DIRECTORS GENERAL OF CIVIL AVIATION-MIDDLE EAST REGION

Second Meeting (DGCA-MID/2)
(Jeddah, Saudi Arabia, 20-22 May 2013)

Agenda Item 6:   **Aviation Safety**

SAFETY MANAGEMENT: A COMMON FOUNDATION FOR COLLABORATION

(Presented by United States)

SUMMARY

U.S. FAA's Global Safety Strategy: SMS Is the basis For Safety Worldwide. Aviation safety has improved dramatically in the last two decades, but changes in traffic, aircraft fleets and the implementation of NextGen and SESAR pose new safety challenges. Implementing SMS will improve the global response to these safety challenges by introducing new methods of safety information sharing, safety risk assessment and mitigation strategy development, safety measurement and safety promotion. Safety pays benefits that extend well beyond the improvements in risk management; safety helps the system to be more efficient and provide the best value for all of the aviation system's customers. The United States seeks support from partner states in ensuring a harmonized and standard approach to constantly improve the safety of the international aviation system**.**

1.   INTRODUCTION

1.1   The United States is grateful to be invited to participate in this second meeting of the MID DGCA to strengthen our commitment to promoting safety and aviation development worldwide. The United States has had much success in addressing safety concerns through improvements in safety policy, systems, and organizational structure – these changes have contributed to a significant gain in risk reduction. Many of these same improvements have also been implemented globally, including the Middle East. For those programs that have not yet seen widespread implementation, the intention of this paper is to share the successes of these safety initiatives and encourage regional support.   System compatibility, harmonization of technical standards, partnership amongst stakeholders, and the promotion and sharing of best practices in the safety enterprise will continue to improve our worldwide record in aviation safety.

2.   DISCUSSION

2.1   Aviation Safety has improved dramatically, however we still experience 1 fatality per million departures in western built aircraft. Last year ICAO estimated that we had approximately 30 million flights per year; 4.0 accidents per million flights, and 1 fatal accident per million flights. Moreover, there are significant disparities between the accident rates in the United States, Western Europe and the Middle East and North Africa.

2.2   In addition, the current safety record is vulnerable to significant industry changes in both the United States and the Middle East; the emergence of much more complex traffic operations and of new business models, aircraft and routes, the demographics of the aviation workforce, the requirement for 24 hour operations – as especially is the case in the Middle East, all pose potential challenges to the current safety record.

2.3   ICAO has developed the new Annex 19 "Safety Management", to become effective in November 2013. This is the first new ICAO Annex in 30 years, and its adoption demonstrates the importance of a globally harmonized approach to safety management. In line with framework of Annex 19, the United States has already begun to implement a state-wide safety management system, and begun developing requirements and guidance for the U.S. aviation industry.

2.4   The components of an SMS; Safety Assurance, Safety Risk Management, and Safety Culture are supported by the promotion of open, non-punitive reporting and information sharing. The U.S. FAA has now imbedded the method by which safety is assured within the organizational structures of the operational and planning units; and participated in the development of a new policy soon to be required of ICAO member states.

2.5   The U.S. FAA has invested heavily in these programs, ranging from the ATSAP (Air Traffic Safety Action Program), which mirrors the Aviation Safety Action Programs (ASAP) used in the aviation industry; the Aviation Safety Information Analysis and Sharing (ASIAS) and the Safety Analysis System (SAS).

2.6   The U.S. FAA created the Aviation Safety Information Analysis and Sharing (ASIAS) capability as a means to provide a national resource for analysis of data to discover common, systemic safety problems that span multiple facets of the global air transportation system. ASIAS uses safety data collected from the public sector and proprietary data from industry stakeholders, to assess identified safety issues and to monitor multiple data sources for potential high-risk safety vulnerabilities. The capability program, the first of its kind, is the result of years of successful information sharing programs supported by air carriers, labor unions, the U.S. FAA, and other stakeholders, and holds to the principle that safety information is inherently meant to be shared to increase aviation safety.

2.7   The U.S. FAA has created a process of continuous safety improvement, linking together safety analysis, reporting, information sharing, mitigation design, implementation, and metrics to assess the success of the safety initiatives promoted by the system. This process is very successful in identifying current problems in aircraft operations or ATM procedures. The ASIAS system provides a method to capture and report the information on these events to the safety community in a rapid, non-punitive manner. INFOShare, attended by over 20 carriers every quarter, allows the U.S. FAA to provide safety information and a venue for peer-to-peer sharing that literally saves lives and millions in the aviation industry. ICAO recognized the need for information sharing, as described by Nancy Graham in her remarks in March 2011:

"The challenge for more mature States and Regions is to complete the transition to a pro-active safety system. Historically, the aviation community has focused its accident prevention efforts on analysis of accidents and serious incidents through detailed investigation of these events and development of measures to prevent their recurrence. In a pro-active system, often referred to as Safety Management, systemic hazards and risks are identified and assessed on a continuous basis and risk mitigating measures are put in place before accidents an incidents occur. In essence, it is similar to preventive medicine. We are building a healthier environment and life style. It does not totally preclude accidents but, as for healthy human beings, it both reduces the likelihood and severity of accidents.

In that context, I am very pleased to announce that two days ago ICAO, the US Department of Transportation, and the Commission of the European Union and the International Air Transport Association (IATA) signed a Memorandum of Understanding which sets the stage for the establishment of a Global Safety Information Exchange."

2.8   However, the analysis of current operations is only one part of the mission of the safety enterprise. Discovery of new potential hazards, understanding the implications of known safety issues and, very importantly, designing systems and processes to deal with the incoming complexities posed by NextGen are all challenges to which the safety community has risen over the last several years.

Safety Management Transformation – from accident forensics to proactive safety management

2.9   Significant gains have been made in dealing with the historical causes of crashes and in improving crash survivability. What remains is the challenge of how to deal with underlying causes, discovery of emergent risks, and mitigations that will reduce accident probability. One example of an emerging hazard is the new level of complexity introduced as the system phases in NextGen technology and procedures. Complexity is illustrated by the problem if implementation of RNP in mixed fleet operations. How does the complexity of implementation of RNP affect traffic operations in an airport with mixed equipage where not all aircraft are capable of executing a procedure? What procedures, training, guidance and oversight are required? What are the special risks for particular airport environments? What should the acceptable risk criteria be?

2.10   Another example is the broad issue of human fatigue, to which crew, pilots, controllers and maintenance personnel are susceptible. Awareness of individual fatigue and the potential risk that it poses to aviation operations has grown in the recent past due in large part to the effect of fatigue on ensuring operations are conducted safely. The National Transportation Safety Board (NTSB) has been concerned about the effects of fatigue on individuals in all transportation industries since the 1980s and has made numerous fatigue-related safety recommendations. Fatigue has been shown to contribute to underlying causes of risk such as: increasingly frequent lapses in performance, memory problems, and an increasing inability to maintain the vigilance required to perform the tasks required.

2.11   The U.S. FAA hosted an international symposium on fatigue, "Aviation Fatigue Management Symposium: Partnerships for Solutions," June 17-19, 2008. The symposium aimed at addressing the issue of human fatigue. In 2010, U.S. FAA issued Advisory Circular 120-100, which summarized the content of the symposium, described fundamental concepts of human cognitive fatigue and how it relates to safe performance of duties by aviation industry employees and provides information on how fatigue can be reduced and how the effects of fatigue can be mitigated.

Employee Coverage

2.12   The risks and potential safety consequences of fatigue vary by each sector, whether that be pilots, crew, controllers, or technicians, so it is important to study a variety of types of employees to gain a full understanding of the risk of fatigue in each context.

Pilots

2.13   The NTSB investigation into the February 2009 crash of Colgan Air Flight 3407 concluded that both pilots' performance was likely impaired because of fatigue. In addition, the NTSB citied fatigue as a cause or contributing factor in four of the last six fatal accidents involving regional air carriers. Congressional concerns prompted the Department of Transportation (DOT) Office of Inspector General (OIG) to conduct an audit of U.S. FAA's regulations and airline policies on crew rest requirements and fatigue issues. The OIG report was published in 2011.

Controllers

2.14   The NTSB investigation into the August 2006 crash of Comair Flight 5191 led to concerns about air traffic controller fatigue and led to specific recommendations to U.S. FAA. Congressional concerns prompted OIG to conduct an audit of several air traffic control facilities. The OIG report was published in 2009.

Technicians

2.15   An U.S. FAA Civil Aerospace Medical Institute report on organization development within Technical Operations Services (TechOps) Operations Control Centers (OCCs) published in 2012, addressed workload and fatigue. One proposed intervention raised in the report was the development of a fatigue risk management approach. In response, U.S. FAA developed a communication, training and management tool called **All Points Safety. All Points Safety** is a communications campaign designed to raise awareness of how the FAA's Air Traffic Organization is providing employees with improved tools, processes and programs that enhance the Agency's ability to **report, compile, analyze, identify and improve hazards in the National Airspace System**.

2.16   Flight and Duty Time Rules were likewise scientifically evaluated and promulgated by the U.S. FAA to respond to the potential effects on safety posed by crew schedules, and similar analysis of operational risks are underway in other workforces within the aviation system.

Near term operational safety management

2.17   Near-term operational safety issues remain a significant concern of the U.S. FAA, as illustrated by the FAA's Air Traffic Organization's Top 5, which is a quantifiable list of hazards that contribute to the highest risk events in the national airspace system. This is the best example of how the U.S. FAA is using data to focus its resources on identifying hazards, taking corrective action and monitoring the results. This approach allows decisions to be made on areas of highest risk to the safe operation of the system, as illustrated by the Top 5:

> i)   *Recovery*. In some cases, separation requirements are not quickly re-established after a loss of separation.
>
> ii) *Traffic Advisories/Safety Alerts* are not being issued, removing a safety barrier and increasing risk.

    iii) *Monitor Initial Departure Headings.* Communications are being transferred prior to ensuring initial departure headings, resulting in aircraft being off frequency while controllers attempt to mitigate losses of separation.

    iv) *Similar Sounding Call Signs.* Aircraft are operating with similar sounding call signs, resulting in increased opportunities for confusion, and incorrect aircraft receiving or reading back clearances.

    v) *Conflicting Procedures.* Facility letters of agreement and standard operating procedures conflict with published arrival and departure procedures, increasing the likelihood for incorrect pilot readback and actions.

The Benefits of Safety Investments

2.18   Economic trends can often be restrictive for airline investments of any kind, and safety improvements must often be weighed against their potential operational and cost impacts to determine which investments have the best potential and highest priority. It is never a question of whether or not to improve safety, rather it is 'when' can the improvement be made and at what cost that drives our decision-making.

2.19   In this context, the U.S. FAA works hard to understand the cost and benefit implications of potential rules, mitigations, and safety enhancements. Some safety changes not only improve the risk picture but the bottom line as well; a good example is in airport surface safety investments both in tower operations and in cockpits.

2.20   Evaluation of the potential benefits of moving map cockpit displays for improved airport surface operations showed benefits in the United States of up to $8.2 million dollars per year in fuel burn costs alone; not to mention improved throughput performance which led to higher aircraft utilization rates and more reliable connection times for passenger itineraries. Safety cases are critical but do not alone make the case for heavy equipment and procedure investments; often safety is also good for the bottom line and the U.S. FAA has developed methods and data to quantify these benefits.

2.21   Along with airports, aircraft, the workforce and traffic, the U.S. FAA has begun to transform to meet the requirements of the Next Generation transportation system. All of the old problems have not been left behind, and along with the transformation come transitional problems, and day-to-day issues that all must be managed within the safety enterprise context. But the system is not limited to the borders of the United States. The high volume of traffic in the Middle East and our increasing presence with carriers, ANSPs and manufacturers, require that we coordinate for a comprehensive global policy to ensure that safety continues to improve.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to note the information contained in this paper.

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