Air Quality around Heathrow Airport

Q3 2017 Briefing

Background

Heathrow Airport Ltd (HAL) began an air quality monitoring programme in 1993. Today HAL owns and operates one on-airport monitor and funds three other monitors around the airport. Data from these four continuous monitoring stations, as well as 18 other continuous monitors operated by surrounding local authorities and DEFRA, are shared and summarised on heathrowairwatch.org.uk.

Air quality management is a key priority for HAL and we continue to work in partnership with our key stakeholders – especially local authorities and national Government – to reduce emissions from airport related sources in the area and play our part to meet the EU limit values and UK air quality objectives. The main pollutants of concern around Heathrow are measured at all stations – nitrogen dioxide (NO_2) and particles (measured as PM_{10} and $PM_{2.5}$).

Headlines

Key information for this quarter is:

- The number of aircraft movements made by the newest aircraft (CAEP8) has increased to 22.90% in the third quarter of 2017 and the percentage continues to rise (see Fig.1).
- There was one exceedance of the hourly mean NO_2 concentration of 200µg/m^3 recorded at the LHR2 continuous monitoring station (12 to date). As LHR2 is located on the airfield, the concentrations recorded are not therefore representative of concentrations to which members of the public are exposed. As there is no public access at this site, it is not considered to be a relevant location for the consideration of limit values. Where there is public access, 18 exceedances of this concentration are allowed per year before the limit value is breached for a given location.
- There were no exceedances of the NO_2 daily mean of 200µg/m^3 at the continuous monitoring stations located outside of the airport boundary. The results from the third quarter of the year therefore indicate that the hourly mean limit value is unlikely to be breached at any monitoring station located in an area of potential public exposure in 2017.
- There were no exceedances of the PM_{10} daily mean of 50µg/m^3 at the continuous monitoring stations located outside of the airport boundary. At relevant locations, 35 exceedances are allowed per year before the limit value is breached for a given location. The results from the first half of the year therefore indicate that the daily mean limit value is unlikely to be breached at any monitoring station in 2017.

Year-to-date monitoring

NO_2, PM_{10}, and $PM_{2.5}$ are measured at HAL-funded monitoring sites. In addition, ozone is measured at the Harlington station. For a strict comparison against air quality objectives, data capture should be >90% over a calendar year.

Table 1 provides a summary of measured data capture from HAL's four monitoring sites as well as year-to-date exceedances of the hourly NO_2 and daily PM_{10} limits. The period data capture for NO_2, PM_{10} and $PM_{2.5}$ at all HAL-funded monitoring sites has been >90%.

Table 1. Period data capture and exceedances of hourly NO_2 and daily PM_{10} at HAL-funded monitoring sites

Monitoring station	NO_2 data capture	PM_{10} data capture	$PM_{2.5}$ data capture	Hourly NO_2 exceedances in Q (ytd)	Daily PM_{10} exceedances in Q (ytd)
Heathrow LHR2	95.7%	99.9%	99.9%	1(12)	0 (7)
Harlington	99.5%	99.6%	99.6%	0 (0)	0 (3)
Green Gates	98.7%	98.8%	98.8%	0 (0)	0 (3)
Oaks Road	99.7%	99.8%	99.8%	0 (0)	0 (3)

The hourly mean limit value for NO_2 is 200µg/m^3, not to be exceeded more than 18 times per calendar year. The daily mean limit value for PM_{10} is 50µg/m^3, not to be exceeded on more than 35 days per calendar year.

Emission Reduction Efforts

We successfully reduced annual ground-based nitrogen oxides (NOx) emissions by 430 tonnes (16%) between 2009 and 2013[1] as part of our commitment to playing our part in improving local air quality. These reductions were achieved through a combination of efforts to reduce emissions from every major source, including aircraft, vehicles, and heating.

CAEP standard of aircraft movements

Through its Committee on Aviation Environmental Protection (CAEP), the International Civil Aviation Organization (ICAO) sets new emissions standards for aircraft engines – including for NO_x. Engine models which were certified on or after 1 January 2014 must meet CAEP8, the latest standard for NOx.

Fig.1. shows the proportion of aircraft movements at Heathrow based on CAEP standards. The proportion of flights made by newer, cleaner aircraft (CAEP6 or better) increased from 57.58% in 2016 to 59.03% at the end of Q3 2017. CAEP8 only movements increased to 22.90%. The trend is expected to continue as airlines proceed in replacing their older, higher emission aircraft and Heathrow's NO_x emission landing charges and engagement encourages the use of best-in-class aircraft.

[1]http://www.heathrowairwatch.org.uk/documents/Heathrow_Airport_2013_Air_Quality_Assessment_Detailed_Emissions_Inventory.pdf

Fig.1. Total aircraft movements since 2010 by CAEP standard