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**FINAL REPORT ON SERIOUS INCIDENT**

**INVOLVING**

**M/S AIR INDIA BOEING B777-300 ER AIRCRAFT**

**VT-ALN**

**AT MUMBAI ON 15.10.2018**

**Jasbir Singh Larhga**  
**Investigator-in-Charge**

**Kunj Lata**  
**Investigator**

## ***Foreword***

*In accordance with Annex 13 to the Convention on International Civil Aviation Organization (ICAO) and Rule 3 of Aircraft (Investigation of Accidents and Incidents), Rules 2017, the sole objective of the investigation of an accident shall be the prevention of accidents and incidents and not apportion blame or liability. The investigation conducted in accordance with the provisions of above said rules shall be separate from any judicial or administrative proceedings to apportion blame or liability.*

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

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**FINAL REPORT ON SERIOUS INCIDENT INVOLVING M/S AIR INDIA**

**BOEING B777-300ER AIRCRAFT VT- ALN AT MUMBAI AIRPORT ON 15/10/2018**

1.	Aircraft Type	B-777-300ER
2.	Nationality	Indian
3.	Registration	VT-ALN
4.	Owner	Air India
5.	Operator	Air India
6.	Pilot – in –Command	Not Applicable
	Extent of Injuries	Nil
7.	Co-Pilot	Not Applicable
	Extent of Injuries	Nil
8.	Place of Incident	Mumbai airport Parking Bay V18
9.	Co-ordinates of Incident Site	19.0541° N 72.5223° E
10.	Last point of Departure	Mumbai
11.	Intended place of Landing	Delhi
12.	Date & Time of Incident	15/10/18 at time 0045 UTC
13.	Passengers on Board	Nil
14.	Extent of Injuries	Nil
15.	Crew on Board	09 Cabin Crew
16.	Extent of Injuries	01 Seriously Injured
17.	Phase of Operation	Pre-Departure
18.	Type of Incident:	Cabin Crew Fall from Aircraft

(ALL TIMINGS IN THE REPORT ARE IN UTC)

## **SYNOPSIS**

M/s Air India Boeing B777-300ER aircraft VT-ALN was operating flight AI864 on 15.10.2018 and was scheduled for Mumbai-Delhi departure when it was involved in an occurrence at Mumbai, wherein a cabin crew fell down from the "Door 5L" of the aircraft while opening the door and was seriously injured.

A set of 12 cabin crew were on duty roster for operating the flight and reached the aircraft in batches of 09 and 03 personnel separately. The first batch of cabin crew boarded the aircraft from the access staircase of the aerobridge attached to the "Door 2L". The second batch arrived later and saw step ladder being aligned at "Door 5L". They proceeded to the ladder and climbed atop the ladder. One ladder operator had also climbed the ladder ahead of them and was trying to align the movable platform of the step ladder with the aircraft. One of the three cabin crew knocked at the "Door 5L" and got attention of the cabin crew stationed inside the aircraft at "Door 5L". The crew standing on the platform outside signaled her to open the door. As she opened the door, she fell down from the door through the gap between the aircraft and step ladder. Due to impact with ground, she received serious injuries fracturing her legs and ankle.

Owing to the nature of injury and duration of hospitalization of the injured cabin crew; the occurrence was classified as a Serious Incident in accordance with the Aircraft (Investigation of Accidents and Incidents) Rules, 2017. DG,AAIB vide its order no. INV-12011/7/2018-AAIB dated 16.10.2018 appointed Mr Jasbir Singh Larhga, Assistant Director, AAIB as an Investigator-in-Charge and Ms Kunj Lata, Assistant Director, AAIB as in Investigator to investigate the incident.

Initial notification of the occurrence was sent to ICAO and NTSB, USA on 23<sup>rd</sup> October 2018 as per requirement of ICAO Annex 13.

# **1 FACTUAL INFORMATION**

## **1.1 History of Flight**

M/s Air India Boeing 777-300 ER aircraft VT-ALN was operating flight AI864 on 15.10.2018 and was scheduled for Mumbai-Delhi departure. The aircraft was parked at "Bay V-18" which is connected to the International Terminal of Mumbai Airport and is normally used for International Departures. The Flight AI 864 is a domestic flight and is normally operated using a narrow body aircraft. However, on 15.10.2018 the flight was being operated using B-777 wide body aircraft.

Prior to the incident, the aircraft had arrived from Jeddah at about 0000 UTC after operating flight AI932 and the passengers had alighted from the aircraft using the Passenger Boarding Bridge(PBB) connected to the "Door 2L" of the aircraft. The ETD for the next flight i.e AI864 was 0130 UTC. Twelve cabin crew were on duty roster for this flight and they had started reporting for duty one by one at Air India's Cabin Crew Movement Control Office by about 2330 UTC (14.10.2018). After Pre Dispatch Formalities and Pre Flight Medical Examination, all of them went to the Departure Gate no. 45D, from where transport arrangement was being made to drop them at "Bay V-18". The crew reached Departure Gate no. 45D and waited for transport. At about 0015 UTC, a van arrived to pick up the crew. Due to restriction in seating capacity of the van, only 09 cabin crew could be accommodated in this van. On reaching the Bay V-18, these 09 cabin crew climbed the access stair case of the PBB and went on to board the aircraft from "Door 2L".

The other 03 cabin crew continued to wait for transport at Gate no. 45D till another van arrived to pick them up at 0025 UTC. When this

set of cabin crew (hereinafter referred to as CC-1, CC-2 and CC-3) reached the aircraft, they did not board the aircraft from the PBB and enquired from the personnel available at the ramp about way to board the aircraft. They were made aware of Step Ladder being aligned to the aircraft and they asked the driver to drop them at the tail of the aircraft.

Thereafter, the driver dropped them at the tail of the aircraft and left. The crew noticed that one of the two Ground Handling Personnel was climbing up the Step Ladder. All three followed him to reach the top of Step Ladder, which had not been properly positioned yet.



*Fig. 1: Picture showing gap and movable platform in retracted position*

On reaching the top of the step ladder, this set of cabin crew noticed the gap between ladder and the aircraft, and communicated the same to the ground handling personnel who was adjusting the movable platform of the step ladder to reduce the gap. CC-1 and CC-2 interacted with the ground handling personnel while he was trying to align the movable platform.

Meanwhile, CC-1 knocked at the "Door 5L" to attract attention of



a cabin crew positioned inside the aircraft at "Door L5" (hereinafter referred to as CC-4). CC-4 gestured towards "Door 2L" and tried communicating to CC-1 to enter the aircraft from "Door 2L" using PBB. However, CC-1 did not understand the gestures and later signaled CC-4 to open the door. Being confident that the ladder was positioned properly, she too opened the door without waiting for clearance from the Ground Handling Personnel. Upon opening the door, she fell down from the aircraft through the gap between aircraft and the step ladder.

All the three cabin crew and ground handling personnel rushed down to assist CC-4. CC-4 was lying on the tarmac with her leg visibly fractured but she was conscious. Other cabin crew provided her first aid and comforted her till arrival of ambulance. CC-4 was taken to hospital for treatment.

## **1.2 Injuries to persons**

INJURIES	CREW	PASSENGERS	OTHERS
FATAL	Nil	Nil	Nil
SERIOUS	1	Nil	Nil
MINOR/ NONE	Nil	Nil	Nil

## **1.3 Damage to the aircraft**

Nil

## **1.4 Other damages**

Nil

## **1.5 Personal Information**

### **1.5.1. Pilot-in-Command**

Not Relevant to the Incident

### **1.5.2. Co-Pilot**

Not Relevant to the Incident

### 1.5.3 Cabin Crew Qualification

	CC-1	CC-2	CC-3	CC-4
Total Experience	28 years	13 years	15 years	28 Years
Date of Last Annual Refresher Training	Oct 2018	July 2018	Sept 2018	March 2018
Date of last Drill on operation of Door and Exit	-	-	-	May 2018

### 1.6 Aircraft Information

Aircraft B777-300ER aircraft is a wide body long range aircraft. There are ten identically operated doors paired along the airplane fuselage. Eight of these could be used to enter and exit the airplane, and also serve as emergency exits. Doors on the left side of the airplane are identified as 1L, 2L, 4L and 5L and are generally used for passenger entry. Doors on the right side of the airplane are 1R, 2R, 4R and 5R and are generally used for servicing of the airplane. Additionally, there are two over wing emergency exit, Door 3L and 3R, which function as emergency exits only.

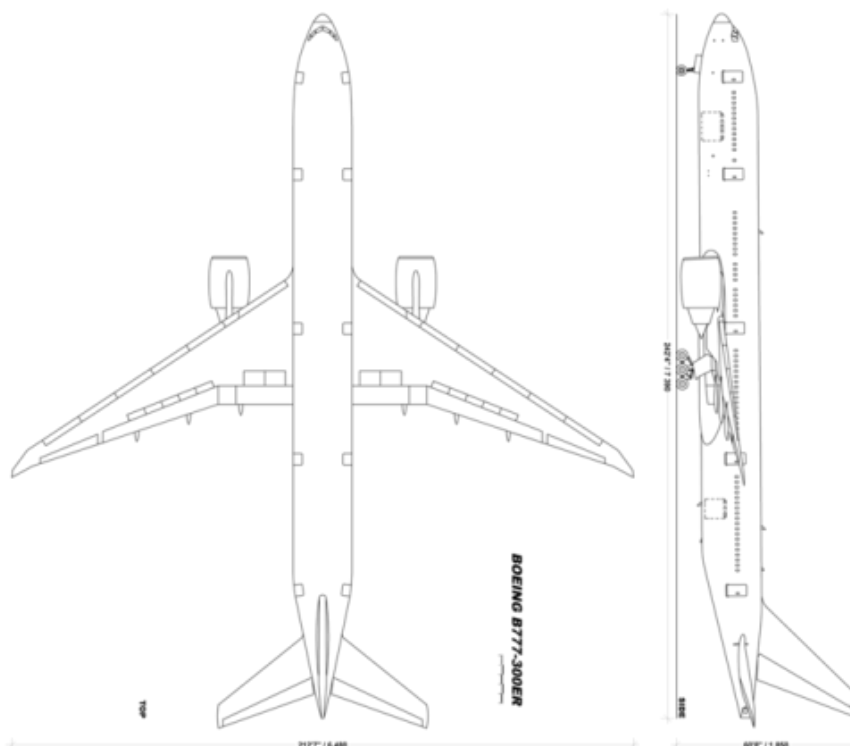
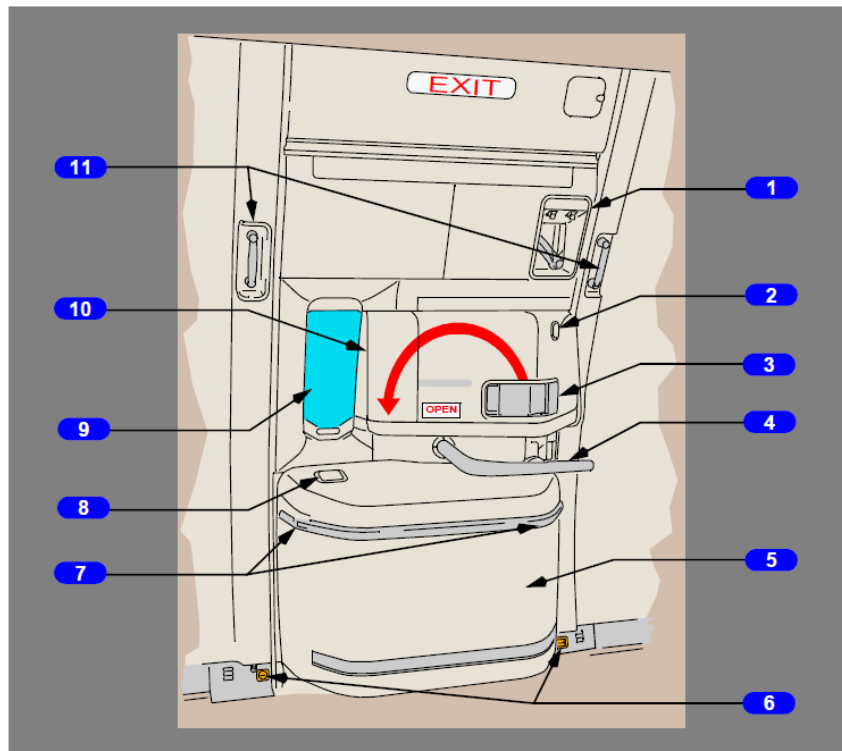


Fig. 2: Layout Diagram of B777-300 aircraft.

The doors can be opened or closed manually from inside or outside the airplane. The passenger entry doors are translating, plug-type doors. During opening, the door first moves inward and upward, and later translates outward and forward. Each door is held in the open position by a gust lock. The gust lock drops into a latch as the door nears its forward limit of travel. A window in each door allows observation outside the airplane.

The height of "Door 5L" from the tarmac varies between 5.10 m to 5.65 m depending upon the loading of the aircraft.



*Fig. 3: Passenger Entry Door from Flight Attendant Manual*

The description of various controls on the passenger entry door as per the Flight Attendant Manual Rev 0 dated Jan 21, 2019 is shown in the Fig. 3 and described below.

1. Door Mode Select Panel.
2. Emergency Power Assist System (EPAS) Reservoir Pressure Gauge. EPAS is unusable, if the gauge needle is outside the green zone.
3. Gust Lock Release Lever. This lever is pulled inward to close the door

4. Door Operating Handle. Door operating handle is rotated in the direction of arrow to open the door and rotated in direction opposite to arrow for closing the door.
5. Door Bustle. The bustle contains the slide/raft.
6. Grit Bar Indicator Flag Viewing Windows. Door and Slide/Raft are armed for automatic operation and slide/raft deployment, when yellow in view. Door and Slide/Raft are not armed, when black in view.
7. Door Bustle Release Handle. The handle is required to be pulled to remove door bustle for access to slide/raft.
8. Slide/Raft Gas Bottle Pressure Gauge. If the gauge is outside the green zone, the system is unusable.
9. Viewing window. Allows observation outside the airplane.
10. Emergency Power assist system(EPAS) Battery Cover. Spring loaded closed-cover flush with the door liner indicates the EPAS system is properly armed.
11. Assist Handles.

### **1.7 Meteorological information**

Not Relevant.

### **1.8 Aids to navigation**

Not Relevant.

### **1.9 Communication**

The aircraft was on ground and was being prepared for departure. There was no communication between aircraft and ATC.

### **1.10 Aerodrome Information**

Mumbai airport is known as Chhatrapati Shivaji International Airport and its ICAO Code is VABB. IATA nomenclature of the airport is BOM. The co-ordinates of ARP are 190530N, 0725158E. The Elevation of airport is 37 feet. Runway Orientation and Dimension are as below:-

Runway 09/27: 3448 x 60 meters

Runway 14/32: 2871 x 45 meters

Mumbai Airport has 8 aprons. Details of the Apron are as below:-

Apron	No of bays	Apron	No of bays
<b>A</b>	1-12	<b>L</b>	1-10
<b>C</b>	10-33	<b>R</b>	1-5
<b>G</b>	1-5	<b>S</b>	1-3
<b>K</b>	1-6	<b>V</b>	4-32

“Apron V” is a remote stand which can be used as left/right parking for two category C aircraft or one category D aircraft. Specifications of “Bay V18” on “Apron V” is given below: -

Bay	Wing span	Length	Rwy Strength (PCN)	Coordinate	Type of aircraft
<b>V18L</b>	35.9	45	110/R/C/W/T	190540.822N, 725223.871E	A321,B739
<b>V18</b>	80	76	110/R/C/W/T	190541.950N, 725223.870E	A388
<b>V18R</b>	35.9	45	110/R/C/W/T	190542.204N, 725223.941E	A321,B739

The parking /docking chart of Apron V is shown below.

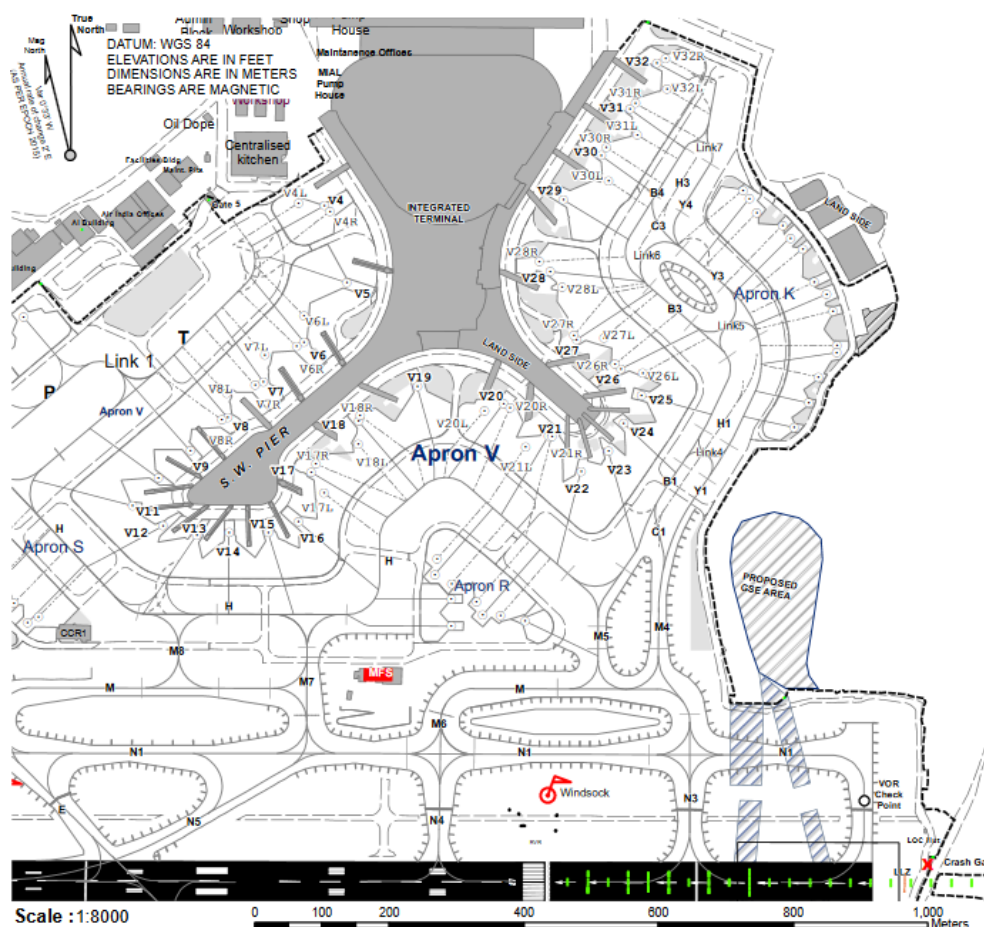


Fig. 4: CSIA "Apron V"

### **1.11 Flight recorders**

Flight Recorders were not downloaded as the aircraft was powered at the time of incident.

### **1.12 Wreckage and impact information**

Nil

### **1.13 Medical and pathological information**

**1.13.1** The cabin crew are required to undergo preflight medical examination as per the CAR Section 5, Series F, Part III. All crew underwent the preflight medical examination and were cleared.

**1.13.2** The medical fitness requirements of the cabin crew are given in CAR Section 7, Series C, Part II. All cabin crew are required to undergo initial and renewal medical examination of equivalent to Class 2 Medical Examination.

As per the above said CAR, all cabin crew are required to undergo a medical examination based on the following requirements:-

- (a) Physical and mental,
- (b) Visual and colour perception, and
- (c) Hearing.

The provisions as applicable for Class 2 Medical Examination as brought out in ICAO Annex 1 Chapter 6 Para 6.2.3, 6.2.4, 6.2.5, 6.4.1, 6.4.2, 6.4.3 and 6.4.4; read in conjunction with ICAO Document 8984 'Manual of Civil Aviation Medicine' as amended from time to time, are to be followed as per the CAR. The provision from the ICAO Annex 1 for Hearing Requirement for Class II Medical Examination is quoted below

*" 6.4.4.1 Applicants who are unable to hear an average conversational voice in a quiet room, using both ears, at a distance of 2 m from the examiner and with the back turned to the examiner, shall be assessed as unfit.*

*6.4.4.2 When tested by pure-tone audiometry, an applicant with a hearing loss, in either ear separately, of more than 35 dB at any of the frequencies 500, 1 000 or 2 000 Hz, or more than 50 dB at 3 000 Hz, shall be assessed as unfit.”*

As per the CAR, the cabin crew is declared Fit, Temporary Unfit or Permanent Unfit at the end of the medical examination. Further, if the medical standards prescribed for Class 2 Medical Examination and those laid down by DGCA are not met; the Medical Fitness is not to be issued or renewed as per the CAR unless the following conditions given in Para 4.7 of CAR are fulfilled:

(a) Accredited medical conclusion indicates that in special circumstances, the applicant’s failure to meet any requirement, whether numerical or otherwise, is such that exercise of the duties is not likely to jeopardize flight safety;

(b) Relevant ability, skill and experience of the applicant and operational conditions have been given due consideration; and

(c) The medical fitness is endorsed with any special limitation or limitations when the safe performance of the cabin crew duties is dependent on compliance with such limitation or limitations.

As per the medical record of the crew obtained from the operator, CC-1 had undergone his last Class II medical examination in Feb 2018. The Audiometry report dated 07.02.2018 indicated that he had mild to moderate slopping sensori-neural hearing loss. He had a hearing loss of 35-40 dB at 1000Hz frequency and 45-50 dB at 2000 Hz frequency in both ears, which made him unfit as per Para 6.4.4.2 of ICAO Annex 1 Chapter 6. There was no record of him having undergone any medical examination to asses fitness as per Para 6.4.4.1 of ICAO Annex 1 Chapter 6. Opinion of an ENT specialist was obtained and he was cleared for flight duties by the Operator.

On directions of the Investigation Team, CC-1 again underwent another medical examination in Jan 2019. The Audiometry report dated 09.01.2019 indicated sloping moderate to moderately severe sensori-neural hearing loss. As per this report, CC-1 now had a hearing loss of 40-45 dB at 1000 Hz frequency and 55-60 dB at 2000Hz frequency in both ears. Hearing loss at 3000Hz frequency was 55 dB in both ears.

CC-1 was later subjected to Special Medical Assessment at Air Force Central Medical Establishment (AFCME, Delhi) in April 2019. Pure Tone Audiometry report from AFCME confirmed the moderate severe hearing loss in both ears but as per the Free Field Hearing Test Report, CC-1 was able to hear Conversational Voices (CV) at 280 cm in his right ear and at 320 cm in his left ear. He was also able to hear Forced Whispers (FW) at 90 cm in both ears. Therefore, CC-1 was meeting the medical requirements stated at Para 6.4.4.1 of ICAO Annex 1 Chapter 6 but not Para 6.4.4.2.

**1.13.3** CC-4 suffered multiple injuries and fractures after falling from the aircraft. Following are the injuries sustained by CC-4 due to fall from the aircraft as per her medical report.

- i) Compound fracture Right Tibia
- ii) Bilateral Calcaneum fracture
- iii) Wedge # of L2 vertebra
- iv) Left side 5th and 6th rib fracture

CC-4 remained hospitalized for about 05 weeks and had to undergo multiple surgeries to recover from the injuries.

#### **1.14 Fire**

Nil

#### **1.15 Survival aspects**

The cabin crew survived the incident with severe injuries.



## **1.16 Tests and research**

Nil

## **1.17 Organizational and management information**

M/s Air India is a scheduled airline which operates Airbus and Boeing fleet on domestic and international sectors. The Airlines Head Quarter is located at New Delhi. The Company is headed by a Chairman & Managing Director who is assisted by a team of professionals from various departments. The Flight Safety Department is headed by Chief of Flight Safety approved by DGCA. The Chief of Safety is an Executive Director who reports directly to the Chairman.

**1.17.1** Standard Operating Procedure for operation of Passenger Step Ladder is laid down in the DGCA approved Ground Handling Operating Manual Issue 4, Rev 0 dated 01 May 2018. As per the Para 2.11.1(d) of the manual, Step Ladder is required to be positioned on the aircraft only in case of remote bay operations or in case Passenger Boarding Bridge (PBB) is not available. In case PBB is available, Step Ladder is used for boarding/de-boarding of passenger only with approval of Aerodrome Operator. The Aerodrome operator at Mumbai does not permit use of step ladders for boarding/de-boarding of passenger when PBB is attached to the aircraft, except in case of an emergency.

However, the Step Ladder was being positioned at "Door 5L" as a safety requirement for the purpose of re-fuelling, mentioned in Para 4.13.4 of the Manual. As per Para 4.13.4, an escape exit is required to be provided on aircraft for purpose of re-fuelling and a step ladder on an open aircraft door can also act as an exit.

The procedure to align the step ladder with the aircraft is given at Para 3.6.13 of the Manual. As per the SOP, the step ladder is aligned with the aircraft and stopped approximately 09 inches away from the

aircraft door. The movable platform of the step ladder is then adjusted to close the gap between the aircraft and the ladder.

Once the step ladder is aligned, the Ground Handling Personnel gives clearance to the cabin crew for opening the door by hand signal (Thumbs Up) or by knocking at the door. The signal for cabin access door operation is described in Para 2.11.1(e). After door opening, side rails are deployed.



*Fig. 5: Step Ladder with movable platform aligned to the aircraft*

**1.17.2** The door operation procedure is given in Safety and Emergency Procedure (SEP) Manual Edition 3, Rev 00, dated 30 March 2016 approved by DGCA. The SEP Manual is taught in the training session and a copy of SEP manual is also given to all cabin crew. It is the responsibility of cabin crew to refer the updates on official website. The door opening procedure given in the SEP Manual is quoted below:-

*"To open the door,*

- *Disarm the EPAS and slide/raft by positioning the mode select lever to DISARMED*
- *raising the door mode select panel access cover and moving the lever to the DISARMED position disengages the grit bar from the door sill. The grit bar indicator flag viewing windows must show completely*

black when the mode select lever is in DISARMED position.

- rotate the handle fully aft(OPEN). This unlocks and unlatches the door and allows it to be pushed open. Pushing the door fully open engages the gust lock.

**Note:** A safety strap is installed in the door sill, approximately halfway up on the left side of the door. It should be used when the door is open.

To use the safety strap, pull the metal handle and attach it to the loop on the right side of the door sill.

**Caution:** The door mode select lever must be fully in the green band to ensure the door is in the DISARMED mode.”

The reference for the door opening procedure quoted above is obtained by the airline operator from the Flight Attendant Manual Rev 18 dated 15 June 2012. The description of Passenger Entry Door from the SEP Manual is shown in the Fig. 6 and described below;

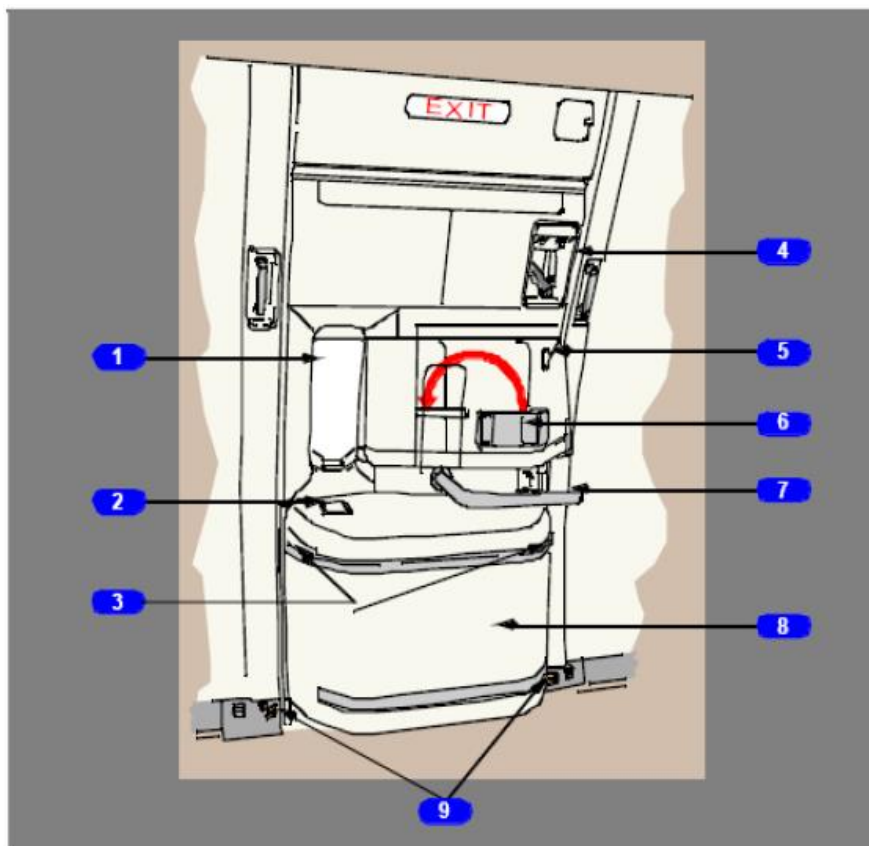


Fig. 6: Passenger Entry Door from SEP Manual

1. Viewing Window.
2. Slide/Raft Gas Bottle Pressure Gauge. If the gauge needle is outside the green zone, the system is unusable.

3. Door Bustle Release Handle.
4. Door Mode Select Panel.
5. Emergency Power Assist System (EPAS) Reservoir. If the pressure gauge needle is outside the green zone, EPAS is unusable.
6. Gust Lock Release Lever. Grab and pull inward to close the door.
7. Door Operating Handle.
8. Door Bustle.
9. Girt Bar Indicator Flag Viewing Windows. If Yellow Flag is in view, door and slide/raft are armed for automatic operation and Slide/raft deployment. If Black flag is in view – door and slide/raft are not armed.

The SEP manual does not give description of Assist Handle and contain no caution or warning to use Assist Handle during Door Opening. Such warning or caution is also not available in the Flight Attendant Manual referred by the operator. The latest Rev 01 dated Jan 21, 2019 of Flight Attendant Manual, however, does contain following warning and advises personnel to use appropriate measure. *“A fall hazard exists anytime a door is open without properly positioned fall protection such as a boarding gateway, stair, stand or equivalent in place outside of the doorway. Use appropriate measures to prevent injury to personnel.”*

As a good practice being followed by Cabin Crew in Air India, if a right handed person opens “Door L5”, then, he/she holds inside aft-door assist handle with left hand and right hand is used to rotate door control handle facing aft, and once the door opens and goes half way in open position the person shifts and turns towards forward side and holds forward door assist handle with right hand and uses left hand (Left hand on Gust lock lever) to push open door fully till locked position. In addition to providing safety, holding the Assist Handle also provides an anchor and stability to the body of user so that all levers can be operated easily without too much of physical effort.

### **1.17.3 Operations & Training**

Training of cabin crew is responsibility of Cabin Safety Training Manager who reports to Director (In-flight). DGCA has laid training requirements for Cabin Crew in CAR Section 7, Series M, Part I.

As per Para 8.4 of Appendix 8 of CAR Section 7, Series M, Part I, all cabin crew are required to be trained on Operation of Doors and Exits. This drill is carried out during initial and type/conversion training and thereafter it is required to be carried out once every 36 months as a part of recurrent or refresher training. The said requirement of CAR is incorporated in Para 2.11 of DGCA approved Cabin Crew Training Manual Issue II, Rev 0 dated 30 March 2016

### **1.18 Additional information**

#### **1.18.1 Noise Level at Mumbai Airport**

Mumbai Airport is one of the airports that are required to carry out a noise mapping study as per the Requirement and Procedure for Monitoring Ambient Noise Level due to Aircraft issued by the Central Pollution Control Board, Ministry of Environment & Forest (MOEF) in June 2008. The said requirement is also reflected in CAR Section 10, Part A, Series I issued by DGCA.

As per the CAR, Mumbai airport is required to establish Noise Monitoring System (NMS) and report on noise monitoring from the NMS is submitted to DGCA on annual basis. As per the annual report submitted to DGCA for the year 2018, the average noise level at periphery of airport varied from 67.3 to 73 dB at different station on 15.10.2018 during day time. It is possible that at the apron too, the noise level was high enough to deter CC-1 from hearing all instructions clearly.

## **1.19 Useful or effective investigation techniques**

Nil

## **2 ANALYSIS**

### **2.1 Aircraft Serviceability**

Aircraft Serviceability was not a factor in the incident.

### **2.2 Crew Qualification**

#### **2.2.1 Training**

All cabin crew are required to undergo training as per CAR Section 7, Series M, Part I. As per Para 8.4 of Appendix 8 of the said CAR, all cabin crew are required to undergo drill on operation of aircraft doors and exits, in the aircraft or emergency exit trainer once in every 36 months as a part of recurrent/extended recurrent and Refresher training in addition to undergoing this drill during Initial and Type/Conversion training. All cabin crew were found to have undergone the said drill. CC-4 had undergone this drill in May 2018.

The SEP Manual of the operator or the Flight Attendant Manual of the OEM from which reference for training of cabin crew is taken do not contain any precaution for holding the Assist Handle while opening the door. This precaution is, however, stressed upon while providing hands on training and instructions given during classroom training.

CC-4 was confident that the Step Ladder is in place and presumed that it will be safe to open the door. She possibly did not take necessary safety precaution to hold the Assist Handle while opening the door and used her body momentum to push the door. Not holding the Assist Handle while opening the door is a factor in the incident.

### **2.2.2 Medical Standards**

The medical standards to be met by all cabin crew are laid down in CAR Section 7, Series C, Part II. All cabin crew are required to undergo medical examination equivalent to Class 2 medical examination. The scrutiny of medical records of involved cabin crew revealed that CC-1 was unfit as per the standards laid in CAR and ICAO Annex 1 Chapter 6 referred therein. The medical reports of CC-1 provided to the investigation team showed that he was not meeting the requirement of Para 6.4.4.2 of ICAO Annex 1 Chapter 6.

Airline did not have any clear and defined procedure for issuing medical fitness to cabin crew not meeting the standards using dispensation given in Para 4.7 of CAR. CC-1 was declared fit after obtaining the opinion of ENT specialist, however, no record was made available to the investigation team of him having undergone medical examination as per para 6.4.4.1 of Annex 1, prior to April 2019.

Investigation team is of the opinion that the requirements for declaring unfit Cabin Crew fit for flight duties as per Para 4.7 of CAR are very subjective and could result in varying interpretations, as has happened in instant case where CC-1 was declared fit by Class 1 Medical Examiners and AFCME but was made unfit by DGCA.

The average noise level at Mumbai airport as per the NMS report submitted to DGCA by the Aerodrome Operator is in the range of 67.3-70 dB at different stations. Hearing loss of CC-1 was to the tune of 40-60 dB for different frequencies. It is, therefore, possible that due to ambient noise and his own medical condition, CC-1 did not comprehend the conversation being held with the Ground Handling Personnel and mistook it as direction to give clearance to the CC-4 for opening the door. The medical condition of crew was a factor in the incident

## **2.3 Standard Operating Procedures**

**2.3.1** The standard operating procedure for aligning the step ladder to the aircraft is laid down in Ground Handling Operating Manual Issue 4, Rev 0 dated 01 May 2018.

As per the SOP, it is the responsibility of ground handling personnel to communicate confirmation signal to the cabin crew onboard the aircraft by way of knocking twice or giving thumbs up for giving clearance to open the door. The step ladder is aligned with the aircraft in such a manner so as to eliminate or minimize the gap between the aircraft and the step ladder. For the purpose of ramp safety, step ladder is moved towards the aircraft and stopped approximately 09 inches away from the aircraft door. After that, the movable platform of the step ladder is then adjusted to close the gap between the aircraft and the step ladder.

Ground handling personnel are required to ensure that no person uses the step ladder unless movable platform is properly aligned with the aircraft. The SOP was not followed and the ground handler allowed the cabin crew to climb the step ladder while the adjustments were still being done. Further, the signal confirming clearance for opening the door was not given by the Ground Handling Personnel but cabin crew (CC-1).

Not following the SOP by Ground handling Personnel and allowing the crew to climb the ladder was a factor in the incident. Cabin Crew infringing on the domain of ground handling personnel was also a factor in the incident.

**2.3.2** As per Para 2.11.1(d) of the Ground Handling Manual, the step ladder should not be used in addition to the PBB for embarking and disembarking of passengers unless approved by the airport operator. The Mumbai Aerodrome operator does not permit use of step ladders for



embarking and disembarking of passengers in addition to PBB, except in case of emergency. The ladder was being aligned with the aircraft as a safety requirement for re-fueling laid down in Para 4.13.4 of GHE manual and was not avoidable, however, ground handlers should have directed crew not to use it for embarking the aircraft.

## **2.4 Sequence of events**

While flight AI864 (Mumbai-Delhi) was being prepared for departure, a set of 09 cabin crew arrived at the aircraft and entered the aircraft using PBB. The second set of 03 cabin crew arrived later and headed to the step ladder which was being aligned by the Ground Handling Personnel as a safety requirement for re-fuelling and not for the purpose of boarding/de-boarding. The Ground Handling Personnel were still in process of adjusting the step ladder and aligning its movable platform to the aircraft, when the 03 cabin crew climbed the step ladder. The statements of crew and ground handling personnel are conflicting as to whether cabin crew climbed the stairs with permission of Ground Handling Personnel, but there is no record of Ground Handling Personnel escalating the matters to the Ramp Supervisor, if crew had climbed without their permission.

Ground Handling Personnel could not prevent cabin crew from climbing the step ladder owing to the hierarchy existing in their organization. The cabin crew pointed out the gap between the aircraft and step ladder to the Ground Handling Personnel and had discussion with him to minimize the gap. During the discussion, the CC-1 knocked at the "Door 5L" and drew attention of CC-4 who had already boarded the aircraft from the PBB and was positioned at the "Door 5L". CC-4 tried signaling to the CC-1 to use the PBB to climb the aircraft. The same was, however, not understood by the CC-1, who also gave thumbs up signal to CC-4 to signal clearance for opening the door.

The statements of Ground Handling Personnel are conflicting with statements of Cabin Crew as to whether Ground Handler directed CC-1 to give clearance for opening the door. However, it is clear from the photograph of step ladder (Fig. 1) that the movable platform had not been aligned with the aircraft. It could be a possibility that CC-1, owing to his medical condition related to hearing, misunderstood the communication with the Ground Handling Personnel and gave clearance to open the door on his behalf.

CC-4 too did not wait for signal from authorized personnel i.e Ground Handling Personnel and presumed that step ladder was properly aligned with the aircraft. Being confident that the step ladder was in place, she opened the door without taking any necessary precaution or holding the Assist Handle. While opening the door she could have used her body to push the door and stepped out. This led to her fall through the gap between the aircraft and the step ladder.

### **3 CONCLUSION**

#### **3.1 Findings**

**3.1.1** The aircraft was connected to the PBB at the time of incident and Step Ladder was being connected as a safety measure for aircraft re-fuelling. The final passenger boarding was done from the PBB.

**3.1.2** As per the SOP, Step Ladder is not to be used for embarking/disembarking when the PBB is connected. CC-1, CC-2 and CC-3 tried to embark the aircraft using Step Ladder when the PBB was still connected to the aircraft.

**3.1.3** The ground handling personnel failed to prevent the crew from climbing up the Step Ladder, while the final alignment had not been completed.

**3.1.4** CC-1 and CC-2 communicated with the ground handling personnel, who was on the Step Ladder trying to minimize the gap. The communication was possibly not comprehended correctly by CC-1 due to his own medical condition and ambient noise.

**3.1.5** CC-1 went on to perform the function of ground handling personnel by knocking at the door and giving clearance to CC-4 for opening the door by way of thumbs up signal.

**3.1.6** CC-4 did not wait for signal from authorized personnel and opened the door without taking necessary safety precautions.

**3.1.7** The Flight Attendant Manual issued by the OEM contains warning regarding fall hazard and advises personnel to use appropriate measures, but it does not specifically mention use of Assist Handle, while opening/closing the door from inside.

**3.1.8** SEP Manual is not updated as per the latest revision in the OEM's Flight Attendant Manual.

**3.1.9** The Para 4.7 of CAR Section 7, Series C, Part II contain very subjective criteria for issuing fitness to cabin crew not meeting the requirement of Class 2 Medical examination. The criteria can give varying results in absence of clear and detailed guidelines.

## **3.2 Probable cause of the Incident**

The incident was caused by "Non-adherence to the laid down Standard Operating Procedures by the Ground Handling Personnel and Cabin Crew"

Absence of any precaution to use Assist Handle in the Flight Attendant Manual and Medical Condition of one of the Cabin Crew were contributory factors.

## **4 RECOMMENDATIONS**

**4.1** Operator should apprise all its Cabin Crew to stick to the laid down procedures and to ensure that embarking/disembarking from aircraft be done through authorized entrances only.

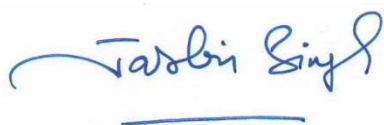
**4.2** Operators should sensitize its crew to respect the authority of Ground Handling Personnel while operating Ground Handling Equipment and not interfere in their working.

**4.3** All Ground Handlers should be apprised to ensure that SOP is followed and in case of disruption by any personnel, the issue be escalated.

**4.4** Operator should revise its SEP Manual as per the latest revision in the Flight Attendant Manual.

**4.5** DGCA should formulate clear, detailed and objective guidelines for issuing fitness certificate as per Para 4.7 of CAR Section 7, Series C, Part II.

**4.6** OEM should explore the feasibility of introducing an advisory regarding use of "Assist Handle" as a safety precaution in its Flight Attendant Manual.



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Investigator

**Place: Delhi**

**Date: 01.08.2019**