PROJECT

SOURDINE

Study of Optimisation Procedures for Decreasing the Impact of Noise Around Airports

Funding: European (4th RTD Framework Programme)
Duration: Dec 1998 - Apr 2000
Status: Complete with results

Background & policy context:
Over the last 40 years, the steady increase in the number of flights and urban developments around airports has greatly increased the exposure of the public to aircraft noise. This is now seen as a major problem to be solved if the current growth in air transport is to be sustained. Some improvements might be realised in the short-term through changes in operational procedures (without any change in aircraft and air traffic control systems), while new equipment may help over the next five to ten years (if developed to meet noise criteria).

Objectives:
SOURDINE aimed to define and assess new procedures leading to a reduction of noise in the vicinity of airports, and to identify the requirements for simulation tools to validate such procedures.

Related Projects:
- AEROCERT - Aircraft environmental impacts and certification criteria.
- METARAIL - Methodologies and actions for rail noise and vibration control.

Parent Programmes:
FP4-TRANSPORT - Specific research, technological development and demonstration programme in the field of transport, 1994-1998

Institute type: Public institution
Institute name: European Commission; Directorate-General for Energy and Transport (DG TREN; formerly DG VII)
Funding type: Public (EU)

Partners:
NA

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Key Results:
An inventory of current regulations and practices affecting aircraft noise has been compiled, together with a study of the operational, safety, capacity and economic constraints that might influence the definition of new procedures. Five models for predicting noise exposure around airports were evaluated, and recommendations made on the capabilities and key variables for modelling.
Noise abatement procedures have been selected and assessed, partly using case studies based on the Amsterdam-Schiphol, Madrid-Barajas and Napoli-Capodichino airports. For the short term, promising procedures are:

- an increased altitude before the aircraft enters its final glide slope;
- a reduced landing flap setting;
- delayed establishment of landing configuration;
- an optimised take-off procedure with rapid initial climb;
- a continuous descent approach procedure (for use outside peak hours).

Cost-benefit analysis highlighted the value of an approach procedure combining delayed stabilisation, reduced landing flap setting and an intercept altitude of 3000 ft for the start of the glide slope. This can reduce noise with no loss in airport capacity.

In the medium term, promising procedures are:

- an advanced continuous descent approach, aided by aircraft and air traffic control systems;
- gradual increase of cutback thrust during climb out;
- an accurate routing to and from the airport using precision area navigation systems;
- an increased glide path angle.

**Policy implications**

SOURDINE found that, while there is common European legislation on aircraft noise, there is a lack of harmonisation between Member States in the application of noise abatement, particularly due to differences in modelling techniques and noise indicators. To assess the potential noise benefits of any specific procedure, it is necessary to use a common and validated modelling tool. Problems with existing models have been highlighted, and a current Eurocontrol project is working on a new tool.

SOURDINE established the framework for further research to simulate and validate new procedures for noise abatement. Future work should look at the following as means of noise abatement: the use of cockpit tools for management of aircraft energy, advanced air traffic management functions, automated thrust management, and air-ground interaction between the flight management system and the arrival manager. This will require a collection of separate simulation tools, rather than an integrated validation platform.

The final outcome of the research programme on noise is expected to be the agreement of new approach and take-off procedures for all European airports, supported by simulation tools and automation tools.

Documents:
- sourdine.pdf (Final report)

**STRIA Roadmaps:** Vehicle design and manufacturing, Network and traffic management systems

**Transport mode:** Air transport

**Transport policies:** Environmental/Emissions aspects