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CASE STUDY: AVIATION FIRE SAFETY

Lehigh Valley Airport Becomes First To Switch To Fluorine-Free Foam

Challenge

Transition a new 54,000-square-foot hangar to the use of fluorine-free foam

Solution:

Perimeter Solutions' SOLBERG® RE-HEALING® RF3 3% Class B Foam Concentrate

Fire Safety System

In 2018, the Lehigh Northampton Airport Authority (LNAA) was in the process of building a new 54,000-square-foot hangar designed to accommodate general aviation aircraft, modern corporate jets and helicopters. This $16.3 million facility would be the Authority's eighth bulk hangar at Lehigh Valley International Airport (ABE) and the first new hangar built since 2006. An important component of this project was the implementation of a fire safety system – and the technology and regulations surrounding firefighting foam had changed over those dozen years.

The Authority worked with C&S Companies of Syracuse, NY in developing the engineering plan for the fire safety sprinkler system. Based on the Pennsylvania Uniform Construction Code (UCC) and various NFPA requirements, the system that was developed featured:

- **Two (2) 2,600-gallon horizontal bladder tanks (one main/one spare).**
- **5,200 gallons of a 3% fire suppressant foam concentrate.**
- **Seven (7) proportioners and hardware supplying foam to the overhead sprinklers and hose reels.**
- **Five (5) hose reels located throughout the Hangar for Fire Department use.**

In addition, the original design specified six (6) open head foam deluge systems protecting the hangar space from overhead. All the deluge systems were to be identical in size and layout, with each featuring 90 open pendent sprinklers. The overall design required five of the six systems flowing with two hose reels. The total demand was for 7,856 gallons per minute (gpm) – roughly 1,547 gpm for each of the five systems operating and 120 gpm for two interior hose reels. The system would be connected to the public water system with four 2,500 gpm fire pumps for boosting water pressure. The fire suppressant foam specified for the product was a standard 3% aqueous film-forming foam (AFFF) foam designed for use with hydrocarbon fuels.

Two 2,600 gallon horizontal bladder tanks containing a total of 5,200 gallons of SOLBERG RE-HEALING RF3 3% Fluorine-free foam.

Multiple foam-water deluge systems protecting the entire hangar floor space. Each deluge system protected an area over 9,000 square feet each.

Foam equipment room shown here was constructed to house main and reserve foam tanks, system risers, fire pumps and controls.

Firefighting Foam Selection

While regulations in the United States have not reached the point of banning these materials, the Airport Authority decided to study fluorine-free fire suppressant foams for use in the new hangar to see if it could optimize project operations. Perimeter Solutions recommended its SOLBERG® RE-HEALING® RF3 3% Class B Foam Concentrate, which was introduced to the market in 2010. SOLBERG RE-HEALING foam concentrates are fluorosurfactant, fluoropolymer-free products for use on Class B hydrocarbon fuel fires.

Three questions regarding the use of this technology were examined:

1. **Was the performance adequate to the firefighting task?**
2. **Would these foams work within the systems that were already under design for our hangar?**
3. **Would there be a dramatic cost difference between the two technologies both in required hardware, foam concentrate price, or replacement cost due to product shelf life?**

Addressing the performance and compatibility issues, SOLBERG RE-HEALING RF3 was tested to the performance criteria of UL Standard 162. UL-162 (Foam Equipment and Liquid Concentrates) is a worldwide-recognized standard for testing firefighting foam concentrates. The main difference with other standards for foams is that UL-162 not only describes a fire testing method for foam concentrates but also confirms "compatibility" between all the components that are present in the "chain" from the manufacturing process to the final use of the product; compatibility with drums, proportioning tests, foam quality tests, marking, etc. are subjected to the standard. SOLBERG RE-HEALING RF3 also had extensive UL Listings for bladder tanks, proportioners, foam chambers, foam makers and fire sprinklers – including those specified in the hangar fire suppression design.

From a hardware and foam cost standpoint, the old technology and the new were nearly identical.

Conclusion

The hangar project at ABE was officially completed in July 2020 with the delivery and loading of 5,200 gallons of innovative environmentally sustainable fluorosurfactant and fluoropolymer-free firefighting foam concentrate from Perimeter Solutions.

If you have any further questions on transitioning to fluorine-free firefighting foam in aviation environments, contact your Perimeter Solutions representative.

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FOR MORE INFORMATION

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