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AIRPORT SAFETY

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"Flying is the safest form of transport" - a common expression of which the aviation industry is justifiably proud. The safety and security of our air transport system is no coincidence throughout the history of flight, safety has been top-of-mind. While most people know that the industry is safe, people who do not work in aviation are seldom aware of the extraordinary lengths gone to by airport operators, airlines, pilots, aircraft manufacturers, air traffic control organizations and service providers to retain this good record and continually strive for improvement.

This dedication to safe operations is seen across the whole aviation sector, from the huge progress in aircraft design including avionics, and engine and system reliability, to less well-known matters such as dimensional standards for airfield layouts,. The safety culture is an integral part of the industry and takes on many forms, including standard operating procedures, adoption of new technology and ensuring that safety is the driving force behind airport operations. ACI strongly believes that safety is who we are and what we do, not just any day, but every day.

Standards for airport design
International standards were first published by the newly-formed United Nations' agency, the International Civil Aviation Organization (ICAO), soon after the Second World War, as commercial aviation began its substantial growth into the industry that exists today. Those years have seen flight move from small propeller-driven aircraft to 555-seat jet aircraft that can fly halfway around the world without stopping. All the while, flying has grown safer. Today's ICAO Annex 14, dealing with Aerodrome Design and Operations, is a comprehensive document covering standards and recommended practices for aerodrome physical characteristics, obstacle restrictions, visual aids, electrical systems, aerodrome services and maintenance. ACI has contributed significantly over the years to the enhancement of this document, through its participation in the ICAO Aerodromes Panel.

Standard operating procedures
The introduction of standard operating procedures employed by airport operators, airlines, pilots, air traffic control organizations, as well as the companies that provide important services such as ground handling and re-fuelling, have played a very important role. Often extra safety margins are built in to operational procedures which add a further layer of safety to an already safe system. Standard operating procedures cover all parts of an airport's operations on the airfield, on the apron, at gates and in maintenance areas.

Vehicles driving on the apron must adhere to strict rules regarding speed, crossing of taxiways, distance to be respected behind aircraft with running engines, and so on. For driving on the airfield, even more stringent measures are in force, including radio contact with the tower. Personnel must also follow a set of procedures designed to ensure their own safety and that of aircraft and passengers (for example wearing high-visibility jackets, hearing protection and remaining at a set distance from operating aircraft). Such procedures are trained and rehearsed to become deeply ingrained in operating practice, enhancing the 'safety culture' in the industry.

In parallel with these, is an important need for the instilling of a safety culture from the top management down, including the notion of a 'just' culture, whereby reporting of safety hazards and occurrences is encouraged, with the intention of learning from these events and discussing solutions, which leads to a continuous reduction in the rate of accidents.

"When we speak of aviation safety, members of the aviation community may have different perspectives on the subject, yet for all of us there is one common concern, that of saving and protecting the lives of passengers, crews, and persons on the ground. Without the excellent safety record that we have worked together so hard to achieve over the past half century and more, we would not enjoy the enormous economic, social and cultural benefits of a vibrant air transport industry."

- Mr. Roberto Kobeh González (President of the Council of ICAO)

Technology, systems and equipment

Progress in systems and equipment at airports has also enabled major gains in safety, in areas such as:

- New lighting systems
- Precision approach and landing systems, from radio-frequency guidance (ILS), to satellite-based navigation
- Surface movement radar
- Visual docking guidance systems for aircraft parking
- Automated meteorological systems

Systems are always being improved. This is clearly seen with rescue and fire fighting equipment, as well as other systems and procedures designed for emergency situations. The essence of safety is the elimination or reduction of risk, lessening the need to rely on emergency services. This does not in any way diminish the importance of airfield emergency services and regular exercises designed to test emergency procedures to their limits.

Adverse weather and night operations can be a threatening condition, and advanced surface movement guidance and control systems (A-SMGCS) are now ready for widespread adoption – these offer aircraft position determination and systems giving visual 'clearance' to pilots, for example through suitable taxiway lighting and 'stop bars' which act like traffic lights for aircraft. Research, development and operational testing of new generation systems has been underway for some years to enable new capabilities such as display in the cockpit of the aircraft's position on the airfield, the positions of other aircraft and vehicles, and even the path to be taken and air traffic control instructions. Such systems should be fully tested and commercially available in the near future.

Safety management systems

Another important element of safety is the adoption of an overall safety management system (SMS) for the airport, which ICAO defines as "a systematic approach to managing safety including the necessary organizational structure, accountabilities, policies and procedures".

ICAO has rightly put a major emphasis on State regulatory oversight, and ACI agrees that national civil aviation authorities must apply clear rules (as far as possible the same ICAO rules and regulations worldwide), must have the capacity to monitor airports and must certificate airport operators accordingly, . Since 2003, according to ICAO rules, airports have been required by their civil aviation authorities to have an aerodrome manual, which sets out all the equipment and procedures in use at that airport.

Since 2005, airports that are certificated (as a minimum, this must include all airports open for international traffic, and is recommended to include all airports open for public use) have been required to have a documented safety management system. The concept of an SMS has taken over from the older notion of reliance on periodic safety audits, and introduces continuous improvement to safety.

As part of this, a safety committee should be set up at airports, involving all the companies and organizations operating on each part of the airfield including, runways, taxiways and aprons. This committee can effectively deal with issues such as the prevention of runway incursions, on which much guidance has been published.

There are also physical measures that can be taken to reduce risk, especially at 'hot-spots' on the airfield, such as decreasing the number of runway crossings needed, by means of changes in layout and procedures. One possibility, though not feasible at all airports due to lack of space, is the provision of perimeter taxiways, allowing aircraft to taxi around runway ends.

An SMS relies heavily on safety assessments whereby a risk assessment is conducted for each procedure, operation or situation taking place on the aerodrome. The purpose is to allow the aerodrome operator to eliminate or to reduce the risk of an accident or incident occurring to a level as low as reasonably practicable. This type of approach has proven to be a way of significantly increasing the level of safety at an aerodrome.

Safety guidance material

Industry guidance material has been produced on the elimination or reduction of major risks such as runway incursions, excursions and confusion. Runway excursions may result from adverse weather conditions, which can reduce runway friction and aircraft braking ability and/or lead to touchdown too far along the runway, are currently receiving special focus. Again there are physical and procedural and training solutions to reduce risk.

Where possible, airports are looking to provide longer runway end safety areas (RESAs) in excess of the ICAO Standard and in accordance with the ICAO recommended practice,, or to find other solutions, such as an arrestor bed, where there is a physical obstacle beyond the runway end (a risk assessment should be carried out) to identify this requirement.

Another area now being intensively studied by the industry (under the umbrella of the Flight Safety Foundation, which ACI supports) is runway confusion and 'wrong runway operation'. ACI is actively involved in all the matters above, and intends to play its full part by developing and disseminating best practice and safety advice.

Training

Airports Council International is also active in training in various aspects of safety on airports. This includes the ACI Global Safety Network courses. Airport Staff can obtain the ACI Global Safety Network Diploma after the completion of the three modules on: safety management systems at aerodromes, airside safety and operations and emergency planning and crisis management. ACI sees training as an essential element in the safety culture of the industry. **www.aci.aero/training**
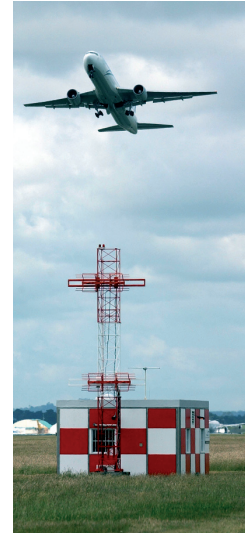
ACI has developed a number of safety-related handbooks for airports: ACI Aerodrome Wildlife Management and Bird Hazard Prevention Handbook; ACI Airside Safety Handbook; ACI Apron Markings and Signs Handbook. These Handbooks are regularly revised. ACI also produces other safety-related documents.