



Investigating Fires in Sprinklered Buildings

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SFPE Fire Service Committee

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Safety Must Be Paramount!



Sprinklered Buildings Burn

June, 1982



July, 2012



March, 2022

firefighterclosecalls.com

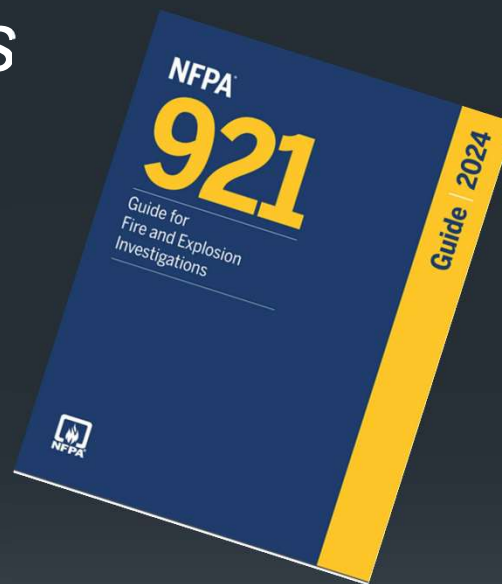


- February, 2000 – 2 Alarms at Southampton Estates, Upper Southampton Township, PA
 - 1 Fatality
 - Dry Pendent Recall – 2 MM Sprinklers
- August, 2009 – Sprinklers activate at kitchen fire in residential occupancy, Truckee, CA
 - 1 Fatality, 4 injuries
 - Alert on Glycerin/Propylene Glycol Systems



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*

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?



1210 B & C
BRIDFORD PARKWAY

F.D.C.

PUMP THIS
CONNECTION FIRST





Yellowstone Lodge







What is the System Supposed to be Pumped at?

- Was there a Preplan?



Investigate Equipment – Gather During Overall Investigation

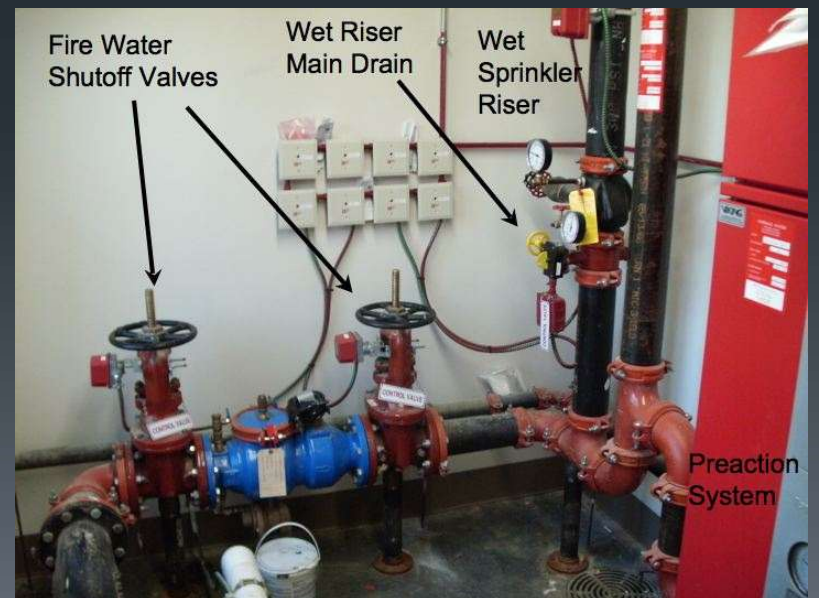
- Obtain Information on the Design and Type of System (Flow Requirements)
- Make/Model/Year/Detailed Information
 - Sprinkler Heads Involved
 - Valves Involved
 - Pump(s) Involved (if provided)
- Check Piping for Potential Obstructions Where Necessary
- *Document/Take Photos!!!*

The image shows a red fire alarm pull station with a white label. The label contains the following information:

HYDRAULIC SYSTEM	
This building is protected by a hydraulically designed Automatic Sprinkler System.	
Date Installed	9-12-02
Location	OIL TANK
No. of Sprinklers	62
Basis of Design	.25
1. Density	ALL
2. Designed area of discharge	
System Design	1562.1
1. Water flow rate	109.5
2. Residual pressure at the base of the riser	
Installed by	Precision Mech

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



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?



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)!*



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?



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



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?



Because Sometimes Things Get Designed Differently!



Credit Unknown

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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