

The Station Night Club Fire that Occurred 20 Feb 03 in
West Warwick, Rhode Island

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Political and Legal Foundations of Fire Protection

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Abstract

On 20 February 2003, a terrible tragedy occurred at the Station Nightclub in West Warwick, Rhode Island. Unapproved pyrotechnics were used as part of a show that the band Great White was putting on. The pyrotechnics were set off early into the show and ignited sound proofing polyurethane foam that was located on the ceiling and the walls proximal to the platform that the band was performing on. Within minutes of the ignition of the foam the building was consumed with fire and smoke. Egress was slowed by the majority of the occupants attempting to escape through the main entrance. One hundred people were killed in this fire. Fire safety inspections, NFPA codes and Ohio Fire Codes are considered in this paper in an effort to apply the lessons learned.

Introduction

I must begin by citing some history about the Station Nightclub. On 27 June 2000, Michael Derdian, co-owner of the club, purchased twenty five sheets of sound proofing foam. The foam was two and a half inches thick. It was made of polyurethane and is generally used for packing material. The cost of the foam was \$575.00. The foam that was purchased was not fire retardant. Fire retardant foam would have cost twice the purchase amount. For \$1,150.00 the fire retardant foam could have been purchased. (Providence Journal, 28 Feb 03).

The Station Nightclub was built in 1946 as a night club and had several owners and remodels over the years. The structure was a single story wood frame building with a footprint of about 4484 square feet. The main entrance was located on the north side of the structure. There was a door located on the west side adjacent to the platform (stage) area. Another door was located on the east end of the structure near the main bar area. Large windows were located on the north side of the structure on both sides of the main entrance. A fourth door was located in the kitchen but would not have been known to anyone other than employees or someone familiar with the building.

On the night of the fire the band Great White was performing. Included as part of their show were some pyrotechnics. These pyrotechnic devices were located on either side of the front of the platform. The pyrotechnics were ignited about thirty seconds into the show.

These pyrotechnics served as the heat source and the polyurethane soundproofing foam located on the ceiling and walls proximal to the platform served as the initial fuel. The wood paneling under the polyurethane foam was ignited and the fire spread into the structure. An estimated 95% of the fuel load was the wood structure and paneling. (NIST Final Report, 27 June 2005). After the foam was consumed the fire transitioned into a wood frame structure fire.

Background and Significance

The focus of this research was to gain knowledge of the fire code enforcement and inspection procedures used by the West Warwick Fire Department. This paper's intent is to serve as a learning aid with respect to code enforcement, fire inspection procedures and documentation. This paper is not intended to find fault or assign blame to any of the entities involved.

Problems faced by many fire departments are both code enforcement and fire safety inspections. These reports cannot be regarded as additional duties. I believe that the reports are generated, but the quality of the report is what is vital to success. It does not do any good to produce a negative report if no action is taken on them. Re-inspections must be done and enforced. They are paramount to the success of any department.

I want to take the lessons learned from the Station Nightclub Fire and apply them as a learning tool for my department. The goal is to convey to the members of my department the importance of documentation and taking action on noted problems.

A study of fire protection systems at the Station Nightclub Fire was done and included in a report filed by (NIST) National Institute of Standards and Technology. It was known that the Station did not have a sprinkler system. According the 2003 edition of the model codes sprinklers would have been required if this structure was new construction. Sprinklers would not have been required for an existing structure like the Station.

Extinguishers were located in the structure; however, they were not located convenient to where the fire started. There is doubt that extinguishers would have made a significant difference in this case.

A NIST reconstruction of the platform area fire demonstrated that a water sprinkler system installed in the test room IAW NFPA 13 (Standard for the Installation of Sprinkler Systems) was able to control the fire. A computer simulation of the full nightclub with and without sprinklers led to similar results for the sprinkler scenario. (NIST report, 27 June 2005).

A heat detection/fire alarm was installed in the nightclub, which activated (sound and light strobe) forty one seconds after ignition. (NIST report, 27 June 2005)

Occupant load and egress was one of the main problems encountered at this fire. It is believed that the inability of exits to handle all of the occupants in the short time available contributed directly to the large loss of life. The number of occupants in the structure at the time of the fire was estimated to be 440-458. (NIST report, 27 June 2005). According to the 2003 model codes the Station would hold 420 occupants.

Three emergency exits were available. The main entrance located on the north side of the structure where almost everybody in the structure entered. A single door located west near the performance platform was another exit. (This door was noted to swing inward on an inspection report dated 10 Nov 2001). A third exit was located on the east side of the structure near the main bar. The main bar also had large windows on either side of it. A fourth door was located in the kitchen and would only have been known by the staff or somebody familiar with the structure.

The rate of egress from the main entrance at the front door of the building was limited initially by a single doorway inside the vestibule, not the visible double doors visible from outside. Approximately 56% -66% of the occupants attempted to exit through the main entrance. The single interior door arrangement leading to the main exterior exit caused a crowd crush.

The windows in the main bar room and sun room accounted for nearly a third of successful evacuations. (NIST report, 27 June 2005).

Given the hazard mix of materials and the lack of sprinklers, the NIST report determined that the fire department could not have saved this structure. The fire department had its first arriving unit on scene in less than five minutes after the first 911 call.

A mass casualty plan was implemented within ten minutes and all occupants requiring medical treatment were evacuated within two hours.

A number of recommendations were put out as a result of the NIST final report of the Station Nightclub Fire. A strong emphasis was put on the adoption of and implementation of aggressive and effective fire inspections and code enforcement. The following items were targeted:

- Documentation of building permits and alterations
- Means of egress inspection and record keeping
- Frequency and rigor of fire inspections-follow up and auditing procedures

- Guidelines and recourse available to the inspector for identified deviations from code

From the 1940s to the 1960s the prevalent regional code in Rhode Island was the National Board Code of Fire Underwriters, later the American Insurance Association (AIA) National Building Code (NBC), last published in 1976. (AIA) also published the Fire Protection Code (FPC), which was the prevalent model fire code in the region. (NIST report, 27 June 2005)

Starting in the 1970s through the end of the century Building Officials and Code Administrators (BOCA) building code was the leading model code in the region.

In 2000, the International Code Council (ICC) published the first International Building Code (IBC) and International Fire Code (IFC), both published in 2003 editions.

The Life Safety Code, published by NFPA, as NFPA 101 deals with deals with life safety from a fire as would a model building code. This code addresses both new and existing construction. NFPA 101 does not permit existing conditions that pose a serious safety risk to remain unabated. The NFPA has published a fire code since 1971 and a building code since 2003.

Ohio Fire Code:

As previously stated it has been calculated that the occupancy load for the Station was 420. Under Ohio Fire Code the Station would fall under A-2 assembly, bar or nightclub. The Station was a mixture of assembly without fixed chairs and un-concentrated tables and chairs.

(3) 1004.3 of the Ohio Fire Code states that every room that is an assembly shall have occupant load posted in a conspicuous place, near the main exit or exit access doorway from the room or space.

Ohio Fire Code Rule Ten (F) (B) Section 1006 Means of Egress Illumination:

(1) 1006.1 Illumination Required. The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied.

We cannot take what seems like minor violations lightly. In a real fire, often you can barely see your hand in front of your face. How are occupants expected to egress from a building fire if the exits lights are not functioning? Building fire safety inspections are the first line of defense for life safety.

Ohio Fire Code (i) 1008.1.9 Panic and Fire Exit Hardware

Where panic hardware is installed it shall comply with the following:

- (i) The actuating portion of the releasing device shall extend at least one half of the door leaf width.*
- (ii) A maximum unlatching force of 15 pounds.*

One door at the Station fire was supposed to have been difficult to open, according to witness accounts. It is unclear if the door was malfunctioning or it was operator error. The point is simply that doors should not be difficult to open and egress through.

Ohio Fire Code (b) 1008.1.2 Door Swing:

Egress doors shall be side hinged swinging. There are no exceptions noted for assembly occupancies.

The Station had a door that swung inward near the platform (stage) area of the building. A fire safety inspection dated 10 Nov 2001 commented that the exit door near the platform (stage) area cannot swing inward. The building owner was instructed to call when ready for re-inspection. The re-inspection signature block was blank when the inspection form was reviewed as part of the fire investigation.

We must follow up on re-inspections. We are not just going through the motions when we inspect. Your actions have second and third order effects that could impact life, property and your career. It is vital that we complete the inspections and re-inspections and that we document them properly.

The use of pyrotechnics at the Station Nightclub was apparently not approved or authorized by anybody. A thought to keep in mind when inspecting businesses that operate at capacity mostly in the evening is to schedule an inspection during peak hours of operation. It will still be necessary to inspect when you can access the building more readily, but by inspecting at peak business time you can get a clearer picture of egress problems, occupant load and other code violations such as blocked exits for example.

Ohio Fire Code Rule 33 Explosives and Fireworks Pyrotechnics

(K) Section 3311 Pyrotechnics and Special Exhibition Permit

(1) 3311.1 *A permit for pyrotechnic exhibition shall be obtained from the local fire official of the jurisdiction for all indoor and outdoor use of pyrotechnic special effects at least five days in advance of the pyrotechnics exhibition.*

Failure to submit the permit application prior to five days in advance of the pyrotechnics exhibition may result in a denial of the application.

(2) 3311.2 Pyrotechnics Special Effects Plans:

Before the performance of any pyrotechnic exhibition, the permit applicant shall submit a plan for the use of pyrotechnic special effects to the local fire official. The plan shall be made in writing in such a form as is acceptable to the local fire official and shall demonstrate compliance with NFPA 1126 listed in rule 1301:7-7-45 of the Administrative Code.

There is a long list of what the plan must include. Names, dates, qualifications, proof of insurance, proof of license, number and type of pyrotechnics to be used, diagrams of the area to be used, and MSDS.

Public Building Record Keeping Practices

No Town of West Warwick or State of Rhode Island documents prior to 20 Feb 2003 were located that mentioned foam material on neither the walls of the nightclub, nor the use of pyrotechnics similar to those used on 20 Feb 2003.

It is important to do a complete 360 degree follow up on items of concern on your fire safety inspections. You and your firefighting brothers and sisters are the ones who will have to combat the fires in your district. You need to take ownership of your district and keep in your mind what you can do to prevent fire and save lives.

Prevention starts with a knowledgeable fire safety inspector. If you are the type that likes to just “check the box” and not open your eyes to existing problems you are in the wrong business.

Emergency Response:

NFPA standards recommend a minimum staffing of four firefighters on both engines and trucks, which was not achieved at the Station Nightclub Fire. Additional firefighters on scene at the crucial initial phase of the response would have benefited the rescue and firefighting efforts.

Mutual aid agreements were very effective at this incident. Communication challenges, limited radio capabilities, and the high volume of traffic hampered the IC's fire ground and triage operations.

Issues regarding manning are a management and collective bargaining fight. Until such time as we get the manning we would like we have to use our resources as smartly as we can. This means no free lancing. Strict adherence to the chain of command and assignments at a fire will be the best use of manpower. Duplication of effort and poor communications will certainly create more problems and cause incident resolution to be prolonged.

Communication is always one of the biggest challenges at incidents. When you factor in mutual aid assignments, it creates even more difficulty. Code use on the radio has by and large gone by the wayside, with the exception of a few safety codes. Clear concise communication, without the use of codes is the acceptable norm now.

Focus of Operations:

Operations should be making the larger, strategic decisions, including who to assign to various groups. Operations should not micromanage specific tactics. Once operations focus turns to specific tactics, he will lose site of the overall incident action plan.

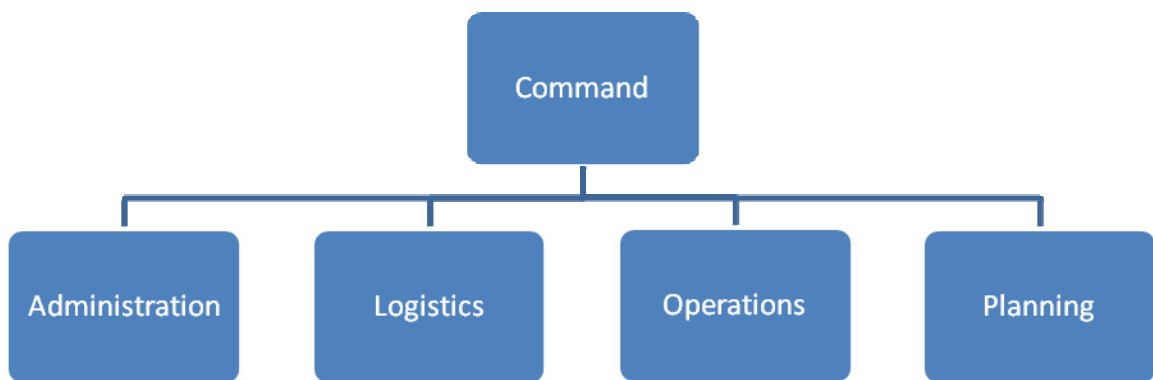
Everyone on the fire ground has a specific assignment, and they should be focusing on their specific assignment. Once focus is lost or those assigned tasks are distracted from, the original objective becomes blurred or lost. Operations must focus on strategic action plans. Sector officers must employ specific tactics. (Coleman, 1997)

At a mass casualty incident, Operations should focus on the extrication, triage, treatment and transportation of the victims. The majority of these tasks will be delegated to other on-scene officers.

A medic should be in charge of triage, treatment and transport. A fire officer should be in charge of extrication efforts.

Operations role is to ensure for Command that the needs of the victims and emergency crews are being met. Command should focus on other scene functions and or delegate them to others. Span of control is what always needs to be kept in mind. Typically the number of people one person can effectively manage is 4-7.

Most large incidents are going to require the establishment of the (IMS) Incident Management System.



Within each of these sections there are various subsections. Each of the subsections carries out different but integral tasks. Again, the importance of span of control cannot be overstated.

Conclusion:

The lessons learned from this tragic fire are that fire safety inspections and code enforcement must be a priority within our fire department organization. In this paper I have shown how the lack of follow up and documentation can lead to disaster. The untreated polyurethane foam was never approved for use in the Station.

Inspections previous to the incident never mandated The Station to remove the foam either. The pyrotechnics that ignited the polyurethane foam were never approved by the fire department. The town and the state both had no documentation whatsoever, which showed prior approval of either the untreated polyurethane foam or the pyrotechnics used in the show.

We, as an organization, must know our district. We must keep our district safe. Never lose sight of the fact that we are the first line of defense. By maintaining quality fire safety inspections and enforcing codes to our limit authorized, we can impact the community in ways that will never be known because we have prevented disaster.

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