Aquinas Hall to Seton Hall
The University of Massachusetts at Amherst Fire Safety Journey
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Abstract
In the early morning hours of December 13, 1977, a fire broke out in Aquinas Hall, a residence hall on the campus of Providence College in Providence, Rhode Island. This fire resulted in the deaths of ten (10) co-eds that lived on the fourth floor of this five-story residence. Over two decades later in the early hours of January 19, 2000, a fire erupted at Boland Hall on the campus of Seton Hall University in South Orange, New Jersey killing three students and injuring fifty-eight (58) others. The reaction to the 1977 Aquinas Hall fire included a call for improved nation-wide campus residential fire safety measures including expanded use of early warning alarms and fire suppression systems. It was a wake up call with an “attention half-life” of unknown duration but it did serve to garner administrative support for instituting a more formalized and better-funded fire safety program at the University of Massachusetts [UMass] Amherst campus. This paper explores some of the fire safety measures that have been implemented at UMass since 1977 and considers how the tragedy at Seton Hall is also having an immediate and perhaps longer lasting impact. The author encourages fire safety professionals to use this opportunity to work together to bring the message that this tragic loss of life that has occurred on campuses across this nation can and must be prevented. The question to be asked is “could a fire scenario like this happen on your campus and if so what are you doing about it?”

Introduction:
The author started his career as the director of Environmental Health and Safety [EH&S] at the University of Massachusetts [UMass] Amherst campus in 1975. He graduated from UMass and was excited about the prospect of heading the safety and health effort at
his alma mater. In retrospect he had little insight into the challenges that he would face in applying his industry based skills and knowledge to a university based EH&S program. In 1975 UMass housed about 12,000 students in 41 residence halls. In addition, UMass operated 41 apartment buildings with a total of 397 apartments. The structures, totaling over 3 million gross square feet of floor space, vary considerably in construction and fire protection capability as a result of the prevailing building codes in effect at the time of construction. No new residence halls have been constructed since 1975 and the on-campus residential population today remains about the same. The UMass population in total, including students, faculty and staff, is about 32,000. In 1975 the EH&S program was part of Vice Chancellor for Student Affairs University Health Services’ operation and had a staff of seven (7) full time staff including two full time staff assigned fire safety responsibilities and a budget of about $100,000. The responsibilities of this group ran the full gamut of EH&S tasks including radiation, environmental health, hazardous waste, lab safety, general safety and fire safety. Today the EH&S program reports to the Vice Chancellor for Administration and Finance and includes a staff of 28 with a budget of about $1.6 million.

The 1977 UMass Situation

During the first two years as directors most time was devoted to the identification of health and safety risks and developing plans to prioritize and begin to develop a strategy to address these needs. Three areas of greatest need were identified early on. These included: (1) compliance with Nuclear Regulatory Commission requirements; (2) proper disposal of accumulated hazardous waste; and (3) fire safety in our residence halls. Of these by far the greatest risk to the campus was the possibility of a fatal fire. UMass had 8 hi-rise residence hall including five that were 17-stories high. None of these or any of the other residences were equipped with full suppression systems. Some buildings have sprinkler heads in trash rooms or similar hi-hazard areas. None of the structures had smoke detection but all were equipped with fire alarm systems, some of which were local alarms. There was no standard fire alarm evacuation signal and there was a serious problem with false alarms. In addition there was a poor working relationship between the local fire department and the EH&S fire safety staff. EH&S had limited ability to affect
change and did not have the needed visibility and credibility with the campus leadership. Many of the buildings were still equipped with soda-acid extinguishes. Fire drills were not conducted on a regular basis and when conducted many of the residents refused to evacuate. Suffice to say this was a critical situation that needed immediate attention. Could anything of substance be accomplished under the leadership of this new director if seemingly no one else in authority had the same sense of urgency?

The Initial Approach

It is important to acknowledge limitations and to seek out assistance from others and the director sought outside help. Three important players entered into the breach to contribute their fire safety expertise. The first was John Fresina, Director of Safety, at MIT who was active in both the Campus Safety Association [CSA] and the National Fire Protection Association [NFPA]. John was a major proponent of sprinkler systems on his campus and his fire safety philosophy became a mantra for the UMass EH&S fire safety program. The second key player was Gene Dimmick, Director of Life Safety at Cornell University. Gene not only invited the UMass director to Ithaca to view what was considered to be perhaps the best campus fire safety program in the country but he also conducted a brief but critical consultative review of the UMass program. His guidance was an important element in formulating the UMass approach. A third fire safety giant that assisted was Rexford Wilson from FirePro. At that time Rex and his colleagues from WPI were on the forefront of developing systems for systematically evaluating the fire safety risk of buildings. Rex was involved in developing probability models that would predict the potential for a fire going from “established” ignition to full room involvement and beyond. This technology was applied to the 41 residence halls and it resulted in assigning the highest fire risk ranking to the lower rise building with wooden roof trusses and no attic fire stopping and a lower risk ranking to our high rise concrete structures. This critical review of the UMass residential fire safety needs culminated in a comprehensive report being submitted to the campus administration in December 1977 in the hope that this report would educate, garner support and most importantly begin a process of improving the level of fire safety in our residences. Little did we know how the receptivity of this report would be tied to an event on December 13, 1977.
In the early-morning hours of December 13, 1977, a fire broke out at Aquinas Hall, a
dormitory at Providence College in Providence Rhode Island. This fire resulted in the
deaths of ten female students who were residents of the fourth floor. Built in 1938,
Aquinas Hall was a U-shaped building of mixed constructions. There were three
enclosed stairways. Dead-end corridors approximately 61 feet long existed at each end of
the dormitory. Room doors were wood composite; some of them had air transfer grills
located approximately five feet from the floor. Doors were not self-closing. The transfer
grills were made of combustible pressed board with holes in it. Hot-air supply ducts
provided heat for the rooms and the return air grills were located in the corridors.
Aquinas Hall had a fire alarm system that consisted of manual pull stations, three heat
detectors and interior alarm horns. There were no smoke detectors or automatic
sprinklers in the building. Portable fire extinguishers were provided on each floor in the
corridors. For the 1977 Christmas holiday, a decoration contest was being held for both
the corridor and individual room decorations. Crepe paper covered walls and ceilings,
providing continuous fuel essentially for the entire length of the corridors. The fire
apparently broke out in the closet of a room on the fourth floor. Three women in the
room awoke when the fire was developing and went to the window. They opened the
window and two of the women jumped as the fire apparatus was arriving on the scene.
Both died of injuries. The third student waited and was successfully rescued by ladder.
The fire was able to spread into the corridor through the combustible transfer grill in the
closed door. Highly combustible Christmas decorations became ignited, and the fire
spread down the corridor in both directions. The room of origin and the corridor were the
only areas that received direct flame and heat damage. Four students died of smoke
inhalation and four others died from burns.

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1 David P Demers, “Ten Students Die in Providence College Dormitory Fire,” Fire Journal, Vol. 72, No. 4
The UMass Reaction

The heat Providence College fire was figuratively felt across the nation and the most common questioned being asked by campus leadership was: “could this happen here?”

The fire safety improvement report submitted to the campus leadership took on best reader status. It was a classical example of the “teachable moment.” The report was summarized and published in the *Fire Journal* as a companion article to the NFPA Providence College fire investigation report.² The first step taken at UMass was to install single-station smoke detectors in all student rooms before the students returned for the spring semester. It was decided to use 110 volt powered photoelectric detectors that were plugged directly into a room outlet. Battery powered detectors were not used due to the possibility of battery removal by students and photo-electric were considered superior to ionization detectors for detecting smoldering fires and less prone to nuisance alarms. There also was a concern that students would be concerned about having a “radioactive” ionization detector in their room. The plan was to initially plug in these units to get them installed quickly and then the following summer to hard-wire the units. A number of other “engineering” steps were initiated over the next several years but the installation of these single station units was the first and perhaps the most cost-effective fire safety measure taken. Along with acquiring unequivocal support for our proposal for increased fire safety measures the EH&S staff increased from seven (7) staff members in 1975 to nineteen (19) in 1977. Another event that occurred just prior to the Providence College fire was the hiring of a new Fire and Safety Officer who also served as the Deputy Chief of the Amherst Fire Department [AFD] Call force. This substantially improved relations between AFD and EHS [this person has since left the University to become the AFD Chief]. The report to the administration called for more resources in the areas of education, emergency planning, inspection and testing services, and an on-going review of the residential protection needs. Unannounced planned full evacuation drills were instituted each semester in every residential building and false alarm evacuations were not substituted for the planned drill. The Student Fire and First Aid Unit was reactivated and assisted in the evacuation drills. Statistics were maintained that demonstrated that

over the next few years there was a decrease in evacuation times and overall increase in percent evacuation. In addition a more formal inspection and testing service was instituted with deficiencies noted and a tracking system put in place to assure corrective action. A comprehensive testing system of all fire prevention equipment including fire extinguishers, fire alarm systems, automatic suppression systems and fire pumps was more formally instituted. A two-way radio system was installed so that all staff could be immediately contacted and the testing and inspection services could be better coordinated. The fire protection recommendations identified in the evaluation report, in addition to the installation of single-station smoke detectors, included: central fire alarm monitoring of all dormitories, early-warning fire detection and alarm systems, smoke control systems in high-rise structures, standpipe systems in dormitories not presently so equipped, proper fire stopping in attic areas, limited sprinkler protection in attic and below-grade levels, sprinkler systems incorporating existing standpipes in high-rise structures, and, ultimately, sprinkler systems in all structures. At the time that these recommendations were the result of code violations. Implementation of these recommendations would be strictly on a voluntary basis, recognizing that most building codes and fire prevention regulations are considered in many respects to be minimum requirements.

It could be argued that the steps taken after the Providence College fire would have taken place purely as a result of the report that had been previously submitted to the administration. That may very well be the case but certainly the tragedy of that fire did provide additional impetus and urgency to the recommendations. There has been considerable progress made in fire safety improvements at UMass in the twenty-three years since that tragic fire. The momentum of the 1977 program recommendations carried on for several years and probably today very few on campus are even aware of the fire or how we got to where the fire safety program is today. We currently operate a comprehensive fire safety program that includes twenty-four hour coverage. The campus has made a number of fire protection improvements including the installation of new fire alarm systems including single-station and system smoke detectors in all residences. All high-rise building have new full automatic sprinkler systems and all elevators have new
fireman recall provisions. Also as a result of an architectural acoustics research project undertaken by the director it was determined that corridor-based fire alarm devices do not consistently provide the needed audibility in the sleeping areas. A minimum goal of 75 decibels at the ear is necessary to provide adequate awakening potential. The most practical way to achieve this goal is to incorporate room-based audible devices. Room-based audible alarms are now part of every residential fire alarm system. As we entered the new millennium we felt comfortable with our fire safety program. We were concerned about the fire safety measures in our fraternities particularly after the May 12, 1996, UNC Phi Gamma Delta fraternity fire that claimed the lives of five students. However, like many campuses our fraternities are privately owned and under the jurisdiction of the local fire department and building inspector. Then it happened again on January 19, 2000 on a campus of another private catholic college in South Orange, New Jersey.

The Seton Hall Fire:
On January 19, 2000, three students were killed and 58 injured in a blaze that began in the third floor commons area of the six-story Boland residence hall at the Seton Hall University. When firefighters arrived, they found two people dead in the commons area. The third victim was found in a room down the hall but could not be revived. The fire was contained to the common area and was quickly extinguished, but smoke and heat traveled through the dorm, which houses 600 students. The building was not equipped with sprinklers because the building pre-dated the 1984 law requiring them. The building was plagued by false alarms with in that there were 18 false alarms at the building since September 1999. There is an ironic connection between Providence College and Seton Hall. When the 1977 Aquinas Hall fire occurred at Providence College the President was Monsignor Peterson. Monsignor Peterson in 1990 became the chancellor of the Seton Hall and on the day of the fire he was set to announce his retirement. The resignation was placed on hold following the Wednesday morning fire. In addition at the time Seton Hall had two of their six residence halls not equipped with full sprinkler systems, Boland hall and Aquinas hall. In the wake of the fatal fire, a Seton Hall spokesperson stated that
the University will do “anything and everything” to improve fire safety at the school, including installing sprinkler systems in dorms that do not require them.

Seton Hall Reaction
There is a predictable outcry at the local, state and federal levels when a tragedy of this magnitude happens. The state of Massachusetts has filed legislation that, if enacted, will provide $100 million to install sprinklers in all public dormitories. Currently at UMass approximately 40 percent of the students live in buildings equipped with full automatic sprinkler systems. Several from the local media have contacted UMass and inquired about our fire safety program in light of the Seton fire. Following the fraternity fire in Chapel Hill, North Carolina on May 12, 1996, with five fatalities and three student injuries the Chapel Hill Town Council enacted fire prevention ordinances requiring the installation of automatic sprinkler systems. All existing fraternity or sorority houses must be retrofitted with full sprinkler protection within five years. In response to the Seton Hall fire Governor Christie Whitman of New Jersey has filed legislation requiring sprinklers in all state dormitories. North Carolina and New Jersey Senators have introduced the College Fire Prevention Act (Senate Bill 2100) to help put sprinklers in student dormitories and in fraternity and sorority houses. The legislation would make matching grants of $100 million in each of the next five years for colleges and universities to install sprinkler systems in student housing. The measure has the College Parents of America organization (http://www.collegeparents.org). Other bills introduced such as Senate Bill 2179 titled the Campus Fire Safety Right to Know Act would require that colleges and universities “disclose to students and their parents the incidents of fires in dormitories and their plans to reduce fire safety hazards in dormitories, to require the USFA to establish fire safety standards for dormitories, and for other purposes.”

Conclusion:
Fatal fires have occurred with alarming regularity in college and university residence halls and in fraternities. The reaction to these fires has a ripple effect of unknown magnitude and duration. The Providence College fire was a definite motivating factor in moving forward with improved fire safety measures at UMass. In the twenty-three
The intervening years between the Providence College fire and the Seton Hall fire all elements of the UMass fire safety program in the forty-one residence halls has improved. The four elements captured by the acronym “PODS” as described in the fire safety guidance document for campus housing administrators\(^3\) have served as the cornerstone for these efforts. This includes Prevention, Occupant Awareness and training, Detection and alarm, and Suppression. UMass has moved from having no residences with full automatic sprinkler systems to having over 40 percent of our students in fully protected structures. EH&S moved from two full time fire staff to a staff of nine and instituted a 24-hour fire safety presence on campus. EH&S fire safety resources include needed emergency response equipment including vehicles, air monitoring, communication devices and personal protective equipment. EH&S has a formal public education program and formal inspection and evacuation drill procedures. A formal EH&S fire safety review process has been instituted which includes EH&S sign-off approval. EH&S fire safety program staffing level has increased from two full time staff to a staff of nine. All residential facilities have early warning systems including room-based audible alarm devices that are centrally monitored. The current local fire chief had worked in EH&S for 18 years as manager of fire safety services so he is well versed in the program operations. The current EH&S fire safety manager also serves as the deputy chief of the local fire department volunteer call force. There is also a forty member student run fire and first aid group operating out of the EH&S office that covers details of public assembly and emergency medical services.

Dr. John Byran from the University of Maryland studied 15 fires from 1967 to 1996 that resulted in 44 reported fatalities and 143 injuries.\(^4\) He noted from this data that “the occupant behavior activities of incendiary fire setting, cooking and smoking appear to be the primary causes of student housing fires, with alcohol consumption being a significant factor.” His study included Providence College fire but not Seton Hall and he noted that major fires have resulted in jurisdictions rapidly enacting requirements mandating the retroactive installation of sprinkler systems. Out of the ashes of these fires has risen

improved fire safety measures. In the journey for fire safety improvements there is no finish line and, although UMass and other colleges and universities have made significant strides forward, much has yet to be done.

Toolbox Resources Material

The following materials are described at: http://www.usaf.fema.gov/safety/college.htm

Get out and Stay Alive [video and training kit]
College Fire Safety Forum: Final Report
Fire Safe Student Housing: A Guide for Campus Administrators
Fire Safety 101: A Factsheet for Colleges and Universities

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