

Investigating Fires in Sprinklered Buildings

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SFPE Fire Service Committee
October 9, 2025

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Safety Must Be Paramount!



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Sprinklered Buildings Burn

June, 1982



July, 2012



March, 2022



July, 2025

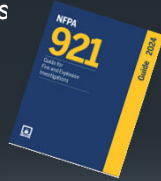


- February, 2000 – 2 Alarms at Southampton Estates, Upper Southampton Township, PA
 - 1 Fatality
 - Dry Pendent Recall – 2 MM Sprinklers
- August, 2009 – Sprinklers activate at kitchen fire in residential occupancy, Truckee, CA
 - 1 Fatality, 4 injuries
 - Alert on Glycerin/Propylene Glycol Systems

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Codes

- NFPA 921-2024 *Guide for Fire and Explosion Investigations*
 - Chapter 8, Section 8.4 (et al)



- NFPA 13E-2020 *Recommended Practice for Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems*

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Starting Point

- Either Forward, or Backward
 - *From the Outside In?*
 - Determine the Type(s) of System
 - Get Input from the Firefighters on Scene Before They Leave
 - Consider Independent Expertise
- Investigate FD Operations w/FDC
 - Did They Connect to the FDC?
 - If Not, Why Not?
 - Marked Correctly?
 - Adapter Needed?
 - Was it the Sprinkler or Standpipe (or Combined) FDC?
 - Was it Pumped, and at What Pressure?
 - *Did Everything Work?*
 - Was the Valve/Pump Attended?



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What is the System Supposed to be Pumped at?

- Was there a Preplan?



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Investigate Equipment – Gather During Overall Investigation

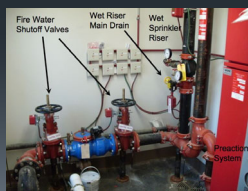
- Obtain Information on the Design and Type of System (Flow Requirements)
- Make/Model/Year/Detailed Information
 - Sprinkler Heads Involved
 - Valves Involved
 - Pump(s) Involved (if provided)
- Check Piping for Potential Obstructions Where Necessary
- Document/Take Photos!!!**



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Investigate Sprinkler Water Supply

- Obtain Piping Drawings for the Fire Area(s)
- Determine the Valves That Supply the Fire Area(s)
- Check the Position of These Valve(s) at the Time of the Fire
 - Open/Closed?
 - Locked/Unlocked?
- Confirm Sprinkler Lines Not Frozen



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Investigate Sprinkler Water Supply

- If Fire Pump Provided
 - Check for Proper Operation
 - On?
 - Transfer Switch Working?
 - Check Battery (diesel)
 - Check Heat in Pump Room
- If Tank Provided
 - Did it Have Adequate Water During Fire?
 - Not Frozen?



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Investigate Sprinkler Water Supply

- Confirm Water Supply Flow/Pressure at the Time of the Fire
 - Water Dept. Records
 - Conduct Flow Test if Possible
 - At Least Get Pressures at Riser(s)
 - Conduct Main Drain (2" Drain) Downstream of Sprinkler Valve(s) to Verify No Impairments
 - *Talk to the Apparatus Operator(s)!*



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Investigate Types of Systems

- Obtain Copies of All Alarm Printouts
- Dry Systems
 - Confirm Air Supply Operating Properly
 - Confirm Valve Setup/Arrangement
 - Any Obstructions?
- Deluge/Preaction Systems
 - Confirm Air Supply Operating Properly
 - Confirm Alarm/Activation System Operations
 - Confirm Valve Setup/Arrangement
 - Sprinklers Properly Aligned and Clear?



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Investigate System Maintenance

- Obtain Copies of Maintenance/Testing Records
 - Sprinkler Systems
 - Detectors for Preaction/Deluge Systems
 - Fire Pumps
- Verify Valves Tested
- Obtain Information on Trip Tests



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Interaction of Sprinkler System With Occupancy

- Determine Fuel in the Area Where the System Operated
 - Fuel Type
 - Fuel Load
 - Fuel Configuration
 - Unusual Hazards
- Confirm System was Designed for Fuel Type, Loading and Configuration
- Did More than 1 System Operate?



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Because Sometimes Things Get Designed Differently!



Credit Unknown

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Conclusion

- Many of the Issues Here Should Be Investigated ASAP After the Fire is Extinguished
 - *Are There Issues With the Sprinklers/Appurtenances?*
- To Ensure More Effective Operations, Better Equipment, and Better Standards – We Must Spend Time Understanding the Performance of Fire Protection Systems and Document that Understanding
 - *Do We Need to Change Standards?*
 - *Do We Need to Change Operations?*
 - *Do We Need to Change Preplans?*
- Use Listing/Approval Agencies As Needed
 - *UL/FM/CPSC*
 - *Samples for Testing If Appropriate*
- **Share Information Learned**

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