



**HELLENIC REPUBLIC
MINISTRY OF INFRASTRUCTURE AND TRANSPORT**

**AIR ACCIDENT INVESTIGATION AND AVIATION
SAFETY BOARD
(AAIASB)**



**ACCIDENT INVESTIGATION REPORT
INVOLVING B737-800 AIRCRAFT
WITH REGISTRATION EI-FRO
AT THE INTERNATIONAL AIRPORT OF CHANIA, CRETE
ON 23rd DECEMBER 2016**

E03 / 2018

**ACCIDENT INVESTIGATION REPORT
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at the International Airport of Chania, Crete
on 23rd December 2016**

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

- **ICAO Annex 13**
- **Regulation (EU) No. 996/2010**
- **Hellenic Republic Law No. 2912/2001**

“In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010 and Law 2912/01, the purpose of investigations into aviation accidents and incidents is not to apportion blame or liability. The sole objective of the investigation and its findings is the prevention of accidents and incidents.

As a result, use of the findings for any purpose other than the prevention of future accidents could result in erroneous conclusions.”

The Air Accident Investigation and Aviation Safety Board

Chairman

Athanasios Binis

Chem. Engineer NTUA-MBA
Aircraft Engineer (B1-C)

Members

Panagiotis Vasilopoulos

Lieutenant General HAF ret.

Akrivos Tsolakis

Lieutenant Colonel HAF ret.

Nikolaos Goutzouris

Lieutenant General HAF ret.

Charalambos Tzonos-Komilis

Captain

Secretary: Kyriakos Katsoulakis

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OPERATOR : **RYANAIR DAC**

OWNER : **RYANAIR DAC**

MANUFACTURER : **BOEING**

COUNTRY OF MANUFACTURE : **U.S.A.**

MODEL : **B737-800**

NATIONALITY : **IRISH**

REGISTRATION : **EI-FRO**

PLACE OF ACCIDENT : **INTERNATIONAL AIRPORT OF
CHANIA, CRETE**

DATE & TIME : **23/12/2016, 15:20 h**

Note : All times are local time
(local time = UTC + 2h)

SYNOPSIS

Following the completion of the refueling procedure on the aircraft with registration EI-FRO, fuel company personnel walked up the aircraft forward stair in order to have the relevant fuel form signed and take a copy of such signed form.

Upon the opening of the aircraft door, the door hit him causing him to fall on the ground from a height of about three meters and sustain serious injuries.

The Air Accident Investigation and Aviation Safety Board was notified of the accident and appointed an investigation team under document AAIASB/3653/27.12.2016.

On 27/12/2016 a Notification to International Authorities was issued and an accredited representative (ACCREP) was appointed by the Irish Air Accident Investigation Unit (AAIU) and an Adviser was appointed by the European Aviation Safety Agency (EASA).

1. FACTUAL INFORMATION

1.1 History of the Flight

The aircraft with registration EI-FRO was on 23/12/2016 parked on parking stand No. 2 at “I. DASKALOGIANNIS” International Airport of Chania, Crete, in readiness to conduct at 16:00 h local time a scheduled flight to Athens International Airport. Crew members were already onboard the aircraft performing the prescribed procedures prior to passengers boarding the aircraft. At the time there was heavy rain and strong wind prevailing in the airport area.

According to the testimony of the fuel company employee, prior to the commencement of the refueling operation, he (the employee) walked up the forward left stair in order to consult with the captain on the quantity of fuel to be delivered. The stair is of the folding type it is a constituent part of the aircraft and opens mechanically both from the outside and from the inside of the aircraft. Part of the handrails is automatically deployed simultaneously with the deployment of the stair, whereas the last section of the handrails, extending over the three last steps, can only be deployed when the door of the aircraft is fully open, since it is supported on the inside of the fuselage, at the point of contact of the door. (Photos 1 & 2).



Photo 1: The forward folding stair of the aircraft fully extended.

The employee reported that during the refueling of the aircraft or immediately thereafter, normally the captain or the first officer or the engineer would be present on the ramp to sign the relevant form for the fuel delivered and take a copy of the signed form.

According to his testimony, on the said day and because it was raining none of the above persons was outside the aircraft. Given that there was no one to sign the form and take a copy thereof and due to the fact that there was no way to communicate with the crew of the aircraft, the employee, as per his own testimony, went up to the aircraft himself in order to handle the relevant procedure for the fuel form. It is noted that when the employee walked up the stair the first time, the left forward door was open and the handrails were deployed in position; however, when he went up a second time in order to complete the procedure relevant to the fuel form, the said door was closed at its greater part due to the rain and there was only a small opening at its side, whereas the handrails at the uppermost part of the stair were not deployed.



Photo 2: Uppermost part of the forward folding stair of the aircraft.

As he reported, when he reached the last step of the stair and before he had a chance to knock on the door of the aircraft in order to let the cabin crew know that he was there in order for them to open the door, the door opened with great force and hit him. The employee believes that the flight attendant, who opened the door, had perceived that he was there and opened the door before he had a chance to knock and communicate with her and arrange for the opening of the door. Consequent to the abrupt hit, the employee

moved in the direction opposite to the direction of opening of the door and even though he tried to hold on to the handrail of the folding stair this was not possible given that the handrails at the uppermost part of the stair were stowed. As a result, the employee lost his balance, fell on the ground from a height of about three meters and sustained serious injuries.

According to the testimony given by the chief flight attendant (No. 1) who opened the door and the testimony of her colleague, a cabin crew member (No. 4), the employee, having knocked on the door of the aircraft and after the crew established that he was outside by looking through the door window, but also through the small opening at the side of the door, given that visibility was poor as a result of the rain, was asked whether he wanted to enter the aircraft. When he replied in the affirmative, he was requested to move back so as not to be hit by the door when opening. The employee was hit by the door and, losing his balance, fell to the ground from a height of about three meters resulting in him sustaining serious injuries (Photo 3).

Then the captain, the first officer, the chief flight attendant and her colleague, a cabin crew member, rushed to help the injured person. At the same time the Acting Airport Manager at the International Airport of Chania and the airport officer on duty were notified and arrived on site. Moreover, an ambulance of Hellenic Air Force 115 Combat Wing and an ambulance of the National Emergency Medical Aid Center (EKAB) were called and arrived at the accident site, given that the Airport had no medical support facilities. The injured person was initially moved to a nearby caravan owned by the ground handling company, where the doctor of 115 Combat Wing attended to his injuries; he was then taken by the EKAB ambulance to the General District Hospital of Chania where he underwent a surgical operation, and following his hospitalization for treatment he was discharged from the hospital on 11/01/2017.



Photo 3: The direction of fall of the fuel personnel from the folding stair.

1.2 Experience of the Persons Involved / Procedures

1.2.1 Refueling personnel

The said employee had been working in the last three years as seasonal personnel of the refueling company at the International Airport of Chania, having first received the appropriate training. Moreover, he had ten years of experience in a corresponding post at the Military Base of Souda. The said employee, during the refueling operation, was wearing suitable personal protective equipment, i.e. overalls, non-slip boots, protective helmet, gloves, goggles and earplugs.

1.2.2 Cabin crew

The chief flight attendant (No. 1) and her colleague, a cabin crew member (No. 4) who was with her at the time of the accident, had received according to corporate procedures the required training with regard to the actions preceding the opening of the aircraft's entrance door.

1.2.3 Procedures

1.2.3.1 Fueling Company

The Operations Manual (O.E.O/18/04, para. 9.5) of the fuelling company stipulates:

“...Sign the note and obtain the signature of the airline’s representative for the quantity and quality of the product delivered. Hand a copy of the fuelling Note to the airline’s representative.”

The same Manual (O.E O/18/4, para. 11.3) also states:

“Fill-in the Consignment Note, entering also the number of the card, if any, aircraft registration number, fuel quantities and type, and request of the aircraft pilot or the representative to sign it.”

The said manual of the company does not specify whether, after the completion of the fueling operation, the company personnel in order to have the fuel form signed and a copy thereof delivered will be required to go on the aircraft himself or wait on the ground for an airline representative for this purpose.

1.2.3.2 Airline

The Airline’s Ground Operations Manual stipulates that the ramp crew supervisor ensures, among others, that no ground staff is allowed to walk up the forward stairs when the forward door has not been opened and the handrails are stowed.

“Ramp Crew Supervisor ensures:

- *No Ground Staff to walk up forward stairs until the forward door has been opened and the handrails extended.”*

Furthermore, in a memo of the airline addressed to the pilots entitled “Aircraft Flooding”, it is stated that in case there is a risk that the aircraft will be flooded by rainwater, the cabin crew on the captain’s orders may delay the boarding/disembarkation of passengers, so that the aircraft door can remain closed preventing water ingress to the aircraft.

1.3 Injuries to Persons

Injuries	Crew	Passengers	Others
Fatal	---	---	---
Serious	---	---	1
Minor / None	-- / --	-- / --	-- / --

2. ANALYSIS

Pursuant to the airline's Ground Operations Manual, the ramp crew supervisor was required to be present in order to make sure that no ground staff would use the forward stair to go up to the aircraft when the door had not been opened and the handrails of the folding stair were not fully extended.

In this particular case there was no ramp crew supervisor present on behalf of the airline to ensure that the above requirement was satisfied, most likely due to the poor weather conditions prevailing at the time of the accident.

Under the procedures established by his company, when the aircraft fueling operation was completed the employee was required to deliver the fuel form to the flight crew or to a representative of the airline in order to be signed, and then to take a copy of the signed form. Realizing, after the refueling was complete, that there was no airline representative on the ground to sign the fuel form and given the inability to communicate with the aircraft crew, he decided to walk up the aircraft himself using the forward folding stair when the door was closed and the handrails at the uppermost part of the stair were stowed.

The employee should not have used the forward stair since the handrails at its uppermost part were not extended, however, possibly out of over-eagerness or due to the fact that he was pressed for time, he acted without taking due account of the prescribed safety measures.

The chief flight attendant (No. 1) in the said flight had received the required training, in line with the corporate procedures with regard to the actions preceding the opening of the aircraft's entry door.

According to her own and the testimony of her colleague, a cabin crew member (No. 4) who was with her at the time of the accident, all prescribed procedures for opening the door were adhered to. First, she looked out of the window of the door and moreover, as required in cases of limited visibility, in this particular case as a result of the rain, she also looked through the opening of the door where she established that the employee was outside. Then, after she asked him to take some steps back in order to avoid being hit by the opening door, she opened the door.

According to the testimony of the fuel company employee, when he reached the last step of the stair and before he had a chance to knock on the door of the aircraft to let the cabin crew know that he was there in order for them to open the door, the door suddenly opened (moving outward) and hit him. He then lost his balance and fell from the stair to the ground, which caused him to sustain serious injuries, even though he wore the requisite equipment for his personal protection. It is noted that in the said folding stair, the last step is narrow (Photo 4) so the person standing on such step for the purpose of knocking on the door to be let in is found in a very short distance from the door of entry to the aircraft.



Photo 4: Uppermost part of the folding stair.

Moreover, when someone is on the last step of the folding stair, they must exercise particular care so as not to lose their balance when moving backwards to steer clear of the door, in order to avoid being hit by it when it opens, as they have to go down one step.

The fact that the handrails at the top part of the stair were not extended was consequent to the fact that the door remained almost closed, as prescribed in the airline instructions in order to avoid the ingress of rainwater inside the aircraft.

From the above it can be seen that the persons involved provide different descriptions as to the sequence of events that led to the accident.

Taking into consideration both versions, the cabin crew prior to starting door opening operations should have made sure that there was no one behind the door and, if they established that there was someone behind the door and after communicating with such person so that he could move away from the door, they ought to have verified that such person had indeed moved away from it.

3. CONCLUSIONS

3.1 Findings

3.1.1 The fuelling personnel, according to the procedures of his company, had to obtain a copy of the form with respect to the fuel delivered, signed by a representative of the airline.

3.1.2 The fuelling personnel had the prescribed personal protective equipment on during the performance of his work.

3.1.3 The fuelling personnel should not have gone up the folding stair given that the aircraft door was closed and the handrails were not extended.

3.1.4 There was no representative of the airline on the ground to sign and receive the relevant document for the aircraft fuelling operation.

3.1.5 There was no representative of the airline on the ground to prevent the employee from going up to the aircraft using the folding stair, given that the door had not been opened and the handrails were not extended.

3.1.6 The chief flight attendant had received proper training concerning the procedure for the opening of the aircraft doors.

3.1.7 The chief flight attendant ought to have paid more attention to the implementation of the procedures for the opening of the door of the aircraft.

3.2 Probable Causes

The failure to follow the procedures and in particular the absence of an airline representative on the ground, to prevent the employee from using the folding stair when the handrails at its uppermost part were not extended.

3.3 Contributing Factors

The weather conditions that at the time prevailed at the site of the accident (heavy rain and strong wind) possibly prevented the airline representative from being on the ground in order to prevent the fuel company employee from using the folding stair. Moreover, weather conditions forced the cabin crew to close the door, when normally the door remains open during the phase of the pre-flight procedures.

4. SAFETY RECOMMENDATIONS

Not applicable.

Nea Philadelphia, 21st December 2018

THE CHAIRMAN

Athanasios Binis

Exact Copy

The Secretary

K. Katsoulakis

THE MEMBERS

P. Vasilopoulos

A. Tsolakis

N. Goutzouris

Ch. Tzonos-Komilis