

RJA Designs Automatic Sprinkler Systems for Large Bioprocessing Facility

Challenge. When Lonza Biologics Inc., one of the world's leading suppliers to the pharmaceutical, healthcare and life science industries, decided to expand its manufacturing facilities, figuring out how to protect its employees and property was made more complex by the sheer size and diversity of its planned operations.

Build-out plans for its existing site in Portsmouth, New Hampshire, called for a new 280,000-square-foot building, which is much larger than a typical bioprocessing facility. Plus, operations at the facility would cover a great variety of functions and material types, which each require different fire protection strategies.

Hired to provide fire protection engineering services for the project, Rolf Jensen & Associates (RJA) first met with the design team to understand the scope of operations that needed to be protected by fire sprinkler systems. Areas that RJA studied included laboratories, clean manufacturing suites, cold rooms, freezer rooms, warehouse space and other storage areas.

RJA then mapped what processes would occur in each area and the materials and systems that would typically be stored or used there. RJA analyzed the differences between areas of similar function; a storage room with products stacked on pallets, for example, would require different fire protection than a room with products on racks.

Solution. Once RJA compiled that information, consultants developed conceptual sprinkler designs that accounted for zoning and the density of various suppression systems. RJA observed a flow test to confirm the capacity of the building's water supply, which, together with sprinkler requirements from the conceptual design, enabled RJA to size the fire pump for the building.

The consultants wrote a design narrative that justified the use of certain systems and specific code references. In cold storage areas, for example, RJA went with a dry pendant design, which keeps the pipe full of water up until the point at which it enters the cold room or freezer.

The Lonza project did pose several special situations. Lonza didn't want accidental discharge in the process manufacturing area due to the high dollar loss of product if it were to become contaminated. To adequately protect that area while minimizing unnecessary sprinkler operation, RJA did a conceptual design for a pre-action sprinkler system that would only discharge if two detectors activated in a given zone. These sprinklers, RJA determined, would be ideal for the majority of Lonza's bioprocess areas, especially obstructed process tanks on platforms requiring coverage from underneath.

Select areas of the plant would be classified as high hazard occupancies due to their use of flammable liquids. In these areas, RJA planned for extra hazard sprinkler protection with a high level of sprinkler density, per NFPA standards.

Clean rooms also presented a unique fire and life safety challenge. To adhere to high standards of cleanliness, Lonza required stainless steel sprinklers and piping, which is outside the scope of a typical specification. Furthermore, Lonza wanted the pipes to be welded, whereas the code is normally fine with threaded pipe.

Result. Upon completion of the conceptual design process, sprinkler contractors bid to do the final design and installation of the system. RJA worked with the owner's selected contractor throughout installation to make sure the equipment was installed properly. Over the course of a year, RJA consultants were onsite about once a month to do walk-throughs as the system went in. Any deficiencies and corrective actions were noted as needed.

At end of the job, RJA provided an affidavit that certified to the best of its knowledge that the systems were installed according to specifications and code. Through diligent planning and testing, RJA could confirm that the Lonza plant and its people would be protected.



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