



ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 33: Other issues to be considered by the Technical Commission

THE EFFECTS OF PREPARING PILOT REPORT ON INCREASING THE EFFECTIVENESS OF THE IMPLEMENTATION OF THE FLIGHT DATA MONITORING (FDM) PROGRAM

(Presented by Iran (Islamic Republic of))

EXECUTIVE SUMMARY

The implementation of flight data monitoring (FDM) program in airlines can greatly help to reduce flight incidents and accidents, increase flight safety and reduce maintenance costs. This will be achieved if the implementation of this program is carried out correctly and taking into account all relevant considerations (which are mentioned in references such as Annex 6, Doc 10000 AN (50) and AMC1 ORO.AOC.130). Preparing pilot report can have a great impact on finding the root causes of events. Considering that there is no mention of the pilot report in the aforementioned regulations, the purpose of this article is to present the benefits of preparing and how to analyse and use such a report by presenting relevant case studies.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objectives on Safety.
<i>Financial implications:</i>	Reduce maintenance costs.
<i>References:</i>	Annex 6 — <i>Operation of Aircraft</i> Doc 10000, <i>Manual on Flight Data Analysis Programmes</i> (FDAP) AN (50) and AMC1 ORO.AOC.130

1. INTRODUCTION

1.1 A pilot report is a report in which the flight events that occurred in a fleet and in a certain period of time are prepared without identifying the pilot's name, in order to check the pilot's performance and compare their performance with each other. In this report, which is provided to the safety manager, in addition to comparing the rate of events related to each pilot, the performance of the pilot and co-pilot is also examined separately.

1.2 By analysing the pilot reports, very useful information is obtained from occurred events, which greatly helps the safety manager to reduce incidents and increase flight safety. Sufficient care should be taken in the preparation and use of this report so as not to violate the confidentiality and non-punitiveness of FDM implementation in the regulations.

- 1.3 The benefits of preparing this report, the following can be mentioned:
- a) identifying high-risk pilots from low-risk ones;
 - b) relation between pilots and aircraft;
 - c) relation between pilot's events with each other;
 - d) following up training of pilots (planning for useful training in simulators); and
 - e) rating pilots.

2. **DIFFERENT PARTS OF THE PILOT REPORT**

- 2.1 A pilot report can consist of the following sections:
- a) list of pilots (in coded form), the number of flights in the reporting period and the number of events by severity;
 - b) list of analysed and occurred flight events (which can be in the form of a table);
 - c) rate of pilot events by different severities;
 - d) pilot's contribution percentage for each event as a bar chart; and
 - e) rate of events of pilots with co-pilots separately for each event, which is given in the form of a matrix or graph.
- 2.2 This helps the safety manager to identify pilots who have more incidents with each other and avoid choosing to fly together as much as possible. It is also possible to identify the root causes of a high number of flight incidents and take the necessary corrective actions.

3. **ANALYSIS OF THE PILOT REPORT**

3.1 In order to be able to make better use of the third part of the report (the rate of pilot's events by different severities), the comparison should be done in two ways. Comparing pilots based on all severities, where pilots with more events are identified. But this chart does not distinguish the high-risk pilot from the low-risk one. Comparing pilots by severity can help identify high-risk pilots.

3.2 **Case study 1:** Figure 1 shows pilots event rate for all severities, which failed to distinguish high-risk from low-risk pilots (Cap-11 seems to be the high-risk pilot (had the most events)). But if this information is separated based on severities, it is possible to identify the high-risk pilot (Figure 2) (it can be seen that in fact CAP-16 has committed the highest number of high-severity events and therefore it is considered a high-risk pilot).

3.3 As pilots are separated by event severity, it is necessary to separate them according to the number of flights. Because if there is no separation, identifying the high-risk pilot from the low-risk one will be wrong. This is shown in Figures 3 to 5. In Figure 3 (the number of flights is not considered), the

CAP-24 is identified as a high-risk pilot. If the number of pilot’s flights is considered (Figures 4 and 5), it is clear that CAP-24 has a high event rate due to the low number of flights, and in fact the CAP-26 is a high-risk pilot.

3.4 Regarding the fourth part of the report, as mentioned, the correct use at the right time of the results obtained from the pilot report can greatly help to increase the level of flight safety and reduce events. The safety manager can take two approaches to analyse the pilot reports:

- a) identification of high-risk pilots (by complying with all regulations and procedures related to maintaining confidentiality and non-punitiveness approach of FDM implementation); and
- b) identifying the root causes of an event.

3.5 In the first approach, the graphs related to the number of events of each pilot are analysed and based on that, decisions are made regarding the pilot training programs. This helps to implement the training program with a specific goal and also to prevent the implementation of the extra training program.

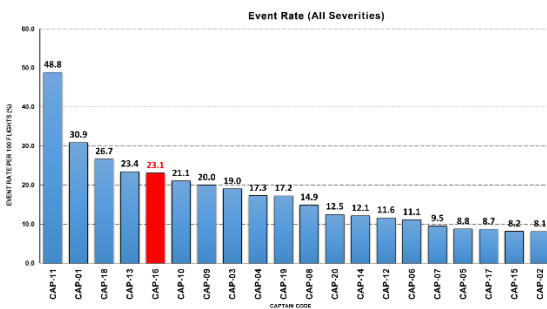


FIGURE 1: EVENT RATE OF PILOTS WITH ALL SEVERITIES

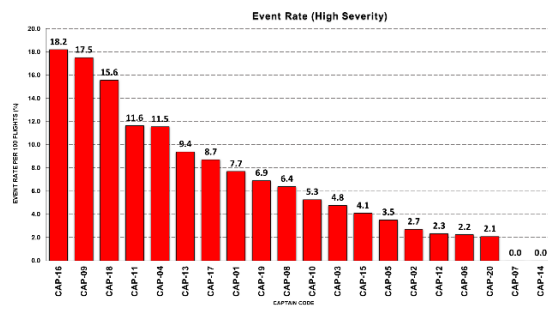


FIGURE 2: EVENT RATE OF PILOTS WITH HIGH SEVERITY

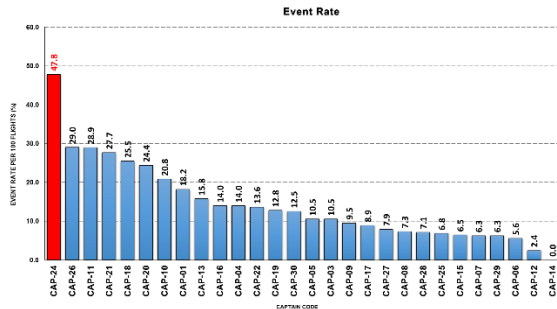


FIGURE 3: EVENT RATE OF PILOTS (NUMBER OF FLIGHTS IS NOT CONSIDERED)

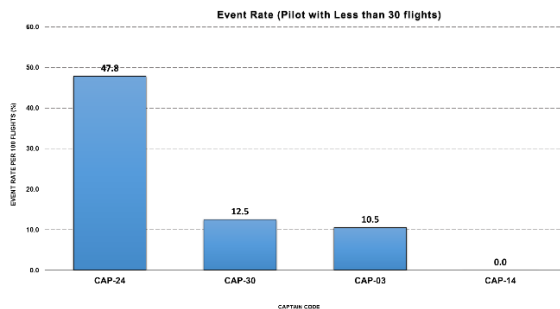


FIGURE 4: EVENT RATE OF PILOTS WITH LESS THAN 30 FLIGHTS

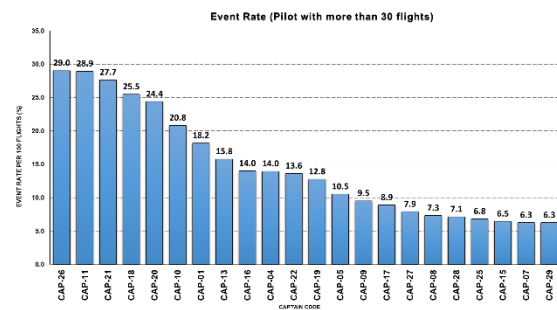


FIGURE 5: EVENT RATE OF PILOTS WITH MORE THAN 30 FLIGHTS

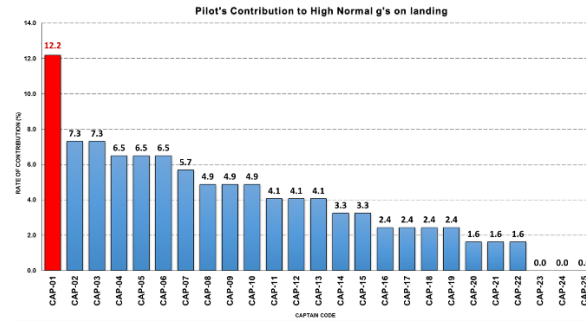


FIGURE 6: PILOT'S CONTRIBUTION TO "HIGH NORMAL G'S ON LANDING"

3.6 If in the chart of pilot's contribution to an event, a pilot(s) with a large number of differences commit the same event, it can be concluded that he/she should be trained or the necessary contact with him/her should be provided in order to clarify the circumstances. In case of timely action and proper training, the event can be prevented from happening again by him/her. Otherwise, it may lead to an incident, in addition to the safety risk, imposes a lot of cost on the airline, as mentioned below.

3.7 **Case Study 2** (Non-timely implementation of corrective action by the safety department): In one of the pilot reports related to an airline, which was prepared by Airsa Chakad Kish¹, it was determined that the event of High Normal g's on landing has a graph as below and one of the pilots has a higher rate of repetitions than others (Figure 6).

3.8 In this event, the landing gear of the aircraft was seriously damaged and due to the lack of timely supply, it led to the grounding of the aircraft. Flight investigation shows that the incident was done by the same pilot (who had the most number of commits). If the pilot report was accurately analyzed and corrective actions were taken in time (reminding the pilot or training him/her), this incident and damage to the aircraft and the airline could have been prevented.

3.9 In the second approach, non-operational root causes can be identified. If the repetition rate of an event by all pilots is almost the same, it can be concluded that non-operational factors play a role in its occurrence. In fact, one should look for non-operational root causes. These factors can include the technical problems, environmental conditions (weather) and airport conditions. The following refers to one of these items.

3.10 **Case Study 3** (Bank angle event): In one of the pilot reports prepared by Airsa Chakad Kish for one of the airlines, it is clear that the "Bank Angle above 500 ft." event has almost the same rate of repetitions by the pilots (Figure 8). Further investigation of the report and analysed data of the event shows that

¹ An FDM and ECTM company in Iran.

this event had a higher rate of repetitions in one of the aircraft of that airline (Figure 9). After the investigations carried out by the experts of Airsa Chakad Kish, it was determined that the cause of this event was a fault in the autopilot system related to that aircraft. Therefore, the necessary actions were taken to fix the defect and the number of repetitions decreased after taking this corrective action.

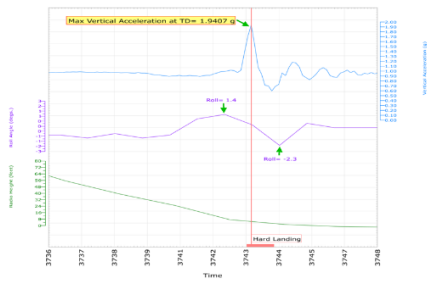


FIGURE 7: PARAMETERS RELATED TO HARD LANDING

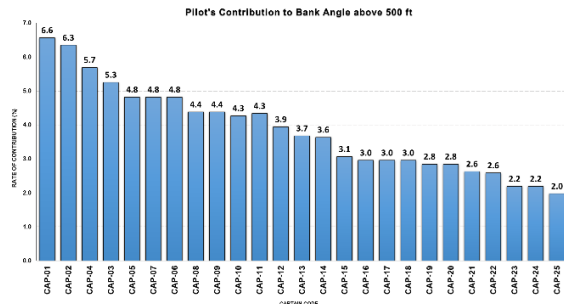


FIGURE 8: PILOT'S CONTRIBUTION TO "BANK ANGLE ABOVE 500 FT."

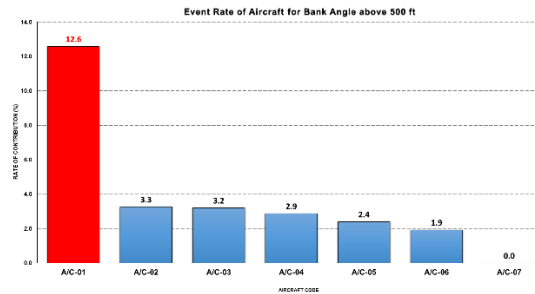


FIGURE 9: EVENT RATE OF AIRCRAFT FOR "BANK ANGLE ABOVE 500 FT."

4. CONCLUSION

4.1 The benefits of pilot report preparation in the implementation of the FDM program were presented. If this report is prepared and used correctly and timely, it will reduce the number of flight incidents, increase safety and reduce maintenance costs. It is suggested to emphasize the preparation of this report in the regulations related to the implementation of the FDM program.