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CONNECTED PROTECTION – HOW TECHNOLOGY IS TRANSFORMING THE FIRE SPRINKLER INDUSTRY
Presenter – Jim McHugh
SAN ANTONIO, TX
AFSA
American Fire Sprinkler Association

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Jim McHugh
AGF Manufacturing
Jim McHugh and his family have been involved in the Fire Sprinkler industry since the founding of AGF, and the introduction of the AGF TESTANDRAIN® valve. Currently serving as President of AGF Manufacturing Inc., Jim is responsible for the development, introduction, and manufacture of specialized valves and unique products specifically designed for the Fire Sprinkler industry. He is a member of NFSA, NFPA, SFPE, ASPE, and AFSA. Jim is a strong proponent of domestic manufacturing and enjoys serving the Fire Sprinkler industry and continuing the tradition of service started by his father, George McHugh III.
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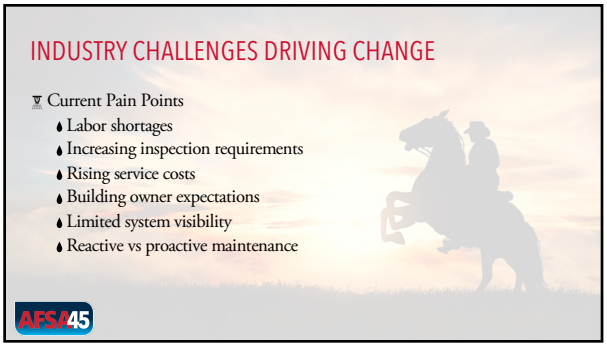
INDUSTRY CHALLENGES DRIVING CHANGE
Current Pain Points
Labor shortages
Increasing inspection requirements
Rising service costs
Building owner expectations
Limited system visibility
Reactive vs proactive maintenance
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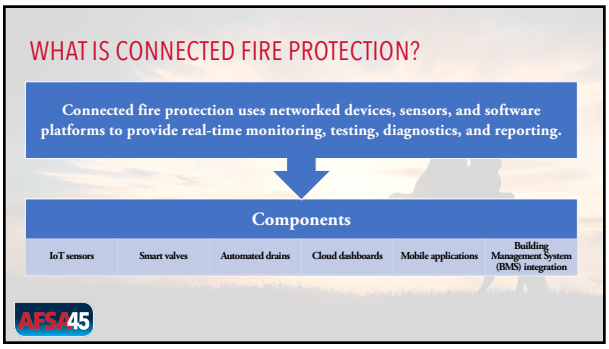
WHAT IS CONNECTED FIRE PROTECTION?
Connected fire protection uses networked devices, sensors, and software platforms to provide real-time monitoring, testing, diagnostics, and reporting.
Components
IoT sensors
Smart valves
Automated drains
Cloud dashboards
Mobile applications
Building Management System (BMS) integration
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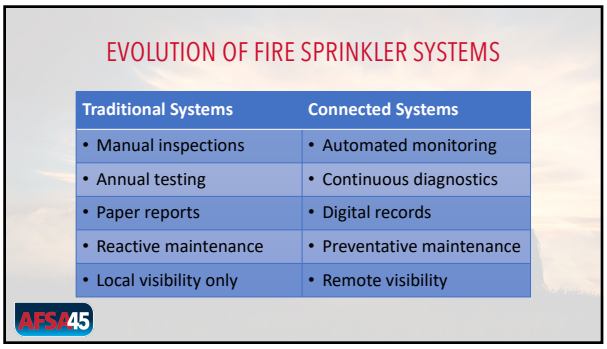
EVOLUTION OF FIRE SPRINKLER SYSTEMS
Traditional Systems
Connected Systems
Manual inspections
Automated monitoring
Annual testing
Continuous diagnostics
Paper reports
Digital records
Reactive maintenance
Preventative maintenance
Local visibility only
Remote visibility
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CONNECTED TECHNOLOGIES

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IoT SENSORS IN FIRE PROTECTION

- **Examples**
  - Pressure monitoring
  - Temperature monitoring
  - Leak detection
  - Water level monitoring
  - Corrosion monitoring
- **Benefits**
  - Early issue detection
  - Reduced property damage
  - Better system health visibility

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SMART WATERFLOW AND SUPERVISORY DEVICES

Connected Devices

- Waterflow switches
- Tamper switches
- Pressure switches
- Tank level sensors

Capabilities

- Real-time alerts
- Historical data tracking
- Remote diagnostics

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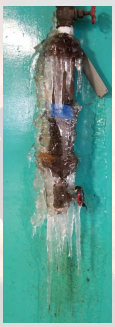
AUTOMATED AUXILIARY DRAINS

- **Traditional Challenges**
  - Forgotten drain points
  - Labor-intensive maintenance
  - Freeze damage risks
- **Connected Solution**
  - Automatic draining
  - Remote status monitoring
  - Heated cabinet enclosure



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AUXILLAIRY DRAIN CABINETS

- **M5400 Heated Cabinet**
  - Temperature controlled cabinet to prevent freezing
  - Float switch monitors condensation levels
  - Activated alarm and warning light when maintenance is needed
  - Can be wired to the Fire Control Panel or BMS

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AUXILLAIRY DRAIN CABINETS

- **M5450 Self Maintaining Cabinet**
  - Temperature controlled cabinet to prevent freezing
  - Float switch monitors condensation levels
  - Activated alarm and warning light when maintenance is needed
  - Can be wired to the Fire Control Panel or BMS
  - Maintains Drain Level by shedding excess condensation to prevent accumulation above the drain

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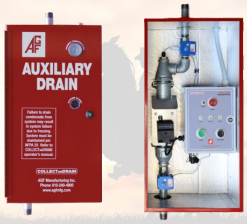
AUXILLAIRY DRAIN CABINETS

- **M5500 Automatic Cabinet**
  - Temperature controlled cabinet to prevent freezing
  - Float switch monitors condensation levels
  - Activated alarm and warning light when maintenance is needed
  - Can be wired to the Fire Control Panel or BMS
  - Fully automatic draining with the push of a remote or local button



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AUTOMATIC TESTING FLOW SWITCH

- **Using Technology to Ensure Compliance**
  - Consider the outcome rather than the process
  - "Performance-Based ITM"?

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PHYSICALLY PRESENT FOR ACCEPTANCE TESTS

- Codes: Permit holder notifies AHJ for acceptance tests
  - Do acceptance tests per standard where required, in presence of AHJ
- Standards: Contractor notifies the AHJ time & date
  - Hydrostatic, main drain, Etc.

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USING TECHNOLOGY TO ENSURE COMPLIANCE

- Some things will always require visual confirmation
  - NFPA 915
- Consider efficiency of automation confirming acceptable conditions at multiple locations on an on-going basis

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AUTOMATED INSPECTION & TESTING

- The performance of inspections and tests at a distant location from the system or component being inspected or tested through the use of electronic devices or equipment installed for the purpose.

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WHAT DO THE STANDARDS SAY?

- **2011-2020 NFPA 25**
  - 4.6.6 Automated Inspection and Testing
- **2019 NFPA 13**
  - 28.3 Automated Inspection and Testing Devices and Equipment
- **2019 NFPA 14**
  - 11.7 Automated Inspection and Testing Devices and Equipment
- **2019 NFPA 20**
  - 14.2.6.2 Automated Inspection and Testing Devices and Equipment

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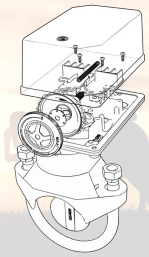
USING TECHNOLOGY TO ENSURE COMPLIANCE

- Automated devices that:
  - Can't be defeated
  - Can conduct inspections and tests without unintended consequences
  - Result in higher frequency inspections and tests
  - Validate the inspection/test that was performed
  - Show results were within acceptable limits



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CLOUD-BASED MONITORING PLATFORMS

- **Dashboard Features**
  - Multi-site monitoring
  - Alarm tracking
  - Asset management
  - Maintenance scheduling
  - Compliance reporting

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DIGITAL PRESSURE SWITCH & AUTO TANK DRAIN

- Displays
  - Pressure Readings
  - Run Hours
  - Amps
  - Cycles
- Extremely easy to adjust pressure settings in the field
- Specifically engineered to pressurize dry pipe and pre-action sprinkler systems according to the parameters of NFPA 13
- UL listed

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BENEFITS FOR ENGINEERS

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IMPROVING DESIGN EFFICIENCY

- Engineering Advantages
  - Better system data
  - Enhanced hydraulic performance tracking
  - Integration with BIM workflows
  - Improved commissioning

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ENHANCED COMMISSIONING AND ACCEPTANCE TESTING

Traditional Process

Manual documentation
Multiple site visits

Connected Process

Automated reporting
Digital test verification
Faster AHJ acceptance

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LIFECYCLE PERFORMANCE MONITORING

- **Benefits**
  - Continuous system health visibility
  - Long-term asset management
  - Data-driven maintenance decisions

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BENEFITS FOR CONTRACTORS

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REDUCING SERVICE CALLS

- Connected Benefits
  - Remote diagnostics
  - Issue verification before dispatch
  - Reduced unnecessary truck rolls
- Result
  - Lower labor costs
  - Higher technician efficiency

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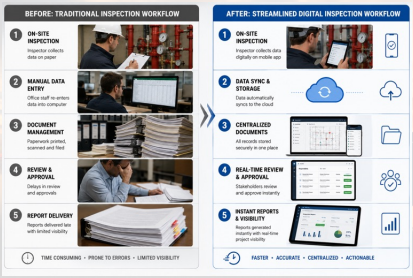
SIMPLIFYING INSPECTION & TESTING



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CREATING NEW REVENUE STREAMS

- Expanded Service Offerings
  - Monitoring subscriptions
  - Remote diagnostics
  - Compliance reporting
  - Predictive maintenance programs

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NFPA & REGULATORY CONSIDERATIONS

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NFPA STANDARDS & EMERGING TECHNOLOGY

- Relevant Standards
  - NFPA 13
  - NFPA 25
  - NFPA 915

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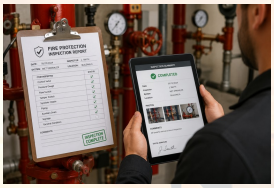
COMPLIANCE BENEFITS

- How Connected Systems Help
  - Automated records
  - Digital testing logs
  - Proof of inspections
  - Faster retrieval during audits



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AHJ EXPECTATIONS & ACCEPTANCE

- What AHJs Are Seeing
  - Increased digital documentation
  - Remote verification capabilities
  - Better record retention

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REAL-WORLD APPLICATIONS

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APPLICATION EXAMPLE: WAREHOUSES

- **Challenges**
  - Large footprints
  - Limited staff
  - High-value inventory
- **Connected Solutions**
  - Remote monitoring
  - Leak detection
  - Valve supervision

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APPLICATION EXAMPLE: HEALTHCARE FACILITIES

- **Benefits**
  - Continuous monitoring
  - Reduced disruption
  - Improved compliance documentation

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APPLICATION EXAMPLE: MULTI-SITE PROPERTY PORTFOLIOS

- **Owner Challenges**
  - Hundreds of systems
  - Multiple vendors
  - Compliance oversight
- **Connected Platform Advantages**
  - Centralized dashboard
  - Portfolio-wide visibility
  - Standardized reporting

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IMPLEMENTATION STRATEGY

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SELECTING CONNECTED SOLUTIONS

- Evaluation Criteria
  - Reliability
  - Cybersecurity
  - Ease of installation
  - NFPA compliance
  - BMS compatibility
  - Total cost of ownership

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INTEGRATION WITH BUILDING MANAGEMENT SYSTEMS

- **Common Platforms**
  - BACnet
  - Modbus
  - Proprietary BMS systems
- **Benefits**
  - Unified building operations
  - Cross-system visibility
  - Faster response times

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CYBERSECURITY CONSIDERATIONS

- **Key Topics**
  - Secure communications
  - Device authentication
  - Cloud security
  - Network segmentation

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REMOTE MONITORING FOR AUXILLIARY DRAINS

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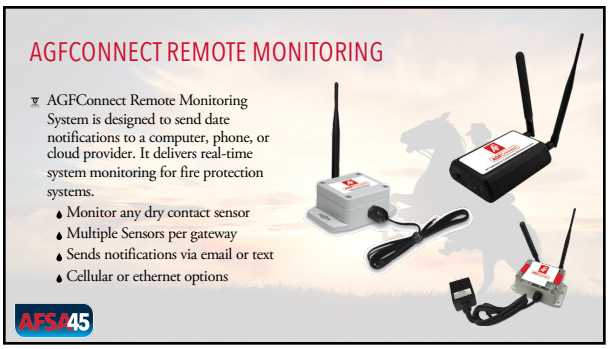

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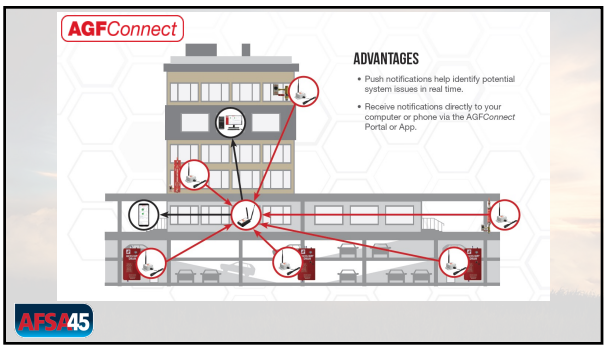

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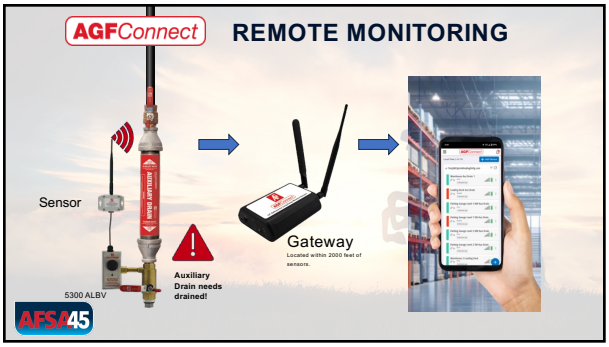

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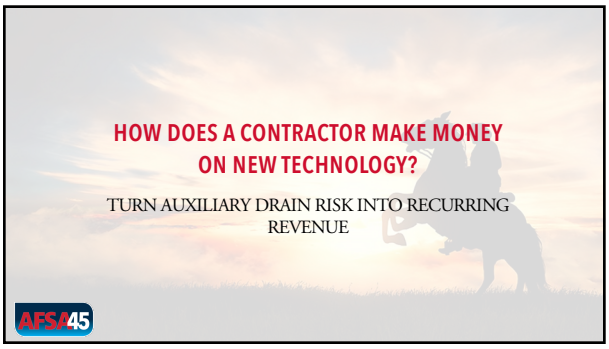

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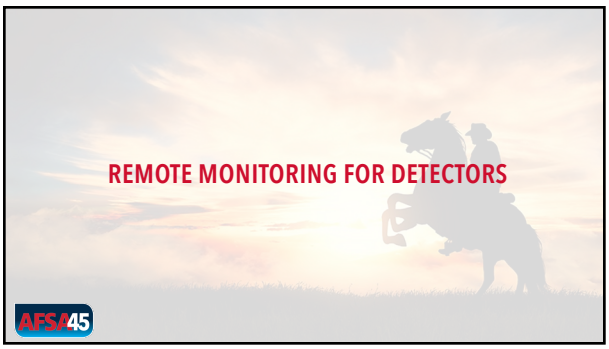

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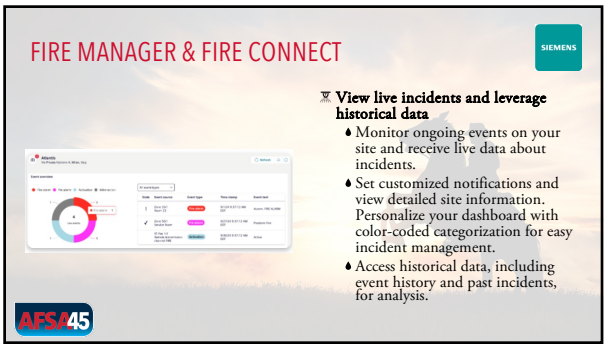

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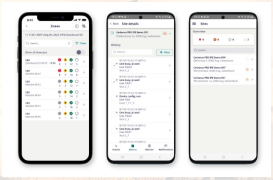
FIRE MANAGER & FIRE CONNECT

- **Access the most critical data anywhere, anytime**
  - Fire Manager comes with a native iOS and Android application, Fire Connect, for facility staff and service providers to download.
  - Use it to get an overview of site statuses as well as live incidents. Access event history, browse past incidents, set mobile push notifications and conduct detector tests (engineer accounts only).



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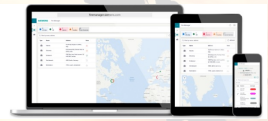
FIRE MANAGER & FIRE CONNECT

- **Conduct maintenance with disturbance-free testing**
  - Perform detector tests effortlessly by receiving test information directly in the app. Conduct disturbance-free tests of hardware and communication with the panel, ensuring safety without disrupting building occupants or business processes.



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INTELLIGENT MISTING FIRE SUPPRESSION SYSTEMS

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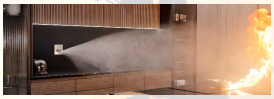
AUTOMIST AUTOMATIC FIRE SUPPRESSION SYSTEM

- **Plumis Technology**
  - Designs technology that detects smoke and targets a fire's location using thermal sensors, which can offer improved efficiency and activation speed over traditional methods.
  - Fire protection technology without the need for piping upgrades or additional setups for tanks and pumps.



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BENEFITS OF AN AUTOMIST AUTOMATIC FIRE SUPPRESSION SYSTEM

- Automist
  - Uses 10 times less water than a typical 13D fire sprinkler system does
  - Maximum water output demand of just 2.4 gallons per minute.
  - Suppresses fire with less water damage.
- Automist only fills with water when fire is detected, leaving you with less risk of leaks and frozen pipes in the winter.

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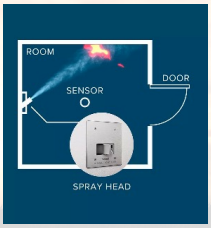
HOW AUTOMIST FIRE SUPPRESSION WORKS

- When overhead smoke sensors are activated, Automist uses thermal sensing to scan the room and locate fire.
- Once the fire is detected, Automist's spray head aims a targeted, high-pressure stream of water mist to suppress the fire, minimizing damage to the rest of the space.



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AUTOMIST APPLICATIONS

- Conventional fire suppression systems can be challenging to install in areas of low water pressure or freezing or seismic risk zones.
  - Automist offers fire protection professionals improved installation for these situations and more.
- Residential fire suppression system
  - The wall-mounted Automist system doesn't need bulky tanks and water pumps or major piping changes
    - Ideal for custom homes, heritage buildings, retrofits, cabins and ADUs.

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FIKE TECHNOLOGY – DURAQUENCH PRO

- The Fike FM approved DuraQuench Pro™ is a cost-effective alternative to the standard conventional light hazard sprinkler system, utilized in data center applications as well as a plug-in on an industrial application where a mist system is specified.

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FIKE TECHNOLOGY – DURAQUENCH PRO

- Water mist systems offer several advantages over sprinklers in many scenarios, including:
  - Fast-acting suppression
  - Uses 50% less water than other sprinkler systems
  - Microbiologically influenced corrosion (MIC) resistance
  - Compliant with NFPA 750

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WHAT MAKES DURAQUENCH PRO A COST-EFFECTIVE OPTION?

- Reduce the need for water storage tank, fire pump, or new underground. DuraQuench is a much smaller pump that is typically served by the domestic, potable water supply at the site, requiring no additional water supply lines. Requires minimal positive water inlet pressure for proper operation.

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CORROSION PREVENTION

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NFPA 13 2019 – WATER SUPPLIES

23.1.5.2
Water supplies and environmental conditions shall be evaluated for conditions that contribute to unusual corrosive properties. Where conditions are found that contribute to unusual corrosive properties, the owner(s) shall notify the sprinkler installer and a plan shall be developed to treat the system using one of the following methods:

(1) Install a water pipe that is corrosion resistant
(2) Treat all water that enters the system using an approved corrosion inhibitor
(3) Implement an approved plan for monitoring the interior conditions of the pipe at established intervals and locations
(4) **Install corrosion monitoring station and monitor at established intervals**
(5) Fill dry-pipe or preaction systems with nitrogen as a supervisory gas to mitigate against corrosion
(6) When using a generator, use an approved nitrogen generator

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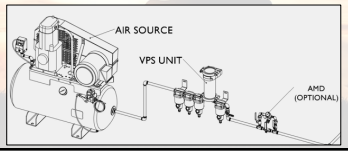
VAPOR PIPE SHIELD

- **Vapor Pipe Shield is a delivery device for Vapor phase Corrosion Inhibitor (VpCI) connected to dry and pre-action systems between the air compressor and the dry pipe valve.**



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CORROSION MONITORS

- CORRinSITE
  - Corrosion plug corrodes at the same rate as the internal pipe
  - Sight glass turns orange when it has corroded pass the limit
  - Easily coupled into new or existing systems
  - Suitable for wet and dry systems

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MIC TEST KITS

- A full analysis includes an Anaerobic and Aerobic MIC evaluation, 6 sample culture studies (8-day incubation), 23 mineral analysis testing, and 3 physical tests to determine any corrosive nature of the water and to determine if minerals are dropping out of the solution, thus causing deposition.
- This testing procedure is the best way to determine the extent of MIC and generalized corrosion that is occurring in the system.

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REQUIRED

FOR CEU CREDIT:

- ✓ Badge scanned at start of seminar
- ✓ Attend full seminar
- ✓ Complete survey 1 of 2 ways:
  - ✓ Survey link is emailed to attendees with scanned badges
  - ✓ Event app by EventsAir
    - Login to app
    - Navigate to seminar survey
  - ✓ Surveys close 10/31/26

Thank you!

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jmchugh@agfmfg.com

Scan QR code to submit questions for **Ask the Experts!**

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2027 Training Schedule

WEBINARS

1/6	Updates to NFPA 20
1/20	Calculating Pressure Reducing Hose Valves
2/3	Consumer Alert: Nitrogen in Sprinkler Systems
2/17	Reviewing Hydraulic Calculations
3/3	Updates to NFPA 13, 2028 Ed.
3/17	Updates to NFPA 13R & 13D, 2028 Eds.
4/7	Topic Coming Soon
4/21	NFPA 25: Roles & Responsibilities
5/5	Standpipe Flow Test Procedures
5/19	Storage 101
6/2	NFPA Technical Meeting - Voting Guide
6/16	Topic Coming Soon
6/30	Topic Coming Soon
7/7	Updates to NFPA 14, 2027 Edition
7/21	Adjacent Hazards & Design Methods
8/4	Acceptance Testing
8/18	Modifications to Existing Systems
9/22	Topic Coming Soon
10/6	Seismic 101
10/20	Proposed Updates to NFPA 25, 2029 Ed.
11/3	Evaluating Fire Pump Flow Tests
11/17	Top 10 Tech Reviews
12/1	Designing Water Storage Tanks
12/15	Pump Room Layout

PROGRAMS

Feb 9 - Mar 5 Apr 20 - May 14 Aug 3 - Aug 27** Oct 26 - Nov 19	Beginning Design School*
Apr 26 - May 7 Nov 1 - 12	Intermediate Design School*
Feb 8 - 10** Apr 12 - 14 Jul 12 - 14 Oct 11 - 13	Sprinkler Hydraulics Calculations Workshop
Apr 19 - 21 Oct 18 - 20	Advanced Hydraulics Calculations Workshop
Feb 11** Apr 30 Jul 23 Sep 24	Introduction to the Fire Sprinkler Industry
Mar 1 - 3 May 17 - 19 Aug 16 - 18 Oct 18 - 20**	NFPA 25 Essentials Workshop
Jun 7 - 10 Sep 20 - 23	Experienced Inspector Skills Lab
Mar 4 - 5 May 20 - 21 Aug 19 - 20 Oct 21 - 22**	NFPA 25 Fire Pump Workshop
Spring Summer Fall	ITM Inspector Development Program* *This program is 20 months.*

** Hybrid course **At General Air Products Lab, Exton, PA*

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September 8-11	Manchester Grand Hyatt San Diego, CA

For More Details Visit:
firesprinkler.org

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Dates subject to change. Programs subject to minimum registrations.

rev 9/14/2026

Virtual Instruction Path (VIP)

for Sprinkler Fitting Apprentices

Level 1 - Begins January 2027

Level 2 - Begins February 2027

Level 3 - Begins January 2027

Level 4 - Begins March 2027

www.firesprinkler.org/VIP

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HANDS-ON WORKSHOPS FOR 2027

FEATURING AFSA'S TRAINING LAB

NFPA 25 Essentials Workshop

Mar | May | Aug | Oct

Description: Understand roles, responsibilities, and NFPA 25 ITM procedures through hands-on testing of wet systems, dry systems, and fire pumps.

NFPA 25 Fire Pump Workshop

Mar | May | Aug | Oct

Description: Develop practical NFPA 25 fire pump ITM skills, including no-flow and full-flow testing, water supply graphing, and performance evaluation.

Introduction to the Fire Sprinkler Industry

Feb | Apr | Jul | Sep

Description: This course is designed for those new to the industry. An introductory, wide-ranging 8-hour course that provides a broad overview of core fire sprinkler industry concepts for those new to the field.

Experienced Inspector Skills Lab NEW

Mar | Sep

Description: Take your ITM expertise beyond the basics. Designed for experienced technicians, this course combines focused classroom instruction with hands-on system lab training to strengthen your application of current NFPA 25 inspection, testing, and maintenance requirements. Refine fire sprinkler testing practices, improve documentation, deliver more consistent service, and help reduce liability while reinforcing knowledge commonly covered on certification exams.

Learn more about AFSA's fire sprinkler lab featuring functional risers, a spray room, fire pumps, and an interactive classroom.

firesprinkler.org/lab