dry Pipe Sprinkler Systems
Dry Pipe Valve Checks

- Wet Pipe checks
- Air pressure – Weekly
- Compare riser air gauge to compressor gauge
- Water Column Test
- Ice buildup
Dry Pipe System Rust & Corrosion

Dry Pipe System Ice Plugs
Dry Pipe System Ice Plugs

Standpipes & Hoses

- Inspect
  - Control Valves – Weekly/Monthly
  - Pressure Regulating Devices – Quarterly
  - Piping, Connections, Cabinet, Hose – Annually
- Tests
  - Hose Storage Device – Annually
  - Hose, Pressure Control/Reducing Valves, Hydrostatic Test, Flow Test – 5 Years
These valves are designed to reduce hose pressure from high pressure pumps.

Where pressure reducing valves were not properly set…
3 Firefighters Died

Private Fire Service Mains

- Check Valves Weekly/Monthly
- Hydrants – Annually and after each operation
- Hose Houses – Quarterly
- Monitor Nozzles – Semiannually
- Piping – Annually
- Testing – 5 Years
Fire Pumps
Fire Pumps

• Pump House Checks
  – Temperature
  – Louvers
• Weekly Running
  – Valves open
  – Start on Pressure Drop
  – Start with both batteries
  – Check batteries
  – Check for leaks

Fire Pumps - Electric

• Electrical Systems
  – Power lights on
  – Transfer/Isolating switches
  – Phase reversal lights
  – Oil level in vertical motor sight glass
  – Electrical components
• Run Monthly at least 10 minutes (change 2011)
  – Constantly attended
  – I advise to run weekly for reliability
• Packings dripping – Bearing not too hot
Fire Pumps - Diesel

• Fluid levels
• Batteries – Full – Corrosion???
• Controller switches & Setting
• Fuel Tank level not less than 2/3 full
  - Run Weekly at least 30 minutes
    - Constantly attended
• Packings dripping – Bearing not too hot
Fire Pump Annual Test
Water Storage Tanks
Water Storage Tanks

• Inspect Water Level (alarm)
• Inspect Heating System
• Inspect Water Temperature (alarm)
• Exterior Inspection
  – Corrosion
  – Ice Build-up
  – Erosion for fabric tanks
• Tank Fill Valves
• 5 Year Inspection & Maintenance

Tank Level Indicators

Tank Collapse

• Covering the vent valve during tank painting is fairly standard practice; unfortunately leaving it covered when drawing out of the tank is very non-standard practice.
Water Spray Fixed Systems

- Check Valves & Water Supply
- Detection Systems (NFPA 72)
- Inspect Hangers, Supports, Fittings, Heads, & Components
- Quarterly Alarms
- Annual Operational Tests
Impairments

- Have a Good Impairment Program
- Follow Your Impairment Program
- Inform Management, Fire Department, Alarm Company, Insurance Carrier
- Discontinue Hazardous Operations
- No Hot Work or Smoking
- Work Continuously

Impairment of Water Supply to a Fire Pump

Excess Pressure Pumps
Types of Sprinkler Heads

Standard Pendant

Standard Upright
Types of Sprinkler Heads

In-Rack sprinkler
Grinnell 165F K=5.6 Duraspeed with watershield

Types of Sprinkler Heads

K17-231 Special Head
Central (Tyco)

Large Drop
Viking LD 286F

Types of Sprinkler Heads

ESFR – Pendant
ASCOA K-1
K-14 155F

ESFR - Upright
Viking VK-520
K-14 165F
Types of Sprinkler Heads

- Dry Sprinkler
  - Fusible Link Releases
  - Sleeve Moves up
  - Water Goes Around Mechanism
  - Water Discharge

Releasing head for deluge systems