AAIS Case Reference: 22/2012

AIR ACCIDENT INVESTIGATION SECTOR

PRELIMINARY

SERIOUS INCIDENT INVESTIGATION REPORT

PILOT INCAPACITATION

Airbus A320-232
A6-EII
ETIHAD AIRWAYS
Abu Dhabi International Airport
United Arab Emirates
17 November 2012

General Civil Aviation Authority
of
United Arab Emirates

AIRCRAFT ACCIDENT BRIEF

GCAA AAI Report No.:	22/2012
Operator:	ETIHAD AIRWAYS
Aircraft Type and Registration:	Airbus 320-232, A6-EII
No. and Type of Engines:	Two (2) IAE V2527-A5 Engines
Date and Time (UTC):	17th November, 2012, 11:31 UTC
Location:	9.5 Nautical miles South East of Abu Dhabi International Airport
Type of Flight:	Passenger Transport
Persons on Board:	76 persons (2 flight crewmembers, 4 cabin crew and 70 passengers)
Injuries:	None
Nature of Damage:	No damage on the Aircraft

The General Civil Aviation Authority (GCAA) was informed of the serious incident, on 17 November 2012 at about 0100 Local Time and initiated the investigation on the same day.

In accordance with Annex 13 to the Convention on the International Civil Aviation, the International Civil Aviation Organization (ICAO) and the State of Design and Manufacturer (France) were notified, accordingly the investigation authority of France, the Bureau d'Enquêtes et d'Analyses (BEA), assigned an Accredited Representative to the investigation. The United Arab Emirates (UAE), Air Accident Investigation Sector (AAIS) of the GCAA is leading the investigation and will issue the Final Report.

Notes:

1. All times in this Report are Local Time UAE (UTC+ 4h)
2. The word "Aircraft" in this Report implies the aircraft involved in the serious incident
3. The word "Team" in this report implies the Investigation Team

OBJECTIVE

This investigation is performed in accordance with the UAE Federal Act No 20 (1991), promulgating the Civil Aviation Law, Chapter VII, Aircraft Accidents, Article 48, CAR Part III Chapter 3 and in conformity with Annex 13 to the Convention on International Civil Aviation.

The sole objective of this Investigation is to prevent aircraft accidents and incidents by identifying and reducing safety-related risk. It is not the purpose of this activity to apportion blame or liability.

The information contained in this Preliminary Report is derived from the factual information gathered during the ongoing investigation of the occurrence. Later interim reports or the final report may contain altered information in case that new evidence appears during the ongoing investigation that requires changes to the information depicted in this Report.

Any specific safety issues identified during the course of the investigation will be advised to all parties through the GCAA Safety Recommendations (SR) procedure.

Reports are publicly available on:

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

TABLE OF CONTENTS

ABBREVIATIONS

AAIS	UAE GCAA Air Accident Investigation Sector
ASDA	Accelerate-Stop Distance Available
ATC	Air Traffic Control
ATPL	Air Transport Pilot License
BEA	Bureau d'Enquêtes et d'Analyses
CAR	UAE Civil Aviation Regulation
CAR-OPS	UAE Civil Aviation Regulation – Flight Operation
CAT	Category
CAVOK	Cloud and Visibility OK
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CVR	Cockpit Voice Recorder
CWY	Clearway
ELP	English Language Proficiency
FDR	Flight Data Recorder
GCAA	UAE General Civil Aviation Authority
ICAO	International Civil Aviation Organization
IAE	International Aero Engines
ILS	Instrument Landing System
KT	Knots
L	Left
LDA	Landing Distance Available
LH	Left Hand
LT	Local Time
M	Metres
mb	millibars
M/E	Multi Engines
MHz	Mega Hertz
MSN	Manufacturer Serial Number
No.	Number
NOSIG	No Significant Change
OK	all correct
PF	Pilot Flying
PIC	Pilot In Command
PM	Pilot Monitoring
Q/QNH	Barometric pressure adjusted to sea level
R	Right
RH	Right Hand
RWY	Runway
SEP	Safety & Emergency Procedures
SN	Serial Number
SWY	Stopway

SOP	Standard Operating Procedures
TO	Take Off
TODA	Take-Off Distance Available
TORA	Take-Off Run Available
TSN	Time Since New
UAE	United Arab Emirates
UTC	Co-ordinated Universal Time
VHF	Very High Frequency
VOR	Very High Frequency Omnidirectional Range (Navigation System)

SYNOPSIS

On 17 November 2012, at approximately 00:43 Local Time UAE, an Airbus A320-232, registration A6-EII, was approaching Abu Dhabi International Airport inbound from Kuwait International Airport, with a total of 76 persons on board. The flight was given instruction by Abu Dhabi Approach Control for the approach to Abu Dhabi Airport, runway 31L. While the crew were configuring the Aircraft for the approach and landing phase of the flight, the captain was the pilot flying (PF) and the co-pilot was the pilot monitoring (PM).

During the approach the captain became unresponsive and subsequently incapacitated. The co-pilot informed the Controller that the captain was incapacitated, thereafter, declared an emergency and assumed control of the handling of the flight and remained as the pilot flying until the Aircraft landed safely.

After landing, the Aircraft stopped on the active runway since the co-pilot was not able to taxi from the right seat as per the Operator's policy. Subsequently, the emergency services arrived to assist the Aircraft and the medical staff boarded to the flight deck to assess the medical status of the captain. The Captain had regained consciousness to a limited extent and was communicative and responsive.

The Aircraft was towed to the passenger terminal where the captain was the first person who disembarks the Aircraft followed by the passengers and the rest of crew. Later on, the captain was transported to the hospital for further medical checks and observation.

The GCAA removed the cockpit voice recorder and flight data recorder to the Flight Recorder Laboratory at the GCAA Headquarter for analysis and playback.

None of the 70 passengers and the 6 crewmembers was injured.

1 FACTUAL INFORMATION

1.1 History of the Flight

On 17 November 2012, at approximately 0042 LT UAE, the crew of Airbus 320-232 , registration mark A6-EII, operating flight number ETD308, inbound from Kuwait International Airport, Kuwait, called Abu Dhabi International Airport Approach Controller advising approach. A total of 76 persons were on board: 2 flight crew members (captain and co-pilot), 4 cabin crew and 70 passengers. The captain was the pilot flying (PF) and the co-pilot was the pilot monitoring (PM).

At 00:42:24, while the Aircraft was approaching Abu Dhabi International Airport (OMAA[1]) and maintaining 2,400 feet altitude, at 9.5 nautical miles south east of the Airport, the captain said something to the co-pilot with an unusual voice pattern compared to the previous flight deck conversation as evidenced on the Cockpit Voice Recorder.

Between 00:42:52 and 00:43:23, the captain attempted to verbalize unsuccessfully and was in difficulty breathing normally, with incoherent verbal communication.

At 00:43:40, the Approach Controller instructed ETD308 turning left for heading 040 and to continue descending to Base Leg for Runway (RWY) 31L after ASKIN waypoint[2]. ETD308 read back the Controller's instruction correctly.

At 00:43:46, the captain was further heard to engage in incoherent verbal communication.

At 00:44:11, the Controller requested confirmation of whether ETD308 was turning left onto heading 040^0, ETD308 replied "*standby and still maintaining heading 125 due to pilot incapacitation*".

At 00:44:37, the Controller instructed ETD308 to turn left heading 360^0 when suddenly ETD308 declared MAYDAY[3] due to pilot incapacitation.

At 00:44:48, the Controller acknowledged the declared emergency, requested ETD308 to turn left onto a heading 360^0 and informed that ground emergency services will be on standby. The Controller requested for confirmation of the emergency, the co-pilot replied that the captain is incapacitated.

At 00:45:15, the Controller contacted ETD308 to advise no restrictions on speed, and to request ETD308 to continue turning left to heading 340^0, and then passed ILS clearance to RWY 31L. The co-pilot replied that he was not yet ready for the approach ILS RWY 31L, due to a potential for an un-stabilized approach. The Controller proposed to ETD308 to hold between 2,000 or 2,500 feet, the co-pilot acknowledged the Controller of holding at 2,500 feet, subsequently, the Controller cleared ETD308 to fly a heading 360^0 and route to the north of the airfield for holding until ready to commit the landing.

At 00:45:52, the co-pilot contacted the Controller informing that the Aircraft was on heading 360^0 and was maintaining 2,500 feet. Shortly thereafter, the co-pilot requested a long final for RWY 31L which was approved by the Controller who requested to be advised on the distance to join the approach and instructed to "*make heading now 040*", ETD308 read back the clearance correctly.

---

[1] OMAA is the ICAO's 4 letter airport code for Abu Dhabi International Airport

[2] ASKIN is the last waypoint as RNAV Standard Arrival for AUH Runway 31L.

[3] *MAYDAY* is an expression, preferably spoken three times, used in the case of a distress: a condition of being threatened by serious and/or imminent danger and of requiring immediate assistance (as defined by Annex 10 to the Convention on International Civil Aviation, Volume II, Chapter 5, paragraph 5.3.1.1).

At 00:46:46, the co-pilot contacted the Controller informing "*ready for the right turn*". The message was not clearly received and thus the Controller asked to repeat it. Later on, the Controller requested ETD308 for confirmation of "*you are not ready for the right turn*", the co-pilot replied that he is ready for the right turn.

At 00:47:01, the Controller contacted ETD308 asking whether the Aircraft was able to turn left into heading 280^0 for the intercept at about 8 miles. The co-pilot replied "*Negative*" and expressed that he like to make right turn long final. The Controller approved ETD308's request by advising direct to SANSU waypoint and descent to 2,000 feet which was read back correctly by the co-pilot.

At 00:47:54, the co-pilot contacted the Controller asking again whether the Controller had copied the MAYDAY call and informing the need of immediate assistance on landing due to pilot incapacitation, the Controller replied that the emergency situation was understood, Airport emergency service was on standby and fire vehicles could be expected on landing. The Controller also informed that traffic advice will be kept continuing along the ETD308 approach.

At 00:48:21, the Controller contacted ETD308 asking more details on the incapacitated pilot: his age and the condition. The co-pilot replied that the incapacitated pilot is the captain and his condition is unknown. During that time, one of the cabin crew was taking care of the captain's oxygen and restraint the incapacitated captain.

At 00:49:00, the co-pilot informed the Controller that the Aircraft was about to intercept the final approach to RWY 31L, accordingly the Controller cleared ETD308 for immediately ILS approach, the co-pilot read back the clearance correctly and informed that the Aircraft had established on the localizer.

At 00:49:47, the Controller contacted ETD308 querying about persons onboard and fuel endurance, ETD308 replied that the fuel onboard was 2,500 kilograms and to standby for the persons onboard, the Controller acknowledged the provided information, confirmed the ILS approach and informed that the Airport emergency services are on standby.

At 00:50:41, the co-pilot requested one of the cabin crew to ask through the passengers address if any doctor is among the passengers.

At 00:51:22, the co-pilot contacted the Controller to inform him about the number of persons onboard, the Controller confirmed the 76 number as well as the fuel onboard correctly and requested ETD308 to establish contact with Abu Dhabi Tower at 119.2 megahertz (MHz) and re-informed that the Airport emergency services are on standby, the co-pilot read back the advised frequency correctly.

At 00:51:40, the co-pilot established contact with the Tower declaring MAYDAY and informing that the Aircraft position is on the localizer of RWY 31L. The Tower informed the surface wind as of 320° 5 knots and cleared ETD308 for landing, the co-pilot read back the clearance correctly.

At 00:53:56, the co-pilot advised the Tower that the Aircraft cannot be taxied after landing and will be stopped on the active runway[4], and will require an emergency assistance which was acknowledged by the Tower.

At 00:55:57, the Aircraft touched down.

At 00:56:18, the Tower requested a confirmation of whether the Aircraft had already completed the landing roll, the co-pilot confirmed the landing roll completion and that the Aircraft had stopped on the runway.

[4] As per the Operator's policy, the right seat pilot is not allowed to taxi the aircraft.

At 00:56:58, the Tower instructed ETD308 to establish contact with the Ground Controller (Ground) at 123.975 MHz which read back correctly.

At 00:57:17, the co-pilot established contact with the Ground informing that the Aircraft was standing on the runway, advising pilot incapacitation and requesting emergency assistance. The Ground replied that the emergency services were notified and 5 vehicles are on their way to the Aircraft.

At 00:57:34, the co-pilot informed the Ground that the engines were shutdown, the Ground replied that arrangements were made to vacate the runway. ETD308 also requested tow truck and the Ground replied that the request had already been processed.

At 01:01:37, and while waiting for the emergency services, the co-pilot tried to talk to the captain by asking "*are you okay?*" at that time the captain had regained consciousness to a limited extent and appeared to be responsive and communicative.

Upon their arrival, about 30 minutes after the Aircraft landing, the paramedics arrived at the Aircraft and admitted the flight deck in order to evaluate the captain's condition. Thereafter the Aircraft was towed to the passenger terminal where the captain was the first person who disembarks. Later on, the captain was transported to the hospital for further checks and observation.

No injuries were reported.

1.2 Injuries to Persons

Injuries	Flight Crew	Cabin Crew	Other Crew Onboard	Passengers	Total Onboard	Others
Fatal	0	0	0	0	0	0
Serious	0	0	0	0	0	0
Minor	0	0	0	0	0	0
None	2	4	0	70	76	0
TOTAL	**2**	**4**	**0**	**70**	**76**	**0**

1.3 Damage to Aircraft

None

1.4 Other Damage

None

1.5 Personnel Information

	Captain	Co-pilot
Gender	Male	Male
Date of Birth	29 August 1968	10 December 1954
Foreign License Number	ATPL TA-1832 (Oman)	ATPL 2039 (Mauritius)
Foreign License Validity	31 January 2011	15 February 2010
UAE License Number	23452 (Aeroplane)	25656 (Aeroplane)
UAE License Validity	28 January 2020	15 June 2016
UAE License Category and Rating	ATPL; M/E Land, A320, A330(P2), A340(P2)	ATPL; M/E Land, A320, A330(P2), A340(P2)
Class and Date of Last Medical	Class I (One); 12 July 2012	Class I (One); 30 November 2011
Flying Experience		
Total All Types	12,297.11 Hours	13,069.23 Hours
Total Command on All Types	4,930.57 Hours	2,500 Hours
Total on Type	332.57 Hours (as PIC)	84.55 Hours
Total last 28 Days	72.34 Hours	35.27 Hours
Total last 24 Hours	05.50 Hours	05.50 Hours
English Language Proficiency (ELP)	Level 6	Level 4

Flight crew performance will be discussed in the final report.

1.6 Aircraft Information

Manufacturer : Airbus

Type : A320-232

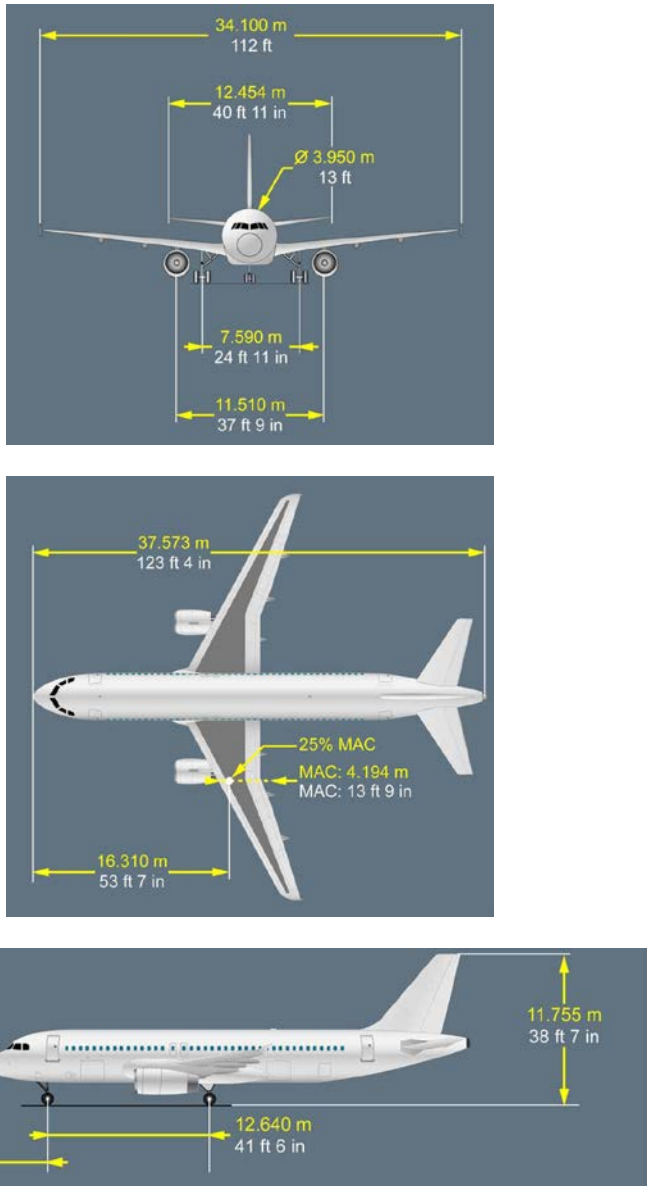
Registration : A6-EII

MSN : 3713

Engine Manufacturer and Model : International Aero Engines (IAE) V2527-A5

C of A Date of Issue : 12 December 2008 (first issue)

C of R Date of Issue : 12 December 2008 (first issue)



3-VIEW DRAWING

1.7 Meteorological Information

The METAR[5] of Abu Dhabi International Airport (OMAA) on 16 November 2012 was as follows:

METAR OMAA 162100Z 30004KT CAVOK 25/20 Q1017 A3005[6] NOSIG=[7]
METAR OMAA 162000Z 31005KT 280V350 CAVOK 26/20 Q1018 A3006 NOSIG=

[5] METAR is a format for aerodrome routine meteorological reports
[6] A3005 indicates the altimeter setting is 30.05 inHg (1,017.6 hPa)
[7] NOSIG means that no significant change is expected to the reported conditions within the next 2 hours

Before the Aircraft landed, 320 degrees / 5 knots of wind information was given to ETD308 by the Tower.

1.8 Aids to Navigation

Aids to navigation were not a factor, the Aircraft performed Abu Dhabi Standard Approach for Runway 31L and the ILS was functioning properly when the occurrence happened until the landing.

1.9 Communications

All communications between the Aircraft and Abu Dhabi Approach on 124.400 MHz, Abu Dhabi Tower on 119.200 MHz and Abu Dhabi Ground on 123.975 MHz were clear.

1.10 Aerodrome Information

Abu Dhabi International Airport has 2 runways with the following information:

Slope of RWY-SWY			SWY dimensions (M)	CWY dimensions (M)	Strip dimensions (M)
13R	-0.2% (first 1310 M) -0.7% (next 690 M) 0% (next 900 M) +0.8% (next 1200M)		55 x 45	420 x 45	4335 x 300
31L	-0.8% (first 1200 M) 0% (next 900 M) +0.7% (next 690 M) +0.2% (next 1310M)		60 x 45	380 x 45	4335 x 300
13L	+0.1%	0%	130 x 60	NIL	4480 x 300
31R	-0.1%	0.2%	130 x 60	NIL	4480 x 300

The declared distances are:

RWY Designator	TORA (M)	TODA (M)	ASDA (M)	LDA (M)	Remarks
13R	4100	4520	4155	4100	NIL
31L	4100	4480	4160	4100	NIL
13L	4100	4100	4230	4100	NIL
31R	4100	4100	4230	4100	NIL

RWY 31L is equipped with an ICAO CAT II/III[8] precision approach lighting system 900 M CL strobe and Flashing RTIL. The Runway centre line lighting is bi - directional with 15 meters spacing, white colour coded in the first 3200 m, white/red ALTN in the next 600 m and red LIH for the last 300 m. The RWY edge lighting is bi-directional with LIL omni-directional component white LIH.

At the time of the occurrence, the northern runway (RWY 31R-13L) was closed, and other traffic aircraft had requested to use RWY 31R for landing. Abu Dhabi Approach informed the traffic aircraft that they were trying to open the northern runway but a short delay was to be expected since they need time to inspect the runway before re-opening.

1.11 Flight Recorders

The Aircraft was equipped with a Flight Data Recorder (FDR) and Cockpit Voice Recorder (CVR) as described herein.

- **CVR**

  Type: Honeywell

  Part Number: 980-6022-001

  Serial Number: CVR120-05570

- **FDR**

  Type: L-3 Comm

  Part Number: 2100-4043-02

  Serial Number: 000620790

[8] *Category II (CAT II) operation* is a precision instrument approach and landing with:
a) a decision height lower than 60 m (200 ft), but not lower than 30 m (100 ft); and
b) a runway visual range not less than 300 m.

CAT III consists of:
- *Category IIIA (CAT IIIA) operation* is a precision instrument approach and landing with:
  a) a decision height lower than 30 m (100 ft) or no decision height; and
  b) a runway visual range not less than 175 m.
- *Category IIIB (CAT IIIB) operation* is a precision instrument approach and landing with:
  a) a decision height lower than 15 m (50 ft), or no decision height; and
  b) a runway visual range less than 175 m but not less than 50 m.
- *Category IIIC (CAT IIIC) operation* is a precision instrument approach and landing with no decision height and no runway visual range limitations.

The CVR and FDR were removed to the Flight Recorder Laboratory at the GCAA Headquarter for the download, analysis and playback.

1.12 Wreckage and Impact Information

Not applicable

1.13 Medical and Pathological Information

Medical examination including alcohol and drug tests were performed and the results will be contained in the Final Report.

1.14 Fire

None

1.15 Survival Aspects

The Airport Emergency Plan was activated once the MAYDAY was declared by the crew.

After the Aircraft landed and stopped on the runway, Abu Dhabi Airport Airfield Rescue and Fire Fighting Services responded immediately. First aid emergency unit responded by providing on board first aid to the incapacitated captain and thereafter brought the captain to the First Aid Emergency Medical Center at the Airport. Although no action was required from the rescue and fire fighting services they were continuously present to monitor and keep standby for as a precaution until the Aircraft was towed out of the runway. Later on, the captain was transported to the Mafraq Hospital for intensive medical checks.

1.16 Tests and Research

None

1.17 Organizational and Management Information

The Operator was set up by Royal (Amiri) Decree in July 2003, commenced commercial operations in November 2003, is licensed by the General Civil Aviation Authority of the UAE and currently (as of November 2012), has a fleet of 65 Airbus and Boeing aircraft operated just over 1,200 flights per week, serving an international network of 84 passenger and cargo destinations in 53 countries.

1.18 Additional Information

1.18.1 Operator's Operations Manual Part A

Pilot Incapacitation according to the Operator's Operations Manual Part A as following:

Paragraph 1.4.2.1 Duties and Responsibilities of Co-Pilot
Specific Responsibilities under point 6:
Specifically the co-pilot is responsible for in the event of Commander Incapacitation, the highest ranking Co-pilot assigned to the flight shall assume command.

Paragraph 4.3 Flight Crew Incapacitation

Refer to Chain of Command (Chapter 1.3) for succession of command in the event of incapacitation of the Commander. In the event of incapacitation of the Commander, the other pilot assumes authority over all persons on board the aircraft until such time a normal chain of command can be re-established. In such event, NOC[9] shall be notified as soon as possible.

The autopilot shall be used to its full capacity to reduce workload and to ensure the safe outcome of the flight.

Paragraph 8.3.15.1.3 Action to be Taken in Case of Incapacitation
Once a subtle or an obvious incapacitation is identified:

- Other pilot in control to immediately make Emergency Alert PA "Cabin Manger to the cockpit immediately"
- Take over control
- Engage the auto-pilot whenever practicable
- Check the position of essential controls and switches
- Concentrate on flying the aeroplane especially during critical phases of flight
- Inform ATC
- Declare emergency if required
- Give NITS[10] briefing to Cabin Manager or Deputy as per SEP manual
- Arrange a landing as soon as possible
- Summon help from cabin crew to take care of the incapacitated flight crew member
- Reorganize the flight deck work
- Distribute the workload among the remaining flight crew
- Do not press for a hasty approach
- Perform checklist earlier than normal
- Achieve landing configuration earlier than normal

[9] Network Operations Centre (NOC) is the 24hours designated control centre for Operator's global operations and is resourced to ensure the daily supervision and management of the flight operation, including aircrew.

[10] N : Nature of emergency
I: Intention of the captain (ground evacuation / ditching)
T: Time available to brief the passengers and prepare the cabin
S: Specific Instructions (if any)

Assisting cabin crew member(s) should:

- Pull the incapacitated pilot back to his seat and fit the shoulder harness
- Place hands across the chest through the shoulder harnesses
- Push the seat completely AFT and fully recline the seatback
- Pull the incapacitated pilot out, without touching any controls or switches, if not possible, remain in the cockpit and provide first aid/oxygen, if required
- Assist the other pilot as directed

Note: The shoulder harnesses should be locked if the incapacitated pilot has to be left unattended in his seat (e.g. assisting cabin crew seeking support).

The CM[11] shall make a PA for a medically qualified passenger and after liaising with the remaining flight crew member will discreetly check if type qualified pilot is on board to replace the incapacitated crew.

1.18.2 Operator's Safety and Emergency Manual

Paragraph 8.2.1 Pilot Incapacitation

In case of incapacitation of a flight crew member in-flight, the other pilot in control will make an emergency PA "Cabin Manager to the Cockpit immediately" and give NITS briefing to the CM or deputy.

Assisting cabin crew to take care of the incapacitated flight crew member as follows:

	PILOT INCAPACITATION DRILL	
PULL	……	PILOT BACK
FASTEN	……	SHOULDER HARNESS
MOVE	……	SEAT AFT AND RECLINE
PULL	……	LEGS AWAY FROM CONTROLS
ADMINISTER	……	FIRST AID*
ASSIST	……	OTHER PILOT

*Ideally out of the flight deck without touching controls/switches

Note: Before fastening shoulder harness, the pilot's arms are to be folded across the chest to restrict movement

The CM shall make a PA for a medically qualified passenger and, after liaising with the remaining flight crew member, discreetly check if a type qualified pilot is onboard to replace the incapacitated crew member.

Based on the crew interview and from the CVR, the crew performed actions as per Operator's Operation Manual for this occurrence.

[11] CM : Cabin Manager

1.18.3 UAE CAR Part II, Chapter 2 : Licences and Ratings - Pilots

Paragraph 2.1.5 Requirements for the Issue of Class and Type Ratings

When applying for a class or type rating, the holder of a pilot's licence shall meet the following requirements in a manner determined by the GCAA:

(b) Type rating as required by paragraph 2.1.3.2 above, the applicant shall have:

(1) gained under appropriate supervision, experience in the applicable type of aircraft and/or flight simulator in the following:

- procedures for crew incapacitation and crew co-ordination including allocation of pilot tasks; crew co-ordination and use of checklist; and,

(2) demonstrated the skill and knowledge required for the safe operation of the applicable type of aircraft, relevant to the duties of pilot-in command.

Paragraph 2.5.5 Skill

(a) The applicant shall have demonstrated the ability to perform, as pilot-in-command of an aircraft within the appropriate category required to be operated with a co-pilot, the following manoeuvres:

(5) procedures for crew incapacitation and crew co-ordination, including allocation of pilot tasks, crew co-operation and use of checklists.

(b) The applicant shall have demonstrated the ability to perform the procedures and manoeuvres described in sub-paragraph (a) above, with a degree of competency appropriate to the privileges granted to the holder of an airline transport pilot licence - aeroplane, and to:

(7) understand and apply crew co-ordination and incapacitation procedures;

1.18.4 ICAO Annex 1 : Personnel Licensing

Paragraph 1.2.4 Medical fitness

1.2.4.2 **Recommendation.—** *From 18 November 2010 States should apply, as part of their State safety programme, basic safety management principles to the medical assessment process of licence holders, that as a minimum include:*

a) routine analysis of in-flight incapacitation events and medical findings during medical assessments to identify areas of increased medical risk; and

b) continuous re-evaluation of the medical assessment process to concentrate on identified areas of increased medical risk.

Paragraph 2.1 General rules concerning pilot licences and ratings

2.1.5 Requirements for the issue of class and type ratings

2.1.5.2 *Type rating as required by 2.1.3.2 a)*

The applicant shall have:

a) gained, under appropriate supervision, experience in the applicable type of aircraft and/or flight simulator in the following:

- procedures for crew incapacitation and crew coordination including allocation of pilot tasks; crew cooperation and use of checklists;

Paragraph 2.5 Multi-crew pilot licence appropriate to the aeroplane category

2.5.1 General requirements for the issue of the licence

2.5.1.3 *Skill*

2.5.1.3.1 The applicant shall have demonstrated the skills required for fulfilling all the competency units specified in Appendix 3 as pilot flying and pilot not flying, to the level required to perform as a co-pilot of turbine-powered aeroplanes certificated for operation with a minimum crew of at least two pilots under VFR and IFR, and to:

e) communicate effectively with other flight crew members and demonstrate the ability to effectively perform procedures for crew incapacitation, crew coordination, including allocation of pilot tasks, crew cooperation, adherence to standard operating procedures (SOPs) and use of checklists.

1.19 Useful or Effective Investigation Techniques

None

2 ANALYSIS

To be determined

3 CONCLUSIONS

To be determined

4 SAFETY RECOMMENDATIONS

None is issued yet.

5 ONGOING INVESTIGATION

The GCAA AAIS will provide updates on the investigation in line with the recommendations of ICAO Annex 13.

If no cause has been identified within 12 months of this accident, an Interim Accident Report will be published to update on the progress of the investigation.

Any specific safety issues identified during the course of the investigation will be advised to all parties through the GCAA Safety Recommendations (SR) procedures.

Upon the completion of the factual data collection, analysis, determination of the findings, causes and contributing factors; the Air Accident Investigation Sector will determine which safety recommendations are required. These will be detailed in the Final Investigation report which will be published.