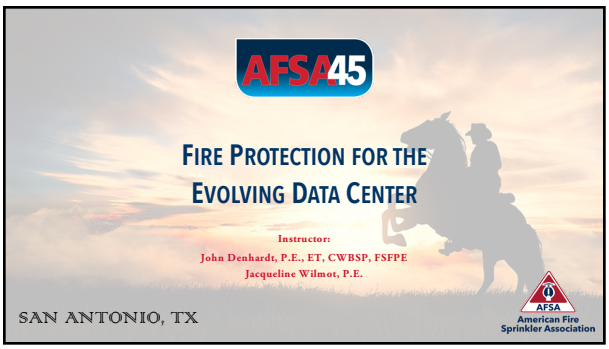
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FIRE PROTECTION FOR THE EVOLVING DATA CENTER
Instructor:
John Denhardt, P.E., ET, CWBSP, FSFPE
Jacqueline Wilmot, P.E.
SAN ANTONIO, TX
AFSA
American Fire Sprinkler Association

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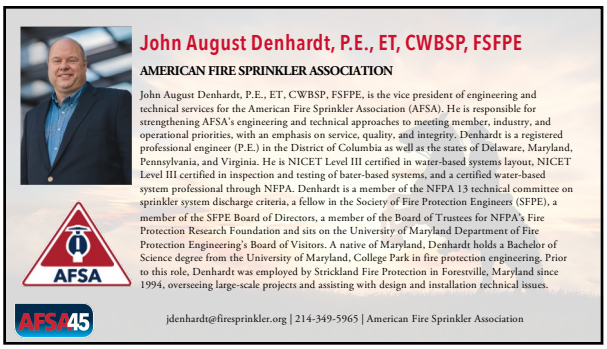
John August Denhardt, P.E., ET, CWBSP, FSFPE
AMERICAN FIRE SPRINKLER ASSOCIATION
John August Denhardt, P.E., ET, CWBSP, FSFPE, is the vice president of engineering and technical services for the American Fire Sprinkler Association (AFSA). He is responsible for strengthening AFSA's engineering and technical approaches to meeting member, industry, and operational priorities, with an emphasis on service, quality, and integrity. Denhardt is a registered professional engineer (P.E.) in the District of Columbia as well as the states of Delaware, Maryland, Pennsylvania, and Virginia. He is NICET Level III certified in water-based systems layout, NICET Level III certified in inspection and testing of bater-based systems, and a certified water-based system professional through NFPA. Denhardt is a member of the NFPA 13 technical committee on sprinkler system discharge criteria, a fellow in the Society of Fire Protection Engineers (SFPE), a member of the SFPE Board of Directors, a member of the Board of Trustees for NFPA's Fire Protection Research Foundation and sits on the University of Maryland Department of Fire Protection Engineering's Board of Visitors. A native of Maryland, Denhardt holds a Bachelor of Science degree from the University of Maryland, College Park in fire protection engineering. Prior to this role, Denhardt was employed by Strickland Fire Protection in Forestville, Maryland since 1994, overseeing large-scale projects and assisting with design and installation technical issues.
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jdenhardt@firesprinkler.org | 214-349-5965 | American Fire Sprinkler Association

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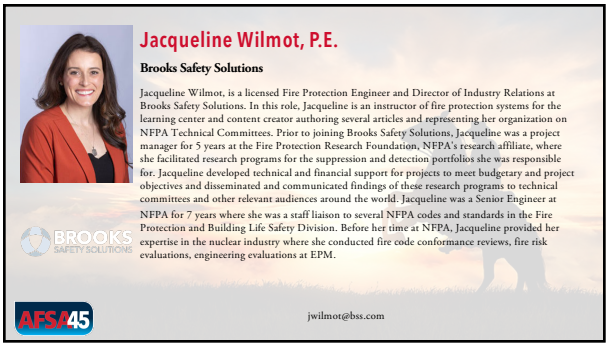
Jacqueline Wilmot, P.E.
Brooks Safety Solutions
Jacqueline Wilmot, is a licensed Fire Protection Engineer and Director of Industry Relations at Brooks Safety Solutions. In this role, Jacqueline is an instructor of fire protection systems for the learning center and content creator authoring several articles and representing her organization on NFPA Technical Committees. Prior to joining Brooks Safety Solutions, Jacqueline was a project manager for 5 years at the Fire Protection Research Foundation, NFPA's research affiliate, where she facilitated research programs for the suppression and detection portfolios she was responsible for. Jacqueline developed technical and financial support for projects to meet budgetary and project objectives and disseminated and communicated findings of these research programs to technical committees and other relevant audiences around the world. Jacqueline was a Senior Engineer at NFPA for 7 years where she was a staff liaison to several NFPA codes and standards in the Fire Protection and Building Life Safety Division. Before her time at NFPA, Jacqueline provided her expertise in the nuclear industry where she conducted fire code conformance reviews, fire risk evaluations, engineering evaluations at EPM.
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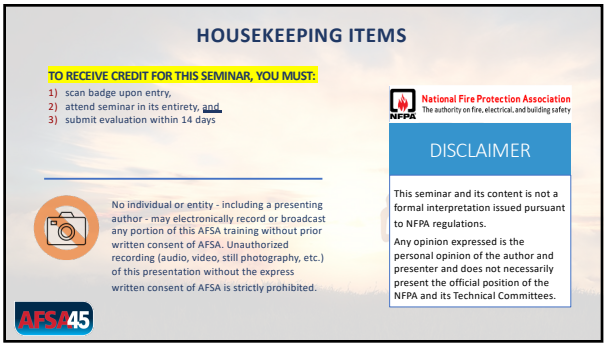
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The authority on fire, electrical, and building safety
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Understanding Data Centers
Types, Tiers, and Risks
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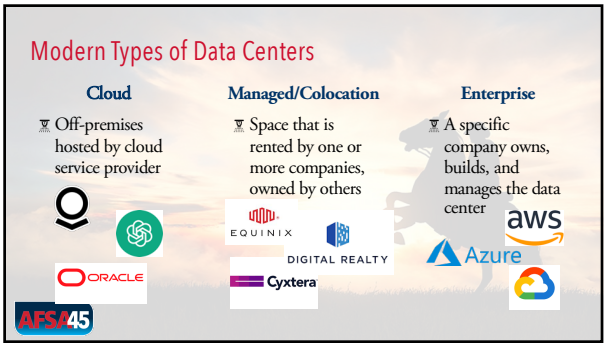
Modern Types of Data Centers
Cloud
Off-premises hosted by cloud service provider
Managed/Colocation
Space that is rented by one or more companies, owned by others
EQUINIX
DIGITAL REALTY
Cyxtera
Enterprise
A specific company owns, builds, and manages the data center
aws
Azure
ORACLE
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Data Center Tiers

	Redundancy In:		Protection Provided For		Client-Side	
	Power	Cooling	Downtime	Fault Tolerance	Cost Level (Relative)	Type
Tier 1					$	Small business, Office
Tier 2	✓	✓			$$	Investment firms, Colocation groups
Tier 3	✓	✓	✓		$$$	Google, Amazon
Tier 4	✓	✓	✓	✓	$$$$	Government, Security, etc.

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Common Causes for Data Center Fires

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Actual Fires

- Markley, Boston, MA
  - Managed data center
  - Shorting power supplies
  - Battery cabinet explosion

- Google, Council Bluffs, IA
  - Enterprise data center
  - Cabinet arc flash explosion
  - Three injuries

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The Cost of Fire

- 59 civilian injuries
- $370 million in property damage
- Operational costs
  - ~$9,000 per minute of downtime
  - 20% contract value from service level agreements
  - Recovery costs

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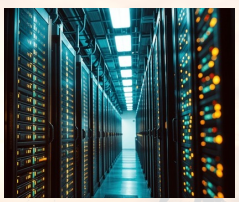
History of the Hazard



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Protecting Data Centers

NFPA Codes & Standards

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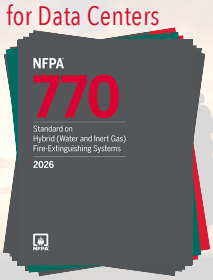
NFPA Codes and Standards for Data Centers

- NFPA 75
- NFPA 855
- NFPA 13
- NFPA 2001
- NFPA 72
- NFPA 90A
- NFPA 220
- NFPA 750
- NFPA 770

Where to start?



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NFPA 75 Design Approaches

Prescriptive Design

- Chapter 4
  - Utilizes NFPA 13 (**9.1.2**) and:
    - Chapter 6 – Construction
    - Chapter 7 – Materials and Equipment
    - Chapter 9 – Fire Protection Equipment
    - Chapter 12 – Emergency Planning

Performance-Based Design

- Chapter 5
  - Goals and Objectives
  - Performance Criteria
  - AHJ Approval

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Fire Risk Assessment

Section 4.2.3

The following elements shall be considered to determine the level of acceptable fire risk in Information Technology Equipment(ITE) spaces:

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Life Safety and Fire Threat

18

Economic Impact

19

Invisible Damage

FERC

BLOCKBUSTER

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Features for Design

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Fire Risk Assessment

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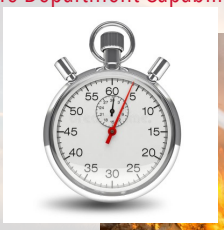
Fire Department Capabilities



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Fire Risk Assessment

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Questions for Design

- How important is this data center?
- Do you have backups?
- What type of protection can you use?

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Protection of ITE Spaces

- Automatic sprinkler systems follow NFPA 13
- Systems protecting ITE areas shall be valved separately
- Smoke detectors to be used in accordance with NFPA 72
- ITE Personnel are to be thoroughly trained

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Chapter 9

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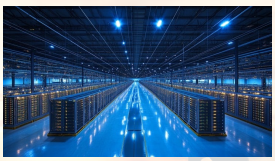
Early Detection Location Requirements



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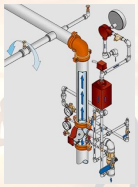
Commonly Accepted Designs



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Commonly Accepted Designs

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Recommended Practices

- Early detection clean agent system
- Single Interlock Pre-action
  - Dedicated Releasing Panel
  - 285 deg. heads
  - 130 sqft spacing

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Why Single?

Single Interlock Preaction	Double Interlock Preaction
Water Delivery Time	Delay in Water Getting to Fire
Design Area	Overused
Damage Protection	Expensive
ITC Location - Pro	ITC Location - Con

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Another Option…

- Water mist systems
  - Smaller amount of water
  - Larger cooling effect
  - Longer length of time for operation on tanks

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But Wait, There's More!

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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!

John Denhardt

Jacqueline Wilmot

technical@firesprinkler.org

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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:
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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