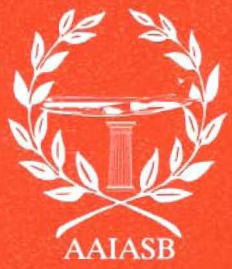

AIR ACCIDENT INVESTIGATION & AVIATION SAFETY BOARD

Accident Investigation Report a/c PH-AHQ of TUI Airlines at Chania International Airport on 12/ 12 /2007

Report No 10/2008

MINISTRY OF TRANSPORT
& COMMUNICATIONS

HELLENIC REPUBLIC
MINISTRY OF TRANSPORT & COMMUNICATIONS

AIR ACCIDENT INVESTIGATION & AVIATION SAFETY BOARD (AAIASB)

ACCIDENT INVESTIGATION REPORT

A/C PH-AHQ OF TUI AIRLINES AT CHANIA INTERNATIONAL AIRPORT

12th DECEMBER 2007

10 / 2008

ACCIDENT INVESTIGATION REPORT
10 / 2008

Accident of the a/c PH-AHQ of TUI Airlines
at the apron of Chania Airport on 12th December 2008

The accident investigation was carried out by the Accident Investigation and Aviation Safety Board in accordance with:

- **ANNEX 13**
- **Hellenic Republic Law 2912/2001**
- **E.U. Directive 94/56**

The sole objective of the investigation is the prevention of similar accidents in the future.

The Accident Investigation and Aviation Safety Board

Chairman
Captain Akrivos D. Tsolakis

Members

John Kondylis
Captain

George Kyriakopoulos
Lawyer

Helias Nikolaidis
Captain

George Stylios
Professor TEI

Secretary
John Papadopoulos

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OPERATOR	**: TUI Airlines, Nederland B.V.**
REGISTERED OWNER	**: SP 24477 Trust Limited**
MANUFACTURER	**: BOEING Co.**
AIRCRAFT TYPE	**: B767-383**
NATIONALITY	**: Nederland**
REGISTRATION	**: PH-AHQ**
PLACE OF ACCIDENT	**: Apron at Chania Airport**
DATE AND TIME	**: 12-12-2007 / 23:38**
NOTE	**: All times are UTC** (Local time = UTC+2h)

SYNOPSIS

At 23:38 h on 12.12.07, during the parking procedure at the Chania Airport apron, the right wing of an aircraft (a/c) type B767-383 collided with a light pylon at the apron causing a section of the wing to break off. The Hellenic Air Accident Investigation and Aviation Safety Board (AAIASB) was notified of the accident at 05:00 h on 13.12.07 and with its AAIASB/1719/13.12.07 document assigned an Investigation Team consisting of J. Papadopoulos, IIC, L. Loukopoulou, Human Factors specialist and G. Bonis, Flight Engineer.

The investigation identified as causes of the accident:

- The lack of decision-making both by the captain and the marshaller for suspension of aircraft movement and resolution of the dangerous situation that developed during movement of the aircraft for parking, and

as contributing factors:

- The ineffective supervision and lack of intervention by the first officer for prevention of the accident, and
- The lack of procedures regarding the exact responsibilities of each person involved in the handling of an aircraft in the apron area, and the lack of specification by the airport whether the aircraft taxiing guidance services with a

"FOLLOW-ME" vehicle (as stated in the AIP) are provided by the airport or the ground handling agent.

The draft final report was send to the Dutch Safety Board for their comments as per Annex 13 of Chicago Convention. The comments from the Dutch Safety Board were taking into account and diverted comments are attached into the Appendix at the end of the report.

Six safety recommendations were issued, one of them during the investigation.

1 Factual Information

1.1 History of the flight

At 23:35 h on 12.12.2007 aircraft (a/c) PH-AHQ, type B767-383 of TUI Airlines, operating as flight OR 978 landed at the Chania Airport (CHQ). The a/c had departed at 18:01 h from Minhad Air Base (NHD) in the UAE with a 10-member crew and was transporting 59 soldiers to Eindhoven (EIN) in the Netherlands. The landing at CHQ had been scheduled.

After landing on runway 29, the authorization given to the a/c by the Tower was to take the first right (exit) towards the apron. Following this authorization, the captain exited the runway by turning right on taxiway E and entered the apron which was wet and sufficiently illuminated.

At the time, there were no other a/c on the apron and the ground handling agent's marshaller waited for the a/c at parking position no. 6. The a/c crew gained visual contact with the marshaller and taxied towards the parking position in front of which stood the marshaller. Based on the landing gear tracks on the apron surface, after entering the apron the a/c proceeded straight towards the blast fences on the N-NE side of the apron without following the markings either for parking position no. 6 which was on the left of the apron entrance or for position no. 7 which was on the right of the apron entrance (photo 1).

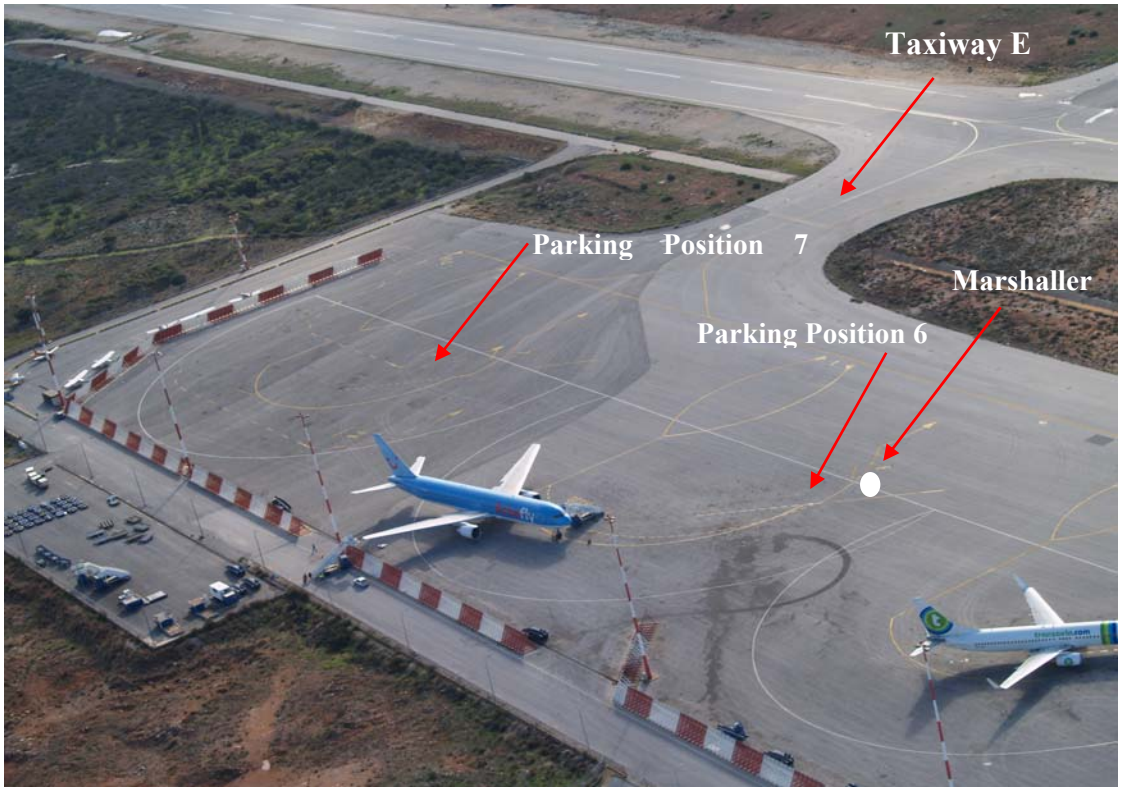

Photo 1. Apron at CHQ.

The track of the nose wheel (photo 2) shows that when it reached a distance of 31 m from the blast fences it turned to the left, bringing the a/c parallel to the blast fences, but that after about 50 m it started turning to the right (photo 3), reaching a distance of 18 m from the blast fences before starting again to turn to the left. By then the right main landing gear had reached a distance of 13.5 m from the blast fences and the right wing was already above them. During initiation of this second left turn of the a/c the wing collided with a light pylon that was in line with the blast fences, causing a section of the wing to break off. The captain brought the a/c to a complete stop. The ground handling agent apron supervisor notified his agency, who informed the Hellenic Civil Aviation Authority (HCAA) who, in turn, informed the airport fire-fighting service. The passengers disembarked with safety.

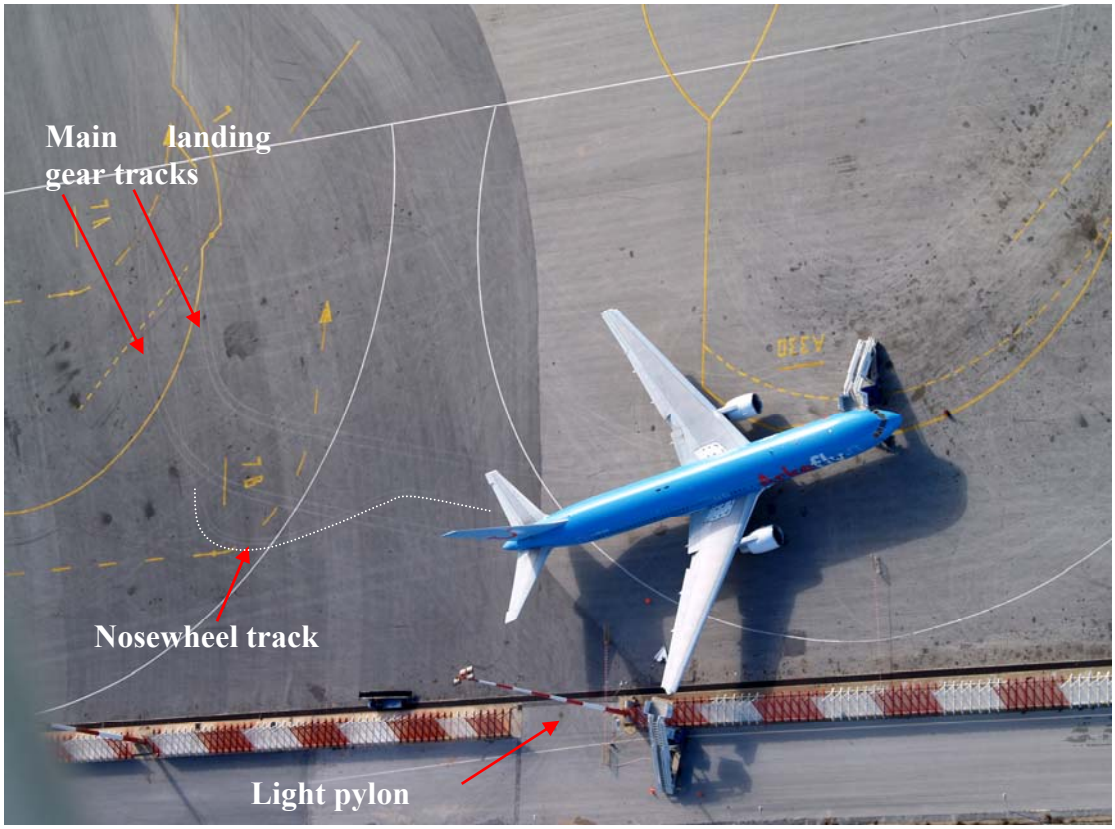

Photo 2. Landing gear tracks.

(The nose wheel track is indicated by the white line parallel to the inscribed track and directly below it.)

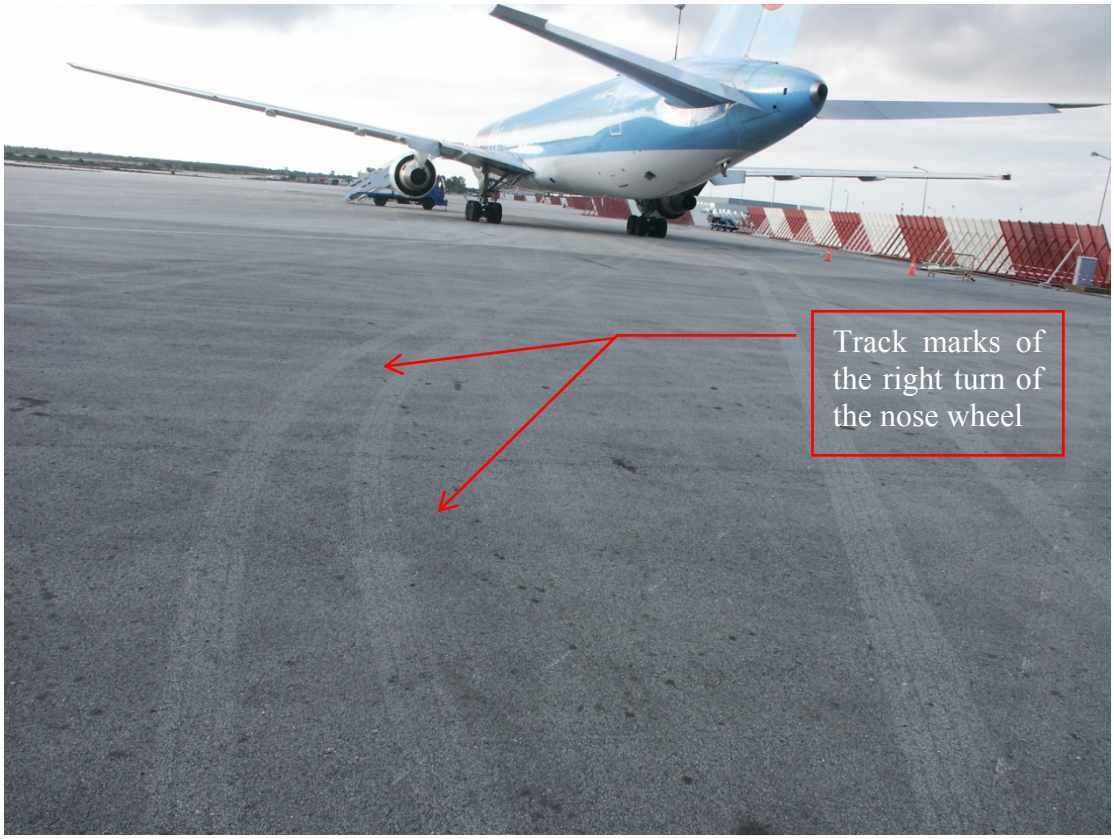

Photo 3. Track marks of the right turn of the nose wheel.

1.2 Injuries to persons

Injuries	**Crew**	**Passengers/Others**
Fatal	**---**	**---**
Serious	---	---
Minor/None	- / 10	- / 59

1.3 Damage to aircraft

The collision caused a 1.5 m in length section of the right wing to break off.

1.4 Other damage

The light pylon sustained abrasions and mild warping on its upper section.

1.5 Personnel information

1.5.1 Captain

Male aged 39 years

License:	Air Transport Pilot's License issued by the Civil Aviation Authority, Netherlands, valid until 01.02.2008
Type ratings:	B757/767
Medical certificate:	Class One issued by the Civil Aviation Authority, Netherlands, valid until 01.05.2008 and Class II, valid until 30.09.2010.
Last LPC:	24.06.2007
Last OPC:	24.06.2007
Flying experience:	Total all types: 7,500 hours Total on type: 2,000 hours
Flying duty period:	within company limits. During last 72 hours: 18:53 h During last 30 days: 72:00 h During last 365 days: 802:12 h

The captain was not familiar with CHQ since this was his first time landing at this airport. He had familiarized himself by studying the Jeppesen charts, per company regulations for airports of this category.

1.5.2 First Officer

Male aged 36 years

License:	Air Transport Pilot's License issued by the Civil Aviation Authority, Netherlands, valid until 01.11.2008
Type ratings:	B757/767
Medical certificate:	Class One issued by the Civil Aviation Authority, Netherlands, valid until 01.12.2008 and Class II, valid until 01.12.2012.
Last LPC:	20.08.2007
Last OPC:	20.08.2007
Flying experience:	Total all types: 3,280 hours Total on type: 1,580 hours
Flying duty period:	within company limits. During last 72 hours: 18:53 h During last 30 days: 74:13 h During last 365 days: 909:18 h

The first officer was not familiar with CHQ since this was his first time landing at this airport.

1.5.3 Marshaller

Male, aged 40 years. He was hired by Olympic Airways in 2002 as a seasonal worker and in 2006, after the required 2-day training course (22.05.2006) by Olympic Airways-Services, was assigned marshaller duties. He had not completed any refresher training as he had not yet completed 2 years of service (the required interval for refresher training, per regulations (see 1.18.3.1). He reported on duty at 21:00 h on 12.12.2007 and his shift was scheduled to end at 04:00 h on 13.12.2007.

1.6 Aircraft information

Manufacturer	:	BOEING AIRCRAFT Co
Type	:	B 767-383ER
Manufacturer's serial number	:	24477

Year of construction	:	1990
Powerplants	:	Two, Pratt & Whitney 4060
Certificate of Registration	:	Registered with the Netherlands, on 29.04.2005, valid until 29.10.2011
Certificate of Airworthiness	:	Issued by the Civil Aviation Authority, Netherlands, valid until 20.02.2008.
Total flight hours	:	73,898 h (11,221 cycles)
Last scheduled maintenance	:	25.10.2007 at 73,339 flight hours and 11,120 cycles

1.7 Meteorological information

Prevailing meteorological conditions at CHQ according to the 23:20 h METAR were: 25012KT 9999 FEW020 SCT030 BKN060 12/07 Q1009=

1.8 Aids to navigation

Not applicable.

1.9 Communications

Communications between the a/c and all ground stations were conducted normally. A copy of the transcript of communications between Tower and a/c was obtained.

1.10 Aerodrome and approved facilities

Chania Airport is state-owned. According to AIP Greece, Volume 1 its operation or supervision is the responsibility of the Hellenic Air Force (AGA-2-4-3, 20 Sep 2005/1), the airport is a military facility open to international air traffic (AGA-3-1-2, 22 Nov 2007/9), and taxiing guidance on the ground is carried out using a "FOLLOW ME" vehicle (AGA 2-4-4, 23 Nov 2006/5).

Air Traffic Control (ATC) services (Approach, Tower) and fire-fighting services are provided by the Hellenic Air Force while the management and operation of facilities, as well as the coordination and the control of the activities of the various airport agents regarding the movement of civil aircraft on the ground is the responsibility of the Hellenic Civil Aviation Authority (HCAA). Regarding ATC there is a relevant agreement between the Hellenic Air Force and the HCAA (Agreement of cooperation between Athens Air Traffic Control Center (ATHINAI ACC) and the Souda

Approach Control Center (SOUDA APP). Regarding the supervision of activities related to the movement of civil aircraft on the ground there is no relevant agreement.

The airport has a runway 3348 m long and 45 m wide in the 112°/292° (11/29) direction and two taxiways, one north and one south of the runway. On the western end of the north taxiway is the apron that extends parallel to it and is used for civil a/c parking. Entry to the apron from the taxiway is via 3 taxiways (E, J, and I) and centerline markings lead to 7 numbered parking positions. Along the length of the apron's northern end there are blast fences and, at intervals and in line with the fences, there are light pylons (Figure 1). These pylons are not depicted in the Hellenic AIP charts or the airport's Jeppesen charts (light pylons are typically not depicted on any airport AIP or Jeppesen chart).

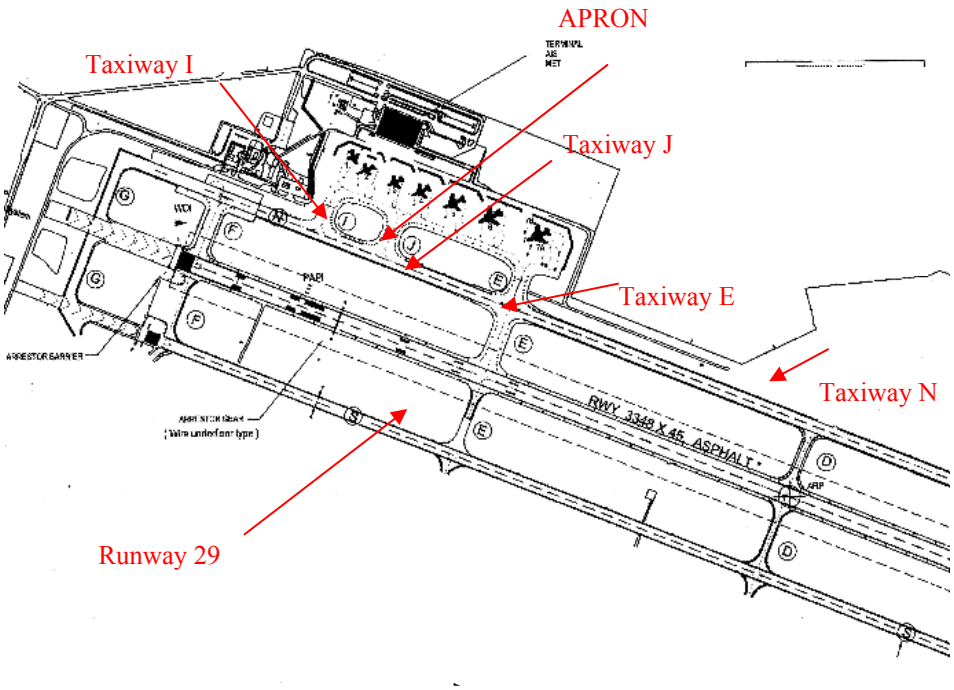

Figure 1. Part of the RWY, Taxiways and Apron.

1.11 Flight Recorders

1.11.1 Cockpit Voice Recorder (CVR)

The a/c was fitted with a Sundstrand 980-6005-056 CVR, serial no. 7053 that records the last 30 min of conversations and sounds in the cockpit. The recorder was transported to the French accident investigation agency (BEA - Bureau d' Enquêtes et d' Analyses) for transcription. The extracted data showed that the recorder had remained operational on the ground for more than 30 min, and so did not contain any information about the time of the accident.

1.11.2 Flight Data Recorder (FDR)

Flight data were extracted from the Quick Access Recorder (QAR). The data show that the a/c exited runway 29 and moved towards the apron with a speed of about 13 kt. During the next 20 sec the speed gradually increased to 23 kt, until the a/c started a left turn with a speed of 7-8 kt. At 23:38:00 the a/c collided with the light pylon at a speed of 5-7 kt.

1.12 Wreckage and collision information

A section of the right wing of the a/c measuring 1.5 m in length broke off after the collision and fell on the ground (photo 4).

Photo 4. Right wing of the aircraft.

1.13 Medical and pathological information

Not applicable.

1.14 Fire

The collision did not cause a fire. The transcript of Tower communications shows that a fire-fighting vehicle arrived at the scene of the accident at 23:54 h. Communication exchanges on the telephone line via which the fire-fighting services were notified by the Airport Duty Officer are not recorded, so the exact time of notification of the fire-fighting services is not known.

1.15 Survival Aspects

Not applicable.

1.16 Tests and research

Not applicable.

1.17 Organisational and management information

1.17.1 Operating company

TUI Airlines is a private air transport company. It has an air transport certificate number NL-49/12, in accordance with JAR-OPS requirements. The company fleet consists of three a/c type B767-300ER and one a/c type B767-800. The company is authorized to operate world wide.

The Flight Safety Officer is responsible for the existing Flight Safety Program which is based primarily on the examination and analysis of incident reports and other flight data collected.

1.17.1.1 Operating Procedures

The company Operations Manual (OM Part A1, p. 8-1.12) states that prior to operating to an aerodrome of Category B, such as CHQ, the Commander should be briefed or self-briefed regarding the particular airport and should have certified and signed the Route and Airport Qualification Form. The captain had self-briefed and had signed the required form for a number of airports that included that of Chania on 04.09.2007. The qualification is valid for a year (and is renewed each time the pilot lands at a particular airport) (OM, Part A1, p. 5-10).

The company Flight Crew Training Manual (FCTM Part B4C, FCTM 757/767 rev 7, October 31, 2007, Chapter 2, Ground Operations) mentions that when a crew is not familiar with a specific airport, it might consider requesting a "FOLLOW ME" vehicle, and that when ground/obstruction clearance is in doubt, the crew must stop the airplane and obtain a wing-walker.

The company Operations Manual (OM Part A1) which describes the captain and first officer's duties there is no specific mention about the responsibilities of each pilot during taxi, nor whether a pilot is obliged to follow the yellow centerline markings that lead to a parking position.

1.18 Chania Airport

1.18.1 Annex 14 (Aerodromes) requirements of the Chicago Convention

According to Article 1, par. 1.4.1, Annex 14, "As of 27 November 2003, States shall certify aerodromes used for international operations in accordance with the specifications contained in this Annex as well as other relevant ICAO specifications through an appropriate regulatory framework." Paragraph 1.4.5 mentions that "As part of the certification process, States shall ensure that an aerodrome manual which will include all pertinent information on the aerodrome site, facilities, services, equipment, operating procedures, organization and management including a safety management system, is submitted by the applicant for approval/acceptance prior to granting the aerodrome certificate."

Chania airport had not completed the authoring and had not submitted for approval the Airport Operation Manual, and was therefore not certified.

Chania airport also does not have a written procedure regarding the manner of guidance of a/c to the apron. The practice that is followed, according to an airport document, is that guidance is carried out by the marshaller after coordination with the Airport Duty Officer about the parking position before the arrival of the aircraft, and if the captain reports difficulty in the parking procedure, the Tower asks for the contribution of a "FOLLOW-ME" vehicle that is provided either by the HCAA or the ground handling agent. During peak hours and whenever this is possible due to his multiple duties, the Airport Duty Officer rides in the vehicle to supervise and coordinate the a/c parking procedure.

1.18.2 Greek Ground Handling Services Regulation

In order to establish the minimum requirements and preconditions for the provision of ground handling services by ground handling agents towards third parties at Greek airports, the HCAA signed in 1998 and published in 1999 a Ground Handling Services Regulation (GHSR). The provisions set forth by the GHSR form the basis for the Local Ground Handling Services Regulation that is published by the management organization[1] of each airport within Greece, based on its own specific needs.

The last version of the GHSR is the D3/B/12686/2929/4-4-07 (GOV. GAZ 469/A/04.04.07), valid from its publication. Annex A of the GHSR (Ground Handling Services List) that describes the various services that ground handling agents offer includes a/c guidance during arrival and departure, when this type of service is not provided by ATC.

Article 22 (Training) of the GHSR refers to the training of ground handling agent personnel, of self-handling users and management organizations. Paragraph 4 of the article states that "the training sections concerning signaling and a/c guidance using "FOLLOW ME" vehicles, procedures and airport infrastructure, and the safety system of the airport, are compiled and provided obligatorily by the airport management organization, and are approved by the HCAA Airport Division. At airports whose operation is the responsibility of the HCAA, the above training is conducted by airport staff, care of the responsible manager of each airport. Paragraph 8 of the same article mentions that the airport management organizations and the already-certified ground handling agents and self-handling users must comply with the above provisions within 8 months of the date of enforcement of the current regulation.

On 12.12.2007 Chania airport did not have a Local Ground Handling Services Regulation and had not compiled and had not submitted for approval the above-mentioned training sections, nor was it providing the corresponding training. In addition, there is no report in writing that mentions the Agency or agent responsible for the guidance of a/c on the apron. The airport, with a 2006 letter addressed to the local representative of the ground handling agent, without specifically noting if a/c

[1] A management organization, according to the regulation, is the organization that "in conjunction or not with other activities, manages and operates the facilities and infrastructure, the coordination and supervision of the various airport agent activities, in accordance with current national legal regulations."

guidance services is offered by ATC or not, reminds him that in accordance with the GHSR the agent has the capability of providing guidance services to a/c ("FOLLOW ME" car guidance) and towards that end requests, among other things, that a vehicle be equipped with an illuminated "FOLLOW-ME" sign, a light and a transmitter/receiver for communication with the company frequency (O.A. Control). The agent has not responded in writing but has equipped one of is vehicles with a strobe light and a "FOLLOW-ME" sign.

1.18.3 Ground Handling Agent

The ground handling agent at Chania airport is Olympic Airways – Services. The initial Standard Ground Handling Agreement between agent and customer (TUI Airlines Nederland B.V.) valid from 01.04.2005 until 31.03.2006 had been extended until 31.03.2008. The agreement refers to ground handling services as described in Annex A of the 1998 IATA Standard Ground Handling Agreement (SGHM) and do not specifically concern only to this airport but all Greek stations at which the agent operates. A/c guidance with a "FOLLOW-ME" vehicle is not among the agreed-upon ground handling services (the specific service is not include in the list of ground handling services in the 1998 IATA SGHM).

1.18.3.1 Marshalling training

The HCAA-approved training syllabus for marshallers, according to the 1999 GHSR that was valid at the time the Agreement between the ground handling agent and the customer had been signed, is included in the agent's Technical Training Reference Manual (30-5-2003 Edition, Rev. 0, Chapter 4, *Non-Type Training Courses*, Section 4-1-13, *Aircraft Marshaling,* p. 1). Initial training lasts 2 days, presupposes the completion of Ramp Safety Awareness training, and includes 12 theoretical and 4 practical hours of training on subjects such as a/c arrival procedures, marshaller responsibilities, taxiing signals, and general safety regulations. A refresher course is required every 2 years.

1.19 Additional information

1.19.1 Statements

According to his statement, the captain exited the runway and proceeded towards the apron with a speed of 12 kt, initially following the yellow centerline markings that leads to the apron. He gained visual contact with the marshaller, who initially remained motionless with the torches high above his head and then moved towards the center of the apron with one hand still above his head and the other dragging the fire extinguisher. When the a/c entered the apron, the marshaller turned his body in the direction in which the a/c was expected to park and remained motionless while the a/c continued its movement straight, towards the blast fences. When the captain judged that he was close to the blast fences and began a left turn to avoid them, the marshaller who until that time had not yet given a signal for a left turn, started moving his hands vigorously towards the blast fences. The captain perceived this signal to mean that he had started the turn too soon, and reluctantly turned right following the marshaller's sign, an action that brought the a/c even closer to the blast fences.

When asked what he would have expected from the marshaller, had the latter considered that the a/c was not following his signals, the captain stated that he expected the marshaller to give the signal for an emergency stop, crossing both hands over his head, a signal which was never given.

According to the first officer's statement, the marshaller gave signals that were not recognizable based on international standards. This is confirmed by the company Director, Flight Operations Engineering who was in the cockpit and who also stated that the marshaller gave signals for a left turn when the a/c had reached very close to the blast fences.

The marshaller stated that the a/c exited taxiway E, proceeded at a high speed towards the blast fences and "by accident entered parking position 7A." He kept his right arm extended and moved the left hand back and forth, indicating to the a/c to turn left but the a/c continued to proceed straight. Despite the fact that he considered the a/c not to be following his signals, he did not give an emergency stop signal, but insisted on his signals for more of a left turn.

During the time of the accident other persons were on the apron. The ground handling agent Apron Supervisor who was between parking positions nos. 4 and 5

stated that the a/c entered the apron without following the centerline markings and proceeded straight towards the blast fences between parking positions nos. 6 and 7, ignoring the marhsaller's signals for a left turn. Next, it started a left turn, and the marshaller who had moved forward (5 - 6 m) towards the a/c continued to signal for a left turn.

The company representative who was in parking position no. 5 reported that after the left turn towards parking position no. 6, the a/c seemed to turn slightly to the right, then a little straight ahead, before returning to the left turn.

Finally, the Troop Movement Controller who was at the blast fences between parking positions nos. 6 and 7 confirmed that the marshaller's signals were for the a/c to proceed straight ahead (i.e., towards the blast fences), instructions that the crew followed. The marshaller insisted on these signals even when the crew seemed to stop or reduce speed a little, as if wondering if it should start the left turn. When the a/c turned to the left, the Controller stated that he no longer understood the marshaller's signals.

1.19.2 Testing of persons involved in Incidents or Accidents

According to a Director, HCAA ruling (D3/B/28021/6495/19.07.07, Gov. Gaz. 1380/B/03.08.07), determination of the level of alcohol or other toxic substances in any person involved in an incident or accident is obligatory and is the responsibility of the Authority of the airport at which the incident or accident took place. Chania airport did not make such a determination.

1.20 Useful or effective investigation techniques

Not applicable.

2 ANALYSIS

2.1 General

Air Traffic Control at CHQ is conducted by Hellenic Air Force staff. Management of the civil aircraft apron is carried out by HCAA personnel who notify the ground handling agent regarding the parking positions of a/c. ATC is not informed about a/c parking positions. Furthermore, ATC has an overall view of the apron, but because of

its distance from the apron, cannot discern the parking positions and the line markings leading to these positions. According to the AIP Greece, taxiing guidance on the ground is carried out using a vehicle with a sign indicating "FOLLOW-ME."

2.2 Aircraft Taxi

The authorization given by Tower to the a/c after landing was to exit the runway using the first right (exit) towards the apron. Even though not familiar with the airport, the captain did not request the contribution of a "FOLLOW-ME" vehicle. The company Flight Crew Training Manual notes that use of a vehicle may be considered "if unfamiliar with the airport." The a/c exited the runway turning right on taxiway E. Taxiing on E was accomplished at a low speed and, given that there was no "FOLLOW-ME" vehicle for guidance of the a/c to its parking position since, according to practice at this airport, Tower requests the contribution of a vehicle only if the captain reports difficulties, the a/c proceeded towards the apron. Upon approaching the apron entrance the captain obtained visual contact with the marshaller who was expecting the a/c in front of parking position no. 6, in front of and to the left of the entrance.

For a crew familiar with the airport, even if not informed of the designated parking position, the marshaller's position left of the entrance was a clear indication that the position at which it was expected to park was position no. 6 and it should follow the centerline that turns left immediately after entry in the apron area. The crew of OR 978 who had not been informed of the designated position was not familiar with the airport since this was the first time for both the captain and the first time to land at this airport. Their familiarization was based on study of the Jeppesen charts prior to and during the flight. As a result, upon entering the apron, the a/c did not turn left following the centerline that would have led it to position no. 6 at which the marshaller was expecting it, but proceeded straight towards the blast fences, counting on turning left when the marshaller signaled for a left turn.

The marshaller who was at position no. 6 was expecting the a/c to follow the centerline towards that position, turning left upon entering the apron. However, the a/c proceeded straight towards the blast fences, which led him to believe, as he stated, that the a/c was proceeding towards position no. 7. It is noted that if the a/c was indeed proceeding towards position no. 7 it should have turned to the right upon entering the apron.

The captain continued moving towards the blast fences and, according to his statement, when it approached them and because the marshaller remained motionless he alone decided and started a turn to the left. As seen from the landing gear tracks, initiation of the left turn occurred when the nose wheel was at a distance of 31 m from the fences. The a/c continued the left turn and proceeded for about 50 m, which brought it parallel to the blast fences. Seeing the marshaller start to then move his arms towards the fences, the captain assumed that he had started the left turn early and reluctantly turned a little to the right which, as seen by the tracks on the ground, brought the a/c right main landing gear 13.5m from the blast fences and the right wing over them. Upon initiating the left turn again in order to align the a/c with the marshaller, the wing collided with a light pylon that was in line with the blast fences.

In contrast, the marshaller stated that, from the moment the a/c entered the apron and seemed to proceed directly towards the blast fences, he made signals to the crew for a left turn which the crew ignored and continued straight.

From the contradictory statements of the crew and the marshaller, regardless of which better represents what really happened, it follows that after the a/c entrance in the apron area a situation developed that both sides recognized as non-normal and wondered about each other's actions, but neither side made the decision to interrupt any further a/c movement in order to coordinate fully with one another. The captain, even though obliged to follow the marshaller's signals, was obliged to suspend all a/c motion to clarify the situation when he did not feel comfortable with those signals. The same applies to the marshaller, who ought to give a signal for an emergency stop of the a/c once he thinks the crew is not following his signals or the prescribed centerline markings for the parking position. In this case, management of the dangerous situation that had developed was not carried out using the safety of the a/c movement as a guiding principle, and the fact that neither the captain who as pilot-in-command, according to ICAO Annex 2, Chapter 2, paragraph 2.4 ".. shall have final authority as to the disposition of the aircraft while in command" nor the marshaller, who according to ICAO Annex 2, Chapter 3.4 is ".. responsible for providing standard marshalling signals to aircraft in a clear and precise manner.." made the decision to proceed to immediate and effective control of the situation had a negative effect in its evolution.

Because of their position, after the initial left turn of the a/c and when it came almost parallel to the blast fences, it was not possible for either the captain or the marshaller to have a clear appreciation for the distance from the right wing to the fences and the light pylon. The captain, on the one hand, who was on the left seat in the cockpit, did not have a view of the right side of the a/c. The marshaller, on the other hand, who was on the left side of the a/c also did not have a view of the a/c right wing. Because of his seat on the right side of the cockpit, the first officer was the only person who had the best possible view of the area on the right side of the aircraft after the left turn and should have identified the proximity of the wing to the blast fences and the ensuing collision with the pylon, and should have alerted the captain of this. Monitoring of the right side of the aircraft during taxi is, after all, among the first officer's duties. In this case, the first officer did not identify the proximity of the wing to the blast fences and the collision that would ensue with the pylon should the a/c continue its movement, and did not alert the captain of this.

Possibly contributing to the first officer's incomplete situational awareness was the fact that he was not familiar with the airport and was not aware of the presence of the pylons. In addition, because of their height and the fact that the light bulbs are at their top and shine downwards, towards the apron, the pylons did not attract his attention. The blast fences, however, were clearly visible and are mentioned in the Jeppesen charts. The first officer should have therefore identified that the captain's right turn brought the right wing of the a/c over the fences and should have brought this to the captain's attention, thus preventing any further a/c movement. The first officer's lack of intervention, given that he was the only person in reality to have a view of the area surrounding the right side of the a/c, allowed the chain of events that had until that moment taken place to continue and to result in the collision of the wing of the a/c with the pylon.

Immediately after the collision of the wing with the pylon, the captain brought to the aircraft to a stop. The fire-fighting vehicle's delayed arrival at the accident site must be considered unreasonably high (16 min after the a/c was brought to a stop), but considering that the ramp agent notified the ground handling agent who notified the Airport Duty Officer who, in turn, notified the fire-fighting services, it is due to the delayed notification of the fire-fighting service. The exact time of notification of the

latter could have been precisely determined if the telephone communications had been recorded.

The Airport Emergency Plan states in par. 4.4.2.2 that "… notification of the fire-fighting services about an incident on the ground is usually received by the Tower. If the notification is not received by the Tower but from another source that noticed it first, or if there are serious reasons to believe an accident on the ground is impending with certainty, the fire-fighting services respond in the same manner they would have, had they been notified by the Tower, and quickly send fire-fighting vehicles to the incident site..."

In this case, the ramp agent, who was on site, notified the ground handling agent, who notified the Airport Duty Officer, who, after arriving on site and ascertaining there was no fuel leak, notified the Tower, who, in turn, notified the fire fighting services. As a result, 16 min elapsed between the time that the aircraft was brought to a stop and the fire fighting services vehicles arrived at the scene.

2.3 Chania Airport

As mentioned above in par. 1.10, the airport is state-owned, its operation or supervision is the responsibility of the Hellenic Air Force, and the airport, though military, is open to international civil air traffic. Management and operation of facilities, as well as the coordination and the control of the activities of the various airport agents regarding the movement of civil aircraft on the ground is the responsibility of the Hellenic Civil Aviation Authority (HCAA). For its smooth operation as a military and a civil airport there is a relevant agreement that covers the provision of services related to ATC and fire-fighting services while there is no corresponding agreement of the management of remaining activities and facilities.

The airport has not been certified in accordance with article 1, par. 14.1 of Annex 14 of the Chicago Convention. Regardless, the runway, taxiway, and apron markings conform to Annex 14 requirements and the apron is adequately illuminated, and none of these factors contributed to the accident.

The airport had not completed the authoring of the AOM and there are no written procedures concerning management of the apron area. Instead, the practice mentioned in par. 1.18.1 is followed and was indeed followed for handling the flight in question.

Written procedures describe the exact responsibilities of each agent and person and specify the exact actions that each must take in order to accomplish their duties. Their existence may have therefore prevented the evolution of the unsafe situation that was created at the ramp area during the parking procedure of the a/c and led to the accident.

The airport has not developed a Local Ground Handling Services Regulation and has not developed and processed for approval training sections that concern signaling and a/c guidance using guidance vehicles (follow-me), per the GHSR that went into effect on 4-4-07 and to which it should have complied by 4-12-07. Marshalling training is offered by the ground handling agent based on training materials approved by the HCAA, per the Basic Regulation that was valid at the time of signing of the agreement between the ground handling agent and the customer.

Despite the fact that the AIP mentions that the taxiing guidance system is accomplished with a "FOLLOW-ME" vehicle, and that the GHSR states that a/c guidance upon arrival and departure, when that service is not provided by ATC, is provided by the ground handling agent, according the airport practice, "FOLLOW-ME" vehicle is provided only when requested and whether this service is provided by ATC or not has not been clarified and the agent has not included it among the agreed-upon services it provides.

The letter that had been addressed to the local representative of the ground handling agent by the airport in 2006 regarding the capability of providing a/c guidance services using a "FOLLOW-ME" vehicle, to which in fact there had been no response, does not constitute proof that this service is the responsibility of the agent. The sign indicating "FOLLOW-ME" and the placement of a strobe light on one of the agent's vehicles, without the possibility of communication with the Tower, should not be taken by the airport to signify that the agent has accepted responsibility for the above service.

2.4 Operator

Taxi guidelines in the company OM do not give emphasis to the first officer's responsibility to monitor the right side of the a/c.

3 CONCLUSIONS

3.1 Findings

3.1.1 The crew was properly licensed and qualified to conduct the flight.

3.1.2. The aircraft was fully serviceable for the duration of the flight.

3.1.3. The marshaller possessed the necessary certificate for his engagement in marshalling duties.

3.1.4. The Tower is not informed about the parking position of a/c. As a result, the authorization given to the crew after landing did not specify the exact a/c parking position on the apron.

3.1.5. Guidance of the a/c was not carried out using a "FOLLOW-ME" vehicle, even though the AIP for Greece mentions that guidance is carried out using a "FOLLOW-ME" vehicle.

3.1.6. The captain did not request a "FOLLOW-ME" vehicle, even though the company Flight Crew Training Manual stated that he "consider requesting" such a vehicle if unfamiliar (as this captain was) with the airport. Upon entering the apron, he obtained visual contact with the marshaller, counted on his guidance, and did not follow any of the centerline markings on the apron surface.

3.1.7. The signals given by the marshaller to guide the a/c were not effective.

3.1.8. The contradictory statements of the captain and the marshaller show that both parties had doubts about each other's actions, yet they let the situation evolve and neither made the decision to suspend movement of the aircraft until the situation is clarified.

3.1.9. The first officer did not monitor adequately the area on the right side of the aircraft and did not alert the captain of the impending danger.

3.1.10. The airport has not been certified, but the dimensions and markings of the runway, the taxiways, and the a/c parking positions conform to Annex 14 requirements and the apron lighting was sufficient and none of these factors contributed to the accident.

3.1.11. The airport does not have an Operating Manual and does not have written procedures for the services that concern aircraft guidance for parking. The lack of procedures allowed the creation of the unsafe condition during parking of the a/c.

3.1.12. The airport does not have a Local Ground Handling Services Regulation and it has not been clarified whether a/c guidance is a service provided by the airport or the ground handling agent.

3.1.13. There is no agreement between the Air Force and the Hellenic Civil Aviation Authority regarding the management and operation of the airport facilities, as well as the coordination and the supervision of civil a/c movement on the ground and the ground handling agent services at the airport.

3.1.14. The fire-fighting vehicle's delayed arrival at the accident site is due to the delay in notification of the fire-fighting services.

3.2 Causes

- Lack of decision-making both by the captain and the marshaller for suspension of aircraft movement and resolution of the dangerous situation that developed during movement of the aircraft for parking, and

3.3 Contributing Factors

- Ineffective supervision and lack of intervention by the first officer for prevention of the accident, and
- Lack of procedures regarding the exact responsibilities of each person involved in the handling of an aircraft in the apron area, and the lack of specification by the airport whether the aircraft taxiing guidance services with a "FOLLOW-ME" vehicle (as stated in the AIP) are provided by the airport or the ground handling agent.

4 SAFETY RECOMMENDATIONS

Chania Airport:

4.1 **2008 – 04** Should take care to complete as soon as possible the Airport Operations Manual which is currently being written, in the context of certification of the airport according to Annex 14 of the Chicago Convention.

The above recommendation was issued during the investigation and sent to the Hellenic Civil Aviation Authority that accepted it.

4.2 **2008 – 13** Should produce a Local Ground Handling Services Regulation and training sections that concern delivering signs and guidance to aircraft using taxiing guidance vehicles, in accordance to the GHSR.

4.3 **2008 – 14** Should specify if a/c guidance services using a "FOLLOW-ME" vehicle is provided by the airport or not so that the agent include it in the services it provides.

4.4 **2008 - 15** Should take care that the communications between the office of the Airport Duty Officer and the airport firefighting services are recorded.

The Hellenic Civil Aviation Authority:

4.5 **2008 - 16** Should take care to ensure that all airports (national and non-national) issue procedures regarding the "Testing of persons involved in the maintenance, preparation, and flight of civil aircraft for the determination of alcohol and toxic substances or drugs." (D3/B/28021/6495/19.07.07, Gov. Gaz. 1380/B/03.08.07)

The Hellenic Civil Aviation Authority and the Air Force:

4.6 **2008 - 17** Should take care to issue an agreement regarding the management and operation of airport facilities, as well as the coordination and supervision of civil a/c movement on the ground and the ground handling agent services at the airport.

Athens, 14 November 2008

THE CHAIRMAN	**THE MEMBERS**
Akrivos Tsolakis	J. Kondylis
	G. Kyriakopoulos
	H. Nikolaidis
Exact Copy **The Secretary**	G. Stylios
J. Papadopoulos	

Note:
This report has been translated and published by the Hellenic Air Accident Investigation and Aviation Safety Board. As accurate as the translation may be, the original text in Greece should be considered as the work of reference.

APPENDIX

Comments of the Dutch Safety Board

The Dutch Safety Board recognized two causal factors as cause of the accident:

1. Failure of the marshaller to recognize the dangerous position of the aircraft and give an emergency stop signal.
2. Failure of the captain to stop the aircraft and check its position when unsure about the marshaller's directions.