

Green Skies

ATM – Environment Challenges

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Ends of Scale

Easiest flow management

Lowest damage to planet Earth

CONCEPT

- Flow Management

- Pollution

A Win – Win Strategy

Aircraft Noise

Collaboration with other stakeholders

Develop clear metrics for assessing the effectiveness of ISRO and IIT and national noise-modeling efforts

Implement a strategic plan for improving noise models based upon the metrics.

Harmonize noise reduction research with similar European research.



Role of Central Govt

Support additional research on the environmental effects of aviation

Investigate the relationships among aircraft emissions and the resulting changes in cirrus clouds, ozone, climate, and air quality

INCENTIVES

Recognize the need for incentives to embrace newer technologies

Ability of government to introduce economic incentives for using advanced environmental technologies.

Tax advantages for operators of greener aircrafts

Direct grants for environmental innovation and/or leadership

Negatives

- The actual effects of aviation on the environment are uncertain.
- Aircraft emissions are only a small contributor to global atmospheric issues.
- Solutions may involve revolutionary changes in aircraft design.
- The noise levels that will ultimately prove acceptable to the general public (especially to people living near airports) and eliminate noise as a critical limitation on the growth of air traffic are unknown.
- Determining which substances identified by the PCB as hazardous air pollutants are contained in aircraft emissions and need to be further reduced
- Understanding and predicting atmospheric response to aircraft emissions as a function of time on local, regional, and global spatial scales

Responsibility

- exploring the suitability of alternate sources of energy for application to aviation, taking full account of safety and operational constraints
- coordinates agency research and technology goals, budgets, and expenditures with national environmental goals and international standards endorsed by the Central government
- periodically reassesses environmental goals and related research programs to ensure that they reflect current understandings of the impact of specific aircraft emissions on the environment and human health
- takes advantage of the unique expertise of both government and industry personnel and reverses the current trend of lessening industry involvement in ISRO sponsored environmental research and technology development

Responsibility

- Support international assessments of the effects of aircraft emissions and the costs and benefits of various alternatives for limiting emissions
- Expedites deployment of new technologies by maturing them to a high technology readiness level (i.e., technology readiness level 6, as defined by NASA) and providing incentives for manufacturers to include them in commercial products and for users to purchase those products

Leadership

- reallocate funds in accordance with long-term goals, shifting some resources from short-term mitigation in localized areas to the development of engine, airframe, and operational/air traffic control technologies that will lead to aircraft that are quieter, operate more efficiently, and produce fewer harmful emissions per revenue-passenger-kilometer
- takeoff and approach noise (which present different technological problems for subsonic aircraft)
- flyover noise from cruise altitudes in very quiet areas
- sonic booms and hyperbooms (i.e., the thermospherically refracted and very low intensity remains of sonic booms)
- taxi and engine run-up noise
- fuel venting and fuel dumping

Leadership

- emission of CO, hydrocarbons, and NO_x in the airport area (below 3,000 feet)
- contrail formation
- emissions of CO₂
- emissions in the upper troposphere and stratosphere (from both subsonic and supersonic aircraft) of water vapor, NO_x, sulfur particles, and carbon particles
- potential for greenhouse effects and depletion of stratospheric ozone



Thank You ATCOs