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EDITORIAL

This year, we have discussed in detail runway overruns, runway incursions and their impact on flight safety.

We were pleasantly surprised that the February 2008 issue of AeroSafety World discussed Air France A340 overrun accident in Toronto which we covered in detail in our February issue. The March 2008 issue of Interpilot, the Journal of IFALPA has discussed EMAS. We are happy that the topics discussed in our newsletter are the current.

The final report on the investigation of the crash of AdamAir B737 in Indonesia on January 1, 2007 was released in March 2008.

We discuss this accident and the findings of the investigation which reflects on the tragic outcome of the lack of safety management in an airline.

We introduce you to Safety Management System (SMS) and its role in reducing possible accidents.

We conclude with the pilot considerations for EMAS Engagement.

As always, we look forward to your feedback, suggestions and contributions which can be sent to our office address given in this page. Happy reading and many more safe landings.

THE CRASH OF ADAMAIR B737

based on Indonesian NTSC report no.KNKT/07.01/08.01.36

On 1 January 2007, a Boeing 737-4Q8 (PK-KKW) operated by Adam SkyConnection Airlines (AdamAir) as flight number DHI 574, was on a scheduled passenger flight from Surabaya (SUB), East Java to Manado (MDC), Sulawesi, at FL350(35,000 feet) when it disappeared from radar.

The aircraft had departed from Djuanda Airport, Surabaya at 05:59 UTC under IFR, with an estimated time of arrival (ETA) at Sam Ratulangi Airport, Manado of 08:14. The fuel endurance on departure from Surabaya was 4 hours 30 minutes, and the crew had flight planned for an alternate of Gorontalo (GTO). The PIC was the PF for the sector and the copilot was the PM. There were 102 people on board which included 7 children and 4 infants.

AdamAir Boeing 737-4Q8 (PK-KKW) at Jakarta on 3 June 2006

A massive search for the wreckage of PK-KKW in the Makassar Strait, in the vicinity of the last radar return was carried out by the Indonesian Navy, Army, Air Force, Police, Search and Rescue organization, a Singaporean Air Force Fokker 50 aircraft, the *USNS Mary Sears*, National Transportation Safety Committee of Indonesia, Air Accident Investigation Bureau of Singapore, Singapore Navy Divers, and other resources.

Nine days after the aircraft disappeared, wreckage was found in the water on the shore along the coast near Pare-Pare, Sulawesi. Locator beacon signals from the flight recorders were heard on 21 January 2007 and their positions logged. As the wreckage was located in the ocean at a depth of about 2,000 meters, requiring specialized recovery equipment not available in the Region, recovery of flight recorders could be done during the last week of August 2007.

The accident was investigated by the National Transportation Safety Committee (NTSC) of Indonesia, with support from NTSB & FAA of US, the Australian Transport Safety Bureau (ATSB), AdamAir, General Electric, Boeing and others. On completion of the investigation, the NTSC released the final report on 25 March 2008.

The DFDR analysis showed that the

aircraft was in cruise at FL350 with the autopilot engaged. The autopilot was holding 5 degrees left aileron wheel in order to maintain wings level. Following the crew's selection of the right Inertial Reference system (IRS) Mode Selector Unit to *ATT* (Attitude) mode, the autopilot disengaged. *The control wheel (aileron) then centered and the aircraft began a slow roll to the right at about 1 deg./sec.* At around 06:58 the aural alert, *BANK ANGLE,* sounded as the aircraft passed 35 degrees right bank.

The report concluded the following as the Deck crew centered causal factors of the accident.

1. The pilots faced an IRS malfunction, which, with their action, rendered the right Electronic Attitude Display indicator(EADI) inoperative.

– The right EADI lost roll indication, horizon, pitch scale, and sky/ground indications.

– The left EADI and the Standby ADI for attitude and direction indication were available before and after the autopilot disengaged.

2. The pilots did not have sufficient knowledge of the aircraft system to quickly and appropriately troubleshoot the IRS problem they were facing. *Their actions to rectify the problem resulted in a number of decision errors.*

3. The pilots consulted the appropriate section of QRH in an attempt to resolve the IRS malfunction. They, however, did not maintain straight and level, constant airspeed flight after switching the IRS Mode Selector to Attitude in accordance with the QRH.

4. The selection of Attitude mode in the IRS, disengaged the autopilot. After the autopilot disengaged and the aircraft rolled right and exceeded 35 degrees right bank, the pilots appeared to have become spatially disoriented.

5. The PF did not manage the task sharing. *CRM practices were not followed.*

6. Both pilots became engrossed with trouble shooting IRS anomalies for at least the last 13 minutes of the flight, with minimal regard to other flight requirements.

7. From about 06:58:40, with a right bank angle of 100 degrees and approaching 60 degrees nose down, the pilots realized their critical situation and attempted to effect recovery by using inappropriate control inputs.

A significant aerodynamic structural failure occurred at the time of the g force reversal; the time of the recording of the *thump, thump* sound on the CVR which was verified by spectrum analysis and determined to be typical of a structural failure. There was no evidence of in-flight fire. The aircraft impacted the water at high speed at a steep descent angle and disintegrated on impact.

8. The AdamAir syllabus of training did not cover complete or partial IRS failure training.

9. There was no evidence of pilots training covering unexpected autopilot disengaging, and the knowledge and skills required for manual handling and using the standby instruments in the event of an IRS failure.

10. At the time of the accident *AdamAir did not provide their pilots with IRS malfunction corrective action training in the simulator, nor did they provide aircraft upset recovery training or proficiency checks.*

11. The *Flight Crew Operations Manual* (FCOM) and the QRH used in AdamAir Boeing737 aircraft had not been revised since the aircraft were delivered in December 2005. This FCOM did not cover initial IRS training material.

Other Causal Factors that contributed to the accident were

- AdamAir had not resolved the airworthiness problems with the IRS that had been reoccurring on their Boeing 737 fleet for more than 3 months.
- The AdamAir maintenance engineering supervision and oversight was not effective and did not ensure that repetitive defects were rectified.

Even after this accident, AdamAir failed to improve the safety standards and a runway overrun in March 2008, ahead of the release of this accident report ensured a tough action.

From March 19,2008, AdamAir was grounded over safety concerns and may shut down for good. The low-cost carrier which began operations in 2003 is on the verge of bankruptcy demonstrating that safety management is as important to business survival as much as a financial management system!!

Safety Management System– an introduction

Dr.M.S.Rajamurthy

The AdamAir B737 crash discussed above is a glaring example of an airline sans flight safety management. Like a financial management system is a must for a successful business, safety management is a must for the success of an airline. Its implementation leads to enhanced safety performance.

In the context of commercial air transport operations, "**Safety Management**" is defined as the systematic management of the risks associated with flight operations, related ground operations and aircraft engineering or maintenance activities to achieve high levels of safety performance.

"Safety Management System (SMS)" is an explicit element of the corporate management responsibility which sets out the safety policy and defines how safety is managed as an integral part of its overall business.

SMS can be compared with a Financial Management System as a method of systematically managing a vital business function. The outputs from such a system are usually felt across the entire organisation. Although financial risks are taken the financial procedures in place ensures that there are no "business surprises". If there are it can be disastrous. An aircraft accident is also an "unexpected loss" and not one any organisation in the civil aviation industry wishes to suffer.

Thus, safety management needs the same focus and care as that given to an organisation's financial health. A developed SMS provides a transparent, recorded system to manage safety. Quality Management should interface with Safety Management as part of the airline's core management system.

Fundamental requirement for SMS

Existence of a positive safety culture is fundamental to SMS. Safety culture is the way in which airline conducts its business and particularly the way it

manages safety. It stems from the communicated principles of top management and results in all staff exhibiting a safety ethos which transcends departmental boundaries. Safety culture can be measured by informal or formal staff surveys, or by observations conducted in safety related work areas.

Safety management is a top down approach and must be seen as an integral strategic aspect of business management, recognising the high priority attached by the company to safety. To that end, a demonstrable Board-level commitment must exist. The contribution of all staff in making SMS very effective must be emphasised.

Implementing SMS

Implementation of a SMS involves evolution rather than revolution.

1) A pragmatic approach should be used to establish SMS, building on existing Quality Management procedures and practices. SMS identifies and prioritises the use of resources to manage risk and it should lead to gains in efficiency.

2) Adoption of "best practice" standards must be the goal.

3) A fully-fledged SMS is a formalised, company-wide system established at corporate level. Flight Operations, engineering & Maintenance, Ground Handling and all others who contribute to the operator's safety performance will have their own processes & procedures under the umbrella of corporate SMS.

4) Where safety sensitive functions of the operator are outsourced (ex. maintenance and ground handling) contractual agreements should identify the need for auditable SMS in the supplier.

SMS is both proactive and reactive, giving a means to anticipate and prevent or reduce the effects of risks.

SMS Prerequisites

The three essential prerequisites for a successful SMS are:

1. A comprehensive corporate approach

An effective SMS will provide a means of achieving enhanced safety performance which meets or exceeds basic compliance with the regulatory requirements associated with safety and quality. It is a well established fact that enhanced safety performance is achieved by effective, devolved executive management in association with a means of independent safety oversight, both of which are the ultimate responsibility of the Board and CEO. The Board and CEO are then able to demonstrate how safety is managed in the company.

A corporate approach to safety must be able to meet the following criteria:

- Published safety accountabilities of managers and key staff
- Requirements for a safety manager
- The ability to demonstrate that it generates a positive safety culture throughout the organisation
- Documented business policies, principles and practices in which safety is inherent
- Commitment to a safety oversight process which is independent of line management
- Regularly reviewed safety improvement plans
- Formal safety review process.

2. An effective organisation for delivering safety

The second essential prerequisite is for an organisation that delivers safe standards by way of:

- Effective arrangements for selection, recruitment, development and training of staff
- Safety awareness training for management and staff
- Defined safety standards for, and auditing of, asset purchases and contracted services
- Controls for the early detection of - and action on – deterioration in the performance of safety-significant equipment or systems or services
- Controls for monitoring and recording the overall safety standards of the company
- The application of appropriate hazard identification, risk assessment and effective management of resources to control those risks
- Change management
- Arrangements enabling staff to communicate significant safety concerns to the appropriate level of management for resolution and feedback of actions taken
- Emergency response planning and simulated exercises to test its effectiveness
- Assessment of commercial policies with regard to impact on safety.

3.Systems to achieve safety oversight

The following elements are desirable:

- A system for analysing flight data for the purpose of monitoring flight operations and for detecting unreported safety events.
- A company wide system for the capture of written safety event issues/ reports
- A planned and comprehensive safety audit review system with flexibility to focus on specific safety concerns as they arise
- A published system for the conduct of internal safety inspections
- Implementation of remedial actions and communication of such information
- Systems for effective use of safety data for performance analysis and for monitoring organisational change as part of the risk management process
- Arrangements for ongoing safety promotion based on the measured internal safety performance and assimilation of experience of other operations
- Periodic review of the continued effectiveness of the safety management system an internal, independent body
- Line manager's monitoring of work in progress in all safety critical activities to confirm compliance with all regulatory requirements, company standards and local procedures.

SMS Benefits

SMS helps organisations to avoid expensive litigation; leads to a reduction in insurance costs & the number of costly investigations; helps to avoid over engineering. It helps organisations apply the lessons learned from past management failures and allocate resources based on risk and avoids buck passing.

Safety management remains at the forefront of methods by which airlines can make aviation, already a very safe form of travel, even safer.

Reference:

"Safety Management systems for commercial air transport Operations," CAP 712,Safety Regulation group, CAA, U.K., April 2002.

Pilot considerations for EMAS Engagement

based on Mark Slimko's article in Interpilot, March 2008

In the January 2008 issue of Flight safety we discussed runway overrun accidents and Engineered Material Arresting System (EMAS). There are 30 EMAS installed in the U.S. including the runways 4R/22L at JFK International, New York.

As we operate to JFK, the following is for the consideration of our B777 deck crew flying this sector, and an information for the other fleet crew.

During the takeoff or landing phase, if a pilot determines that the aircraft will exit the runway end and enter the EMAS, the following procedures should be followed:

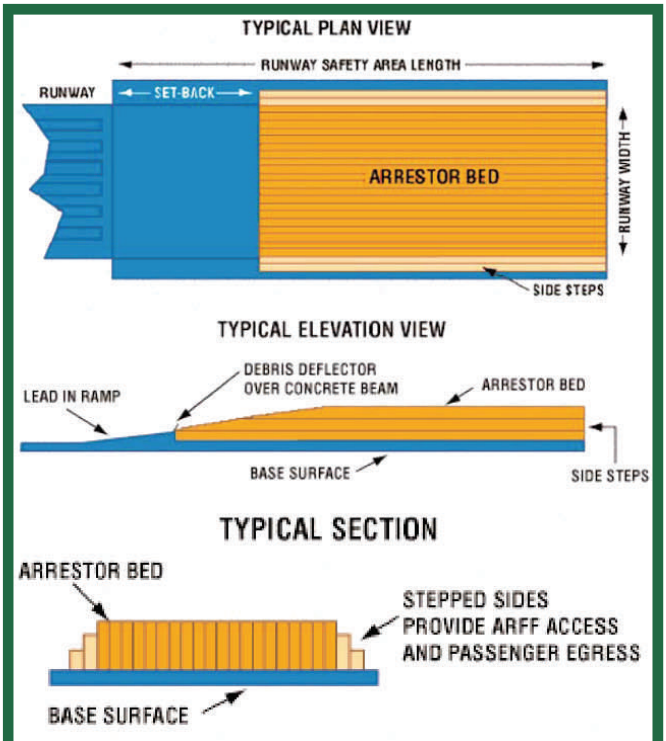
1. Regardless of aircraft speed upon exiting the runway, continue to follow Rejected/Aborted Takeoff procedures, or if landing, Maximum Braking procedures outlined in the Flight Manual.

2. Not veering left or right of the bed and continuing straight ahead will maximize stopping capability of the EMAS bed. The quality of deceleration will be best within the confines of the bed. The further the aircraft travels into the bed, and into deeper concrete, the greater the deceleration.

3. The arrestor bed is a passive system, so there is no action required by the pilot, as is the case for other traditional arresting systems such as cables, chains and aircraft netting.

4. Once stopped, do not attempt to taxi or otherwise move the aircraft.

5. An arrestment by itself doesn't by default require an emergency ground egress, but it may be impractical to offload passengers and crew via mobile or built-in airstairs, thus necessitating the use of slides or aircraft stairs.



Details of Engineered Material Arresting System (EMAS)

Should an emergency egress be required, use standard aircraft emergency ground egress procedures.

Where the surface of the bed has been breached, the loose material will crush under foot. During egress, it is important to note that the two sides and the back of the arrestor bed have continuous steps built in to help provide easy access for responding ARFF vehicles and to enable passengers to safely step off of the bed.

Web Watch

http://www.dephub.go.id/knkt/ntsc home/ntsc.htm - full investigation report of the AdamAir Boeing 737 accident is available here, worth reading to appreciate the need for safety management.

PHOTO OF THE MONTH

Close encounters of the runway kind!

Luxembourg, July 6, 2004.

Imagine a Cessna getting crushed by a Jumbo! Here a Cargolux Boeing 747-4R7F/SCD coming in to land and a Cessna 172 just exiting the runway?

In the March 2008 issue of Flight Safety we had discussed much about runway incursions. Here is a real-life close encounter.

The Confidential Aviation Hazard Reporting System (CAHRS) provides a means of reporting hazards and risks in the aviation system before there is loss of life, injury or damage. It is open to anyone who wishes to submit a hazard report or safety deficiencies confidentially and non-punitively. Reports help to identify deficiencies and provide safety enhancement in areas of aviation. CAHRS forms can be collected at different location of KAC (i.e. Flight Dispatch) Premises. Completed forms can be dropped in FS&QA allocated box at Flight Dispatch or e-mailed to kwioeku@kuwaitairways.com or faxed to 00965-4749823 or mail to Flight Safety and Quality Assurance office, Operations Department, P.O. Box 394, Safat 13004, Kuwait Airways –Kuwait.