Incident response moves beyond ARFF

New aircraft and natural disasters prompt airports to assess their emergency procedures

RAMON LOPEZ

The Aircraft Rescue & Fire Fighting (ARFF) Working Group held its 22nd Annual Conference and Symposium on 26-29 September 2011 in Orlando, Florida.

The event included a presentation on how airports handled evacuated citizens and property from foreign countries in the wake of recent natural disasters, and a debate on the issues that hinder accident response.

Another session described how airport firefighters responded to the most serious A380 accident to date, while other speakers discussed the recently-issued US Federal Aviation Administration (FAA) ARFF vehicle procurement policy, the latest airport co-operative research projects and continuing federal research and development programmes.

On 11 March 2011 a 9.0 magnitude earthquake and tsunami struck Sendai, Japan, the most powerful ever to hit the island nation. The disaster led to the country's worst nuclear crisis as the Fukushima Daiichi nuclear power plant was severely damaged, spreading radioactive material as far as 150 miles (240 km) away. On 18 March, officials at Seattle-Tacoma International Airport were notified that the Pentagon had ordered a repatriation operation for US military dependents living in Japan. Seattle-Tacoma was earmarked to receive the evacuees, with the first charter flight expected to arrive the next day.

The airport mobilised to support 100 military staff, providing them with a makeshift co-ordination centre in a 3,000 ft^2 (280 m^2) auditorium, hard-wired telephones and access to the airport's computer system.

The airport also initiated its incident command system. Port of Seattle staff volunteers assisted with childcare, baggage management, and escorting and feeding. Airport workers created signage for all temporary facilities, managed cleaning services and debris removal, co-ordinated wheelchair

Striking ambition: Oshkosh eyes increased international impact

Oshkosh Airport Products continues to be a major provider of vehicles for aircraft rescue and firefighting (ARFF) and snow removal.

The company, a subsidiary of the Oshkosh Corporation, is the market leader in the US and remains competitive in the international marketplace despite competition from rivals such as Rosenbauer and E-One. All three firms exhibited at the Aircraft Rescue & Fire Fighting Working Group's 22nd Annual Conference & Symposium, held 26-29 September 2011 in Orlando, Florida.

In 2011, Oshkosh Airport Products reported several lucrative contracts in the US and overseas for its equipment, including the latest version of its Striker ARFF vehicle. The company also added a critical piece of firefighting technology to its product line.

Its Striker vehicle was introduced in 2001 with three models having water capacities of 1,500, 3,000 and 4,500 gallons. The less technical, lower-cost vehicles remain available for export in certain overseas markets, such as Mexico and elsewhere in Latin America. They include the 6x6 Striker 3000 and 8x8 Striker 4500 ARFF trucks, both powered by Caterpillar diesel engines.

Rolled out in 2009, the second-generation vehicle is commonly referred to as Global Striker. Jeff Resch, vice president and general manager of Oshkosh Airport Products for the past two years, told *Jane's* that "we wanted to make the second version of Striker a global product that is accepted everywhere, including Asia, Europe, Africa and Latin America. We really feel this product meets all the standards and safety requirements, not only in the US but also in Europe, which also has the highest standards." He added that Oshkosh "just felt it was time for a vehicle upgrade".

Two models of Global Striker are available: a 4x4 vehicle with a gross weight of 62,000 lb (28,122 kg) and a 1,500 gallon water tank and 210 gallon foam tank; and, a 6x6 truck that weighs 87,000 lb, and carries 3,000 and 420 gallons of water and foam respectively. A 700 hp Deutz TCD 2015 16.0 L V8 engine powers each vehicle.

The big driver in development of Global Striker was introduction of stricter emissions standards in the US. Resch said "we wanted the latest, greatest and cleanest engine available in this product, and the Deutz engine was the best fit on emissions, power and performance".

An 8x8 version of Global Striker is on the drawing board. It would carry more water and foam and could require two engines. Resch said there is a niche market among the largest international airports for an 8x8 Global Striker. "The bigger the planes, the more water they want," he added. "An 8x8 Global Striker is a couple [of] years away. We've just started doing preliminary research, and we want to talk to our customers in its development."

Steve Schwartz, the company's product manager for ARFF equipment, said Global Striker has a different body style and incorporates new features that make it more user- friendly for operators and firefighters. Global Striker offers an independent suspension and improved nozzles and turrets. The truck also has a wider footprint for improved stability.

He added that Global Striker offers increased front window visibility and more glass on the side doors. "The cab's layout is more intuitive for the driver and the

These Oshkosh Striker 3000 6x6 vehicles are in use at Shanghai Hongqiao International Airport.

Oshkosh: 1442777

services and provided translators.

Thirteen chartered repatriation flights arrived at Seattle-Tacoma with a total of 2,121 passengers, including 200 children, and 180 pets. Important, care and comfort was to be provided and rapid travel to onward destinations had to be facilitated.

Passengers were separated into three groups: those with military orders and transfer arrangements were prioritised, followed by military dependents with military orders but in need of airline bookings and transfer assistance to their final destinations in the US. The third category had neither military orders nor airline reservations. Some of them lacked passports or enough money to feed themselves.

When the first flight arrived, the military did not have an accurate manifest. It took almost eight hours to process 233 passengers. Processing time for the final flight was reduced to two hours for 182 passengers. In the end, the operation lasted six days, from 19-25 March. Randy Krause, the fire chief at Seattle-Tacoma International, stressed that "preparedness and flexibility are critical when creating an airport emergency plan".

The same was true at Washington Dulles International, according to Russell Kerns, a battalion chief who heads the hazardous materials (HAZMAT) team there. He said that an event on 21 March 2011 "caught us with our pants down".

Two flight attendants who had worked an ANA direct flight from Japan complained of "flu-like symptoms" that wouldn't go away after four days. Medical personnel believed that they were, in fact, suffering from radiation exposure, or worse, contamination, and hit alarm bells. As it turned out, the flight attendants were suffering nothing more than anxiety, Kerns said.

Emergency response notifications were made to fire and rescue departments, emergency medical facilities and federal health authorities in the Washington area. The airport's Level A, Type 1 HAZMAT Response Team was put on full alert, and the airport's radiological portal used to inspect incoming cargo was put to good use. "The incident created quite a stir for the next month," said Kerns.

Extinguishing delays

In June 2011, the FAA published a new Advisorry Circular (AC) 150/5220-10E Guide Specification for Aircraft Rescue and Fire Fighting Vehicles, aimed at operations directors who intend to use Airport Improvement Program (AIP) funding to buy emergency vehicles. It describes the selection process and minimum vehicle requirements established by Federal Regulation Part 139, Certification of Airports. Appendix B describes two types of ARFF vehicle training devices: Aircraft Skin Penetration Device and Computer Based Simulation Training System.

FAA ARFF specialist Marc Tonnacliff

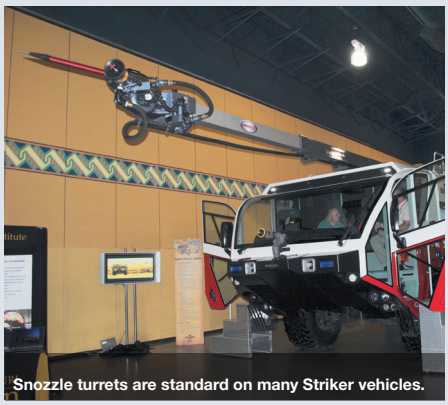
passengers. There are fewer switches and buttons. We put all driver functions on the left side and the firefighting systems on the right side."

Joysticks on the centre console control the bumper turret and the roof turret, fire suppression controls and indicator lighting. Global Strike has twin monitors for firefighting and visibility. The left monitor provides water and foam levels; the right screen is connected to the forward-looking infrared (FLIR) system, backup camera and video recorder. Aside from water and foam, Global Strike also employs dry chemicals and Halotron, a clean fire extinguishing agent.

Other features available on the new-generation Striker include Oshkosh TAK-4 all wheel independent suspension, and a rear steer system to reduce tire wear and improve turning circle.

Resch said Global Striker sales "are what we had anticipated", adding: "We are really happy with the results. We designed it to meet US needs and to be accepted internationally." Singapore Changi has purchased five vehicles. Redmond Municipal Airport in Oregon bought one to supplement a Striker already in service; an airport in Portugal has ordered one and is considering a second; and Oshkosh announced in December that it has sold 10 Global Strikers to Spanish airport operator Aena Aeropuertos for more than EUR5 million (USD). The 6x6 models will be deployed at Madrid Barajas, as well as other major airports throughout the country. Deliveries of the new-generation Strikers to Spain will begin in September 2012.

Resch added that "China has been good for us"



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Snozzle turrets are standard on many Striker vehicles.

and the company has an office there. Another will be opened in Russia and the company is making inroads in India. More than 100 Oshkosh airport vehicles and fire trucks from Pierce Manufacturing (part of Oshkosh Fire & Emergency) were sold in China during the fiscal year ending 30 September 2011.

Resch said "we have the dominant market share in the US and internationally, and we're right there with our friends from Rosenbauer."

Holding onto market share prompted Oshkosh in April 2011 to purchase the Snozzle high-reach extendable turret product line and all related intellectual property from Crash Rescue Equipment Services, of Dallas, Texas. Production will be relocated to the Oshkosh facility in Appleton, Wisconsin – the main assembly plant for Striker ARFF vehicles and the home of Pierce Manufacturing.

In noting that Snozzle turrets are fitted as standard on many Striker ARFF vehicles, Resch said Oshkosh bought the innovative turret to "improve [the vehicle] as regards features, dependability and reliability, and honestly to control our destiny. We look to control this product. We will consider on a case-by-case basis sales to our competitors. Currently, Snozzles are on competing ARFF vehicles. That may not be the case in the future."

Jim Johnson, Oshkosh Corporation executive vice-president and president of the Fire & Emergency segment, said "this acquisition gives Oshkosh Airport Products and Pierce customers exclusivity to the Snozzle high-reach extendable turret".

The Snozzle is not the only high-reach extendable turret available – Rosenbauer offers its Stinger high-reach elevated turret (HRET) to its customers.

Snozzle apparatus is available with a piercing nozzle that can strategically enter an aircraft passenger cabin, cargo compartment or other structure for direct application of firefighting agents. The lightweight, highly flexible extendable turret is able to operate as an elevated water tower through a doorway or over a wing exit without endangering firefighters.

The Snozzle can shoot a full master stream (1,300 litres or more) at ground level, and can reach down to attack fuel spills at the seat of the fire. Sold in 50 ft or 65 ft boom lengths – and single- or dual-nozzle configurations – the Snozzle is available with a tip-mounted FLIR camera that allows the operator to quickly locate and pinpoint the heat source.

discussed the latest developments in technology, techniques and requirements, and outlined ongoing research at the FAA Technical Center of interest to airport firefighters. He also reviewed new Airport Co-operative Research Program projects, including one that will determine how best to integrate community emergency response teams with airport fire and rescue assets. Another project involves management of airports that support the fighting of forest fires and other aerial firefighting. A manual will lay out fuel, fire retardant and water requirements for water bombers and other firefighting aircraft.

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Jack Kreckie, regulatory affairs officer with the ARFF Working Group, said that emergency response for the A380 and other New Large Aircraft is a "hot issue" for his members.

NLA factors

The FAA Airport Technology R&D Branch's Operation of New Large Aircraft (NLA) Research Program is evaluating specialist ARFF vehicles and equipment that are capable of performing multiple tasks at an aircraft incident. The FAA is exploring firefighting strategies and emergency procedures related to the A380 and the B-747-8. Issues such as NLA fuel load, fuel tank locations, double-deck cabin, increased passenger capacity, increased footprint of evacuation slides and thermoplastic composite materials will require research to determine the most effective strategies for ensuring rapid extinguishment, safe evacuation and minimal damage.

NLAs have higher percentages of composites than ever before and research conducted shows that some composite materials sustain significant damage after only 10 seconds of heat exposure. Composite fires tend to be deep-seated (similar to a charcoal fire), continue to smolder internally and require copious amounts of water to fully extinguish. The FAA is investigating what types of agents, application methods and quantities are optimal for quickly extinguishing composite fires.

NLAs have extensive fuel tank networks in centre wing boxes, wings and vertical stabilisers and can carry over 80,000 gallons of fuel. This increased fuel load and multiple locations may affect ARFF services, especially since existing firefighting agent quantity recommendations are based solely on wing tanks.

The added fuel load could contribute to a larger pool fire area and the multiple locations could change the dynamics of effectively attacking three dimensional spray fuel fires. The FAA is focusing research on determining additional hazards and firefighting procedures involving aircraft with unique fuel storage locations.

Ram Brabakaran, a staff officer in the Airport Emergency Service at Singapore Changi, already knows how to deal with A380 mishaps. In November 2010, Qantas Flight 32 departed Changi Airport with 433 passengers and 26 crewmembers on board. It suffered an uncontained failure of the No 2 Rolls-Royce Trent 900 turbofan engine over western Indonesia four minutes after takeoff, forcing the Sydney-bound four-engine A380 back to Changi. The engine cowling had stripped away and there were holes in the wing. There was an engine oil fire that led to release of the intermediate pressure turbine disc. After dumping fuel, it landed safely at Changi with no injuries.

Safely on the ground, firefighters saw that there was no fire but fuel was leaking from the wing. The flight deck crew was unable to shut down the No. 1 engine. Firefighters applied water and foam to stop the powerplant.

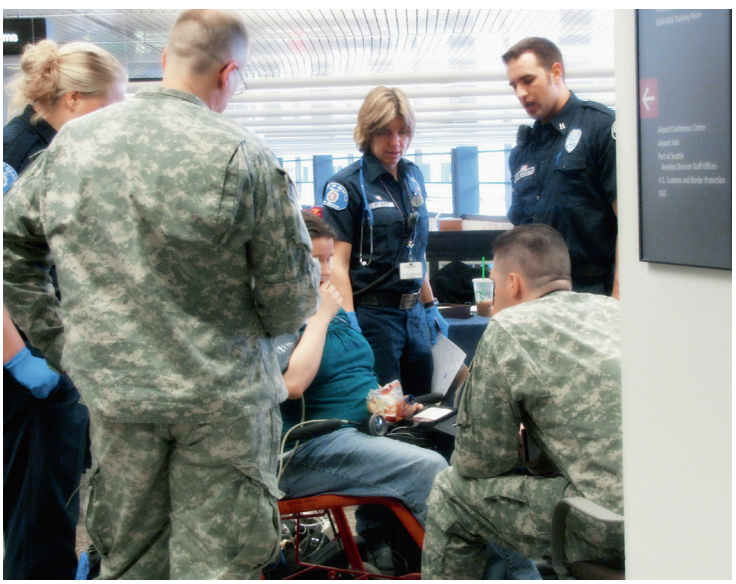
The 16 emergency slides were not used but passenger steps, emergency air stairs and buses were deployed on the starboard side main deck for an orderly evacuation of the 459 passengers and crew that took 75 minutes to complete. The runway was reopened ten hours later. Brabakaran told *Jane's* that "the response would have been much different had the A380 been on fire".

Jack Kreckie, a consultant with ARFF Professional Services, and the ARFF Working Group's regulatory affairs officer, said that the A380 represents a host of safety concerns from the number of emergency slides to the heavy use of composite materials. "The A380 carries more fuel and more people than the older jetliners, but we have not increased our ARFF requirements for them," he told *Jane's*. "This is a hot issue, and more and more airports are being affected by it."

Kreckie moderated a discussion on critical issues hindering accident response at airports, which included the Notice to Captain (NOTOC) book, access to reinforced cockpits and A380 evacuations.

The NOTOC book, which lists the type and location of hazardous materials on board, is often incomplete and is sometimes missing. Cargo aircraft often carry animals and human organs, so responders need to be cautious of any animals carried on board, particularly dangerous ones, and of biohazards such as blood-borne pathogens. Kreckie added that firefighters need to know who is onboard a burning cargo aircraft, saying that the NOTOC book for freighters does not currently include a passenger manifest.

Meanwhile, pass codes are required for easy access to reinforced cockpits. Firefighters need them to rescue incapacitated flight deck crews. "Fire axes and other forcible entry tools will eventually get through those doors, but it takes time," said Kreckie. ■



Port of Seattle: 1442779

Airport emergency teams must not only deal with fires and incidents on the runway, but are also called upon to respond to disasters further afield. Pictured is a scene at Seattle-Tacoma International Airport, which dealt with US citizens evacuated from Japan after the earthquake, tsunami and radiation leak in March 2011.