

FINAL INVESTIGATION REPORT

**GROUND INCIDENT INVOLING M/S ETHIOPIAN AIRLINES
AIRCRAFT ET-AMG AND M/S AIR INDIA AIRCRFT VT-EXD AT DELHI
ON 08.08.2017**

LIST OF ABBREVIATIONS

AISATS	Air India Singapore Airport Terminal Services Ltd.
AMSL	Above Mean Sea Level
AOCC	Airport Operations Control Centre
ATC	Air Traffic Control
AVDGS	Advanced Visual Docking Guidance System
CAR	Civil Aviation Requirements
CCTV	Closed-Circuit Television
DME	Distance Measuring Equipment
DGCA	Directorate General of Civil Aviation
DIAL	Delhi International Airport Pvt. Ltd.
ETA	Expected Time of Arrival
ETD	Expected Time of Departure
ICAO	International Civil Aviation Organisation
IST	Indian Standard Time
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LT	Local Time
LH	Left Hand
MAYFLY	Planned allocation of resources
PIC	Pilot In-Command
RH	Right Hand
SLA	Service Level Agreement
SOP	Standard Operating Procedure
STA	Standard Time of Arrival
STD	Standard Time of Departure
UTC	Coordinated Universal Time
UFIS	Universal Flight Information System
U/H	Utility Hand/Helper
VDGS	Visual Docking Guidance system
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR	Very High Frequency Omni Range

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In accordance with Annex 13 to the International Civil Aviation Organisation Convention and the Aircraft (Investigation of Accidents & incidents) Rules 2012, the sole purpose of this investigation is to prevent aviation incidents and accidents. It is not the purpose of the investigation to apportion blame or liability.

FINAL INVESTIGATION
REPORT ON GROUND INCIDENT INVOLVING M/S ETHIOPIAN AIRLINES
AIRCRAFT ET-AMG AND M/S AIR INDIA AIRCRAFT VT-EXD AT DELHI
ON 08.08.2017

1. **Aircraft Type** : BOEING 767-300(ETHIOPIAN) AND
AIRBUS A320-200 SHARKLET (AIR INDIA)
- Nationality** : ETHIOPIAN(ET-AMG),
INDIAN(VT-EXD)
- Registration** : ET-AMG(ETHIOPIAN) &
VT-EXD(AIR INDIA)
2. **Owner/Operator** : ETHIOPIAN(ET-AMG) &
AIR INDIA (VT-EXD)
3. **Date of occurrence** : 08.08.2017
4. **Time** : 2040UTC
5. **Last point of Departure** : VIDP (DELHI)
6. **Point of intended landing** : HAAB(ADDIS ABABA BOLE
INTERNATIONAL AIRPORT)
7. **Geographical location of site**
Of Occurrence (Lat. Long) : 28°56'30''N,77 °08'55''E
8. **Type of operation** : COMMERCIAL AIR TRANSPORT REVENUE
OPERATIONS
9. **Phase of operation** : PUSHBACK
10. **Type of occurrence** : Ground Incident

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

SYNOPSIS:-

M/s. Ethiopian Airline's Boeing B-767 aircraft ET-AMG operating flight No.ET-686 from Delhi to Addis Ababa was involved in a Ground Incident on 08.08.2017 at 20:40 UTC (09.08.2017 , 02:10IST), IGI Airport, Delhi. When the Ethiopian aircraft was being pushed back from stand 87, its starboard side wingtip, entangled with the Port side sharklet of the M/s. Air India's A320 aircraft which was parked on the adjacent aircraft stand 86L.

Earlier on 08.08.2017 at 04:10 UTC (09:40IST), Ethiopian aircraft had arrived from Addis Ababa and the aircraft was received on stand 87 of IGI Airport, T2 remote stand, Delhi as per the stand allotment made by DIAL. The ground handling agent for M/s. Ethiopian airlines is M/s. Celebi Ground Handling Delhi, Pvt.Ltd., Later, on the same day at 16:25UTC(21:55 IST), the Air India aircraft flight AI-5542(Jeddah-Delhi) arrived and parked on aircraft stand 86L as per the allocation made by DIAL.

As per the DGCA, India, vide Order No.AV.15024/19/2017-AS dated 10.08.2017 the occurrence was investigated under Rule 13 (1) of Aircraft (Investigation of Accidents and Incidents), Rules 2012 by an inquiry officer.

The most probable cause of Incident was improper stand allocation made by the aerodrome personnel without following Standard Operating Procedures (SOP) for M/s. Air India's aircraft. Non availability of wing walkers during pushback of M/s. Ethiopian aircraft was a contributory factor.

1. FACTUAL INFORMATION

1.1. History of flight:

M/s Air India Airbus A320 aircraft bearing registration VT-EXD was parked on aircraft stand 86L of Delhi International airport at 16:25UTC (21:55 IST) on 08.08.2017 after operating a HAJJ flight AI-5542(Jeddah-Delhi). M/s Ethiopian aircraft was already parked on aircraft stand 87 on arrival from Addis Ababa operating flight ET-686 on 08.08.2017 at 04:10UTC (09:40 IST).

On 09.08.2017, M/s Ethiopian Airlines Boeing B-767 aircraft bearing registration ET-AMG was supposed to operate flight no.ET-686 from IGI Airport, Delhi to ADDIS ABABA International airport at 20:40UTC. The supervision and pushback operation was performed by M/s. Celebi Ground Handling Delhi, Pvt. Ltd. After obtaining positive push back clearance from ATC at 20:37 UTC, when the aircraft was being pushed back from aircraft stand 87 for the scheduled flight to Addis Ababa, the starboard side wing of Ethiopian aircraft got entangled with the Port side sharklet of the Air India aircraft which was parked on the adjacent aircraft stand 86L. Push back was stopped and the occurrence was reported to the concerned personnel. The incident occurred during night time and weather was fine at the time of incident.

Both the aircraft received minor damages. During the subject period Apron 31 of T3 Terminal was closed due to R3 taxiway works under NOTAM and 04 bays were blocked for HAJJ operations.

1.2 Injuries to persons:

Injuries	Crew	Passengers	Others
Fatal	Nil	Nil	Nil
Serious	Nil	Nil	Nil
Minor	Nil	Nil	Nil

1.3 Damage to aircraft:

Damage to both the aircraft's were minor and sustainable.

1.3.1 Damage to Ethiopian aircraft

During the damage assessment inspection, following damages were reported;

The RH side Aileron assembly was punctured and torn, the aileron attachment fitting was found deformed. Wing lower skin was cracked and torn. Rear spar web was punctured. Upper T-chord and Lower T-chord was found cracked and deformed.

1.3.2 Damage to Air India aircraft

M/s. Air India A320-214 LHS Sharklet got damaged.

- A. Leading Edge of Sharklet Out Board side has the following damages;
Dent and Distortion, Tear, Fasteners were pulled, small portion of Leading Edge had separated from Sharklet spar.
- B. Inboard side middle chord wise joint has pulled 20 fasteners.

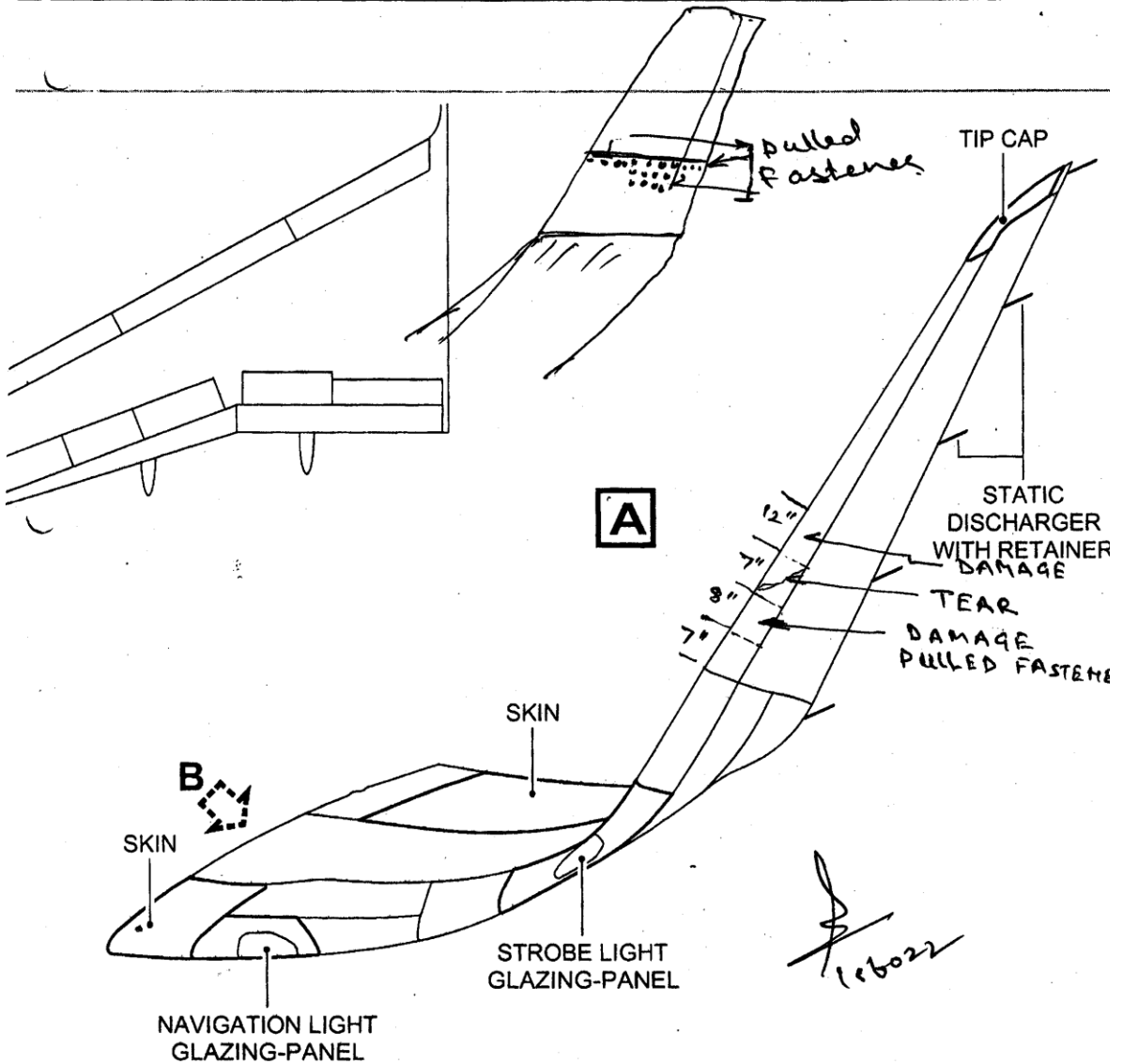
DAMAGE REPORT
 LHS SHARKLET VT-EXD: MSN 6724
LEADING EDGE - OIB SIDE HAS
 DAMAGE, TEAR, PULLED FASTENER
 SMALL PORTION SEPERATED FROM SPAR.

MIDDLE CORDWISE JOINT → B || B * FASTENER ARE PULLE

Customer : IAC
 Type : A318/A319/A320/A321
 Rev. Date : May 01, 2017

Manual : AMM
 Selected applicability : 254-254

57-30-00-11300-00-B / SHEET 1/1 - Sharklet



SHARKLET

Schematic depicting damage to Air India aircraft

1.4 Other damages:

Nil

1.5 Personnel information:

1.5.1 Cockpit Crew:

Cockpit was manned at the time of occurrence by Crew of Ethiopian airlines. After obtaining the clearance from ATC, the Pushback clearance was communicated from the Cockpit to the ground headset personnel of M/s Celebi.

1.5.2 Ground Handling Personnel:

The ground handling operations were carried out by suitably trained personnel of M/s.Celebi Ground Handling Delhi, Pvt. Ltd.

1.6 Aircraft information:

1.6.1. Operator	:	M/s. Ethiopian airline
Aircraft Type	:	Boeing 767-300
Aircraft Registration	:	ET-AMG
Aircraft Flight Hours	:	67676
Aircraft Flight Cycles	:	16879
1.6.2. Operator	:	M/s. Air India
Aircraft Type	:	Airbus A320
Aircraft Registration	:	VT-EXD
Aircraft Model No.	:	A320-200 with Sharklet

1.7 Meteorological information:

Weather prevailed at the time of the occurrence was fine and clear.

1.8 Aids of navigation:

N/A.

1.9 Communication:

Two way radio communications was available between aircraft and ATC.

1.10 Aerodrome information:

Indira Gandhi International Airport, Delhi, is the international airport serving the city of Delhi. The ICAO location indicator is VIDP and the IATA location identifier is DEL. The

Airport Reference Point(ARP) is 28°34'07''N 07°70'64''E located at an elevation of 777 feet above Mean sea level.

The Airport has three runways. Airport is equipped with VOR,DME, navigation and ILS CAT IIIB landing aids.

The airport consists of separate terminals for handling Domestic, General Aviation, and International Operations including cargo operations.

T3 terminal has got 5 Apron namely Apron 31,32,33,34 and Apron 35. Stand Numbers 86-92 are under T2 Remote stand.

As per the NOTAM, Apron 31 was not available due R3 TWY works were in progress. In addition as per the information 04 stands were blocked for Hajj operation i.e., Reserved for HAJJ flights.

1.11 Flight recorders:

N/A.

1.12 Wreckage and impact information:

M/s. Ethiopian aircraft after being pushed back approximately 47ft from its nose wheel parked position on lead in/out line of Bay no.87, its starboard side wing made contact with the port side wing of M/s Air India aircraft which was parked on Bay no. 86L.M/s. Ethiopian aircraft starboard side aileron and wingtip sustained damages. M/s Air India aircraft shark let received damages. Approx. 2ft of Ethiopian aircraft starboard side wing pierced into Air India aircraft shark let on its portside.

The Air India aircraft was parked on stand 86L. However after the occurrence, the Air India aircraft got displaced towards the port side. At the displaced position, the nose wheel found approx. 3'4" ahead of nose wheel marking and 5'1" towards portside from the lead line.



1.13 Medical and pathological information:

N/A

1.14 Fire:

There was no fire or smoke during or following the incident.

1.15 Survival aspects:

The incident was survivable. There was no injury to the passengers, crew or any other ground personnel.

1.16 Tests and research:

Nil.

1.17 Organizational & Management Information:-

1.17.1 DIAL:-

Delhi International Airport (P) Limited (DIAL) is a joint venture, formed as a consortium between GMR Group (54%), Airports Authority of India (26%), and Fraport AG & Eraman Malaysia (10% each). GMR is the lead member of the consortium, Fraport AG is the airport operator and Eraman Malaysia is the retail advisor.

All the Apron control and Bay allocation and other related activities are under the controls of DIAL.

1.17.2 Ethiopian Airlines:-

Ethiopian Airlines (EAL) is the flag carrier of Ethiopia and is a wholly owned by the country's government. The airline has been a member of the International Air Transport Association (IATA) since 1959, and of the African Airlines Association (AFRAA) since 1968. Ethiopian is a Star Alliance member, having joined in December 2011. The airline is operating approximately 100 international and 21 domestic destinations.

1.17.3 Air India:-

Air India is the flag carrier airline of India. It is owned by Air India Limited, a government-owned enterprise, and operates a fleet of Airbus and Boeing aircraft serving 90 destinations including 53 domestic destinations and 37 international destinations. The airline has its hub at Indira Gandhi International Airport, New Delhi, and Chhatrapati Shivaji International Airport, Mumbai alongside several focus cities across India. The airline became the 27th member of Star Alliance on 11 July 2014.

1.17.4 Celebi Ground Handling Delhi:

M/s. Celebi Ground Handling Delhi is registered under Companies Act, 1956 on 18th Nov 2009. Company has approx. 1400 full time employees on its roll and not outsourcing any activities. Celebi Ground Handling Delhi at IGI Airport carrying out ground handling activities for 22 international operators. Celebi is handling Ethiopian Airlines since April 2011.

1.18. Additional information:

1.18.1 Aeronautical Information Publication (AIP) Delhi Airport:-

Continuous nose-wheel guide lines available at MARS (Multiple Aircraft Ramp System) centre stands for use of wide body aircraft and in single aircraft stands broken nose-wheel guide lines of left & right MARS stand for narrow bodied aircraft. All stands are provided with stand identification signs and Nose-wheel guide lines at apron. Taxing guidance signages are provided on all TWY intersections, straight section and holding positions as per ICAO Annex-14. Advanced Visual Docking Guidance System (AVDGS) are available on nose-in parking stands

of T-3. Docking of aircraft is done with the help of marshaller at remote parking stands and other contact stands where AVDGS is not provided.

Parking stands 86 to 92 are suitable for B747-400 type of aircraft.

1.18.2 Airport Operations Control Centre:-

The AOCC is the command, coordination and control centre for the whole airport relating to the major operational areas like passengers, baggage and cargo and aircraft.

AOCC coordinates with Air Traffic Control (ATC) to improve and maximise efficiency on air operations and aircraft stand/slot allocations. Airport ground resources such as parking stands are allocated on a dynamic basis based on the various variables.

1.18.3 Terminal- II Remote stands for Code ‘C’ aircraft (as per DIAL SOP):-

The additional code “C” stands are planned as an ad-hoc measure to accommodate the shortage of code “C” stands in any exigency and not published for regular use.

The same dependencies are mapped in gate management system of AOCC

Similarly, Apron configuration and dependencies from apron 86-92 are re-configured to accommodate additional code-’C’ aircraft as an ad-hoc measure to accommodate the shortage of code ‘C’ stands in any exigency and not published for regular use. The same dependencies are mapped in gate management system of AOCC.

In-case of aircraft on stands 81,82,83,84,85,86,87 then following stands will get blocked: 82R/L,83R/L,84R/L,85R/L,86R/L.

Stands 81,82R/L,83R/L,84R/L,85R/L,86R/L,87 are suitable for code-’C’ aircraft provided 81-87 are vacant.

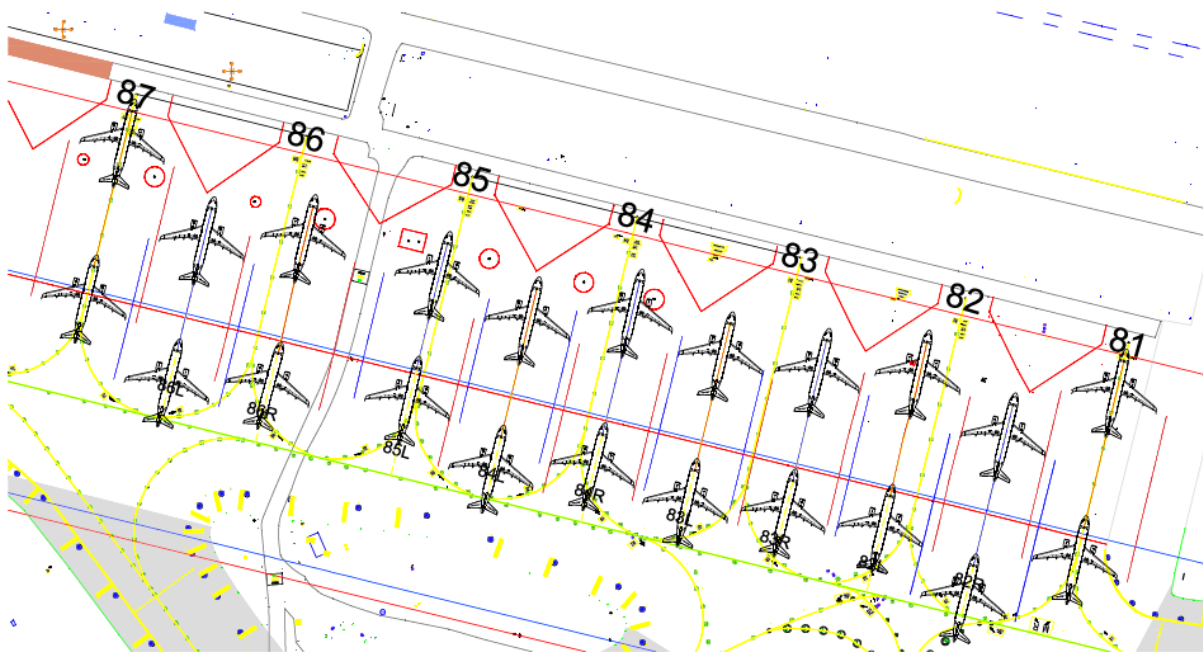
Stands 81,82,83,84,85,86 are suitable for B 747-300 and 87 is suitable for B747-400 of aircraft provided stands 81,82R/L,83R/L,84R/L,85L,86R/L,87 are vacant.

Individual stand availability is tabulated below:-

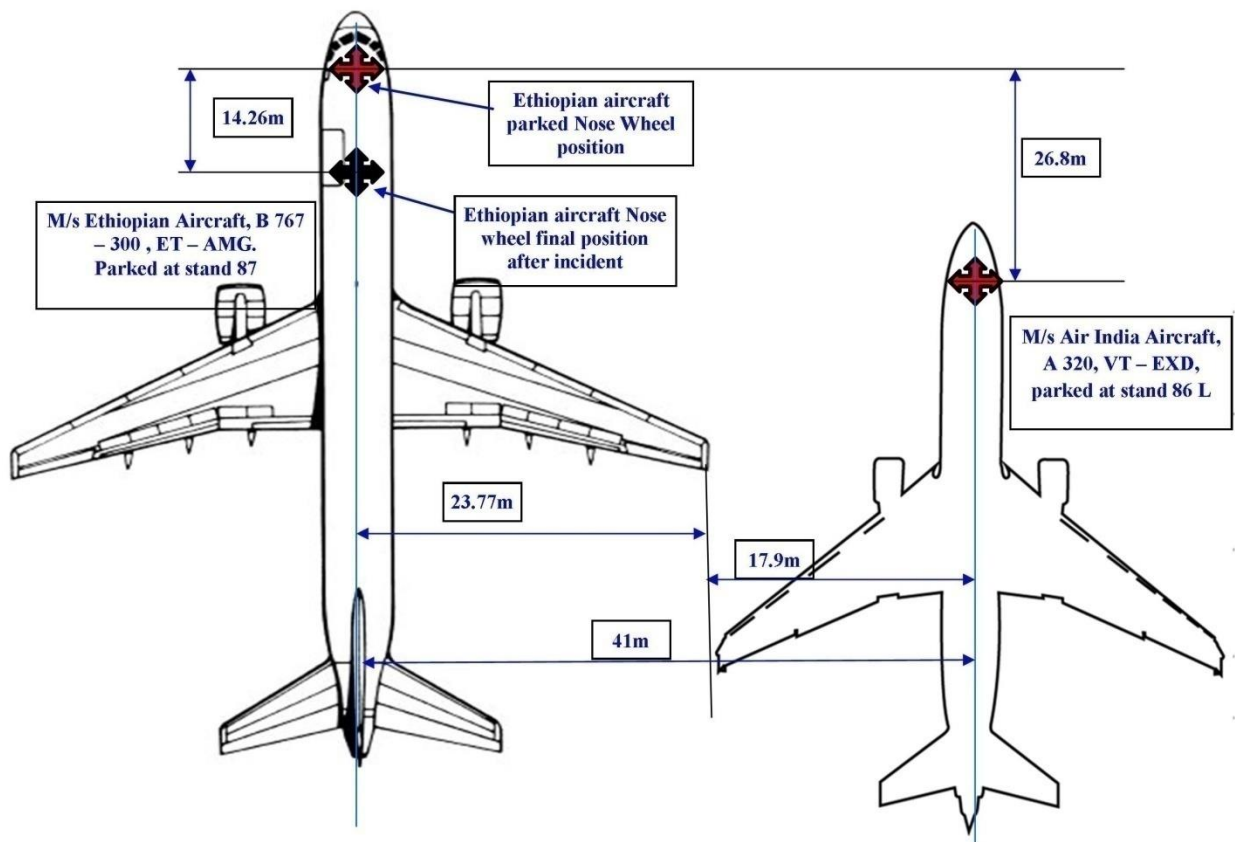
T2 Remote:

Stand Occupied	Stand(s) Blocked
82L	82
82R	81 and 82
83L	83 and 84
83R	82 and 83
84L	84 and 85
84R	84
85L	85
86L	86 and 87
86R	86

Stand Occupied	Stand(s) Blocked
81	82R
82	82R,82L,83R
83	83L,83R
84	83L,84R,84L
85	84L,85L
86	86L,86R
87	86L



T2 Remote stand layout (not to scale).



Schematic of the Stand allocation to Ethiopian and Air India aircraft (not to scale).

1.18.4UFIS(Universal Flight Information System)

Planning and processing the flight, resource planning and management for the terminal are performed by AOCC through a software based environment –UFIS (Universal Flight Information System).

UFIS provides system integration and interfaces to external systems such as the ATC and SITA Telex .Airport Operational Database (AOCC), Flight Information Processing System, Flight Information Display System (FIDS) and Apron Management System.

The AOCC(Airport Operational Database) provide data integration platform for all IT systems at the airport as well as off-airport systems. Information from UFIS and other systems is stored in the AOCC and is made available to authorized applications and systems.

The apron management application is a rule-based system which enables planners and dispatchers to plan for gate, stand, check-in counter and baggage belt assignment to individual aircraft. A rule generator is used to develop new rules or edit existing ones to cater for changes in operational procedures and agreements with the airlines.

As per the UFIS history log, initial bay allotment for Ethiopian aircraft was made to Bay No. 87 at 00:56 UTC (06:26:04 IST) and on-block at 04:10 UTC (09:40:45 IST) on the same stand.

As per the UFIS history log, initial bay allotment for Air India aircraft was made to Bay No. 86. However, at 14:58 UTC (20:28:23IST), 86 was changed in to 86L by GOS desk operations executive.

The UFIS system has got the inbuilt alert system to alert the duty personnel. On the same day also it did alert the duty personnel; by cautioned that;

AI5542(A): Position 086L: Nature restriction (01 05 =07=08):43

AI5542(A): Position not available 05:30 09.08.17 – 05:29 10.08.17 reason: Blocked for AI Haj Operations/VT-EXD Park

AI5542(A): Aircraft restriction/ Wing overlap with aircraft ET686 B763 at position 087.

1.18.5SOP: Allocation of Aircraft Stands, T3:-

Activity	Person Responsible	Timeline
AOCC Planning shall plan and allocate the parking stand for all D+1 international flights.	AOCC planning	One day before
The international flights as per the approved schedule updated in the system shall be allocated parking stands. The planning shall be done based on the compatibility of stands and aircraft. Once, the planning is completed, the plan shall be released in the form of May Fly to all internal and external stakeholders before 1800hrs and also released for operations in UFIS.	AOCC Planning	One day before
On the day of operation, as soon as the ATC	ATC Coordinator	Real Time

Coordinator takes hand over from the outgoing staff, he/she shall verify the resources allocated and status of turn-around, to ensure the optimum utilization of parking stand without any conflicts.		
ETA of every flight is provided by the ATC on hotline. Each ETA provided for the flight shall be recorded in the ETA log book along with the parking stand allocated for the flight. The parking stand for each flight shall be communicated to ATC.	ATC Coordinator	Real Time
Any deviation/change in May Fly allocation of international flights due to operational reasons must be notified to the concerned airline/ground handler positioned in AOCC at the earliest.	ATC Coordinator	Real Time
Notify ATC for any change in stand allocation if the stand has already been passed for the affected flight.	ATC Coordinator	Real Time

1.18.6 Civil Aviation Requirements, Section 04, Series B Part I (3.13.6):-

Clearance distances on aircraft stands

An aircraft stand shall provide the following minimum clearances between an aircraft entering or exiting the stand and any adjacent building, aircraft on another stand and other objects:

Code letter	Clearance
A	3 m
B	3 m
C	4.5 m
D	7.5 m
E	7.5 m
F	7.5 m

When special circumstances so warrant, these clearances may be reduced at a nose-in aircraft stand, where the code letter is D, E or F:

- a) between the terminal, including any fixed passenger bridge, and the nose of an aircraft; and
- b) over any portion of the stand provided with azimuth guidance by a visual docking guidance system.

Note: On aprons, consideration also has to be given to the provision of service roads and to maneuvering and storage area for ground equipment.

1.18.7 SOP for Push-back(with tow bar):-

As per the M/s. Ethiopian GHM,

1. Only those personnel trained and qualified should perform aircraft movement operations functions. The person 'incharge' of the operation should brief all other personnel involved in the operation of their responsibilities.
2. Personnel performing marshalling or wing-walking function should utilize proper equipment for night and day operations.
3. All personnel on the towing crew shall remain vigilant and alert for any circumstances which could result endanger to lives and equipment,
4. A marshaller will be responsible for providing standard marshalling signals, in a clear and precise manner, to arriving and departing aircraft.
5. A GSE operator will be responsible for following the hand signals of the marshaller.
6. Tow truck operator to make sure clearance is obtained from the signalman before commencing the towing/ pushback operation.
7. Tow truck operator to make sure clearance is obtained from the ground crew in the headset before commencing the towing/ pushback operation.
8. Tow truck operator to follow the signal from the marshaller and tow/ pushback the aircraft with extreme caution.

1.18.8 Ground Handling manual of M/s Celebi Ground Handling Delhi

As per the manual, personnel incharge of push back are;

Cockpit personnel

Head Set operator (Operations Executive/ Aircraft Technician)

Push-Back Driver

Wing Walker Personnel

Head Set Operator coordinates the push back operation between cockpit crew and push back operator. He/ She starts the pushback upon instruction from the cockpit personnel.

If He/ She spots any obstruction on the path of the aircraft movement that would endanger push-back operation, he / she has the authority to halt the operation. Push back operator initiates the operation in-line with the instruction given by the headset operator.

During the period until the aircraft goes out of the position, Wing-walker has the authority to halt the operation by informing the headset staff through hand signals, in order to prevent the aircraft from damage which may be caused.

As a Push-back Steps; A walk around check of Aircraft to be done by the airline technician or the Operation executive assigned to the aircraft after all the vehicles/ Equipment have been

disconnected and removed. Action is taken in accordance with the rules stated in AHM and GOM of the airlines serviced.

1.18.9. Statement of AOCC ATC Coordinator:-

On the date of occurrence AOCC Operations Executive was performing shift duty from 1400 UTC to 0200 UTC (1930IST to 0730IST) and was allocated ATC coordination desk, wherein the responsibilities included bay allocation, ETA updation and ATC Coordination. During the subject period Apron 31 was closed due to TWYR3 works under NOTAM and 04 bays were blocked for HAJ operations.

In-order to maximise bay utilisation the Air India flight allocated on stand 86 was changed to 86L, so that 86R is available in-case of requirement. ATC Coordinator added that UFIS system is mapped in such a manner that if stand 87 is occupied then aircraft should not be parked on stand 86L and accordingly it gave the alert, however unintentionally the alert was missed ; assuming that alert is due bay(86) being blocked for HAJJ flight.

1.18.10. Statement of AOCC T3 GOS desk Executive:-

On the day of occurrence the Operations Executive reported for duty in night shift and he was allotted duty on T3 GOS desk in AOCC.

During the time, the Operations Executive was working on T3 GOS desk, staff on ATC Coordination desk advised him to change of allocation of Air India HAJJ flight from stand 86 to 86L as the ATC Coordinator was busy on Hotline. When the Operations Executive (T3 GOS desk) performed the change of aircraft stand the colour was allocation was RED, but the subject stand was already blocked for HAJJ operations. The colour of the subject Air India aircraft allocation was already being shown in RED even before the change of bay (from 86 to 86L).Hence, due to the same he could not recognise the conflict, which had to be checked manually.

The Operations Executive (T3 GOS desk) had not performed ATC coordination desk duty till date and only performed the bay change on directions of the ATC Coordinator.

Normal allocations are indicated in blue on the timelines, whereas allocations with conflicts are indicated in RED on the timeline. The reason for any conflict would have to be checked manually by querying the allocation and there are no automatic pop-up conflict messages.

1.18.11. Statement of Celebi Headset Operator:-

On the day of occurrence he reported for duty at 17:00 UTC (22.30IST) and Ethiopian ET-687 was the first flight allotted to him. He was performing duty of headset operator for the subject departure flight handling. He had completed 1 month as headset operator as on date of

occurrence and had performed nearly 20-25 headset operations. The visibility on the bay was satisfactory. Since the Captain wanted to talk with ET staff he handed over the headset to ET staff. Later the ET engineer handed over the headset back to the headset operator; soon after the Captain conveyed the clearance for push back and advised to start pushback. Then he checked for removal of wheel chocks and gave the clearance to Push Back tractor operator.

Since he had seen the ET engineer had performed walk-around inspection, he presumed that any anomaly would have been brought to his attention. As he started the push back, the wing of Ethiopian aircraft hit the wing of Air India aircraft. At the time of occurrence only, he noticed that there was no wing walker.

1.18.12. Statement of Celebi Pushback tractor Operator:-

The Pushback tractor operator informed that, the directions of the headset operator were being followed for the Push back operations of Ethiopian aircraft from stand 87.

1.18.13. Statement of Celebi Team Lead:-

On the date of occurrence the shift duty was from 12:30 UTC to 22:00 UTC (1800IST to 0330IST) and was allotted ET-687 departure of 09.08.2017. The team lead reached the bay by 07:00 UTC (0030IST) with 05 U/H and 04 operators. Flood lighting on the bay was satisfactory. After completion of loading activities when flight was ready for departure, he advised 01 loader for removal of Nose wheel chocks and 04 loaders for MLG chocks. Team lead was standing near Nose wheel to attach the tow bar to push back tractor. Team lead advised 02 loaders to perform wing walking function, but before they reached position for wing walking, pushback was started and Ethiopian aircraft wing hit the left wing of Air India aircraft.

1.18.14. Statement of Celebi Loaders:-

As per the statement of the loaders, they were not given directions for performing the wing walker functions.

1.19 Useful or effective investigation techniques:-

Nil

2. Analysis:-

Ethiopian Airlines aircraft Boeing B-767 aircraft ET-AMG operating flight no. ET-686 from Delhi to Addis Ababa was involved in a Ground incident on 08.08.2017 at IGI Airport, Delhi.

On 08.08.2017 at 04:10 UTC (09:40 IST), Ethiopian B767 aircraft ET-AMG arrived from Addis Ababa to Delhi and was received on aircraft stand 87 as per the stand allocation made by DIAL AOCC. The ground handling of the Ethiopian airlines was conducted by M/s Celebi Ground Handling Delhi Ltd. based on the S.L.A. On the same day at 16:25UTC, the Air India

aircraft HAJJ Charter flight from Jeddah was accommodated on aircraft stand 86L as per the allocation made by DIAL AOCC.

On 08.08.2017, at around 20:40UTC, M/s. Ethiopian Airlines Boeing B-767 aircraft ET-AMG operating flight no.ET-686 started push back for Addis Ababa from stand 87 of IGI airport Delhi. After pushed back approximately 47ft, the Starboard side wingtip of the Ethiopian aircraft, entangled with the Port side sharklet of the Air India's A320 aircraft parked on the adjacent aircraft stand 86L.

M/s. Ethiopian aircraft starboard side aileron and wingtip sustained damages also M/s Air India aircraft shark let received damages. Approx. 2ft of Ethiopian aircraft starboard side wing pierced into Air India aircraft shark let on the portside.

2.1 Aircraft Stand Allocation:-

The Air India aircraft was parked on stand 86L. However after the occurrence, the Air India aircraft got displaced towards the port side. At the displaced position, the nose wheel found approx. 3'4" ahead of nose wheel marking and 5'1" towards portside from the lead line.

As per the UFIS history log, initial bay allotment for Air India aircraft was made to Bay No. 86. However, at 14:58 UTC (20:28:23IST), 86 was changed in to 86L by T3 GOS desk operations executive.

As per the UFIS history log, initial bay allotment for Ethiopian aircraft was made to Bay No. 87 at 00:56 UTC (06:26:04IST) and on-block at 04:10 UTC (09:40:45IST) on the same stand.

The UFIS system has got the inbuilt alert system to alert the duty personnel. On the same day also it did alert the duty personnel; by cautioned that;

AI5542(A): Position 086L: Nature restriction (01 05 =07 =08):43

AI5542(A): Position not available 05:30 09.08.17 – 05:29 10.08.17 reason: Blocked for AI Haj Operations/VT-EXD Park

AI5542(A): Aircraft restriction/ Wingoverlap with aircraft ET686 B763 at position 087.

The screenshot shows the UFIS interface with a list of aircraft stands on the left and a conflict resolution window on the right. The stands listed are 086 (B743), 086L (739J) (highlighted), 086R (739J), 087 (B744), 088 (B744), 089 (B744), 090 (B744), 091 (B744), 092 (B744), 098 (B744), and 099 (B744). The conflict resolution window displays the following messages:

- Blocked for AI Haj Operations
- Conflicts
- AI5542 (A): Position 086L: Nature restriction (01 05 =07 =08):43
- AI5542 (A): Position not available 05:30 09.08.17 - 05:29 10.08.17 reason: Blocked for AI Haj Operations/VTEXD PARK
- AI5542 (A): Aircraft-Restriction/Wingoverlap with aircraft (ET 686 B763) at Position 087
- Confirm all Conflicts
- Delete Allocation
- Delete Resource Chain
- Towing
- Positions

At the bottom of the interface, there is a status bar showing: AI5542 (I) 21:20 JED / OEJD ONBL: 21:53 Gate: - < 32A / A320 VTEXD >

UFIS Conflict messages generated w.r.t Air India VT-EXD allocation on stand 86L

As per the AOCC- ATC Coordinator, during the subject period Apron 31 was closed due to R3TWY works under NOTAM and 04 bays were blocked for HAJJ operations. In-order to maximise the bay utilisation, Air India flight initially allocated on stand 86 was changed to stand 86L, so that stand 86R is available in-case of requirement. The UFIS system alert was overlooked by assuming that alert is due bay being blocked for HAJJ flight.

As per the AOCC-T3 GOS desk operations executive, during the time of Operation, staff on ATC Coordination desk advised to change of allocation of arrival Air India HAJJ flight from stand 86 to 86L. When it was performed, the colour of the new allocation was in RED. The colour of Air India allocation was already being shown in RED even before the change of bay, since the subject stand was already blocked for HAJ operations. The executive could not recognise the conflict, which had to be checked manually.

Aircraft Stand Allocation Procedure:-

- The stand 86 was allocated as per procedure well in advance for the arrival Air India flight by AOCC planning.
- Further the SOP states that, as soon as the ATC Coordinator takes over from the outgoing staff, he/she shall verify the resources allocated and status of turn-around, to ensure the optimum utilization of parking stand without any conflicts.

Hence, from the SOP it is clear that; the responsibility and duty of aircraft stand management on real time is vested with the ATC Coordinator.

The motive of the ATC coordinator to change the bay allocation to 86L from the pre-allocated stand 86 seems to be in-line with the procedure for making stand 86R available in case of any requirement, as apron 31 was unavailable due maintenance activity; however the implementation of plan by advising/delegating the responsibility to another person is non-adherence to the laid down SOP.

- In addition, as per SOP the ATC coordinator has to ensure the optimum utilization of parking stand 'without any conflicts'.

The action of delegating the requirement i.e., intention of ATC coordinator to the T3 GOS personnel; who had not performed the duty of an ATC coordinator till date further added to the event. The T3-GOS desk personnel could not envision the possibility of new/additional system generated conflict warning(s) since the Air India aircraft allocation was already shown with pre-existing conflicts on the initial stand (86), he did not check for the reason for the colour indicated warning on the allocation timeline after change of stand to 86L.

From the available evidence, it is of the view that whenever the parking stand is reserved for any operation it will be shown in RED in the UFIS system. Also, whenever there is a conflict w.r.t the stand during the allocation will be shown in RED. The conflict, if any generated need to be checked manually and then resolved. However, as the executive could not distinguish between these two issues, stand 86L was allotted by neglecting the warning messages generated through UFIS. Also, the AOCC personnel did not cross-refer the DIAL SOP.

It is also observed that, the additional code 'C' stands used by DIAL as “ an ad-hoc measure to accommodate the shortage of code 'c' stands in exigency” are not published in the AIP for Delhi (VIDP)airport. These measures were also not circulated to the stakeholders by DIAL.

From the above, it is clear that the allotment of Air India (Code-C) aircraft at stand 86L , adjacent to Ethiopian(Code-D) aircraft at stand 87 without ensuring the required wing tip clearances between these aircraft's had resulted in the occurrence.

2.2. Pushback Operation:-

The Ground handling operations of M/s Ethiopian was carried out by M/s. Celebi Ground Handling Delhi, Pvt. Ltd. As per the Celebi Ground Handling Manual, Head Set Operator is the person who coordinates the push back operation between cockpit crew and pushback operator. On the day of occurrence, the push back started after obtaining clearance from the cockpit. The push back operator initiated the operation in-line with the instruction given by the head set operator, as specified in the Celebi Ground handling manual.

Weather prevailed at the time of incident was clear and fine and is not a contributory factor to the occurrence.

The apron flood lighting at the place/apron of occurrence was satisfactory and adequate lighting was available at the time of occurrence. Hence, apron lighting is not a contributory factor to the occurrence.

During the period wing walker has the authority to halt the operation by informing the head set staff through hand signal, in-order to prevent the aircraft from damage. The equipment operators are also trained for performing wing-walker function.

There were adequate equipment operators available for the flight handling. However, as they were engaged with the other related activities, none of them were available for wing-walker duties. In addition, the head set operator was not aware of the bay constraint and his experience was less (01 month). Hence, the push back was commenced by the headset operator without wing walkers in position.

The availability of wing-walkers would have averted the occurrence.

3. Conclusion:-

3.1 Findings:-

1. The Ethiopian aircraft arrived at Delhi on 08.08.2017 and was parked on stand 87 at 04:10 UTC (0940IST).
The Air India aircraft arrived at Delhi on 08.08.2017 and was parked on stand 86L at 16:25UTC.
2. The initial allocation planned for the arrival Air India aircraft was stand 86, however at 14:58 UTC (20:28IST) was changed to stand 86L by AOCC personnel.

3. The additional code 'C' stands used by DIAL as “an ad-hoc measure to accommodate the shortage of code 'c' stands in exigency” are not published in the AIP for Delhi (VIDP) airport.
4. As per DIAL SOP ,whereby “ad-hoc” additional code 'c' stand were created; whenever stand no.87 is occupied by an aircraft, stand no.86L is blocked for another allocation which was not adhered to by the AOCC duty personnel.
5. Planning and processing the flight, resource planning and management for the terminal are performed by AOCC through a software based environment -UFIS.
The UFIS system has got the inbuilt alert system to alert the duty personnel. On the same day also it did alert the duty personnel; by cautioned that;
AI5542(A): Position 086L: Nature restriction (01 05 =07=08):43
AI5542(A): Position not available 05:30 09.08.17 – 05:29 10.08.17 reason: Blocked for AI Haj Operations/VT-EXD Park
AI5542(A): Aircraft restriction/ Wing overlap with aircraft ET686 B763 at position 087.
However, the caution was over looked by the DIAL AOCC personnel.
6. M/s Celebi Ground Handling Delhi was conducting the ground handling operations of Ethiopian airlines aircraft.
7. On 08.08.2017, at around 20:40UTC, M/s. Ethiopian Airlines Boeing B-767 aircraft ET-AMG operating flight no. ET-686 started push back for Addis Ababa from stand 87 of IGI airport Delhi.
8. The Headset Operator was in two way communication with the cockpit. Pushback clearance was obtained by the Headset operator before commencing the push back operation.
9. Clearance was given by the Celebi Headset Operator for Push back of Ethiopian airlines aircraft without Wing walkers in position, before the start of push back operation of Ethiopian aircraft.
10. There were no delays experienced by the departing aircraft.
11. As per CAR Sec.4 Series B Part 1, para 3.13.6, minimum clearance required between an aircraft (Code –D) entering or exiting the stand and aircraft on another stand and other objects is 7.5m.
Wingspan of Airbus A320 with shark-let is 35.8m and Wingspan of Boeing B767-300 is 47.57m. The minimum required distance between the stands for accommodating B-767 (Code-D) and A320 (Code-C) should be 48.19m (41.68m+7.5m). However, the distance between the stands 87 and 86L is 41m only, which is less than the summation of half the wing span length of both the aircraft.
12. Aircraft stands compatibility is defined in AIP based on the aircraft type rather than denoting the aircraft category/code for which the stand is suitable.

3.2 Probable cause:-

The most probable cause of Incident was improper stand allocation made by the aerodrome personnel without following Standard Operating procedures (SOP).

Non availability of wing walkers during pushback of M/s. Ethiopian aircraft was a contributory factor.

4. Safety Recommendations:-

1. Necessary action may be taken with respect to DIAL personnel for their lapses in allocation of aircraft stand.
2. The AOCC UFIS system for allocation of aircraft stands may be modified in view of all conflicts, stand blocking being reflected in same colour code.
3. Necessary action may be taken against DIAL for making use of “Ad-hoc” aircraft stands without publishing in the AIP.
4. Necessary corrective training to the Celebi Head Set Operator in view of findings no.09.


(R.Rajendran)
Inquiry Officer