A Burning Consideration

Hey Julia,

Mom said you might switch your engineering major in graduate school. I want you to read my essay on the History and Impact of Automated Sprinklers because there might be a career consideration in it for you. This is what I've completed so far.

In America perforated pipe fire sprinkler systems existed in textile mills from 1852, but it wasn't until 1874 that the first practical automated fire sprinkler system was installed in the Henry S. Parmalee piano factory in New Haven, Connecticut. Parmalee, however, did not hold the first patent; that was issued in 1872 to Philip W. Pratt of Abington Massachusetts. Parmalee's contribution was his improved automatic perforated sprinkler head which utilized valves held closed against water pressure by a heavy spring made of low fusing metal that would melt at 165 degrees F. [5,9]. Further improvement of the sprinkler head is attributed to Fredrick Grinnell, owner of the Providence Steam and Gas Pipe Company in Rhode Island. His 1882 design severed direct contact of the soldered metal joints with water by seating a valve in the center of a flexible diaphragm which moved outward by water pressure causing the soldered joint to break [12]. To alleviate false alarms caused by fluctuating water pressure variations in the main water supply pipe, a variable pressure alarm valve was invented by John Tyler. In 1900, Edward H. Kirkby developed an automatic clock work fire brigade alarm transmitter which would notify the nearest fire station [7]. Now, automatic sprinkler systems could detect, control, and report a fire.

By 1895, the sprinkler community had various recognized standards which dealt with the installation of automatic sprinkler systems. A quest for a national standard fire code system ensued and in 1896, the National Fire Protection Association was formed to administrate sprinklers. The original organizations in NFPA included various insurance agencies involved in fire, water, and electricity safety. Later, other non-insurance members were given Associate membership [5].

The early twentieth century saw further technological and regulatory advances. After the 1903 Iroquois Theater Fire in Chicago, Illinois, automatic fire sprinklers along with other building code requirements were made mandatory. And so the fire protection industry evolved: a major fire, then, new regulations and equipment. By the 1940's, sprinklers were almost exclusively installed in commercial buildings, because owners could usually recover the expense through reduced insurance premiums [4]. After the Beverly Hills Supper Club fire in 1977, building codes for newly built public-gathering locations such as hospitals, schools, and theaters mandated installation of automatic fire sprinkler systems, not only to protect the buildings, but also the occupants [2]. The private sector, since the second half of the twentieth century, installed smoke detectors and some people believe they are adequately protected. However, close to 4,000 people die each year (mostly in residential fires), many more are injured, and billions of dollars of real estate are destroyed [6]. Now, the focus for NFPA , the American Fire Sprinkler

Association, Congress, and state and local officials is to save lives and property by implementing reform in residential fire sprinkler system requirements and by educating the public about automatic fire sprinkler systems. Progress on House Regulation 1824, the Fire Sprinkler Incentive Act of 2003 to present (concerning a tax incentive five–year depreciation schedule) is still in committee, but more and more legislative support is occurring each month [6,10]. This May in Rochester, New York, local building and fire officials attending the International Code Council Final Action Hearing will have the opportunity to "vote to modify the International Residential Code to require fire sprinklers in all residential structures." [6]

Hi Lisa,

Great job. What kind of things should the public know about automated sprinklers, and what is being done for us college kids?

Hey Julia,

The public needs to know that automated fire sprinkler systems have proven themselves to be highly effective in controlling fires and they need to know how sprinklers work. There are basically two categories, commercial and residential, and four sprinkler systems: wet pipe system, extensively used in businesses and in housing; dry pipe system, used in unheated spaces; pre-action system, used in places housing valuable items; and deluge system, used with foam or water in hazardous areas where fires spread rapidly. The basic goal of automated fire sprinklers is to immediately control a fire at the point of origin; thus, each sprinkler head acts independently of each other (except in the deluge system) because of temperature activation sensitivity, usually 165 degrees F. Each sprinkler head discharges 23 gallons per minute versus 250 gallons per minute from a fire department's hose. This means much less water damage and much more accurate placement of the water which is determined by an area and density method and other needed calculations done by a certified sprinkler system design Technologists. Cost of a sprinkler system ranges from $2.00 to $10.00 or more per square foot for specialty systems, or in layman terms, about the same cost per square foot of carpeting a house [1,3].

You are right to be concerned about fire safety on college campuses as 94 students have died in fires, mostly in off-campus and Greek housing beginning in January 2000. Since the Seton Hall University fire in 2000, HR 295 passed and September is recognized as Campus Safety Month. Also, the College Fire Prevention Act will provide $100 million a year for five years in matching grants for the installation of sprinklers in residence halls and Greek housing. Then, the Collegiate Housing and Infrastructure Act will allow contributions for physical upgrades to Greek housing to be tax deductible [6].

Hi Lisa,

It is reassuring to know that college campuses are becoming safer from fires. Is the Technologist job what you had in mind for me?

Hey Julia,

With the advent of new regulations and increased demand for automatic sprinkler systems, various employment opportunities exist, such as, fire sprinkler contractor, fire sprinkler designer, sales representatives, fire sprinkler fitters, and inspectors. However, the profession that might interest you is a fire protection engineer. This field is facing a three to one ratio in demand

to supply; hence, median income, including bonuses, was $92,000 in 2005. The three schools you might look into are: Oklahoma State University, University of Maryland, and Worcester Polytechnic Institute. In the meanwhile, take a fire chemistry class and see if this is a field you would consider [1,8]

Well Julia, I learned that installing automated fire sprinklers in commercial buildings may have begun over a hundred thirty years ago, but the field is still wide open for residential protection. America can improve on its fire safety record by decreasing loss of life and property through automated fire sprinkler systems. Maybe someday, you too, could be a part of the fire protection industry.

Stay safe,
Lisa

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