

EUROPES LARGEST ARFF SIMULATOR OPENS AT MANCHESTER INTERNATIONAL AIRPORT

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Flames engulf a jet as it stands on the ground at Manchester Airport.

But this is no emergency. It is the most advanced aircraft fire training simulator in Europe.

Manchester Airport Fire Service put the £2.6m rig, on display for the first time on November 15th.

We set it ablaze and then put out the flames in a powerful demonstration of our crews skills, watched by colleagues and safety chiefs from around the world. Now we will use it to keep practicing those skills so we can handle all manner of incidents.

CFO Chris Formby, said: "Our fire crews already have tremendous confidence in themselves and their equipment. This simulator gives us a chance to challenge them in a

safe environment and to prepare them for anything they may face in the future. It is a major investment for Manchester Airport and shows how committed it is to passenger safety."

Airport spokesman Andrew Cornish said: "Passenger safety is our utmost priority. The new aircraft fire simulator will allow our 104 firefighters to train in the most realistic environment possible. This training facility has been specifically designed to match the needs of Manchester Airport."

The simulator was handed over during October and on the 15th November 2006 was revealed to colleagues, the press and safety chief's from around the world.

But this latest piece of equipment is not a new fire appliance, lad-

ders, or PPE it's the most advanced aircraft fire training simulator in Europe. The simulator was made by **Simulation TERS in Burton-upon-Trent** and was brought in parts on 21 lorries. It is 40 meters long and is designed to resemble some of the aircraft types that use the airport.

The nose and fuselage represent a Boeing 747 jumbo jet, while one of the wings represents a Boeing 767. The simulator has three decks, rows of metal seats, overhead lockers, a cockpit and even a first class cabin. Our firefighters will be able to practice a large number of scenarios, including small fires in toilet cubicles or the galley to rolling ceiling fires on the main deck.

The simulator burns aviation fuel and gas, making it the first of its kind in Britain. The simulator, was



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HISTORY

The simulator, which has been 6 years in the planning was manufactured and assembled before being numbered, disassembled and stored pending transportation to its new home. During all phases of construction myself and other fire service personnel visited Simulation's Burton-upon-Trent facilities to monitor construction and give feedback on areas of concern. It was evident then that the simulator was going to be a giant. On my first visit to the site the number two engine had already been constructed I originally thought that Simulation had got the measure-

ments wrong this MD11 engine was the same size as our old 737 rig! Of course Simulation had got the scale exact and the true size of the new simulator was apparent.

Ground work on site commenced in Jan 2006 and by mid April 2006 the area was ready for the arrival of the simulator sections. In the space of 3 weeks the sections were transported the 65 miles on 21 lorries and reassembled and the full size of the simulator could then be gauged. It then took 5 months to fully fit out all the internal & external scenarios including the hundreds of meters of gas and kerosene piping for the scenarios, the electrical cabling for lighting, safety systems, pilot ignitions systems, gas and temperature monitoring systems, the ventilation system and the installation of the LPG, Kerosene and Water Deluge systems.

After extensive commissioning by the manufacturer, the Fire Service were finally allowed access to the simulator and for the first time the crews could see the exceptional attention to detail that had been achieved by Simulation.

SIMULATOR DIMENSIONS	
Length	44 Metres (144.6 feet)
Wing Span	25.7 Metres (84.3 feet)
Fuselage Ground Clearance	2.5 Metres (8.2 feet)
Sill Height to Cargo Deck	3.1 Metres (10.7 feet)
Sill Height to Mid Deck	5.3 Metres (17.3 feet)
Sill Height to Top Deck	8.0 Metres (26.2 feet)
Fuselage Height	10.5 Metres (34.4 feet)
Overall Height	13.0 Metres (42.6 feet)
Total Weight	268 Tonnes (590,838.86 pounds)

put through its paces to the astonishment of the gathered dignitaries who responded with a rapturous round of applause. Russian spectator Denis Barbulev said: "What we've seen here today is amazing. It's unbelievable. I've never experienced anything like it. We don't have anything like this in Moscow."

The rig, which is the largest most advanced dual-fuel multi-deck aircraft simulator in Europe, also boasts a phenomenal array of scenarios. Which contains 41 scenarios in total, 29 external and 12 internal.

Speaking at the simulator launch,

Chris Formby, Fire Service General Manager/Chief Fire Officer, said: "Our fire crews already have tremendous confidence in themselves and their equipment. This simulator gives us a chance to challenge them in a safe environment and to prepare them for anything they may face in the future. It is a major investment for Manchester Airport and shows how committed we are to passenger safety."

Airport spokesman Andrew Cornish said: "Passenger safety is our utmost priority. The new aircraft fire simulator will allow our 104 fire-fighters to train in the most realistic environment possible. This training



Below is a list of the features and scenarios available to our Fire Crews.

EXTERNAL FEATURES & SCENARIOS:

- The fuselage section of the simulator is based on a Boeing 747 design.
- The top engine is based on a MD11 design.
- The port wing represents a Boeing 767 wing and undercarriage with a Pratt & Whitney 4062 engine. The engine is positioned on the ground to simulate a collapsed undercarriage/split wing scenario.
- The starboard wing represents a Boeing 747 wing and undercarriage with a General Electric CF6 80C engine.
- The external scenarios are:
 - Port engine combustion chamber, accessory section & exhaust section fires.
 - Port undercarriage brake assembly & Oleo leg fire.
 - Port wing root fire.
 - Port split wing fire.

- Port running fuel fire.
- Starboard undercarriage brake assembly & Oleo leg fire.
- Starboard engine combustion chamber, accessory section & exhaust section fires.
- Starboard wing root fire.
- No 2 engine fire.

All the above external scenarios have dual fuel capability with the exception of the running fuel scenario, which is kerosene only. All scenarios have auto electronic ignition with pilot flame detection, 3-stage intensity control and are controlled from the raised control room with the exercise Oi/c having over-all control via a dead man's switch.

To protect the structure there is a 3 zone water cooling system, which automatically selects the appropriate zone, dependent on the fire scenario selected and is actuated when the scenario pilot is ignited.

The internal scenarios are divided into three decks as follows.

Internal features & scenarios cargo deck: -

- Avionics access via a hatch forward of the nose gear with retractable ladder.
- Front section of the cargo deck fitted with ULD with fire scenario.
- Full size hydraulically operated cargo door with external controls identical to the real article.
- Rear section of cargo deck fitted with seating respective of a Boeing 757 layout.
- 2 x gem smoke machines provide the ability to smoke-log the cargo deck area.

Internal features & scenarios middle deck forward section: -

- Starboard washroom waste bin

fire.

- Economy seating centre front row 4 seat fire.
- Ceiling role over fire in starboard isle.
- Port overhead locker fire.
- 3 x gem smoke machines provide the ability to smoke-log the mid deck area.

INTERNAL FEATURES & SCENARIOS MIDDLE DECK REAR SECTION:

- Economy seating centre front row 2 seat fire.
- Ceiling role over fire in starboard isle.
- Port overhead locker fire.

Internal features & scenarios top deck: -

- Flight deck front instrument panel fire.
- Flight deck overhead instrument panel fire.
- Flight deck rest area bed fire.
- Rear galley fire.
- 2 x gem smoke machines provide the ability to smoke-log the top deck area.

All the above internal scenarios are LPG fueled, have 3-stage intensity control and are controlled from internal touch screen control pendants situated in the location. Realistic counter balanced lockers are fitted to mid and top deck areas.

TRAINING GROUND

In addition to the simulator structure a new infrastructure had to be installed. An extension to the existing training ground was carried out along with modifications to drainage, water and electrical services.



monitor the temperature throughout the simulator and if the preset temperature is reached will automatically switch all scenarios off, switch all lights on, operate the emergency audible warning and the ventilation system to evacuate the simulator of the excessive heat.

If the simulator is being used for external scenarios, the internal temperature monitoring system still monitors the temperature but will not take any action if the presets are reached.

All internal scenarios are controlled by an Instructor with the touch screen control pendant fitted with a dead mans switch and an emergency button. Once the exercise has finished and the run exercise button is released the ventilation fans automatically operate for 30 seconds to ensure that all products of combustion are evacuated from the simulator. The ventilation fans have the ability to clear the simulator from fully smoked to fully clear in approx 60 seconds.

A new elevated control room to house the touch screen control monitors, aviation fuel storage and pumping facilities incorporating a 5,000 litre double bundled storage tank, LPG storage facility of 6 x 4,000 litre pressurized storage vessels which provides LPG for the external and internal scenarios and a 35,000 litre water storage tank and pumping facility which feeds the automatic water deluge system have all had to be incorporated into the overall infrastructure.

if triggered will automatically switch all scenarios off, switch all lights on, operate the emergency audible warning and operate the ventilation system to evacuate the simulator of any gas. When the simulator is not in use and switched to standby mode, the monitoring of the internal conditions is still carried out and if the detectors are triggered the system will switch on and deal with the event before reverting back to standby mode.

Sensors at 1.5m & at ceiling level

BUILT-IN SAFETY MEASURES

All fuselage doors are protected with spring loaded safety gates with audible warning and flashing beacons. All access doors are fitted with a different audible warning and flashing beacons and all are monitored on the control room touch screen computer.

Ventilation fans ensure an air circulation while the simulator is in use with at least 6 air changes per minute. These fans automatically switch off when smoke is produced.

Gas monitors are situated throughout the simulator to detect the presence of any un-burnt LPG and

