Government of India
Director General of Civil Aviation

Final Investigation Report on incident of Pilot Incapacitation to M/s Blue Dart Aviation Ltd. Boeing 757-25C Aircraft VT-BDN at Delhi on 21/09/2021

Foreword

In accordance with Annex 13 to the International Civil Aviation Organisation Convention and the Aircraft (Investigation of Accidents &Incidents) Rules 2017, the sole objective of this investigation is to prevent aviation incidents/ accidents in the future. It is not the purpose of the investigation to apportion blame or liability.

This report has been prepared based upon the evidences collected during the investigation and opinions obtained from the experts. Consequently, the use of this report for any purpose other than for the prevention of future incidents/accidents, could lead to erroneous interpretations.

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Final Investigation Report on incident of Pilot Incapacitation to M/s Blue Dart Aviation Ltd. Boeing 757-25C Aircraft VT-BDN at Delhi on 21/09/2021

1.	Aircraft Type	: B757-25C
	Nationality	: INDIAN
	Registration	: VT - BDN
2.	Owner	: M/s Blue Dart Aviation Ltd.
3.	Operator	: M/s Blue Dart Aviation Ltd.
4.	Pilot – in –Command	: ATPL holder
	Extent of injuries	: Nil
	First Officer	: CPL Holder
	Extent of injuries	: Nil, however First Officer fainted during approach
5.	Date & Time of Incident	: 21/09/2021; 0015 Hrs IST approx
6.	Place of Incident	: Delhi
7.	Last point of Departure	: Kolkata
8.	Intended place of Landing	: Delhi
9.	No. of Passengers on board	: Nil
10.	Type of operation	: Scheduled Cargo
11.	Phase of operation	: Descent
12.	Type of incident	: Pilot Incapacitation

(All timings in the report are in IST unless or otherwise specified)

SYNOPSIS

On 21/09/2021, M/s Blue Dart Aviation Ltd. Boeing 757-25C aircraft VT-BDN was involved in an incident of Pilot Incapacitation while operating scheduled cargo flight BZ-201 from Kolkata to Delhi. The aircraft was under the command of pilot an ATPL holder with First Officer a CPL holder.

The take-off, climb and cruise was uneventful. During approach at Delhi when the aircraft was on LOC intercept Hdg for RW11, First Officer exhibited seizure like activity and became unresponsive thereafter. First Officer was pushed back in to her seat immediately by the PIC and PIC locked her shoulder harness. The landing checklist was accomplished by PIC and subsequently a safe landing was carried out at Delhi.

There was no damage to the aircraft. There were no fire and no injury to any of the occupants on board the aircraft.

DGCA-India, vide Order No DGCA-15018(11)/1/2021-DAS dated 14/10/2021 instituted investigation of the incident under Rule 13 (1) of Aircraft (Investigation of Accidents and Incidents), Rules 2017 by appointing an Investigator-In-Charge.

The investigation concluded that the probable cause of First Officer incapacitation was a Syncope.

1. FACTUAL INFORMATION

1.1 History of the flight

On 21/09/2021, M/s Blue Dart Aviation Ltd. Boeing 757-25C aircraft VT-BDN was involved in an incident of Pilot Incapacitation while operating scheduled cargo flight BZ-201 from Kolkata to Delhi. The aircraft was under the command of pilot an ATPL holder with First Officer a CPL holder. Both the operating crew were duly qualified to operate the flight.

The aircraft departed from Kolkata at 22:35 Hrs IST on 20/09/2021. The take-off, climb and cruise was uneventful. During approach at Delhi when the aircraft was on LOC intercept HDG for RW11, First Officer developed a condition which seemed to be a seizure. First Officer fainted thereafter. First Officer was pushed back in to her seat immediately by the PIC and PIC locked her shoulder harness to prevent her from interfering with essential controls or switches. The landing checklist was accomplished by PIC and subsequently a safe landing was carried out at Delhi.

After vacation from taxiway Y1, First Officer regained consciousness but still seemed incoherent. While taxying, PIC contacted their Flight Operations on company frequency updating about the situation and requested for medical assistance on arrival. First Officer seemed to have fully recovered after chocks ON at the parking stand. Crew exited the aircraft and went to M/s Blue Dart dispatch office. PIC then contacted M/s Blue Dart senior VP-Flight Operations over phone and appraised about the situation. Senior VP-Flight Operations instructed him to relieve First Officer from further duties and she left to her home from the airport. No medical assistance was required by First Officer at the airport.

As per PIC Statement, First Officer was absolutely fine during the entire cruise. PIC left his seat once by handing over the controls to First Officer during cruise to use the toilet during the flight. When ATC gave them HDG 075 deg to intercept LOC RWY11 for approach, First Officer read back the RT call. After approx. 30 seconds of reading back the RT call, First Officer made a peculiar sound on the intercom mic. This sound became louder and her head tilted back on the chair head rest. Her hands simultaneously came down beside her legs, fully straightened and started fluttering. Her body got stiff. PIC pushed her seat back and locked her shoulder harness to prevent her from interfering with the controls. By that time First Officer had fainted but she was making a chocking sound that was heard on the mic for about 30 seconds after fainting.

As per First Officer statement, she operated a return charter flight from Kolkata to China on 18/09/2021. She left the hotel early morning at around 0600 IST. The flight departed from Kolkata at 0900 IST and landed back at Kolkata on the same day at 1910 IST. She checked in back at hotel around 2100 IST at night. The next day i.e. 19/09/2021 was her rest period which was a normal day at the hotel. Keeping in

mind the COVID precautions, she remained inside the hotel, the entire day. On 20/09/2021, she was rostered to operate Kolkata-Delhi-Bangalore flight with a halt of few hours at Delhi for the change of aircraft. On the morning of 20/09/2021, she woke up late and had a late breakfast. She skipped her lunch that day. She got her dinner packed from the hotel for the flight and planned to consume it after landing at Delhi. Then she checked out of the hotel, reported for the incident flight at their dispatch office at Kolkata and signed Breath Analyser declaration and proceeded for flight. She was active and alert throughout the flight. She was handling RT. After reading back the transmission for turn right heading 075, she does not remember anything till vacating the runway on taxiway Y1. She was not on any medication and also did not consume any over the counter (OTC) medicines before the incident flight.

PIC did not declare the emergency to ATC after the incapacitation of the First Officer. As per PIC statement, he did not inform ATC as the aircraft was on number 1 for landing and was just 5 minutes from touchdown, when First Officer incapacitated. Also, aircraft was in a critical phase of flight (10 NM on LOC RWY11) with extremely high workload period. PIC stated that he planned to declare emergency after landing so that medical assistance would be ready but First Officer regained consciousness and was responding coherently after landing.

PIC did not make PDR entry in techlog and also did not inform M/s Blue Dart Chief of Flight Safety as well as Engineer available at station about the incident. PIC contacted their senior VP-Flight Operations over phone and appraised him of the situation. However, the information was not shared by senior VP-Flight Operations with the Chief of Flight Safety. As a result, CVR could not be downloaded. As per PIC statement; he informed about the incapacitation of First Officer to Flight Dispatch Officer of M/s Blue Dart on company frequency asking for a doctor on arrival, as he was worried about the health of First Officer and wanted to take her to a Doctor as soon as possible after landing. Due to this, he missed out making PDR entry. There was no damage to aircraft and no injury to personnel on board the aircraft

1.2 Injuries to persons

Injuries	Crew	Passenger	Others
FATAL	Nil	Nil	Nil
SERIOUS	Nil	Nil	Nil
~~Minor~~/None	02	00	----

1.3 Damage to aircraft

The aircraft landed safely and there was no damage to the aircraft.

1.4 Other damage : Nil

1.5 Personnel information

1.5.1 Pilot – in – Command

AGE & Gender	: 33 Yrs & Male
License type	: ATPL
Date of Initial Issue	: 11/12/2018
License valid upto	: 10/12/2023
Category (Aerolpane/Helicopter)	: Aeroplane
Aircraft rating on License	: Cessna 152, Cessna 172, G-58, B757-200
Date of endorsements as PIC	: 16/09/2019
Date of last Class 1 Medical Exam	: 18/10/2021
Class 1 Medical Exam valid upto	: 26/10/2022
Date of issue of FRTOL	: 04/06/2013
FRTOL Valid upto	: 03/06/2023
Last IR check date	: 14/05/2021
Total flying experience	: 2949 Hrs 20 mins
Total flying experience on type	: 2692 Hrs 55 mins
Total flying experience as PIC on type	: 752 Hrs 35 mins
Total flying experience in last 365 days	: 415 Hrs
Total flying experience in last 180 days	: 222 Hrs 40 mins
Total flying experience in last 90 days	: 128 Hrs 40 mins
Total flying experience in last 30 days	: 36 Hrs 10 mins
Total flying experience in last 07 Days	: 12 Hrs 30 mins
Total flying experience in last 24 Hours	: Nil
Rest before duty	: 59 Hrs 05 mins

1.5.2 First Officer

Age & Gender	: 31 Yrs & Female
License type	: CPL
Date of Issue	: 13/07/2015

License valid upto	: 12/07/2025
Category (Aerolpane/Helicopter)	: Aeroplane
Aircraft rating on License	: DA-40, DA-42, B757-200
Date of endorsements as PIC	: N/A
Date of last Class 1 Medical Exam	: 25/03/2021
Class 1 Medical Exam valid upto	: 03/04/2022
Date of issue of FRTOL	: 13/07/2015
FRTOL Valid upto	: 12/07/2025
Last IR check date	: 01/07/2021
Total flying experience	: 1848 Hrs 10 mins
Total flying experience on type	: 1648 Hrs 10 mins
Total flying experience as PIC on type	: Nil
Total flying experience in last 365 days	: 376 Hrs 40 mins
Total flying experience in last 180 days	: 140 Hrs 40 mins
Total flying experience in last 90 days	: 81 Hrs 55 mins
Total flying experience in last 30 days	: 24 Hrs 55 mins
Total flying experience in last 07 Days	: 12 Hrs 10 mins
Total flying experience in last 24 Hours	: Nil
Rest before duty	: 47 Hrs 45 mins

PIC was not involved in any serious incident/ accident in past. First Officer was involved in a similar incident on 01/09/2017 on ground at Mumbai after operating flight from Chennai to Mumbai. Both the operating crew had adequate rest prior to operating the incident flight.

1.6 Aircraft Information

Boeing 757 25C aircraft is manufactured by the Boeing Company, USA. The aircraft is fitted with 2 Rolls Royce engines RB211 turbofan engines. The maximum all up weight is 108862 Kgs.

1.6.1 Aircraft :-	
Manufacturer	The Boeing Company, USA
Type	Boeing 757-25C
Owner & Operator	M/s Blue Dart Aviation Ltd.
Manufacturer S. No.	25898

Year of Manufacturer	1992
Certificate of Airworthiness	Issued on 17/11/2008
Airworthiness Review Certificate	Valid upto 15/10/2022
Category	Normal
Sub Division	Mail/Goods
Certificate of Registration No. and validity	3864/5, Contineous
Minimum Crew Required	02
Maximum All Up Weight Authorised	108862 Kg
Last Major Inspection	1C, S1C, 2C, S2C, 4C, S4C & 8C on 29.07.2021
Last Inspection	Transit
Airframe Hrs. Since New	62484:44 Hrs
Status of Airworthiness Directives, Service Bulletins, DGCA Mandatory Modifications	All Applicable SB's, AD's & DGCA Man –Mod's are complied.

1.6.2 Engine :-		
Manufacturer	Rolls Royce	
Type	RR RB211-535E4	
Serial No.	31024 (LH)	31749 (RH)
Time Since New (TSN)	66143:05 Hrs	32635:40 Hrs
Time Since Overhaul (TSO)	1294:05 Hrs	1414:40 Hrs
Cycle Since New	23888	17401
Cycle Since Last Shop Visit	983	1049
Last Major Inspection carried out	Level 4 Shop Visit 20/07/2020	Level 3 Shop Visit 07/10/2020
Last Inspection carried out	Transit	
Average Fuel Consumption	3345.47 Kg/Hr	

Average Oil Consumption	0.05 Q/Hr
Fuel Used	JET A-1

1.7 Meteorological information

At the time of landing at Delhi, the weather reported by ATC was visibility of 3500 meters, Winds 110/04 knots with no significant change in the prevailing weather conditions.

1.8 Aids to navigation

At IGI Airport, New Delhi the VOR/DME, ILS landing facility and PAPI are available on either side of all the three runways.

1.9 Communications

There was always two way communication between the ATC and the aircraft.

1.10 Aerodrome information

The following are the relevant details of IGI Airport, New Delhi.

ICAO code: VIDP

Co-ordinates: N 28^0 34' 07''

E 077^0 06' 44''

Elevation : 778 ft

Indira Gandhi International Airport is operated by Delhi International Airport Ltd. (DIAL). The ATC is controlled by Airports Authority of India (AAI). It has three runways. Round the clock MET services are available with trend forecasting on every half hourly basis.

1.11 Flight recorders

The aircraft is fitted with Honeywell Digital Fight Data Acquisition Unit (DFDAU) and Fairchild model Solid State Cockpit Voice Recorder (SSCVR).

- The CVR was not removed after the incident and hence it was not available for investigation.
- The relevant DFDR data was analysed and there was no abnormality observed.

1.12 Wreckage and impact information

There was no damage either to the aircraft or to any ground facilities.

1.13 Medical and pathological Information

The First Officer underwent Class 1 Initial Medical Examination on 24/01/2014 and was assessed as 'Fit with no limitations'. However, during the initial medical examination she was found to have 'anemia' for which she was assessed temporary medically unfit for flying duties until correction of all blood parameters. Thereafter, she has been undergoing all renewal medical examinations as per laid down regulations of DGCA and was assessed medically 'fit' until during the medical assessment validity period, on 01/09/2017, the First Officer had an incident of loss of consciousness on ground at Mumbai after operating a flight from Chennai to Mumbai. She was scheduled to operate three sectors Delhi-Chennai-Mumbai-Delhi. Aircraft departed from Delhi at 0700 IST and landed into Chennai at 1010 IST. For the second sector the push back from Chennai was at 1105 IST and landed at Mumbai at 1250 IST. Post landing at Mumbai while the loading and unloading under progress, she suffered transient loss of consciousness at around 1330 IST for approximately two minutes. On witnessing the incident, PIC alerted the airport medical staff. The Airport Doctor of Mumbai International Airport examined the First Officer at around 1400 IST at the parking bay inside the aeroplane. Before the doctor arrived, she had spontaneous recovery and regained full consciousness. The doctor then examined her and found all her vital parameters to be normal. He recorded occurrence of frothing from mouth and convulsive activity. He prescribed her only oral rehydration solution to drink. She then discontinued the flight and came back home on a commercial flight to Delhi.

This incident was reported to DGCA, following which a 'Special Medical Examination' was conducted for the First Officer, in accordance with the Aircraft Rules 1937, Rule 42. This medical examination was conducted on 20/09/2017 at a DGCA empanelled IAF Boarding Centre; AFCME, New Delhi. During the evaluation at AFCME, it was concluded that owing to the high afternoon temperatures at Mumbai, coupled with exhaustion and dehydration she suffered a 'Vasovagal Syncope'. Therefore, as per the recommended practices laid down in ICAO Doc 8984 'Manual of Civil Aviation Medicine', after a medical unfitness period of three months, she was assessed fit to resume flying duties vide DGCA Medical Assessment dated 20/12/2017 with limitation to fly as Pilot in Command along with a qualified and experienced pilot on type. She was thereafter assessed 'fit with no limitations' on 21/06/2018, however, she was detected to have 'Hypothyroidism' and was prescribed medications (Tab Thyronorm 75mcg/day) for the same. All subsequent Class 1 periodic renewal medical examinations were assessed as 'Fit with no limitations'. The last renewal medical examination was conducted by a DGCA empanelled Class 1 Medical Examiner on 25/03/2021 which as assessed by DGCA as 'fit with no limitations' with a validity until 24/03/2022.

However, once again during this validity period, on 21/09/2021, the First Officer experienced a second incident of loss of consciousness (and this time) 'inflight'.

As per the statement of the First Officer, she had operated a return charter flight from Kolkata to China on 18/09/2021. For which, she left the hotel early morning on 18/09/2021 at around 0600 IST. The flight departed from Kolkata at 0900 IST and landed back at Kolkata on the same day at 1910 IST. She checked-in back at the hotel around 2100 IST. The next day i.e. on 19/09/2021, was her rest period. She was confined to the hotel owing to the prevailing COVID advisories in the region. On 20/09/2021, the next day, she was rostered to operate Kolkata-Delhi-Bangalore flight with a halt of few hours at Delhi for the change of aircraft. On the morning of 20/09/2021, she woke up late and had a late breakfast (which was routine and nothing out of ordinary). She skipped her lunch that day and stayed in the hotel room. She got her dinner packed for the flight and planned to consume it after landing at Delhi. She checked out of the hotel, reported for the incident flight at their dispatch office at Kolkata and signed the Alcohol Breath Analyser declaration as per DGCA circular no. DGCA-15031/4/2020-DAS dated 13/05/2021 and thereafter proceeded for the flight. She was observed to be alert throughout the flight. She denies being on any regular medications and did not consume any over the counter medications before the incident flight. As per PIC Statement, First Officer was absolutely fine during the entire cruise. PIC left his seat once by handing over the controls to First Officer during cruise to use the toilet during the flight. When ATC gave them HDG 075 deg to intercept LOC RWY11 for approach, First Officer read back the RT call. After approx. 30 seconds of reading back the RT call, First Officer made a peculiar sound on the intercom mic. This sound became louder and her head tilted back on the chair head rest. Her hands simultaneously came down beside her legs, fully straightened and started fluttering. Her body got stiff. PIC pushed her seat back and locked her shoulder harness to prevent her from interfering with the controls. By that time First Officer had fainted but she was making a chocking sound that was heard on the mic for about 30 seconds after fainting. The landing checklist was accomplished by PIC and subsequently a safe landing was carried out at Delhi.

After vacation from taxiway Y1, First Officer spontaneously regained consciousness but still seemed little incoherent and disoriented. While taxying, PIC contacted their Flight Operations on company frequency updating about the situation and requested for medical assistance on arrival. First Officer gained complete consciousness and orientation after the chocks ON at the parking stand. First Officer exited the aircraft and went to M/s Blue Dart dispatch office without any assistance. PIC then contacted M/s Blue Dart senior VP-Flight Operations over phone and appraised about the situation. Senior VP-Flight Operations instructed him to relieve First Officer from further duties and she left to her home from the airport. No medical assistance was required by First Officer at the airport.

1.14 Fire:

There was no fire.

1.15 Survival aspects:

The incident was survivable.

1.16 Tests and research: Nil

1.17 Organizational and management information:

Blue Dart Aviation Ltd is Scheduled Air Transport (Cargo) Operator and has current valid operators permit and at present operates services to / from Chennai, Bangalore, Mumbai, Delhi, Calcutta, Hyderabad and Ahmedabad. The Head Office is at Chennai Airport.

The Company is headed by Managing Director assisted by a team of professionals of various departments. The Flight Safety Department is headed by Chief of Flight Safety approved by DGCA.

At present the fleet comprises of six Boeing 757-200 aircraft. The Main Base of Blue Dart Aviation Ltd is Chennai. Sub Bases are Delhi and Bangalore. Kolkata and Hyderabad are layover Stations. Mumbai and Ahmedabad are Transit Stations.

1.18 Additional information:

1.18.1 SOP in case of crew incapacitation

SOP in case of crew incapacitation as defined in Operations Manual of M/s Blue Dart is mentioned below:

For detection of pilot incapacitation, it is essential that crew members closely monitor the aeroplane's flight path in the critical stages of take-off, initial climb, final approach and landing, and immediately question any deviation from the norm. Adherence to this procedure should assist early detection of the incapacitation of the handling pilot. Medical advice indicates that immediate first aid is not essential or necessary in cases of sudden incapacitation. Therefore, any attempts at first aid should be delayed until after the immediate operational problems have been dealt with.

The recovery from a detected incapacitation of the handling pilot shall follow the sequence below:-

- The fit pilot must assume control and return the aeroplane to safe flight path.
- The fit pilot must take whatever steps are possible to ensure that the incapacitated pilot cannot interfere with the handling of the aircraft. These steps may include involving jump seat passengers to restrain the incapacitated pilot. He must read QRH and other check list loudly and action as per SOP.
- The fit pilot must land the aeroplane as soon as practicable to ensure safety of the occupants as well as the aircraft.

If the event occurs at a period of low workload, is passive and is not accompanied by other adverse factors, it should be well within the capacity of the crew either to complete the flight as planned or to divert it to an earlier landing. In these circumstances the diversion would be dictated by considerations of securing medical attention for the afflicted pilot, provided the aircraft is not thereby endangered.

If the event occurs at a period of high workload and / or is severe, proceed as follows:-

- Restrain the incapacitated crew member so that he cannot interfere with essential controls or switches by fitting and locking full shoulder harness, sliding the seat fully aft and locking partly reclined.
- Declare an emergency and inform ATC of the situation and proceed to the nearest suitable airfield at which medical assistance can be provided. Radar vectors from ATC can significantly reduce workload.
- Pass as much medical detail as available to ATC and request an ambulance to meet the aircraft on arrival.
- Do not allow the incapacitated crew member to take any other further part in the conduct of flight, even if he feels fully fit.
- After landing, taxi to a normal, but nearest practical, ramp position if able. This is where facilities will exist to best remove the incapacitated crew member quickly. In case the Captain is incapacitated, the co-pilot is not to taxi the aircraft. The co-pilot is to stop the aircraft on the runway and ask for towing assistance. The intention to do so must be communicated to ATC well in advance.
- After the flight, all crew members must obtain medical clearance before their next flight.
- Use all available automation to reduce workload in such situations.
- In addition, pilots are reminded of the importance of :-
  i). Always having the rudder pedals and seats adjusted so they are in position to take over immediate control.

  ii). Be alert at all times, particularly when close to the ground during take-off or landing. Look out for any deviation from the normal flight path or failure to acknowledge or respond to any standard callouts.

<u>Crew action upon confirming pilot incapacitation as defined in Flight Crew Training Manual is mentioned below:</u>

If a pilot is confirmed to be incapacitated, the other pilot should take over the controls and check the position of essential controls and switches.

- after ensuring the airplane is under control, engage the autopilot to reduce workload;
- declare an emergency;
- use the cabin crew (if available). When practical, try to restrain the

incapacitated pilot and slide the seat to the full-aft position. The shoulder harness lock may be used to restrain the incapacitated pilot;

- flight deck duties should be organized to prepare for landing;
- consider using help from other pilots or crew members aboard the airplane.

1.18.2 DGCA Regulation

As per CAR Section 5 Series C Part 1; in case of pilot incapacitation, CVR is to be downloaded for the purpose of investigation. Approved Chief of Flight Safety of the organization may take decision regarding removal of CVR only in cases of low speed rejected take-off due ATC instructions, wildlife incursion and bird hit. Director of Air Safety/Regional Controller of Air Safety in Consultation with DAS (HQ) may exempt the removal of CVR in extraordinary situations.

1.18.3 Occurrence Reporting Procedure

As per the occurrence reporting procedure described in M/s Blue Dart Flight Safety Manual; Principal reporting officer is PIC and alternate reporting officer is Station Manager or Duty Officer or Engineering shift in charge.

The PIC will report the incident to Chief of Flight Safety and Flight Operations. The Chief of Flight Safety is responsible to report it by quickest means within 24 Hrs to AAIB and DGCA. The Chief of Flight Safety shall also inform to Accountable Manager and all Heads of Department.

1.19 Useful or effective investigation techniques : Nil

2. ANALYSIS

2.1 Serviceability of the aircraft

On the day of incident, the aircraft had valid Annual Review Certificate and Certificate of Registration. The aircraft was released for flight after pre-flight inspection. On the day of incident, the aircraft had logged 62484:44 Hrs Airframe Hours.

There was no defect reported on the aircraft prior to the flight. The aircraft and engines are maintained as per the approved maintenance programme. All the concerned Airworthiness Directive, mandatory Service Bulletins, DGCA Mandatory Modifications on this aircraft and its engine has been complied with as on date of incident.

From the above, it is inferred that the serviceability of the aircraft is not a contributory factor to the incident.

2.2 Operational Aspect

The First Officer got incapacitated during approach at Delhi when the aircraft was on LOC intercept HDG for RW11. The aircraft was on number 1 for landing and was just 5 mins from touchdown. First Officer was pushed back in to her seat immediately by the PIC and PIC locked her shoulder harness to prevent her from interfering with essential controls or switches. The landing checklist was accomplished by PIC and subsequently a safe landing was carried out at Delhi.

Aircraft was in a critical phase of flight (10 NM on LOC RWY11) with extremely high workload when the First Officer got incapacitated. As per M/s Bluedart Operational manual; if the event of incapacitation occurs at a period of high workload and / or is severe, pilot handling the aircraft has to declare an emergency and inform ATC of the situation and proceed to the nearest suitable airfield at which medical assistance can be provided. Radar vectors from ATC can significantly reduce workload. It is also required to pass as much medical detail as available to ATC and request an ambulance to meet the aircraft on arrival.

In this case, PIC did not inform ATC about the incapacitation of First Officer. Also an emergency was not declared by the PIC. PIC stated that he planned to declare emergency after landing so that medical assistance would be ready but First Officer regained consciousness and was responding coherently after landing. While taxying, PIC contacted their Flight Operations on company frequency updating about the situation and requested for medical assistance on arrival.

As per CAR Section 5 Series C Part 1; in case of pilot incapacitation, CVR is to be downloaded for the purpose of investigation.

As per the occurrence reporting procedure described in M/s Blue Dart Flight Safety Manual; principal reporting officer is PIC and alternate reporting officer is Station Manager or Duty Officer or Engineering shift in charge. The PIC was required to report the incident to Chief of Flight Safety and Flight Operations. In this case, PIC did not inform to Chief of Flight Safety, M/s Blue Dart about the incident, instead PIC contacted Head of Operations, M/s Blue Dart over phone and appraised about the situation. The information was not shared by senior VP-Flight Operations to Chief of Flight Safety. PIC did not make PDR entry in techlog and also did not inform company's Engineer available at the station. As a result CVR could not be downloaded.

From the above, it is inferred that the actions of PIC were not in line with their own company approved procedures of occurrence reporting and flight crew incapacitation. However his actions were not the contributory factor to the incident.

2.3 Aeromedical Aspects

2.3.1 Previous Incident of Loss of Consciousness on 01/09/2017

On 01/09/2017, the First Officer experienced an incident of transient loss of consciousness on ground after operating a flight from Chennai to Mumbai. The incident was witnessed and she lost consciousness for approximately two minutes. The Airport Doctor of MIAL who had examined the First Officer inside the aeroplane, has recorded the occurrence of frothing from mouth and convulsive activity. She did obtain any further medical attention at the site and she then discontinued the flight and came back home on a commercial flight to Delhi.

During the incident, no aeromedical stressors could be identified, however, there were triggers for a syncope viz. high humidity and high temperature. Therefore, a diagnosis of 'Vasovagal Syncope' was made. However, frothing from the mouth and convulsive activity witnessed by the other flight crew does not support this diagnosis. This aspect was highlighted by DGCA during the assessment process vide DGCA Medical Directorate letter no. AV/22025/22/DMS/Med dated 06/10/2017 and AFCME New Delhi was requested to re-examine the diagnosis. However, in view of supporting reports from the Neurologist, normal neurological evaluation including MRI Brain, EEG, 2D Echo, TMT & Holter study and the final opinion of President Medical Board at AFCME, the diagnosis of 'Vasovagal Syncope' was retained and approved by DGCA. But, no Head Up Tilt Table Test to confirm the cardiovascular response to orthostasis was done during the evaluation process.

She was assessed fit to resume flying duties vide DGCA Medical Assessment dated 20/12/2017 with limitation to fly as 'Pilot in Command along with a qualified and experienced pilot on type'. She was thereafter assesses 'fit with no limitations' on 21/06/2018.

2.3.2 Other co-morbidities

The First Officer was detected to have 'Hypothyroidism' and was prescribed medications (Tab Thyronorm 75mcg/day) for the same. The medical literature is amply clear that a euthyroid state (even in patients with Hypthyroidism managed with medications) does not trigger incidents of syncope or seizures or loss of consciousness.

2.3.3 Present Incident of Loss of Consciousness on 21/09/2021

The 32 years old First Officer had second incident of loss of consciousness on 21/09/2021 during approach approximately 05 minutes before touch down with spontaneous recovery and no residual effects. She has ever since undergone extensive medical investigation to distinguish syncope from other conditions likely to cause transient loss of consciousness, (most importantly) seizure, before concluding the aeromedical disposition for fitness for flying.

2.3.4 Analysis of Aeromedical Concerns

Few important aeromedical concerns in this incident are:-

(a) There are often specific settings associated with occurrence of a syncope. These include, psychological stress, fear, micturition, physical exertion and medical procedures such as venipuncture, pain, sight of blood and others. No such preconditions existed in the current incident as well as the previous one in 2017.

(b) In vasodepressor syncope, a significant prodromal period of 2-5 min is common during which distinct symptoms may occur. These symptoms include visual symptoms, nausea, queasiness, yawning, lightheadedness, pallor and sweating are some of the usual features. She did not experience any of the symptoms during both the incidents.

(c) Syncope characteristically occurs in the upright positions and is unusual while sitting, however, she had the second incident while sitting on the PM seat.

(d) She had frothing from the mouth and convulsions during the first incident of loss of consciousness in 2017. Frothing and brief convulsive twitching or tonic posturing occurs in only 10% individuals with syncope. Even during the second incident, she had brief convulsive movements and stiffening of limbs as witnessed by the PIC. These symptoms are more suggestive of a seizure rather than syncope.

(e) All her neurological investigations including EEG and MRI Brain are normal. All her cardiovascular investigations including Head up Tilt Table Test (HUTT), 2D Echo & 24 hrs Holter are normal.

(f) During both the incidents Neurologists have considered her as a case of Syncope and recommended fitness for flying. None of the treating specialists have advised her any seizure precautions or anticonvulsant therapy. She has not been on any medications since Sep 2017 except Thyronorm for Hypothyroidism.

(g) Aeromedically, both Vasovagal Syncope as well as seizure disorder can cause acute (sudden) in-fight incapacitation and are considered medical hazards for safe flight operations.

Dilemma does exist in this instant case regarding the diagnosis or medical cause for loss of consciousness between Seizure disorder & Vasovagal syncope. The aeromedical disposal for fitness for flying for Class 1 medical assessment is different in both the cases. Notwithstanding that, even with two incidents of syncope the fitness for flying duties for the First Officer has to be based on the current aeromedical literature on the subject.

2.3.5 Syncope in Commercial Pilots

The definition of syncope implies an episode of transient loss of consciousness which is both rapid in onset and in resolution. A decrease in cerebral blood flow, usually precipitated by a fall in systemic blood pressure, almost always results in a physical collapse followed by an immediate and spontaneous recovery. The term ‘global cerebral

hypoperfusion' might avoid confusion between other forms of 'collapse' such as seizure or stroke by unmistakably defining the physiological process involved. In flight crew, the early detection of any underlying pathology, as well as the management of what might be considered a 'benign event' in many cases in the general population, is crucial for flight safety.

Syncope is both incapacitating and unpredictable, presenting a significant challenge in aircrew assessment. It is, however, a relatively common symptom in the general population and accounts for up to 3 to 6% of all hospital admissions reporting transient loss of consciousness. Aircrew experiencing a syncopal event usually require a period of time off flying and the application of an Operational Multi-Crew Limitation (like PIC with QEP) which permits flying only as or with a qualified copilot, in order to reduce the risks associated with recurrence. Determining the duration of these risk-mitigating measures is challenging.

The current available guidance on the subject lacks transparency and relies heavily on specialists' opinions. A formalized decision-making process has been adopted by certain CAAs based on current medical literature on syncope and the approaches of other national aviation authorities.

3 CONCLUSIONS

3.1 Findings

1. On the day of incident, the aircraft had valid ARC, CoR and was released for flight after pre-flight inspection. Serviceability of the aircraft is not a contributory factor to the incident.
2. Both the pilot had valid license and medical at the time of incident.
3. Both the operating crew were duly qualified to operate the flight and had rested well prior to undertaking the flight.
4. Before operating the incident flight, both the crew submitted declaration in lieu of Breath Analyser test as per DGCA circular no. DGCA-15031/4/2020-DAS dated 13/05/2021.
5. Weather at the time of incident was fair and is not a contributory factor to the incident.
6. Aircraft was in a critical phase of flight (10 NM on LOC RWY11) with high workload when the First Officer got incapacitated.
7. The landing checklist was accomplished by PIC and subsequently a safe landing was carried out at Delhi.
8. First Officer spontaneously regained consciousness as observed after vacation from taxiway Y1, but was still slightly dazed and disoriented.
9. First Officer regained full consciousness and orientation after chocks ON at the parking stand. She exited the aircraft without any assistance and there were no residual effects of incident of unconsciousness.
10. No medical assistance was offered to First Officer at the airport.

11. First Officer had a similar incident of incapacitation on 01/09/2017 on ground at Mumbai after operating flight from Chennai to Mumbai. Subsequently medical evaluation was carried out and was diagnosed as a case of Vasovagal Syncope. She was declared fit for flying on 20/12/2017 with limitation to fly as PIC along with a qualified and experienced pilot. She was thereafter assesses 'fit with no limitations' on 21/06/2018.
12. The First Officer has been medically evaluated and is currently unfit for flying duties.
13. There still exists dilemma in the medical cause for sudden incapacitation of the First Officer as the symptoms neither exclusively fit the diagnosis of Seizure nor Syncope.
14. As per M/s Bluedart Operational manual; if the event of incapacitation occurs at a period of high workload and / or is severe, pilot handling the aircraft has to declare an emergency and inform ATC of the situation and proceed to the nearest suitable airfield at which medical assistance can be provided. It is also required to pass as much medical detail as available to ATC and request an ambulance to meet the aircraft on arrival. PIC did not inform ATC about the incapacitation of First Officer. Also an emergency was not declared by the PIC.
15. As per the occurrence reporting procedure described in M/s Blue Dart Flight Safety Manual; principal reporting officer is PIC and alternate reporting officer is Station Manager or Duty Officer or Engineering shift in charge. The PIC was required to report the incident to Chief of Flight Safety and Flight Operations. In this case, PIC did not inform M/s Blue Dart Chief of Flight Safety about the incident. PIC also did not make PDR entry in techlog.
16. The actions of PIC were not in line with their own company approved procedures of occurrence reporting and flight crew incapacitation.
17. CVR was not downloaded after the flight and hence was not available for investigation.
18. There were no fire and no injury to any of the occupants on board the aircraft.

3.2. Probable cause of the Incident

The most probable cause of incapacitation of First Officer was due to Syncope.

4. Safety Recommendations

4.1 The Medical Departments of all scheduled and non-scheduled Operators to educate aircrew on the risks of syncope and encourage reporting of such occurrences even outside their duty period. Implementation of non-pharmacological approach to the prevention of vasovagal syncope is recommended for all scheduled and non-scheduled operators. Such measures include, ensuring adequate hydration, salt intake and physical counter-pressure maneuvers that include squeezing hands, arms, and crossing legs for as long as tolerable when a prodrome is detected prior to a possible syncopal event.

4.2 Comprehensive and interpretive guidance material for the assessment of commercial aircrew with Syncope to be issued by Medical Directorate DGCA based on the available evidence relevant to the pilot population.

4.3 Any other action deemed fit by DGCA in view of finding.

(Gp Capt. Y. S. Dahiya)
Director Medical Services (Civil Aviation)
Member

(Akhil Shukla)
Assistant Director Air Safety
Investigator In-Charge

Date: 22/12/2022
Place: New Delhi