ATU Annual Dissemination Event
The challenges that ATU face

11-12-14
Andy Rhoades – Head of Service Protection
For example, on January 10, 1996, a routine capital improvement project caused damage to an electrical cable at Newark International Airport, resulting in more than $1 billion of impacts, including hundreds of canceled and re-routed flights, disruption of travel to tens of thousands of people, and complete closure of the airport for more than 24 hours. This accident was the direct result of not knowing where the electrical cable was located. Unfortunately, this is not an isolated incident. This study found that some major airports experience almost daily utility damages caused by construction activities.

Scott is one of the first people on-site, because his job is to scan every inch for the exact positions of any underground services. Sometimes he discovers cables that don't appear on any plans. So if Scott is uncertain or suspicious, he'll hold-up everything until he's sure we can all carry on safely. "Damaging an airfield service could be a catastrophic, cause the airport to close, and flights to be delayed all around the world."

We’re Heathrow Safe. And proud of it
Would you like to dig here?
Design Example
Design example

Part of Step 9 of Airline moves to enable the closure of T2
Minor works to provide additional baggage stillage
Last part of works was to provide lightning protection
Process was not followed leading to a serious near miss.
Actual

Designer did not take into account buried services when designing baggage stillage.

• There was live fuel mains, fire mains, communication cables and low voltage cables beneath.

Principal Contractor was under pressure to deliver.

Principal Contractor put pressure on their sub contractor who were new to the environment.
Actual

Lightning rod through cathodic bed so structure of baggage stillage becomes sacrificial anode and rusts at accelerated rate.

If not discovered any lightning strike would have been arcing off the Fuel main.

No one briefed subcontractors on requirements, contractor could not understand the drawing, no one on site was qualified to or have right equipment to locate services. At no point did anyone stop and ask.

This was one of 3 incidents that led the Fuel company to stop all works within 6m of a Fuel main across the airport for 2 months.

With 129km of Fuel main across the airport the impact was huge.
Potential

400mm core straight through pressurised Fuel main.

“This would have punched straight through the pressurised pipe and resulted in a jet of fuel up to 150m high at 10,000 – 20,000 ltrs/min….”

Fuel Company

“Fuel would have flowed for 10 minutes, 2 minutes for alarm to be raised, 4 minutes for us to get there, 4 ½ minutes for Fuel to stop flowing after hitting Fuel Stop Buttons and informing Fuel Company Control.”

Airport Fire Service

10 minutes of flow at 10,000 ltrs/min is 1km square at 1cm deep.
Exclusion zone put in by emergency services starts at 500m radius from point of incident.
Potential – 500m radius exclusion zone.
Potential – Storm catchment areas

Any Fuel that fell into the pink will drain to Eastern Outfall, any that falls into the green will go to the Southern Outfall.
Potential

Any Fuel that drains to the Southern outfall can be intercepted at Mayfield Farm.
- Depending on recent rainfall it may be able to be contained there.

Any Fuel that drains into the Eastern outfall will drain under southern runway, through British Airways Technical Block E and into the southern outfall.
- Risk of Fuel vapor into TBE from internal slot drains out of same chamber.
- Such a large amount of Fuel will weir into the reservoir and quickly spread across the surface, potentially making it over the outfall into the river Crane.
- The contamination may be pumped back through the Airport Fire main system from M1/14 Pumping Station as it gets its supply out of this reservoir.

“Such pollution from an incident like this will cost high £100k to low £1m’s to clean up, and will take at least 2 months depending on weather… The prosecution would result in an unlimited fine from the Crown Court.”

Heathrow Environmental
Potential

Such a large amount of Fuel under the southern runway would result in having to close the runway from Block 84/85 stop bar east. This would mean southern runway would be take off only for smaller aircraft. Larger aircraft would need to depart from northern landing runway which would cause large delay and an increase in complaints due to noise because of de-alternation.

Duty Manager Airside

“London Fire Brigade are not equipped to deal with such an incident on the airport, our equipment is designed to deal with an urban environment, we would rely on the Airport Fire Service to lead.”

Heathrow Station Manager LFB
“150m Fuel in the air, 10’s of 1000’s of litres across the ground, that would be airport closed. We are not resourced to deal with that, we would immediately have to down grade airport to CAT 8, very quickly as the lake of Fuel grew we would down grade to a CAT 6, if the Fuel was across a large area we would need our entire resource and that would mean down grading again and we don’t land aircraft here below CAT 6.”

Station Manager Airfield Fire Service
Everyday Example
Everyday example

Any Fuel that fell into the pink will drain to Eastern Outfall, any that falls into the green will go to the Southern Outfall.
Every day example

Any Fuel that fell into the pink will drain to Eastern Outfall, any that falls into the green will go to the Southern Outfall.
BT Strike

Behaviours
Winter of 2010 (Politics)
Begg Report 2011

Heathrow Winter Resilience Enquiry

Report of the
Heathrow Winter Resilience Enquiry
Begg Report 2011

£50 million investment in equipment
Current Snow Base not big enough
Political pressure to be ready for next Snow event
Almost no additional survey down due to time constraints
£8 million pound new Snow Base designed
De-scoped to £5 million to meet November deadline

Design based on known information not survey
Snow Base 1947

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Snow Base 1949

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Snow Base 1951

New Substation
Any Fuel that fell into the pink will drain to Eastern Outfall, any that falls into the green will go to the Southern Outfall.
Snow Base 1973

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Snow Base 1996

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Snow Base 2013

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Snow Base Now

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Why ?
1994 - Out of Crisis Comes Investment

2004 40% of Services mapped to ± 500mm
2014 74% of Services mapped to ± 500mm
117 previously unknown cables discovered
3 buried manholes
6 previously unknown pipes
Project 2 years late
60% over budget
Service Strikes due to poor information.
Any questions?