



# Keeping Heathrow moving through winter

**James Shapland**, the Met Office's Heathrow Operations Manager, explains how the Met Office and Heathrow are working together to ensure the airport runs smoothly during the challenging winter period.

Winter weather offers a particular set of challenges to the efficient and smooth running of an airport, and few operations in the UK can be impacted as much by significant weather events as Heathrow.

Weather disruptions can lead to significant strain on Heathrow and the people who use it, not just in terms of scheduling issues around the arrival and departure of flights, but also on the vast array of associated infrastructure, disruption to passengers and the resourcing of staff.

When it comes to the scheduling of flights, there is very little room for manoeuvre. Whilst airports typically run to 50-60% of runway

capacity, Heathrow runs at 98% capacity every day. This means that what would be smaller issues at other airports across the UK can create bigger scheduling challenges at Heathrow. For example, strong winds that have only a minor impact on flight times at most other airports can create a significant knock-on effect of delays at Heathrow. An aircraft arriving from Frankfurt may have a further four movements scheduled for that day – so this also impacts other major hubs in Europe or the US which are set to be served by that aircraft.

Serious weather events can have a significant impact on Heathrow's operations, so these must be planned for with real

precision to minimise the effect on the airport and its passengers. High snowfall for example requires snow ploughs to clear one runway, therefore only one of Heathrow's two runways can be operational during this process. This essentially more than halves the capacity of Heathrow – but less planning would have an even bigger impact.

It is therefore vital that Heathrow and the Met Office work in close collaboration 24 hours a day to ensure that when impactful weather does occur, appropriate forecast measures are put in place to minimise and manage disruptions. This can only happen with in-depth and detailed planning and coordination.

**Why put aviation meteorologists at Heathrow?**

The Begg Report, commissioned by BAA following a significant snow event in 2010, found that better communications and preparation for bad weather was required at Heathrow. The report advised Heathrow to establish better links with a meteorological organisation to reduce the risk of weather

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impacting scheduling and passenger flow at the airport. The Met Office was asked to fulfil this role and renew our partnership – we had previously worked with Heathrow when Met Office aviation meteorologists were based at the airport in the 1980s. In 2011, a trial of ‘on-site aviation meteorologists’ at Heathrow was conducted and in 2013, Heathrow and the Met Office signed a five year contract for meteorological services.

Five aviation meteorologists are now based onsite, plus myself as Operations



Improvements in communication between Heathrow and the Met Office in recent years include the establishment of five dedicated meteorologists at the airport

Manager, in a newly opened operations centre that sees us working alongside the duty managers at Heathrow and other organisations that provide information to keep the airport operating efficiently. This means our onsite aviation meteorologists are giving first hand, up to the minute advice, which informs

NATS traffic services and the airlines on weather that may affect the airport.

The new Heathrow Airport Operations Centre (APOC) brings together members of each team responsible for running the airport efficiently. This includes forecasting, air traffic control, aircraft and passenger flow managers

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to associated infrastructure teams, such as surrounding motorways and public transport. On a day-to-day basis, our aviation meteorologists continuously advise the airport 24/7 on any weather events that are likely to have an impact. This vital information is then passed on to airlines, so a truly coordinated effort is put into managing and minimising disruption to schedules and ultimately the passengers.

Our short-term forecasts are vital for staff operational planning – frost or snow events will mean that more staff will be required at Heathrow for defrosting purposes. In these cases the Met Office must provide at least 48 hours' notice so Heathrow can arrange call-in staff to manage the implications of poor weather.

The Met Office also advises on conditions such as air temperature, ground temperature, surface winds and winds at 3,000ft. This guidance isn't just for managing runway schedules – high surface winds may mean that items around the terminals may need strapping down for safety purposes, so the

Met Office provides important advice which those responsible for health and safety at Heathrow can act upon.

### Medium and long-range planning

Whilst the Met Office team on the ground at Heathrow provides continuous advice throughout each day, our long-term planning and forecasting plays an equally crucial role. In conjunction with specialist scientists at the Met Office's Exeter headquarters, we produce a three month long-range weather climatology summary which indicates, for example, if weather is set to be warmer, colder or wetter than average for that time of year.

These long-term indications are vital for Heathrow to successfully plan future operations and purchasing decisions. A colder than usual winter will necessitate an increased purchase of grit and de-icing fluid. Equally, the long-term forecast helps Heathrow to plan staff logistical requirements – such as if more staff are likely to be required to deal with issues arising from the weather.

We are also able to help Heathrow plan its

energy usage – a mild start to the winter may mean that heating can be kept off for longer than usual. With one of the largest heating bills in the UK, a mild winter can save Heathrow hundreds of thousands of pounds in energy bills – and of course help the airport to be more environmentally friendly by conserving energy. This all helps with the financial planning of the airport.

The Met Office also provides a more detailed 15 day forecast for which we work closely alongside the European Centre for Medium Range Weather Forecast (ECMWF) as well as international agencies such as MeteoFrance or DWD in Germany. This collaboration allows us to analyse how the Met Office models are performing.

### On Hand to Help

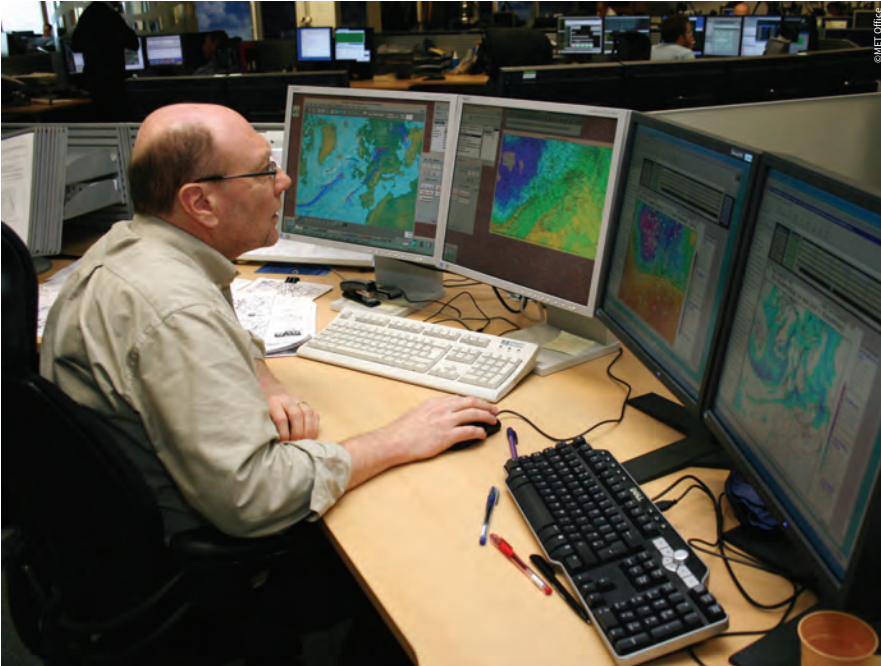
Our forecasting is not only important for Heathrow but also for airlines based at the airport. Giving airlines enough time to cancel flights allows them to adjust schedules and keep passengers informed. When there is a significant event, very close collaboration with the airport and airlines is undertaken. The Heathrow Snow Response Forecast will first highlight the likelihood of snow on the five day forecast. 24 hours before, exact timings for snowfall will be shared which will include how long the snow is expected to persist and how heavily it is set to fall.

***The Met Office is currently investing significant resources into improving fog and low cloud forecasting***

More than 5-10cm of snow in a short period of time will mean specialist snow removal crews will be required, snow clearance vehicles will be prepared and crews need to be advised on what will need doing, when. If snow clearance is required, a schedule will be compiled. The Heathrow Snow Response Forecast is updated 18 hours in advance, 12 hours in advance and then every two hours, to make changes based on the level of snowfall.

Fog is another problematic weather event – and one that provides its own unique set of challenges. Snow's arrival can be easily tracked, but the spatial nature of fog makes it unpredictable, localised and difficult to





As well as short- and long-term forecasting for adverse weather, the Met Office also advises Heathrow on air temperature, ground temperature, surface winds and winds at 3,000ft

forecast. The Met Office is currently investing significant resources into improving fog and low cloud forecasting. Again, we are working closely with Heathrow Airport on this, and increasing our scientific investigation into modelling. We recently unveiled plans for a

new, more powerful super-computer which is expected to enhance the forecasting capability for fog and low cloud, not just at Heathrow but right across the UK.

The weather will always 'still happen' but by working in partnership with Heathrow, we

are able to support it in mitigating the impact. To help ensure things run smoothly when this does happen, Heathrow runs five or six 'scenarios' a year – drills which take place when the airport is closed overnight. This may include practising snow plough operations, formations and so on.

A lot of planning and practice takes place at Heathrow to ensure that when the Met Office gives its forecasts, the right decisions and actions can be taken quickly, efficiently and professionally. Together with Heathrow, we are offering a world-leading service which ensures that Heathrow, passengers, airlines and businesses are well informed – and therefore well prepared – for whatever Mother Nature has to throw at us. ✈



**James Shapland** has worked for the Met Office since 2005, having trained as a weather forecaster as part of the Mobile Meteorological Unit in the Royal Air Force. Based at Brize Norton, he was deployed to Iraq and Afghanistan to support NATO operations. Between 2011 and 2013, he worked for the Bureau of Meteorology in Australia as part of an embedded team of meteorologists at Qantas Airlines before returning to the UK as an advisor at Heathrow Airport. In May 2014, he became Operations Manager of the Met Office team at Heathrow.



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