

TOOLBOX TALKS

FENWAY AT 100

(Partial Article, see NFPA Journal®, July/August 2012 for full article)

By Steven A. Adelman

At 100 years of age, Fenway is the nation's oldest professional sports stadium currently in use & the smallest stadium in Major League Baseball (MLB). While not perfect, its recent improvements have made it remarkably compliant with NFPA codes regarding life safety, fire alarms, sprinkler systems, & emergency messaging. Over the past decade, the team has spent an estimated \$285 million on improvements to the stadium.

A ballpark is born: Fenway Park opened during a grim era for safety in public buildings. In 1903, the Iroquois Theater fire in Chicago left 602 people dead. In 1908, the Rhoades Opera House fire in Boyertown, Pennsylvania killed 170 people. The same year, 175 people, mostly children, died in a fire at Lakeview Grammar School in Collinwood, Ohio. A year before Fenway Park admitted its first patrons, 146 garment workers died from fire, smoke, or jumping to their deaths during the infamous Triangle Waist Co. fire in New York City. Until that time, the prevailing ethos was to create buildings that could withstand fire, but little consideration was given to the safety of people inside those buildings if a fire actually broke out.

By the time Fenway opened, significant steps to support life safety as a worthwhile goal of codes & standards had already been taken. At NFPA's annual meeting in May of 1912, a new document, "Suggestions for the Organization & Execution of Fire Drills in Factories, Schools, Department Stores & Theatres," was approved for adoption by members, marking NFPA's entry into the realm of occupant & life safety. In 1913, the first NFPA Committee on Safety to Life was formed, which led to the development of NFPA's original Building Exits Code in 1927, the precursor to the modern Life Safety Code. Even as the emergence of steel, masonry, & concrete signaled a new safety consciousness among owners of stadiums & other buildings, wood construction was still in abundance; Fenway used hundreds of thousands of pieces of lumber to support the concrete framing, as well as in the centerfield bleachers, right field pavilion, outfield fences, & the 11,700 temporary wooden outfield seats added in anticipation of the Red Sox playing in the "World's Series" in 1912, which they did, beating the New York Giants.

In the 1930s, especially after the rebuilding effort undertaken following the fire of 1934, Fenway began to take on its modern profile. Its seating capacity was about 35,000, with grandstand seats made of solid oak, some of which remain in use to this day. A 37-foot-high left-field wall made of sheet metal replaced the original structure, a wooden fence that had been built atop an earthen embankment. A high-tech scoreboard was added that included lights to indicate the number of balls & strikes. The ballpark was painted "Dartmouth Green," which remains its signature color. At Fenway, the field's small dimensions allowed fans to sit particularly close to the action, resulting in occasional injuries. Before the 1936 season, the Red Sox added baseball's first screen behind home plate to protect fans from foul balls. The team also added a 23-foot-high net above the left-field wall to protect pedestrians & property on Lansdowne Street, which ran immediately behind the wall, from well-struck balls flying out of the park. Improvements continued over the years. In 1947, the team became the 14th of 16 major league teams to install lights. The first electronic scoreboard was installed in 1962, & a larger message board over the center field bleachers was added in 1976. The first elevator was installed in 1983, which represented a small step towards becoming an accessible building in the era before the 1990 Americans with Disabilities Act, to which NFPA 101 substantially conformed in 1994. It also allowed ballpark management to consider the appropriate use of elevators in Fenway's emergency plans, as required by the Life Safety Code.

A new emphasis on life safety: All of those changes pale in comparison to what has occurred at Fenway since 2002, however, when new ownership brought its own vision of a modern ballpark. **If the occasional upgrade during most of Fenway's first 90 years was like a Tim Wakefield knuckleball meandering towards the plate,**

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then the speed & scope of renovations over the last 10 years more closely resembled a Pedro Martinez fastball exploding through the strike zone.

The pressure to modernize intensified in the early 1990s with the opening of Oriole Park at Camden Yards in Baltimore, which represented the leading edge of a wave of new retro-style urban ballparks that featured modern comforts & conveniences within the compact footprint of old-school, baseball-only stadiums. Conditioned to the discomfort & inconvenience of Fenway, I was not prepared for the pleasure of baseball in these new-generation stadiums. When my wife, a Baltimore native, first took me to Camden Yards, I marveled at its wide concourses, grown-up-sized seats, which, unlike Fenway's, all faced towards home plate, & the bright orderliness of Eutaw Street, which had been converted to a vibrant pedestrian walkway between the outfield fence & a beautifully restored old warehouse building behind it. As John Harrington, the team's CEO, told The Boston Globe in 1996, **"We don't really want to leave Fenway Park. The spirits that are there are great. The problem is this 83-year-old stadium has become obsolete."** A "Save Fenway" movement became more vocal, intensifying the bickering & indecision. The organization was in a state of turmoil when the Red Sox were put up for sale in 2001, & one of the overriding questions concerned the new owners' plan for Fenway Park. The sale of the club, for nearly \$700 million, was approved & finalized by MLB in early 2002, & the new owners were adamant that their desire was to save Fenway. Larry Lucchino, the Sox' new president & CEO, who had orchestrated the creation of Camden Yards in a similar role with the Baltimore Orioles a decade earlier. One of Lucchino's first moves with the Red Sox was to hire Janet Marie Smith, the architect with whom he'd worked on Camden Yards, to devise an overall plan to upgrade Fenway. As part of a 10-year plan of off-season improvements, Smith's designers identified a number of conditions that needed improvement at Fenway, including two areas of particular interest to life safety professionals: improving crowd circulation, & updating the ballpark's fire & life safety technology. If any of Fenway Park's pre-2002 designers considered the building's occupant load, such as the Life Safety Code's limit on the number of fixed seats plus any standing-room-only allotments at one person per 7 square feet, it was not apparent, especially in the crush of humanity exiting the ballpark following a game. **Given that the first consideration when preparing an NFPA 101 life safety evaluation is the "nature of the events & the participants & attendees," the fact that Red Sox fans generally stay through the last pitch would seem to be an important issue.**

The first dramatic change for most fans entering Fenway Park came in September 2002 with the creation of the Yawkey Way Concourse. Yawkey Way is the street outside Fenway's main gate, which had always been hopelessly (if fragrantly) congested with fans, sausage-&pepper carts, & guys hawking programs & peanuts. Just as Smith had incorporated Eutaw Street into the ticketed area of Baltimore's Camden Yards, Yawkey Way became a 25,000-square-foot pedestrian concourse with portable turnstiles at either end. This expansion outside the stadium walls allowed the Red Sox to remove a maze of turnstiles inside the building that had resulted in long lines of fans waiting in cramped spaces to show their tickets. From a life safety perspective, the Yawkey Way Concourse was the first major step towards compliance with the Life Safety Code's means of egress requirements, which it addressed in two important respects. First, pushing Fenway's main entrance away from its cramped interior to both ends of an entire street removed the human bottleneck created by turnstiles: "13.2.2.9 No turnstiles or other devices that restrict the movement of persons shall be installed in any assembly occupancy in such a manner as to interfere with required means of egress facilities." Additionally, the new concourse brought Fenway closer to meeting the Life Safety Code's capacity of means of egress requirements, especially regarding main entrance width: "13.2.3.6.1 The main entrance/exit shall be of a width that accommodates one-half of the total occupant load & shall be at the level of exit discharge or shall connect to a stairway or ramp leading to a street."

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In this sense, balancing the requirements for new & existing construction lets designers try to meet the requirements for new construction, with the understanding that meeting the rules for existing construction still offers, in most cases, a significant life safety improvement.

In 2003, a new area dubbed the Big Concourse was introduced, another 25,000-square-foot area that was located beneath the centerfield bleachers & right-field grandstand. Walls were removed between Fenway Park & two abutting buildings, & the concourse, which had been 35 feet wide, was expanded to 65 feet by tearing out old storage rooms & restrooms. The club also installed restrooms in a neighboring building that had been annexed to the stadium. By dramatically expanding pedestrian areas under the outfield seats, the Big Concourse permitted movement through access & egress routes "without undue hindrance" by fans, crowd management, security, & emergency medical personnel, complying with Life Safety Code provisions 13.2.5.4.2 & 13.2.5.4.3.

In August 2003, NFPA issued Tentative Interim Amendments (TIAs) to bolster its requirements for fire sprinklers, crowd management, & main entrance/exit capacity in nightclubs & similar small venues. This was largely in response to a February 20, 2003 fire that killed 100 people at The Station nightclub, located about an hour south of Fenway in West Warwick, Rhode Island. Although the changes were directed specifically at nightclub-type venues, the TIAs for NFPA 101 and NFPA 5000® Building Construction & Safety Code®, underscored the need for all building owners to ensure that patrons could safely exit a venue, even if as many as two-thirds of them try to leave the same way they entered. In compliance with Life Safety Code Chapter 13 regarding existing assembly occupancies, as well as the spirit of the 2003 TIAs, the Red Sox continued to improve access, ingress, & egress at Fenway. In 2006, access near Gate D was improved when the team added a new staircase over the players' parking lot. The next season, a staircase was added from the concourse near Gate A to the top of the grandstand behind third base, as well as a new elevator in left field that served all levels of the ballpark. In 2010, staircases were added behind home plate & from the Gate A concourse to the Lower Third Base concourse. Even seat replacement was done with an eye towards improving ingress & egress. In 2010, the original wooden seats in the left-field grandstand were refurbished & fitted with self-rising mechanisms, making it easier for fans to enter & exit each row.

Information explosion: As the 10-year renovation plan proceeded, it became increasingly important to create a fully integrated fire alarm system. Not only had the Red Sox created a kind of "greater Fenway Park" by moving operations into adjacent buildings, but the walls separating Fenway from some of its neighbors had been removed or altered to create more space, as with the Big Concourse project.

The Red Sox needed a single system for fire safety & crowd management to protect Fenway Park's increasingly complex network of buildings & operations. The club began this integration process before the 2009 season with the installation of an emergency voice/alarm communications (EVAC) network servicing the ballpark & surrounding buildings. In anticipation of the updated 2010 requirements regarding zoned audio for selective paging in NFPA 72®, National Fire Alarm & Signaling Code, Fenway's new network included integrated voice messaging & selective paging throughout the ballpark complex. Consistent with the provisions of NFPA 72, the EVAC system permits authorized users from the Red Sox or the Boston Fire Department to select from hundreds of pre-recorded messages & send them from a command center to any of the connected buildings or tenants. It even allows authorized users to deliver real-time announcements throughout the ballpark, including the playing field. In 2011, three large high-definition video screens were installed, each of which can convey information "as if you were watching on your [TV] at home," according to Jerry Cifarelli, CEO of ANC Sports Enterprises, which installed the screens. The main centerfield screen is 38 feet tall by 100 feet wide.

There is also a new 17-by-100-foot left-centerfield screen & a relatively modest 16-by-30-foot right-field video screen.

The Life Safety Code underscores that building technology & crowd management must be coordinated to ensure occupant safety: "13.4.1.3 Life safety evaluations shall include assessments of both building systems & management features upon which reliance is placed for the safety of facility occupants, & such assessments shall consider scenarios appropriate to the facility." In his 1971 treatise, *Pedestrian Planning & Design*, John J. Fruin defined information as the perception by patrons that causes people to take group action. **He noted that people in a crowd rarely have a broad view of what is happening around them, so unless authoritative information is provided from a reliable source, patrons may act on the speculation of others nearby.** At Fenway, by using the combined informational muscle of the EVAC system & the giant video screens, the Red Sox or city fire officials can now provide tailored information & instructions to the crowd in the event of a fire or other emergency, thereby overcoming the tendency of crowds to move aimlessly in the absence of information.

Fenway Park's life safety upgrades have been made in the shadow of higher-profile projects at the stadium, particularly the addition of seats atop the left-field "Green Monster" wall, but it is difficult to argue that any changes have been more important than those that bring the ballpark into tighter compliance with documents like NFPA 72 or NFPA 101. **The new openness, convenience, & safety features have done no harm to the essential character of the place.**

Transformed by Flame

How the fires of 1926 & 1934 shaped the modern Fenway

In 1912, the NEW Red Sox stadium in the Fenway, while comparatively safer than the old Huntington Avenue Grounds due to the greater use of steel & concrete, was still a fire hazard by modern standards. **The "temporary" wooden bleacher seats added in left field for the 1912 post-season were a case in point: they remained in use for the next 14 years.**

On May 7, 1926, three small fires broke out in those bleachers when trash & paper ignited beneath the wood-frame stands. The fire department did not respond to the fire — fans extinguished the flames themselves. After the game on May 8, however, fire broke out again in the same area. This time, the entire bleachers section was involved, & fire consumed the grandstand roof & surrounding properties. **The fire department responded to this blaze, but it was too late to do any good; the stands were entirely destroyed.** One can only imagine the deaths or injuries that might have occurred if this second fire had begun during the game rather than after the stadium had emptied.

In 1933, a change of ownership brought renewed life to Fenway Park. After the season, new owner Tom Yawkey added steel & concrete stands throughout the ballpark, which were supported by wooden forms during their construction phase. On January 5, 1934, a fire that began in the wooden supports burned for five hours, destroying the new seating areas in left field & center field, as well as most of five other buildings surrounding the ballpark. The next day, The Boston Globe reported that the "conflagration spread with amazing rapidity, sweeping across Lansdowne Street to gut completely two brick structures & seriously damage two others." Miraculously, there were no fatalities reported among the 700 construction workers on the job that day.

It was the depth of the Great Depression, & insurance covered only part of the property damage, but Yawkey was determined to have the stadium ready to go for the upcoming season. **He spent about \$1.25 million in Depression-era dollars, which included hiring additional workers, & finished the reconstruction of the damaged bleachers before Opening Day.**

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