

الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY



Air Accident Investigation Sector

Serious Incident - Summary Report - AAIS Case N° AIFN/0017/2014

Pilot Incapacitation

Operator: Emirates
Aircraft Type: Boeing 777-21H (ER)
Nationality and Registration: United Arab Emirates, A6-EMJ
Place of Occurrence: Dubai International Airport
State of Occurrence: United Arab Emirates
Date of Occurrence: 22 October 2014



Investigation Objective

This Investigation is performed pursuant to the United Arab Emirates *Federal Act 20 of 1991*, promulgating the *Civil Aviation Law, Chapter VII-Aircraft Accidents*, Article 48. It is in compliance with *Part VI, Chapter 3 of the Civil Aviation Regulations*, in conformity with *Annex 13 to the Convention on International Civil Aviation*, and in adherence to the *Air Accidents and Incidents Investigation Manual*.

The sole objective of this Investigation is to prevent aircraft accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

Investigation Process

The Operator's on-duty Safety Manager notified the Air Accident Investigation Sector (AAIS), Duty Investigator Hotline, regarding the pilot incapacitation, involving Boeing 777-21H (ER) passenger Aircraft, registration A6-EMJ.

After the initial investigation, the occurrence was classified as 'serious incident'. Accordingly, the AAIS notified the National Transportation Safety Board (NTSB) of the United States (State of Manufacture), and also notified the International Civil Aviation Organization (ICAO).

This Investigation was conducted in-depth for the events leading up to the occurrence, with a review of non-contributing safety issues that need to be addressed.

This Summary Report does not resort to any proof production procedure for the determination of civil or criminal liability, and is issued in accordance with Standard 3.1 of *Annex 13* which was incorporated in the legal system of the United Arab Emirates.

The use of this Summary Report for any purpose other than that of preventing future accidents, may lead to erroneous interpretations and conclusions.

All AAIS reports are publicly available at:

<http://www.gcaa.gov.ae/en/epublication/pages/investigationreport.aspx>

Notes:

- 1 Whenever the following words are mentioned in this Report with the first letter Capitalized, it shall mean:
 - (Aircraft) - the aircraft involved in this serious incident
 - (Investigation) - the investigation into this serious incident
 - (Incident) - this investigated serious incident
 - (Report) - this serious incident investigation Final Report
 - (Operator) the operator of the aircraft involved in this serious incident
 - (Commander) the Commander of the serious incident flight
 - (Copilot) the Copilot of the serious incident flight.
- 2 Unless otherwise mentioned, all times in this Report are Local Time of the United Arab Emirates (Coordinated Universal Time [UTC] = Local Time minus 4 hours).
- 3 Photos used in this Report are taken from different sources and are adjusted from the original for the sole purpose of improving the clarity of the Report. Modifications to images used in this Report are limited to cropping, magnification, file compression, or enhancement of color, brightness, contrast or insertion of text boxes, arrows or lines.



Factual Information

History of the Flight

On 22 October 2014, a scheduled passenger flight EK565, operated by a Boeing 777 Aircraft, registration A6-EMJ, powered by two Rolls Royce Trent 800 engines, departed from Dubai International Airport, the United Arab Emirates, operating a commercial passenger flight to Bengaluru International Airport, India.

Prior to operating flight EK565, the Commander's flying hours and duty time were within the regulatory and Operator's limitations. On the day before the flight, the Commander had lunch at a Dubai hotel and he then rested for approximately six hours. He awoke around midnight refreshed, as per his statement, and he consumed black coffee, but no food. Company transportation transferred him to the airport and he reported for duty.

The Aircraft departed from Dubai at 0330 UTC for the three and a half hour flight to Bengaluru, which was uneventful. During the ground time, both pilots remained on-board the Aircraft and the Commander consumed his first meal of the day, which consisted of a muffin, omelet, and some fruit. The flight departed Bengaluru at 1026 local time with the Commander being the pilot flying (PF). Approximately one hour after departure, the Commander developed a headache and felt nauseous. He took two pain relief tablets from the Aircraft first aid kit and left his seat several times to visit the bathroom due to nausea, which was not associated with vomit. He did not develop fever, chest pain, or diarrhea, but he experienced a persistent mild headache.

At the top of descent, the Commander suddenly felt nauseous, he could not focus, and he felt that he was about to faint. He passed the controls to the pilot monitoring (PM) by announcing "You have control." The Copilot saw the Commander trying to stand up but he then lost consciousness and fell back in his seat. The Commander did not bite his tongue, he had no bowel or bladder incontinence, nor repeated jerking. The Copilot assumed control of the Aircraft

and called the senior cabin crewmember to the cockpit. The senior cabin crewmember strapped the unconscious Commander to his seat. Approximately three minutes after becoming unconscious, the Commander regained consciousness, but said that he felt "Fuzzy". He informed the Copilot that he was unable to assist with the landing, but he was able to communicate and interact.

The Copilot continued flying the Aircraft and declared a MAYDAY due to pilot incapacitation. Air traffic control provided immediate priority and the flight landed at Dubai International Airport at approximately 1238 local time. The air traffic controller, in consultation with the airport management, decided that no emergency phase declaration was necessary.

After parking, the engines were shut down and the passengers disembarked normally.

Paramedics boarded the Aircraft and provided oxygen to the Commander who was then able to walk off the Aircraft. The paramedics escorted him to the airport clinic for electrocardiogram (ECG)¹ and blood pressure examinations, the results of which were normal. The Commander then went to the Operator's clinic. Further to the medical assessment, the General Civil Aviation Authority (GCAA) suspended his medical certificate.

There were no injuries to the crew or passengers, nor was there any damage to the Aircraft.

Personnel Information

Both pilots held a valid airline transport pilot license (ATPL) issued by the GCAA with Boeing 777 type rating, and valid class 1 medical certificates.

The Commander had successfully completed his proficiency checks.

The Commander's flying experience was 17,787 hours, and he had been employed by the Operator since 1988.

The Commander had presented himself to the Operator's clinic on 10 February 2014,

¹ An electrocardiogram (ECG) is a device that measures the heart's electrical activity and creates a graph of time versus the detected the voltage



approximately eight months before the Incident, with a history of stress, tiredness, and anxiety. He was referred to a psychiatrist. A formal diagnosis of mood disorder was made following an extensive assessment in accordance with part II, chapter V of the United Arab Emirates *Civil Aviation Regulations (CAR)*². He successfully completed a functional simulator test. This functional test examined his handling, scanning, situation awareness, and decision-making capabilities. He also underwent a dizziness assessment.

The Commander responded well to the prescribed treatment and he resumed flying duties during May 2014, approximately five months before the Incident. The process followed for his class 1 license re-instatement was as per the *Civil Aviation Advisory Publication (CAAP) 19 – Aeromedical*³ guidance, which involved two GCAA-approved psychiatrists. His license had a limitation of a monthly aeromedical examiner's (AME) review, along with a regular psychiatric review.

The two psychiatrists' reviews, which were made available to the Investigation, indicated that the Commander was fit for duty. He was treated for other medical conditions in May 2013 and in July 2014, including lower back pain. These were found not to be related to this Incident.

The Commander underwent his monthly AME review two days before the Incident and he was found euthymic. The AME referred the Commander for a psychiatric review, as per his medical certificate limitation.

On the day of the Incident, the Commander visited the Operator's clinic, where a doctor examined him approximately two hours after the Incident. The doctor indicated in her report that he was tired and she referred him for additional assessments and tests. All results were normal.

The Commander reported symptoms associated with dizziness, lightheadedness, and disorientation after his in-flight collapse, and on 31 December 2014, approximately two months after the Incident, he sustained a second syncopal

episode, which was not witnessed. He felt that he was about to black out. He had no chest pain, no shortness of breath, and no palpitations. He collapsed, struck and injured his head, and lost consciousness. He regained consciousness after an unknown period of time. He visited the emergency department of a hospital on 1 January 2015, where assessments and investigations did not indicate any abnormalities and he was discharged on the following day.

During January 2015, the Commander underwent several specialist assessments and no neurological or neuropsychological cause was found to explain the episodes.

Aeromedical Board

Following the Senior Aeromedical Board recommendation, the GCAA revoked the Commander's medical certificate, according to *CAR Part II – Medical Provisions*, in May 2015, because of the unexplained falling attacks. This Board convened following the request of the GCAA aeromedical inspector in order to assess the eligibility of the Commander to hold a GCAA medical certificate. The presence of a flight operations inspector was not requested. The Board took into account the past and current medical condition of the Commander and considered:

- (a) The Commander's syncope spells associated with loss of consciousness along with lightheadedness and disorientation,
- (b) The medical examinations and investigations, which were neurological, cardiologic, psychological, which did not exclude any organic or psychological explanation of these syncope spells,
- (c) The exclusion of the events from being associated with any blood loss, dehydration, cardiac output, cardiac rhythm, neurological, or fatigue,
- (d) ICAO *Document 8994 – Manual of Civil Aviation Medicine*, Part II, chapter 10,

² CAR Part II, chapter V, was the Regulations for the aircrew medical provisions' applied in the United Arab Emirates

³ A publication which provided information and policy regarding GCAA-approved aeromedical examiners' system and aeromedical certification, revision 03 issued in September 2012 was the current at the time of the Incident



provision 10.2.25, and CAR Part II, chapter 5, provision 5.4.2.1.

The Board recommended the revocation of the Commander's medical certificate.

Aircraft Information

The Incident Aircraft was a Boeing 777-21HER, manufacturer serial number 27253, first registered in the United Arab Emirates on 30 September 1997.

Additional Information

Other Investigations

Other crew incapacitation events, not related to this Operator, were previously investigated by the AAIS with a number of safety recommendations being made, as detailed in the respective Final Reports issued on 28 June 2015 and on 16 November 2012⁴.

The Operator's pilot incapacitation guidance

The Operator's *Operations Manual*, Part A, section 8, contained procedures related to the *Incapacitation of Flight Crew Members*, and actions in the event of any pilot incapacitation. The procedures ensure the safety of the flight and the coordination among the cabin and the flight crewmembers to secure the incapacitated pilot and evaluate the operational aspects of the flight. The *Manual* also contained policy that should be applied irrespective of the duration of the incapacitation. Furthermore, the *Manual* contained guidance for the remaining pilot to declare an emergency and land as soon as practical. Moreover, the remaining pilot should fly the aircraft from his/her normal position.

In addition, the *Operations Manual*, Part E, section 3 – *Flight Crew Incapacitation*, contained policies and procedures for the cabin crewmembers when a pilot is incapacitated. In more detail, the Operator provided information on the use of flight crewmembers seat and restraint devices, and required cabin crewmembers to move the incapacitated pilot away from the flight controls, secure his/her position, and move his/her

seat backwards in order to be able to transport him/her away from the cockpit.

Analysis

General

The Investigation into this Incident collected data from various sources for the purpose of determining the causes and contributing factors.

This section of the Report explains the contribution of every investigation aspect to the Incident and to the severity of the consequences. The analysis also contains safety issues that may not be contributory to the Incident but are significant in adversely affecting safety.

Nothing in this section is to be understood as apportioning blame or liability.

Operator's Emergency Procedures

The Aircraft Operator's manuals contained adequate emergency policies and procedures related to pilot incapacitation. The policies and procedures provide necessary information for the flight and cabin crewmembers to perform their duties safely.

Crew Performance and Handling of the Emergency

The crewmembers initial and recurrent training assisted them in identifying the situation correctly. The Commander recognized that he was about to faint and he was able to warn the Copilot, who took over control of the Aircraft. The Copilot called the senior cabin crewmember, who entered the cockpit and secured the incapacitated Commander in his seat using his seat belt.

The crew practiced good crew resource management with the Copilot controlling the Aircraft. The cockpit-cabin communication was appropriate, and safety information was exchanged in a timely and accurate manner, which contributed to a safe landing.

⁴ AAIS Final Report No. AIFN/0006/2015, issued on 10 November 2016, and Final Report No. AIFN/0022/2012, issued on 20 September 2015



The Pilot Incapacitation

The Commander was well-rested, and was able to perform his duties. There were no known precursors which could have contributed to his incapacitation. Following the first fainting episode, the Commander experienced a second episode approximately two months later when alone in his accommodation. Fainting usually occurs when there is insufficient blood flow to the brain. Loss of consciousness may be associated with a temporary low blood flow. It most often occurs when blood pressure is too low and the heart does not send the required supply of oxygen, which is carried by the blood, to the brain.

All subsequent examinations and tests performed on the Commander were unable to indicate the cause of the syncope and the risk for recurrence remained undetermined. Based on this, the Medical Board recommended to the GCAA Aeromedical that the Commander's license be revoked, which was accepted.

Previous Investigations

The AAIS has investigated pilot incapacitations in the past and has already published the results of the investigations along with the relevant safety recommendations. The Investigation reviewed these safety recommendations, the policies and procedures of the Operator, and the crewmembers' performance during this Incident. The review indicated that the Operator had implemented all of the safety improvement opportunities identified in the previous investigations. The Investigation believes that no additional safety recommendations are required regarding this pilot incapacitation Incident.

Conclusions

General

From the evidence available, the following findings, causes, and contributing factors were determined with respect to this Incident. These findings shall not be read as apportioning blame or liability to any particular organization or individual.

Findings

Findings relevant to the Aircraft

- (a) The Aircraft was certified, equipped, and maintained in accordance with the

existing requirements of the *Civil Aviation Regulations* of the United Arab Emirates.

- (b) The Aircraft was airworthy when it was released to service.
- (c) There was no evidence of any defect or malfunction of the Aircraft that could have contributed to the Incident.

Findings relevant to the crew

- (a) The flight and cabin crewmembers were licensed and qualified for the flight in accordance with the existing requirements of the *Civil Aviation Regulations* of the United Arab Emirates.
- (b) The flight and cabin crewmembers were adequately rested prior to the flight and operated within the published flight and duty limitations.
- (c) The Commander was scheduled to perform a round trip flight to Bengaluru, India.
- (d) The Commander had an additional syncopal episode approximately two months after his first in-flight episode.
- (e) Subsequent examinations did not reveal the reason for the Commander's episodes.

Findings relevant to the Operator and flight operation

- (a) The Copilot was the pilot monitoring (PM) and the Commander was the pilot flying (PF).
- (b) The Commander developed a headache and felt nauseous during the flight to Dubai.
- (c) At the top of descent, the Commander felt that he could not focus, and that he was about to faint.
- (d) Just before the Commander lost consciousness, he announced that he was going to faint.
- (e) The Commander passed control to the Copilot before losing consciousness.
- (f) The Commander was unconscious for approximately three minutes.
- (g) The Copilot called the senior cabin crewmember to the cockpit after the Commander lost consciousness.
- (h) The senior cabin crewmember secured the Commander in his seat.



- (i) The Copilot continued flying the Aircraft, declared a MAYDAY as per the Operator's procedure, and landed the Aircraft uneventfully.
- (j) Crew coordination and communication was effective and worked well.

Cause(s)

The AAIS did not determine the cause of the unexplained fainting attack that led to the Commander's incapacitation.

Safety Recommendations

The Operator had implemented all safety improvement opportunities identified in the previous AAIS investigations. The AAIS believes that no additional safety recommendations are required regarding this pilot incapacitation Incident.

This Report is issued by:

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