European Bank
for Reconstruction and Development

Sub-sectoral Environmental and Social Guidelines: Air Transportation

PROCESS DESCRIPTION

This guideline focuses on subsonic civil air transport and environmental aspects associated with the preparation, loading, operation and maintenance of aircraft. It covers airside, landside and airborne activities associated with the air transport vessels, cargo and passengers.

There has been substantial technological development with respect to engine efficiency and greenhouse gas emission reduction and noise abatement through engine and mainframe design. While considerable progress has been made to reduce the noise signature of aircraft, public perception and low tolerance of aircraft generated noise is demonstrated by the number of complaints received. This is usually attributed to increasing air traffic as well as continual encroachment on communities near to airports and airfields. To address this concern, some airports have adopted operation restrictions above the existing International Civil Aviation Organisation (ICAO) certification guidelines.

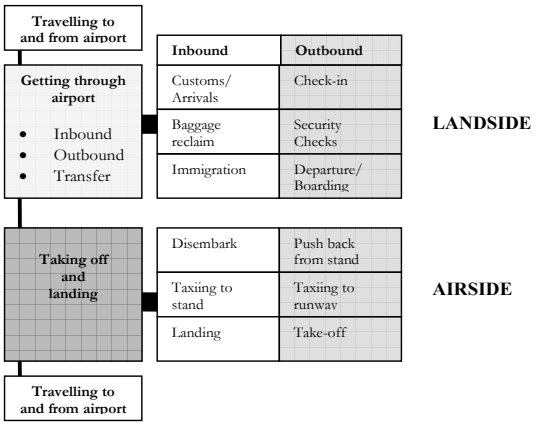
This guideline does not focus on the operation and management of airports. Users of this guideline document are referred to the sub-sectoral environmental guideline for airports. A diagrammatic representation of processes which underpin air transport is presented in Fig 1 below:

Landside

This refers to the processes that occur furthest away from the aircraft. These include processes of checking in, passport control and security outbound and passport control baggage retrieval and customs for inbound occur on the same footprint of the airport facility. All transactional processes occur in this zone

Airside

This refers to the processes that occur closest to the aircraft and is primarily associated with the embarking and disembarking of passengers and cargo from the aircraft. Other processes



associated with the operation and maintenance of the aircraft occur in this zone

Fig 1: Schematic diagram of air transport processes

Airspace

This refers to the area where the aircraft in flight operates. It is heavily regulated and managed by both national and international bodies regarding the charges associated with using airspace and agreements for cross charging and management of the environmental impacts of air transport. The safe, efficient and effective provision of air navigation services to the users of the air navigation services. Airports within Europe cooperate within ICAO requirements.

Airspace is divided into designated flight tracks which aim to minimise the impact of noise on communities and other global environmental impacts.

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SUMMARY OF KEY ENVIRONMENTAL, HEALTH AND SAFETY RISK/LIABILITY ISSUES

Noise

- It is the responsibility of the engine manufacturer to ensure that an aircraft meets certification standards for noise. Engines are rated under the ICAO noise classification scheme. Chapter 2 aircraft are the noisiest and these are being phased out. The average rating is Chapter 4, achieved by most aircraft engine manufacturers. Aircraft with Chapter 4 rating are preferred by airlines seeking to fly in to airport which operate under strict local noise limits

- Takeoff and landing are the aircraft activities which create the most noise. Often pilots apply techniques to minimise the areas affected by the noise during takeoff and landing

- At some airports only aircraft with quieter engines are given access to night flight slots

Emissions to Air

Present commercial aircraft fly at subsonic altitude of 8-13 km where they directly release emissions into the upper troposphere and lower stratosphere and therefore have a direct impact on atmospheric composition. At these altitudes, these emissions affect regional or global climate directly or indirectly though subsequent chemical reactions.

The zone of impact will be dependent on the altitude of the aircraft. There is concern that the environmental impact of aircraft emissions could reverse the recovery of the ozone layer stimulated the Montreal Protocol. ICAO is concerned about the overall effect of aircraft emissions as the climatic impacts of emissions and particulates are not comprehensively understood. The local, ground level environment impacts and health and safety concerns are better understood.

- Aircraft emissions are the result of the combustion of kerosene, the main fuel source for aircraft. This process results in the following direct emissions:

    - Water vapour in the form of contrails and cirrus clouds from emissions generated by aircraft flying within the stratosphere. This causes dual impacts; Firstly, it leads to an increase in cirrus cloud formation, which contributes to global warming and secondly it reacts with Nitrous Oxides (NO_x) to destroy the ozone in the stratosphere. Ozone shields the earth from harmful Ultra Violet radiation.

    - Atmosphere: Sulphur Oxide (SO_x) and soot form aerosols which scatter sunlight and thus have a cooling effect however soot can absorb radiation and is believed to have a warming effect.

Solid Waste

Flight operation waste and maintenance waste is managed by airport waste management facilities and is not covered in this guideline. However, it is the responsibility of the airline to correctly dispose of all waste to the requirements of the airport management authority. General waste is created on board through provision of refreshments and reading material. Airlines are encouraged to segregate this waste for disposal but the airline is dependent on the recycling facilities provided by each airport.

Waste water

Sewerage from aircraft can have an environmental impact depending on how it is collected and disposed of.

Bird strikes

Birds flying in the take off and landing zones can present a risk to aircraft in the form of bird strikes which can lead to accidents. The management of the air space associated with takeoff and landing is the responsibility of the relevant airport management authority including the removal of potential ornithological threats. Pilots are trained in the management and emergency response necessary for the safe control of aircraft during a bird strike.

Noise and Vibration

Staff supervising aircraft loading can be subject to noise and vibration that can result in occupational health problems.

Staff undertaking maintenance activities can be exposed to high levels of noise and vibration.

OTHER POTENTIAL ENVIRONMENTAL AND HEALTH AND SAFETY RISKS/LIABILITIES

Use of natural resources

Airlines use large quantities of aviation fuel. The quantities of fuel consumed vary depending on type of aircraft, maintenance regime, weather conditions, altitude, and flying time, including stacking times waiting to land.

Pulmonary Issues

Regular flyers are at greater risk of developing circulatory problems especially in the legs.

Collision

Damage to aircraft during unplanned movement and positioning of aircraft on the stand and apron can present a health and safety risk to personnel operating on the ground.

Aircraft personnel operating on the ground are at risk of collision with vehicles using the apron area.

Security threats

Increasingly airlines are subject to security threats which could result in casualties and possible loss of equipment.

KEY SOCIAL, LABOUR AND COMMUNITY RISK/LIABILITY ISSUES

Noise and Visual Impact

Stacking, circling, arriving and departing aircraft prior creates disruption from noise, vibration and visual impact as aircraft will stack at relatively low. This leads to a constant elevated noise level as aircraft enter, circle and leave the hold pattern.

FINANCIAL IMPLICATIONS

- Some airports charge take-off and landing fees that are based, in part, on the certification noise for the aircraft. The noise related component of the fees is significant and can result in a 100% increase in takeoff/landing charges fees for noisier aircraft.

- Airlines which operate at night, such as cargo operators face equipment and scheduling constraints and increased costs

due to the high noise rating of vessels used for cargo transit.

- Despite technological and operational improvements in aircraft the impact of emissions still remains a major concern. While projections have accounted for emissions reductions due to improvements in fuel efficiency potential cost associated with this overall impact is a concern and in certain jurisdictions could result in emissions charges.

- If ICAO consider an international fuel tax this would significantly add to the cost of flying and may impact demand.

- Fiscal measures may be introduced to offset the uncertainty associated with future environment impact associated with past and future aircraft emissions. Countries or regions may impose emissions related charges on airlines using certain airports. This may be anti-competitive if not implemented internationally.

- Damage to airport infrastructure, damage to own or other aircraft due to insufficient care during landing and parking procedures will incur costs to an airline.

- Aircraft flying in circles is inefficient and costly both in terms of time and fuel.

- Injuries may lead to increased payroll costs to replace skilled workers and lost production time.

- Capital investment may be required to comply with new environmental, health and safety requirements.

- Fines, penalties and third party claims may be incurred for non-compliance with environment, health and safety regulations.

IMPROVEMENTS

- Airlines should aim to have aircraft with quieter engines such as ICAO Chapter 4 and 5 rated aircraft. Current aircraft must meet Chapter 3 noise regulations as a minimum. Due to the very slow renewal rate of airline fleets worldwide, the impact of improved, quieter engines will provide effects only in the long-term.

- Work with airport management authorities and air traffic controls to enable efficient use of airport slots to reduce stacking, fuel consumption, increased emissions and noise.

- Consider refitting aircraft with engines that have low emission combustors, in order to reduce emissions.

- To reduce the risk of noise exposure isolate noisy equipment and rotate tasks to minimise time spent in a noisy area over an eight hour period and provide personal protective equipment where people have to enter noisy areas;

- Ensure sufficient security checks are implemented regarding passengers and/or cargo;

- Ensure all aircraft and cargo is routinely checked for tampering.

- Provision of personal protective equipment (PPE) that is fit for the task to prevent injury and maintain hygiene standards. Staff should be trained in the correct selection, use and maintenance of PPE;

- Ensure flight personnel understand the risks associated with circulatory problems.

GUIDE TO INITIAL DUE DILIGENCE SITE VISITS

- Establish ownership and registration and insurance of the vessel. Are all the operational requirements regarding standards, permits and certificates present?
- Establish and review the organisational structure for operational management of the vessel
- Establish the nature of operations (passenger transit or cargo) and identify and examine operational procedures.
- Observe housekeeping on board;
- Establish waste disposal arrangements;
- Establish waste water disposal arrangements;
- Check log for reportable incidents; reportable discharges, action taken and associated fines; previous incidences of non-compliance
- Ensure crew are trained for their roles on board and hold relevant qualifications and training certificates appropriate to their roles
- Ensure and inspect vessels emergency response plans and equipment
- Review and inspect waste management systems for management and transfer to appropriate waste facility at port of entry
- Review aircraft communications systems and communications plan, especially with respect to emergency response
- Have there been any reportable incidents e.g. fires, explosions, injuries, fatalities?
- Has there been a notifiable and/or reportable breach in site operation and management? Have there been any permits or licenses revoked due to operational transgressions or poor health safety or environmental practices? Has the relevant authorities inspected the facility and or vehicles concerned? What were there findings?
- Is there clear, designated organisational responsibility for environmental, health, safety and welfare?
- Is there a communicated logistics management plan and emergency response plan?
- Are staff wearing Personal Protective Equipment?
- Check that wages and working hours are consistent with the average for the sector and national standards;
- Does the business plan have line items for Environment, Health and Safety improvements?
- If the investment or refinancing will led to restructuring of the company, what will be the potential impacts on health and safety at the operational, employee welfare and wide community impacts level?
- If the company plans to invest in new technology, what will be the impact on

human resources, in particular health and safety and employee welfare?

- Check the conditions and duration of validity for all permits;
- Check that labour standards, contracting and remuneration are in line with national law and are consistent with the average for the sector
- Check that hours, including overtime, are recorded and staff should receive written details of hours worked and payment received
- Has the company received inspections from the local labour inspectorate in the previous three years? Have these resulted in any penalties, fines, major recommendation or corrective action plans;
- Does the organisation have a grievance mechanism which allows employees to raise workplace concerns?
- Are employees free to form, or join, a worker's organisation of their choosing?

Take notes and ask questions relating to any activities that address the improvements listed in the improvements section of this document.

ACTION PLANS

Dependent on the individual air transport activity, select appropriate improvements from the list above to include in the action plan. As a minimum, any business should be required to have the following in place:

- Operational procedures to manage environmental, health and safety risks;
- Monitoring programmes;
- Improvement objectives, targets and project plans;
- Training for personnel;
- Regular inspections, checks and audits with records to demonstrate achievement of the required level of performance against legal requirements and improvement action;
- Emergency plans for environment, health and safety accidents or hygiene non-compliance;
- Management review/demonstrated involvement in environment, health, safety and hygiene management.

REFERENCES AND ADDITIONAL SOURCES

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