A Framework For An
"Airport Safety Assurance" Standard

Granted that protecting against unknown airport safety and security hazards or threat is an imperfect science, it is difficult to plan where to start. Added to this is the fact that the future of airport safety and security will always be an unknown entity, and as such it is more confusing about how to design, develop and package a proactive airport SMS. The "ApSAS" suggested in this article using the FAA's four pillar-concept as well as 'self-correcting' management system using PDCA principle does provided guideline where to start and how to minimize risks.

The safety assurance of the facilities that exist on and around an airport is vital to today's commercial airlines operations. Since 9/11 tragedy in USA, the airport operational safety has been identified as a very important area of concern by civil aviation authorities throughout the world. Many international bodies as well as state owned civil aviation agencies and authorities are examining the need for an 'airport safety assurance' system (ApSAS throughout this article) for the past few years and come up, independent of each other, with changes in the existing provisions or with issuing new advisory circulars.

In USA, FAR Part 139 requires airport certification of land airports serving commercial air carriers to have airport certification manuals (ACM) documented to include, in Clause 309, safety provisions for airports. The stipulation is marginally adequate. The Manual on Certification of Aerodromes (ICAO Document # 9774) outlines the requirements for an aerodrome operator's safety management system (SMS); however, it does not provide specific guidance on its implementation. The recently released Safety Management Manual (ICAO Document # 9859) may have filled the void to some extent, but it does not prescribe any safety assurance standard for airport operators similar to that by IATA prescribing an 'operational safety audit' standard (known as IOSA-standard for airline operators).

In November 2005, the ICAO ammended Annex 14, volume 1 – Airport Design and Operations – to require member states to have their certified international airports to establish an SMS. In March 2006, the ACI presented to the ICAO's DGCA Conference with a proposal to introduce a web based safety network system for airports. In US, the FAA's advisory circular on 'Airport Safety Self-Inspection' (150/5200-18B) established a checklist primarily designed for airport operations areas such as: ramp/apron-aircraft parking areas, taxiways, runways, fuelling facilities, buildings and hangers. However, the approach is not system based.

Finally, in February 2007, the FAA proposed through an advisory circular 150/5200-37 to US airport operators to implement an SMS not only to meet the ICAO standards, but also to complement the existing regulations of 14 CFR Part 139. The core SMS-model suggested by this particular FAA advisory circular is based on the concept of the four elements Plan-Do-Check-Act (PDCA) cycle of continuous improvement to control safety-risks. This implies that individual processes in an airport operations are planned (PLAN), performed as planned (DO), reviewed for effectiveness (CHECK), and modified as necessary (ACT).

SOME OF THE POSSIBLE PLAN (AIRPORT SAFETY ASSURANCE) CONSIDERATIONS:

- Understand existing legislative, best industry practice and requirements
- Identify safety objectives
- Establish contingency plans and business recovery plans
- Confirm airside procedures are documented and up-to-date for all activities
- Check all risk assessments are complete

SOME OF THE POSSIBLE DO (AIRPORT SAFETY ASSURANCE) CONSIDERATIONS:

- Initial training and testing
- Competence and refresher training processes in place
- Infrastructure and equipment checks being carried out
- Staff meetings and consultation processes talk about safety
- Reporting of all accidents, incidents and near-misses in place
- Investigation and trend analysis of accidents, incidents and near-misses takes place
- Deficiency reporting in place
- Behavioural reporting in place
- Record keeping

SOME OF THE POSSIBLE CHECK (AIRPORT SAFETY ASSURANCE) CONSIDERATIONS:

- Senior management airside audits or inspections occur regularly
- Audits of trainers and trainees occur? Including any third parties
- Different levels of checks take place for all airside areas
- Risk assessments validation
- Identify deficiency trends and accident, incident and near-miss trends:
- Measure safety performance

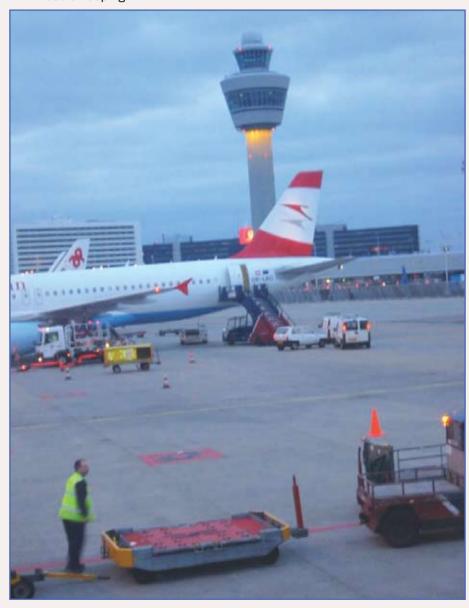**SOME OF THE POSSIBLE ACT (AIRPORT SAFETY ASSURANCE) CONSIDERATIONS:**

- Identify root causes of accidents, incidents and near-misses
- Ensure preventive actions are taken and documented
- Share safety information with airside community
- Work with others to identify and understand best industry practice
- Understand regulator's future requirements in good time
- Establish future safety objectives

Generally accepted industry standards and the ICAO guidance describe SMSs in terms of four distinct elements: Safety Policy & Objectives; Safety Risk Management; Safety Assurance; and Safety Promotion. The core SMS-model suggested by the FAA advisory circular is also based on the concept of the same four elements called "safety pillars". Both approaches are good and very helpful; however, the continuous improvement aspect is not built-in to any of those two systems.

The ApSAS suggested in this article is indeed based on system concept of continuous improvement while, at the same time, inducing the concepts propounded by ICAO and FAA. The goal of the ApSAS is to reduce risk to a level as low as reasonably practicable.

The proposed ApSAS uses the iterative concept of P-D-C-A principle. The safety assurance system, like quality system, must go through on-going cycle of continuous improvement, from organization to implementation to audits to taking corrective & preventive actions and so on. Therefore, the framework for the proposed ApSAS is developed in line with the eight management principles that constitute the foundation of ISO 9001:2000 standard.

It is suggested that the ApSAS will have a total of five parts including the above four main pillars (each part called 'Clauses' hereafter). The requirements for specifications to be documented and implemented by an airport operator are inherent in the system. The fifth clause of the ApSAS is titled "Safety Improvement" that should contain provisions dealing with

self-evaluation of the airport's currently practiced SMS. This is in line with the 'check' and 'act' parts of the PDCA-principle. Thus, the five clauses of ApSAS standard are:

- Safety Policy and Objectives
- Safety Risk Management
- Safety Assurance
- Safety Promotion
- Safety Improvement

The first pillar, safety policy and objectives, is not just an expression by the organization; it is about the development of a safety management organization for the airport. The emphasis here is on the airport operator's organization and it's management system. The clauses should address developing an SMS-manual, management commitment, periodic management reviews of the SMS, documentation requirements, establishing stakeholders responsibilities, establishing safety policy, and establishing safety objectives consistent with the safety policy.

According to the FAA advisory circular, the second pillar, safety risk management, is about the airport operations risk management. The airport operator must attempt to optimize safety performance of its operations

through: (a) proactive identification of hazards, (b) assessment and measurement of safety risks, (c) taking actions to mitigate the hazards and risks to an acceptable level, (d) tracking the mitigation activities to ensure that they are appropriate and effective, and (e) if required, modifying the mitigation activities.

This author proposes to add an additional 'emergency response plan' as a complimentary part to be included in this pillar. After 9/11 events of 2001, this makes sense because any emergency (or crisis) response plan is always based upon an assessment of risk appropriate to the size and type of operations. The proposed (ap)SMS standard recognizes that airport operation is a business and there is significant risk in running an airport operation. While it makes good business sense to reduce risk and avoid the very high costs associated with airport incidents and accidents, it would be prohibitively expensive and detrimental to the business environment if an airport operator were to try to eliminate all risks. This clause should address the operator's existing risk management system along with its performance measures as a means of evaluating the effectiveness. The

standard would require the operator define acceptable and unacceptable levels of safety risk, actual safety risk analysis and defining mitigation strategies.

The third pillar, safety assurance, is another cornerstone of the ApSAS, in that, the risk controls developed under the second pillar now become organizational system requirements. This includes safety oversight. The proposed ApSAS standard requires the airport operator to have a 'Self Auditing Program' (SAP) implemented to assess how well the organization adhering to safety policy and meeting its safety objectives (in addition to the airport operator's existing responsibilities for self-inspection and correction of discrepancies under 14 CFR Part 139 in USA or any other equivalent requirements in the rest of the world). The SAP must include each operations areas of an airport. Since airport operations today involve participation of so many non-airport employed service providers, 'outsourcing controls' is added as a supplementary component to safety oversight.

Safety promotion, the final pillar in FAA's advisory circular, is the foundation of a sound safety culture. This pillar stresses safety training, com-

munication and participation. This clause addresses safety training and education, safety communications, and safety competency. The idea of this part of the proposed ApSAS standard is to make sure that the safety promotion efforts must be visible in all aspects of an airport operation. This is about developing a safety culture.

The Safety Improvement clause is really looking at the safety management lifecycle throughout. This clause requires measurement of customer perception, monitoring and measuring the SMS performance, implementation of corrective action for each safety non-conformity (SNC) generated during the SAP, determining actions to eliminate the causes of potential SNC, and safety lessons learned.

The ApSAS proposed here describes the requirements for an airport operator's SMS. The ApSAS suggested here is applicable to any FAA Part 139 certified airports and general aviation (GA) airports in US as well as any equivalent status airports in the rest of the world. The ApSAS auditor will determine individual provisions not applicable to a specific airport operator. The ApSAS establishes the minimum acceptable requirements as per the references established above. An auditor conducting an audit against the

ApSAS must be, at minimum:

- An IRCA (or equivalent) certified ISO 9001:2000 Lead Assessor

- Be thoroughly familiar with FAA 14 CFR Part 139, Airport Certification Process (for USA; equivalent in other states)

- Be thoroughly familiar with

(a) ICAO Annex 14, Volume 1, Aerodrome Design and Operations (latest amendment);

(b) ICAO Document 9774, Certification of Aerodromes;

(c) ICAO Document 9859, Safety Management Manual; and

(d) ICAO Annex 17, Safeguarding International Civil Aviation Against Acts of Unlawful Interference.

It is suggested that the 'Audit Duration' for Class 1 and Class 2 airports under Part 139, all clauses of the ApSAS should be applicable and the audit duration should be at least 5-days 80 hours by 2 auditors. For Class 3, Class 4 and GA airports, Clauses 4 and 8 are musts and the remaining Clauses as applicable to the airport; the audit duration should not exceed 5-days 40 hours by 1 auditor.

It is also suggested that the Audit Cycle for each airport certified under

the ApSAS must go through re-certification audit every third year; and a surveillance audit due annually.

Finally, the Audit Method, an experienced auditor can follow several methods; however, it is strongly recommended that the auditor assigned for accreditation audit follow the guidelines provided in EASA Document # Q.1003-00.

In conclusion, the concept of an ApSAS suggested here focuses on combination of systems, policies, programmes, processes, plans, procedures, sets of measures, facilities, components, types of equipment or any other aspects of airport operations under the scope of safety that are considered an operational necessity, and with which an airport operator will be expected to be in conformity at the conclusion of the ApSAS audit.

- Sushant Deb
The author consults on airline/airport safety-security-quality management system and provides internal auditing services for airlines/airports. He is a certified Lead Assessor for international standards such as ISO 9001:2000, AS 9100B, AS 9110 and AS9120. He is a member of Flight Safety Foundation and American Society for Quality. ●

Now From Europe To Australia In Less Than Five Hours In An Hypersonic Jet

British engineers have unveiled plans for a hypersonic jet which could fly from Europe to Australia in less than five hours.

The A2 plane, designed by engineering company Reaction Engines based in Oxfordshire, southern England, could carry 300 passengers at a top speed of almost 4,000 mph (6,400 kmh), five times the speed of sound.

The LAPCAT (Long-Term Advanced Propulsion Concepts and Technologies) project, backed by the European Space Agency, could see the plane operating within 25 years, the firm's boss Alan Bond told the **Guardian daily.**

"The A2 is designed to leave Brussels international airport, fly quietly and subsonically out into the north Atlantic at mach 0.9 before reaching mach 5 across the North Pole and heading over the Pacific to Australia," he said.

The plane, which at 143 metres (469 feet) long would be about twice the size of the biggest current jets, could fly non-stop for up to 12,500 miles (20,000 km).

It operates on liquid hydrogen, which is more ecologically friendly as it gives off water and nitrous oxide instead of carbon emissions.

Passengers would have to put up with having no windows, due to problems with heat produced at high

speeds. Instead designers may put flat screen televisions where the windows would be, giving the impression of seeing outside.

Fares would be comparable with current first class tickets on standard flights, of around 3,500 pounds (4,700 euros, 6,900 dollars).

The flight time from Brussels to Australia would be four hours and 40 minutes. "It sounds incredible by today's standards but I don't see why future generations can't make day trips to Australasia," he said.

"Our work shows that it is possible technically; now it's up to the world to decide if it wants it."(AFP) ●