4 RECOMMENDATIONS

4.1 Safety Actions Taken or in Progress

4.1.1 To NTSB

4.1.1.1 **2005 – 37** On 25 August 2005, the AAIASB recommended to the NTSB that the Boeing Company consider taking action to emphasize flight crew training and awareness in relation to (a) the importance of verifying the bleed and pack system configuration after takeoff and (b) the understanding and recognition of the differences between cabin altitude and takeoff configuration warnings.

Response/Action: On 25 August 2005, the NTSB responded that the Boeing Company was prepared to issue an October 2005 revision to 737-300/400/500/600/700/800/900/BBJ Flight Crew Training Manuals (FCTM) to include a new section entitled Air Systems/Cabin Altitude Warning reminding flight crews on how to understand and recognize the differences between the two meanings of the warning horn and reminding them of the importance of verifying the bleed and pack system configuration after takeoff.

4.1.1.2 **2005 – 38** On 25 August 2005, the AAIASB recommended to the NTSB that the Boeing Company clarify the Aircraft Maintenance Manual (AMM) maintenance procedure for Cabin Pressure Leakage Test (05-51-91) to explicitly specify the actions necessary to complete the maintenance test. Currently, under the title of section F ***"Put the airplane back to its initial condition"***, there were three action items but none of them referred for the pressure mode selector to be placed in the position AUTO.

Response/Action: On 12 October 2005, the NTSB responded that the Boeing Company had released a Temporary Revision to 737-300/400/500 AMM 05-51-91/20 on 29 September 2005 to include a specific step to put the pressure mode selector in AUTO at the conclusion of the cabin pressure leakage test. This change was planned for official release in the 12 January 2006 revision cycle of that manual. The same change to the corresponding 737-600/700/800/900/BBJ and 737-100/200 AMM were planned for official releases in the 21 October 2005 and 1 August 2006 revisions, respectively.

4.1.1.3 **2005 – 39** On 13 September 2005, the AAIASB recommended to the NTSB that the Boeing Company consider revising the Aircraft Maintenance Manual (AMM) 05-51-91 by adding an additional step associated with section F ***("Put the airplane back to its initial condition")***: to re-install the oxygen mask regulators (if removed) per AMM 35-12-00.

Response/Action: On 1 September, 2006, the FAA responded to the Safety Recommendation. The FAA informed the Board that the Boeing 737 Maintenance Review Board Chairman had advised Boeing of the AMM missing steps in December 2005. Boeing revised the 737-300/400/500 AMM with the 12 January 2006 revision, and added to AMM 05-51-91, paragraph

2.F, a step 4 which stated "***Move the pressurization mode selector on the forward overhead panel to AUTO***", and a step 5 which stated "***If the crew oxygen mask regulator was removed, then install and test the mask demand regulator (AMM 35-12-86/401).***" As a result, the FAA (Office of Accident Investigation, Safety Recommendation Review Board) classified the corresponding FAA recommendation as ***"Closed – Acceptable Action"***.

4.1.1.4 **2005 – 41** On 23 December 2005, the AAIASB recommended to the NTSB that the Boeing Company consider enhancing the design of the Preflight checklist to better distinguish between items referring to the air conditioning and the pressurization systems of the aircraft and to include an explicit line item instructing flight crews to set the pressurization mode selector to AUTO.

Response/Action: On 10 January 2005, the NTSB responded that the Boeing Company was preparing to issue enhancements to the flight crew procedures associated with the Boeing 737 Cabin Altitude Warning System by issuing a revision to 737-200/300/400/500/600/700/800/900/ BBJ Flight Crew Operations Manuals (FCOM)/Quick Reference Handbooks (QRH). The changes included modification of an existing Normal Checklist (NC), deletion of an existing Non-Normal Checklist (NNC), addition of a new NNC, and change in terminology.

4.1.1.5 **2005 – 42** On 23 December 2005, the AAIASB recommended to the NTSB that the Boeing Company reconsider the design of the Cabin Pressure Control System controls and indicators so as to better attract and retain the flight crew's attention when the pressurization mode selector position is in the MAN (manual) position.

Response/Action: On 30 June 2006, in its comments on the draft Final Report, the Boeing Company responded that a change in the colour of the indicator, as specifically suggested by the AAIASB, could provide a misleading indication to the flight crew that another failure had occurred requiring additional action.

4.1.2 To Cyprus AAIIB

4.1.2.1 **2005 – 40** On 20 October 2005, the AAIASB recommended to the Cyprus Air Accident and Incident Investigation Board that all airlines under the jurisdiction of the Cyprus DCA standardize cabin crew procedures for access to the flight deck and use of the cockpit door, and include relevant training in the Operations Manual.

Response/Action: On 28 November 2005, the Cyprus DCA responded to the AAIASB that such a procedure had been included in Cypriot air operators' manuals already before the Helios Airways accident. After the accident, and still within the framework of national and international regulations, the air

operators had made appropriate changes to the procedure for access to the flight deck.

4.1.3 To Hellenic ACC

4.1.3.1 **2005 – 43** On 2 May 2006, the AAIASB recommended to the Hellenic ACC that it consider the need for adding an indication on the label attached to the target of a flight on the radar scope, to draw a controller's attention when radio communication has not been achieved, and that it establish procedures to specify a time limit within which a controller should take the initiative to contact a flight that omitted to report its position when it crossed a compulsory reporting point (FIR boundaries, etc.). ICAO procedures (Doc 4444) stated that action should be taken if a report from an aircraft is not received within a ***"reasonable period of time"***, and it is left to regional air navigation agreements to prescribe a specified time interval.

Response/Action: On 28 June 2006, the Hellenic ACC responded that:

a) An appropriate procedure has been installed in the software of the radar system, in order to provide a visual indication to the controller if radio communication between the ACC and an aircraft has not been achieved.

b) The time limit within which a controller should take the initiative to contact a flight that omitted to report its position has been specified to three minutes and the requirement has been inserted in the ACC Operations Manual.

4.1.4 Actions by the FAA

On 22 June 2006, the FAA issued Airworthiness Directive (AD) 2006-13-13 applicable to all Boeing 737 series. This was an Immediately Adopted Rule, which became effective on 7 July 2006. The AD required revisions to the Airplane Flight Manual (AFM) within 60 days to advise the flight crew of improved procedures for pre-flight setup of the cabin pressurization system, as well as improved procedures for interpreting and responding to the cabin altitude / configuration warning horn.

Specifically, the AD revised the AFM, Normal Procedures, for the Boeing 737 series to include a procedure: ***"For normal operations, the pressurization mode selector should be in AUTO prior to takeoff."***

The AD also specified changes to the AFM, Emergency or Non-Normal Procedures sections:

"WARNING HORN–CABIN ALTITUDE OR CONFIGURATION RECALL

Condition: An intermittent or steady warning horn sounds:

- ***In flight an intermittent horn indicates the cabin altitude is at or above 10 000 ft;***
- ***On the ground an intermittent horn indicates an improper takeoff configuration when advancing thrust levers to takeoff thrust; and***

- *In flight a steady horn indicates an improper landing configuration.*

If an intermittent horn sounds in flight:
OXYGEN MASKS AND REGULATORS.....ON, 100%
CREW COMMUNICATIONS.....ESTABLISH
Do the CABIN ALTITUDE WARNING OR RAPID DEPRESSURIZATION checklist.

If an intermittent horn sounds on the ground:
Assure proper airplane takeoff configuration.
If a steady horn sounds in flight:
Assure proper airplane landing configuration."

The FAA advised that once a design change is developed, approved, and available, the FAA may consider additional rulemaking.

4.2 Recommended Safety Actions

4.2.1 To EASA/JAA

4.2.1.1 **2006 – 41** EASA/JAA require all airlines to amend cabin crew procedures. so that, when the oxygen masks deploy in the cabin due to loss of cabin pressure or insufficient cabin pressure and if the aircraft does not suspend climb, or level-off or start a descent,, the Cabin Chief (or the cabin crew member situated closest to the flight deck) be required to immediately notify the flight crew of the oxygen masks deployment and to confirm that the flight crew have donned their oxygen masks..

4.2.1.2 **2006 – 42** EASA/JAA require aircraft manufacturers to install in newly manufactured aircraft, and on a retrofit basis in older aircraft, in addition to the existing cabin altitude warning horn, a visual and/or an oral alert warning when the cabin altitude exceeds 10 000 ft.

4.2.1.3 **2006 – 44** EASA/JAA require practical hypoxia training as a mandatory part of flight crew and cabin crew training. This training should include the use of recently developed hypoxia training tools that reduce the amount of oxygen a trainee receives while wearing a mask and performing tasks.

4.2.2 To EASA/JAA and ICAO

4.2.2.1 **2006 – 45** EASA/JAA and ICAO require aircraft manufacturers to evaluate the feasibility of installation of a CVR that records the entire flight.

4.2.2.2 **2006 – 46** EASA/JAA and ICAO require all company communications with the aircraft (operations office, technical base/stations, and airport stations) to be recorded.

4.2.2.3 **2006 – 47** EASA/JAA and ICAO require the aircraft manufacturers to also record cabin altitude on the FDR.

4.2.2.4 **2006 – 48** EASA/JAA and ICAO study the feasibility of requiring the installation of crash protected image recorders on the flight deck of commercial aircraft.

4.2.2.1 **2006 – 49** EASA/JAA and ICAO implement a means to record international safety audits of the States' Civil Aviation Authorities, which ensures that the findings can be tracked in depth, action plans are developed and implemented in shortest possible time; and impose the necessary pressure when they become aware that international obligations and standards are not being met by the Authorities.

4.2.3 To The Republic of Cyprus

4.2.3.1 **2006 – 50** The Republic of Cyprus should support by all necessary resources the already under-reorganization Cyprus DCA so that it may be better equipped to carry out the governmental aviation safety oversight functions and to meet its international obligations in the shortest possible time.

Athens 4 October 2006

THE CHAIRMAN

Akrivos Tsolakis

THE MEMBERS

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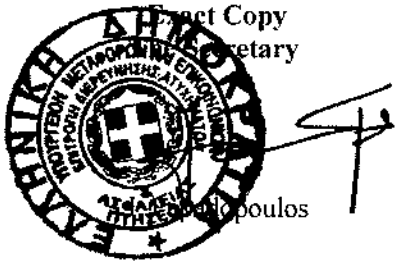
G. Georgas

G. Kassavetis

A. Katsifas



Exact Copy
Secretary

poulos