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# **ROBOTIC PARKING SYSTEMS COMPLY WITH THE 2011 EDITION NFPA 88A: STANDARD FOR PARKING STRUCTURES – PART 1**

The 2011 Edition of “NFPA 88A: Standard for Parking Structures” includes for the first time a chapter on Special Structures and covers definitions and requirements for the new genre of parking structures termed “Automated Mechanical Type Parking Structures.”

These new NFPA (National Fire Protection Association) 88A codes ensure parking garages are fire-safe and provide requirements concerning the construction and protection of open and enclosed parking structures, as well as the control of hazards.

Robotic Parking Systems’ CEO was instrumental in getting the needs of the automated parking industry recognized in this key international code, and the company’s automated parking facilities fully comply with NFPA 88A codes.

In the next several blogs I’ll cover various practical applications of the 88A codes in the Robotic Parking System.

NFPA 13 “In-Rack Sprinklers” requires sprinklers about every 130 square feet. In our robotic parking garages, two sprinklers cover each pallet / parking space.

Here are several photos of the sprinkler system in our 800 space car park that opened for operation in 2009.



The Robotic Parking System goes beyond requirements by adopting a water mist foam system used broadly in Europe that actually EXTINGUISHES a fire rather than regular water sprinklers which keep a fire within specific limits over a period of time.

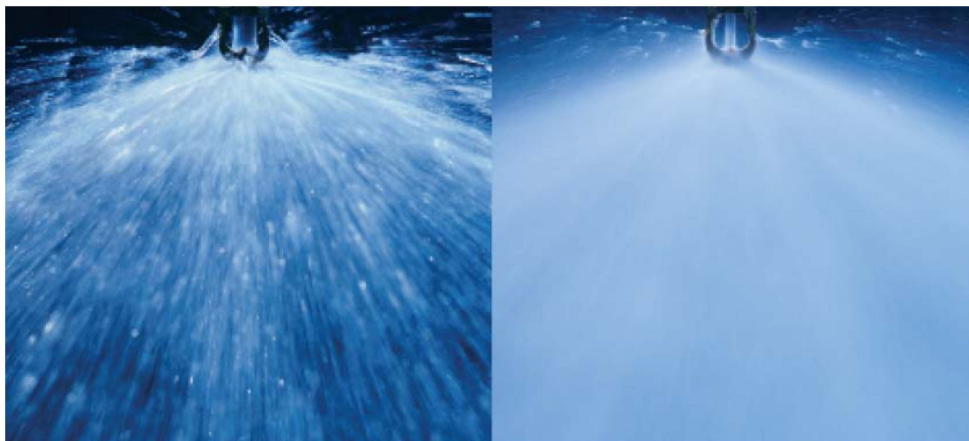
More about this water mist foam system in Part 2.

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# ROBOTIC PARKING SYSTEMS COMPLY WITH THE 2011 EDITION NFPA 88A: STANDARD FOR PARKING STRUCTURES – PART 2

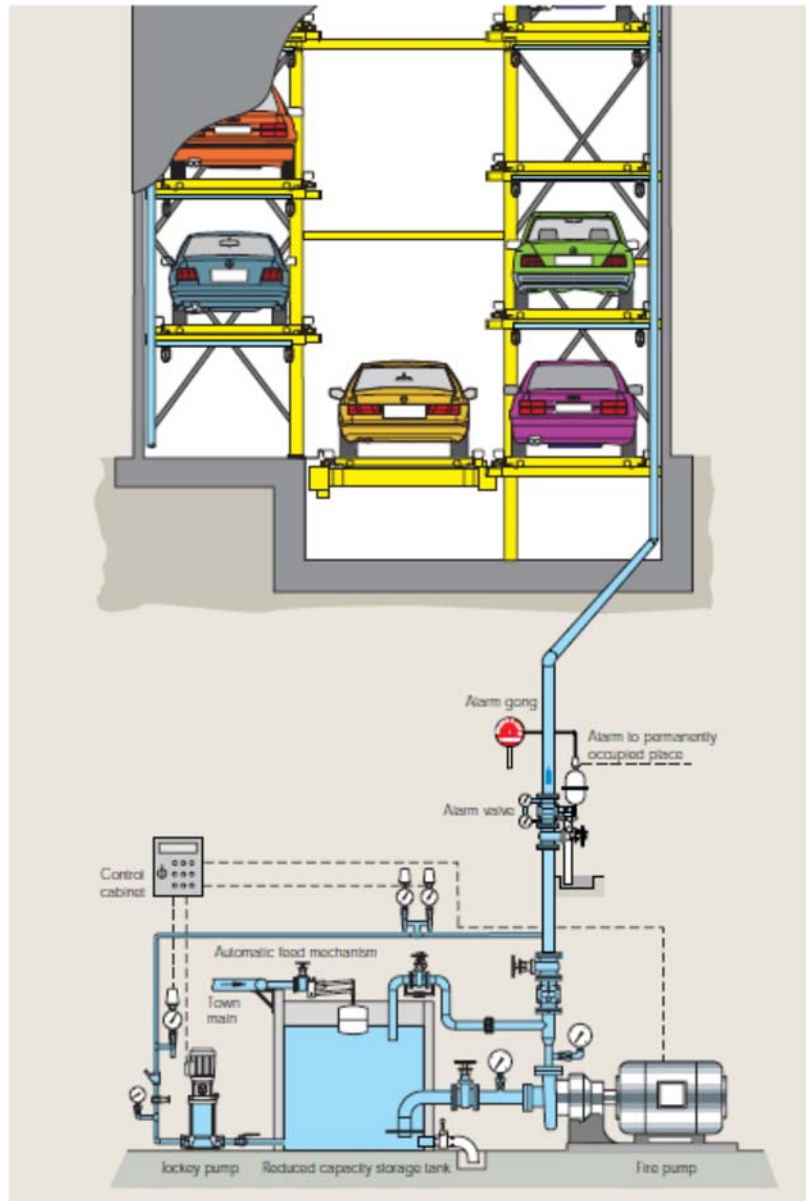
Robotic Parking Systems go a step beyond NFPA 88A code requirements regarding sprinklers in automated parking structures and use a fog of fine water mist with foam additive for fire protection. This system developed in Germany offers increased protection and extinguishing efficiency while reducing potential water damages to vehicles and automation equipment in the facility. The system uses up to 85 percent less water in comparison with a conventional sprinkler system and combines the advantages of a sprinkler system with those of a high-pressure extinguishing system.



*Spray from regular sprinklers compared to the fog of fine water mist foam system.*

Minimax – one company which produces such systems – has over 100 years of experience and has received over 2000 approvals (including UL) for their products in over 20 countries.

This type of fire protection system is used in airports, hospitals, power plants, steel plants, silos and bunkers and more. Water mist foam systems are also used to protect ships and offshore facilities such as oil platforms that require a higher-than-average level of safety due to the special conditions prevailing at sea. In these environments people cannot quickly escape in case of fire and immediate fire fighting help from outside cannot be expected.



*Diagram of a water mist foam system in an automated parking facility.*

The water mist foam extinguishing system offers a very quick response time using only a small amount of water because of the close and aimed arrangement of the specialized sprinklers in the parking area as well as increased pressure. The

technology efficiently exploits the physical properties of water. The extinguishing water and foam is applied through these special nozzles or sprinklers in a fog so that the total surface area of the extinguishing water is multiplied many times. This larger total surface of the extinguishing water and foam allows it to absorb heat, to evaporate more quickly and impede the supply of oxygen to the fire. The cooling and smothering effect allows for particularly effective fire fighting.



*Specialized  
sprinklers for the  
water mist foam  
system.*

Many fire insurers have also recognized the effective fire protection provided by these systems by granting premium discounts.

The major difference between regular sprinklers and the water mist foam system is that regular sprinklers hold the fire until fire fighters can arrive on scene to extinguish the fire. In this case fire fighters must enter the facility to fight the fire and have space to move around. In the case of the fine water mist foam system, the fire is extinguished completely before the fire fighters arrive.

The cost of this water mist foam system is equivalent to a regular sprinkler system.

Part 3 will cover some examples of the application of these types of systems.

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# **ROBOTIC PARKING SYSTEMS COMPLY WITH THE 2011 EDITION NFPA 88A: STANDARD FOR PARKING STRUCTURES – PART 3**

In Part 2 we discussed how water mist foam systems such as those utilized in our Robotic Parking Systems apply extinguishing water and foam in a fog so that the total surface area of the mixture is multiplied many times. The mixture absorbs heat, evaporates more quickly and impedes the supply of oxygen to the fire. The cooling and smothering effect is extremely effective in fire fighting.

Water mist foam systems are used to protect ships and offshore facilities such as oil platforms. Effective fire extinguishing systems are a must at sea where people cannot quickly escape in case of fire and immediate fire fighting help from outside cannot be expected.

Additionally, a key factor for fire extinguishing systems on a ship is minimizing the space and weight of materials and equipment. The water mist foam systems uses up to 85 to 90 percent less water in comparison with a conventional sprinkler system.

Since water mist foam systems came into use there has been only one ship fire on a vessel built after 1995 — the Star Princess.

This Star Princess fire is believed to have been caused by a cigarette left burning on a balcony. The fire became hot enough to melt the highly combustible balcony divides made of polycarbonate, polyurethane deck tiles and the plastic furniture.

Plus, there was no detection or fire suppression system on the balcony.

After installing water mist foam fire suppression systems on ship balconies, there have been ZERO ship fires reported.

This same highly effective system is utilized in our automated parking facilities to extinguish fires before they spread or fire fighters are required on the scene.

Take a look at the photograph shown below.



By using the fine water mist foam system, potential fires are extinguished completely so it becomes unnecessary for fire fighters to enter the building to extinguish the fire.



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# **ROBOTIC PARKING SYSTEMS COMPLY WITH THE 2011 EDITION NFPA 88A: STANDARD FOR PARKING STRUCTURES – PART 4**

### Access

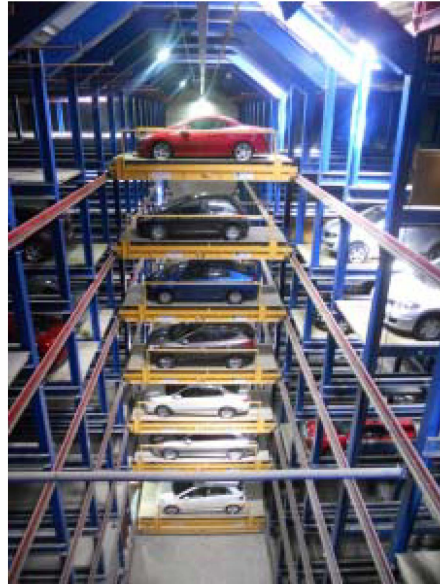
Chapter 9 *Special Structures* of the 2011 Edition NFPA 88A: *Standard for Parking Structures* specifies the access required in an automated parking garage for fire service and maintenance personnel.

Robotic Parking Systems comply with these NFPA regulations including horizontal walkways for access at intervals of 6 meters / 19.5 feet vertically and 30 meters / 98.5 feet horizontally. Stairways, landings, platforms and catwalks provide the required access to fire personnel.

Additionally, as we have discussed in the previous posts in the series, the water mist foam system used in the Robotic Parking System actually extinguishes fires before they spread or fire fighters are required on the scene. This provides an extra layer of safety for both the facility, personal property and fire department personnel.

### Ventilation

Since there are no people or running cars inside the garage, there are lower lighting and ventilation requirements for an automated parking facility. This adds up to increased savings for the developer.



Per the 2011 regulations, the required ventilation in an enclosed automated parking garage is a minimum of 2 ACH (air changes per hour). Conventional parking garages require about 8 to 10 ACH. Openings at the roof and at the bottom of the Robotic Parking System take advantage of the natural chimney effect and provide the required 2 ACH in an above ground facility without further mechanical ventilation equipment. Underground automated parking facilities do require mechanical ventilation but much less than the conventional garages.

This is the last in our series on complying with 2011 NFPA 88A. If you have any additional questions, you can always contact us directly at [info@roboticparking.com](mailto:info@roboticparking.com).

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