

‘Assess the noise pollution problems caused around airports by Concorde’

Answer 1

The sound limit at Kennedy airport, New York, is 112 PNdB*, and at Heathrow London, 110 PNdB. The manufacturers of Concorde (Sud-Aviation and the British Aircraft Corporation) have promised that Concorde will range between 104 and 108 PNdB, depending on its weight at take-off.

At the start of Concorde operations at Heathrow, 21 of the first 35 departures exceeded 110 PNdB, and in the first eight months of operations 72% of the 97 departures exceeded 110 PNdB. Overall in 1976 there were 109 infringements of Heathrow’s limit by Concorde. These measurements of Concorde were about 7 PNdB lower than during its early endurance trials. At the same time there were 1,941 infringements by subsonic jets. Concorde rarely features in the list of the ten noisiest take-offs each month at Heathrow, and subsonic aircraft at Kennedy have been recorded at 121 PNdB – twice the limit.

At Dulles airport, Washington, Concorde has averaged 119.9 PNdB at take-off and 117.8 PNdB on landing. This is 12-13 PNdB higher than the averages for subsonic aircraft. The noise levels have been going down, and with them, the number of complaints. In September 1976 the average level was 121.3 PNdB and there were 186 complaints (29 of these to one take-off). In October the average was 117.4 PNdB and there were 101 complaints. During this time polls of opinion concerning Concorde’s trial period at Dulles showed an initial opposition of 36.9% drop to 26.2%. In New York, opposition to Concorde landing at Kennedy has dropped from 63% in January 1976 to 53% in April 1977.

While 500,000 people are affected by aircraft noise in Washington, 2,000,000 are affected at Kennedy. It has been estimated that 40,000 extra people will be affected by noise if 80 Concorde serve 12 US cities. This represents a 1% increase. Bumps in the runway at Kennedy force Concorde to take off closer to heavily populated areas, but due to advanced flight control characteristics Concorde can begin to bank at an altitude of 100 ft. compared with an average of 480 ft. for subsonic aircraft, and so can turn away from heavily populated areas sooner after take-off.

*PNdB means Perceived Noise Decibels – a logarithmic scale of noise

Mark out of 20:

Strengths:

Weaknesses:

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Answer 2

Opposition to Concorde based on arguments concerning noise pollution takes two main themes. The first is concerned with the 'sonic boom' – a phenomenon of supersonic flight *unique* to Concorde amongst commercial aircraft. The second is concerned with noise levels around airports caused during take-off and landing. This second theme is common to all aircraft, and the issue at stake is whether Concorde is significantly noisier than subsonic aircraft.

Comparisons with other aircraft are complicated by the changing nature of jet fleets. Early jet aircraft (e.g. the DC8 and 707) used turbo-jet engines, and whilst these have been quietened, they are much noisier than second-generation fan-jet engined aircraft (eg DC10 and jumbo 747). Eventually these older aircraft will be phased out, but at the moment Concorde is being compared with them.

There are also problems of measurement. Objective measures (meters giving a reading in decibels) cannot give any impression of 'shrillness' or subjectively experienced nuisance. An aircraft giving higher decibel readings may not be experienced as 'noisier' by someone hearing it take off. Subjective measures also involve problems, as 'noise' is such a multi-faceted phenomenon, and different people use different criteria in assessing it. There are dangers, also, in questionnaire surveys of reactions of people living around airports. Average ratings of 'nuisance' change over time without any changes in objectively measured decibel levels or frequency of aircraft movements and so other factors must be involved. These factors can be political. Boeing took care to sub-contract for parts for its SST at factories surrounding Kennedy airport, so that votes concerning whether SSTs should be allowed to use the airport would be influenced by residents' concerns for their jobs! Workers at Filton and Toulouse would hardly try to ban Concorde landing near their homes, however noisy it is!

Finally, there is a variation in recorded noise levels dependent on the skill of the pilot, and load factors of the aircraft. Subsonic aircraft have been measured at twice the legal noise level, struggling to take off with heavy loads in adverse conditions. Concorde has been flying under-loaded, with skilled pilots, who have even been reported banking away from noise monitors.

Given this variety of problems, it would seem likely that Concorde causes even more noise pollution than data suggests, and that in comparison with subsonic jets will become comparatively worse as time goes on.

Mark out of 20:

Strengths:

Weaknesses: