

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 shall be the prevention of accidents and serious incidents and not to apportion blame or liability. The investigation conducted in accordance with the provisions of the 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 and 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.

GLOSSARY

AAI	Airports Authority of India
AAIB	Aircraft Accident Investigation Bureau, India
ACC	Area Control Centre
AOP	Air Operator Permit
ATC	Air Traffic Control
ATD	Actual Time of Departure
ATIS	Automatic Terminal Information Service
ATPL	Airline Transport Pilot Licence
AMM	Aircraft Maintenance Manual
AUW	All Up Weight
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
COI	Committee of Inquiry
CPL	Commercial Pilot Licence
DGCA	Directorate General of Civil Aviation
DFDR	Digital Flight Data Recorder
DME	Distance Measuring Equipment
ETA	Expected Time of Arrival
HOW	Hand off Watch
HZ	Haze
IACO	International Civil Aviation Organization
IATA	International Air Transport Association
IFR	Instrument Flight Rule
ILS	Instrument Landing System
NM	Nautical Mile
PIC	Pilot In Command
QFE	Query Field Elevation
QNH	Query Nautical Height
R/T	Radio Telephony
RA	Resolution Advisory
STCA	Short Term Conflict Alert
SQMS	Standards, Quality Management and Safety
SOP	Standard Operating Procedures
TOW	Take off Watch
TCAS	Traffic Alert & Collision Avoidance System
VHF	Very High Frequency
VOR	Very High Frequency Omni Range
UTC	Co-ordinated Universal Time

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Final Investigation Report on Serious Incident (Airprox) between Airbus A320 Aircraft VT-DEL (M/s Air Asia Ltd) & Aircraft VT-IHJ (M/s Indigo Ltd) at Kolkata on 15.10.2018.

- 1. Aircraft**
 - Type** : Airbus A 320 (both)
 - Nationality** : Indian
 - Registration** : VT-DEL & VT-IHJ
- 2. Owner/ Operator** : Air Asia (VT-DEL) / Indigo (VT-IHJ)
- 3. Pilot – in –Command** : ATPL Holders
 - Extent of injuries** : Nil
- 4. First Officer** : Qualified on type
 - Extent of injuries** : Nil
- 5. Place of Incident** : Kolkata ACC
- 6. Date & Time of Incident** : 15th October 2018, 0549 UTC
- 7. Last point of Departure** : Bagdogra (VT-DEL) and Kolkata (VT-IHJ)
- 8. Point of intended landing** : Kolkata (VT-DEL) and Bagdogra (VT-IHJ)
- 9. Type of operation** : Scheduled Operation
- 10. Phase of operation** : During Descent (VT-DEL) & Climb (VT-IHJ)
- 11. Type of Occurrence** : Air Proximity

(ALL TIMINGS IN THE REPORT ARE IN UTC)

SYNOPSIS

On 15.10.2018, Air Asia Flight IAD583 (VT-DEL), A320, Bagdogra to Kolkata, was operating on ATS route W69 at FL310, while Indigo Flight IGO797 (VT-IHJ), A320, Kolkata to Bagdogra, was climbing to FL300 on a direct track to ONOTO (reporting point on ATS route W69).

IAD583 requested descent near ONOTO. The controller asked IGO797 to stop climb at FL290 and simultaneously cleared IAD583 also to descent to FL290. STCA alert was generated.

The controller, after realizing the conflict between IAD583 and IGO797, which were on reciprocal tracks, directed left turn and diverging heading to both aircraft i.e. Heading 090 to IAD583 and Heading 270 to IGO797. By the time both aircraft followed instructions issued to them, there was breach of separation and both aircraft reported receiving RA.

Investigation has revealed that the required standard vertical and lateral (radar) separation got reduced to 800 feet and 2.8 NM (Nautical Mile), respectively at 054840 UTC. After "Resolution of Conflict", both Aircraft resumed normal navigation.

Director General, Aircraft Accident Investigation Bureau appointed Investigator – In-Charge and Investigator vide order number INV-12011/8/2018-AAIB dated 17 October 2018, to investigate the cause of the Serious Incident under Rule 11 (1) of Aircraft (Investigation of Accidents and Incidents), Rules 2017. Further, a Corrigendum was issued vide order no INV-12011/8/2018-AAIB dated 26 May 2019 and change in Investigator –In-Charge was affected.

At 054743 the RSR controller instructed IAD583 to turn left heading 090 and simultaneously instructed IGO797 to turn left heading 270. Both the aircraft had read back the same. IAD583 was observed to have changed the heading to 120 and IGO797 was continuing with the same heading. However at 054825 UTC both the aircraft reported TCAS RA and followed RA procedures. IAD583 climbed to FL294 while IGO797 descended to FL285.

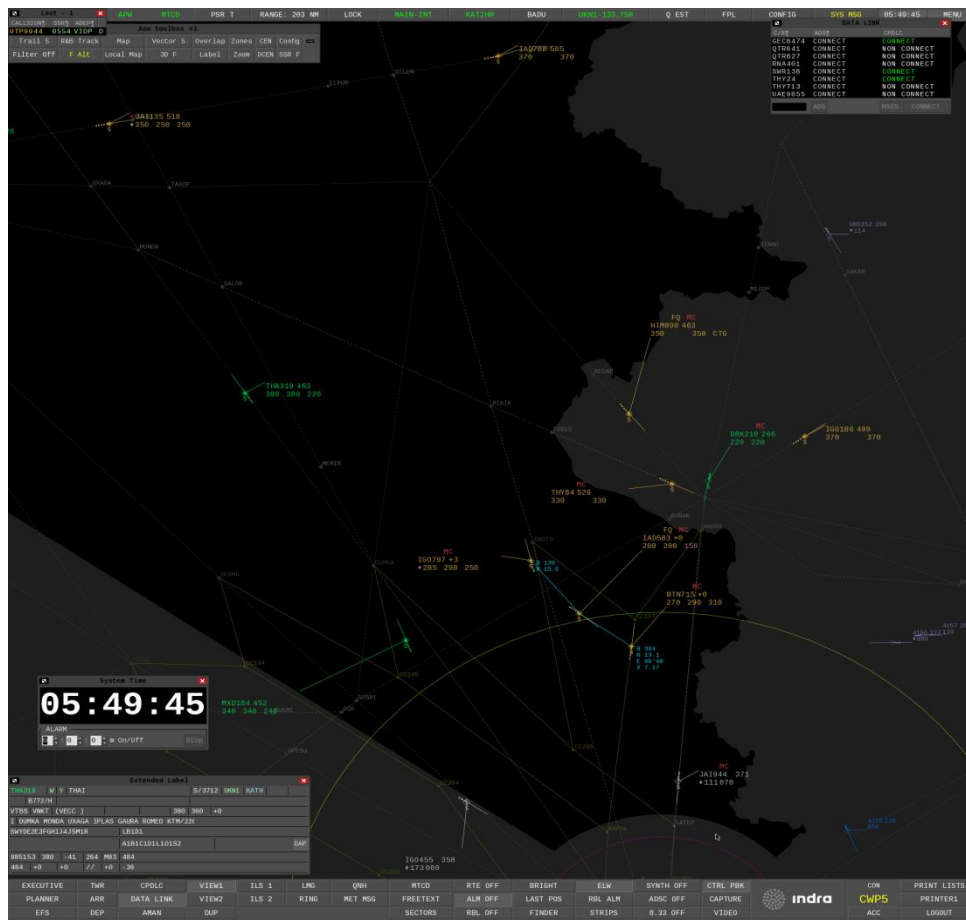


STCA (Red) was generated at 054810 UTC

The minimum separation between IAD583 and IGO797 was:

- At 054822 UTC—5.8 NM horizontal and 200 feet vertical.
- At 054827 UTC—4.9 NM horizontal and 500 feet vertical.
- At 054840 UTC—2.8 horizontal and 800 feet vertical.

At 054945 UTC, both the aircraft were clear of conflict when IAD583 was climbing past FL 297 and IGO797 was descending through FL285.



At 054945 UTC, both the aircraft were clear of conflict

After clear of conflict with IGO797, IAD583 was observed to have continued with the heading 120 and entered into conflict with traffic BTN715 (Bhutan Air). On observing conflict at 054925 UTC, the Planning Controller in coordination with Executive controller instructed BTN715 to stop climbing and maintain FL270. Thereafter, both the aircraft continued normal navigation.

1.2 Injuries to Persons

There was no injury to any of the occupant on board any of the aircraft.

1.3 Damage to Aircraft

Nil

1.4 Other Damage

Nil

1.5 Personnel Information

Both the flights were operated by scheduled airlines and all the flight crew were appropriately qualified & licensed as per the existing regulations for operating the flight.

The RSR North Executive Controller was authorized to handle R/T (Radiotelephony) in the Radar environment and Planning Controller in procedural respectively.

1.6 Aircraft Information

Both involved aircraft were short- to medium-range, narrow-body Airbus A320, commercial passenger twin-engine jet airliners.

1.7 Meteorological Information

The weather was fine and has got no bearing on the occurrence.

1.8 Aids to Navigation

All aids to navigation on ground along with RSR North frequency 133.75 MHz, were reported working normal. All the aircraft navigational systems were also working normal.

1.9 Communications

During the time of incident both the aircraft, IAD583 & IGO797 were in positive contact with RSR North at 133.75 MHz. There was always two-way communications between concerned ATC unit and both the aircraft.

1.9.1 ATC Tape Transcript

The ATC tape recording of frequency 133.75 MHz, RSR North was replayed and the relevant transcript is as follows:

RSR NORTH, Frequency 133.75 MHz, Transmission with IAD583 & IGO797

TIME IN UTC (HHMMSS)	FROM	TO	TEXT
052834	IAD583	UKN	LEAVING LEVEL 14---(GRABLED)
052857	IAD583	UKN	CALLING
052857	UKN	IAD583	GO AHEAD

052857	IAD583	UKN	LEAVING 150 FOR 240 REQUEST DIRECT TEBID
052857	UKN	IAD583	IDENTIFIED CONFIRM RELEASED BY BAGDOGRA?
052857	IAD538	UKN	AFFIRM
052857	UKN	IAD583	ROGER, CLIMB TO FL 310 AND
052920	UKN	IAD583	YOU CAN PROCEED DIRECT BIKIK IN COORDINATION WITH BAGDOGRA FROM LOTPU
052925	IAD583	UKN	-----BIKIK AND 310 (GRABLED)
052925	UKN	IAD583	AFFIRM CLEARED ONOTO 2A ARRIVAL ILS APPROACH RWY 19L-----(GRABLED)
054426	IGO797	UKN	WE ARE CLIMBING PASSING LEVEL 258
054426	UKN	IGO797	ROGER REPORT FINAL LEVEL REQUESTED
054426	IGO797	UKN	320 SIR
054437	UKN	IGO797	STAND BY DUE RECIPROCAL
054520	IAD583	UKN	REQUESTING DESCENT IAD583
054520	UKN	IAD583	STAND BY
054653	UKN	IGO797	STOP CLIMB AT FL290
054653	IGO797	UKN	STOP CLIMB AT 290 IGO797
054653	UKN	IAD583	DESCENT TO FL290
054653	IAD583	UKN	DESCENT 290 IAD583
054743	UKN	IAD588	TURN LEFT HEADING 090 SIR
054752	UKN	IAD583	TURN LEFT HEADING 090
054752	IAD583	UKN	LEFT 090
054752	UKN	IGO797	TURN LEFT HEADING 270
054708	IGO797	UKN	TURNING LEFT HEADING-----ZERO (GARBLED)
054804	UKN	IGO797	AFFIRM
054825	IGO797	UKN	TCAS RA
054825	UKN	IGO797	ROGER SIR
054825	IAD583	UKN	TCAS RA IAD583
054825	UKN	IAD583	ROGER
054858	IGO797	UKN	CLEAR OF CONFLICT
054858	UKN	IGO797	ROGER SIR
054903	IGO797	UKN	WE WILL REPO---RAISE RA REPORT SIR IGO797
054903	IGO797	UKN	ROGER SIR
054911	IAD583	UKN	REQUEST TAIL NO OF TRAFFIC

054911	UKN	IAD583	NOW PROCEED DIRECT TO CC205
054911	IAD583	UKN	CC205 IAD583
054949	IGO797	IAD583	IAD REQUEST YOUR CALL SIGN AGAIN
054953	IAD583	IGO797	IAD583, VTDEL, WHAT IS YOURS
054950	IGO797	IAD583	IAD583 , DEL COPIED WE ARE IGO797 , VTIHJ
055006	IAD583	IGO797	797 IHJ COPIED IAD583---(GRABLED)
055012	UKN	IAD583	DESCENT TO FL, STAND BY FOR DESCENT SIR AND PROCEED DIRECT CC20--
055012	IAD583	UKN	PROCEEDING DIRECT CC205 AND STANDING BY FOR DESCENT
055109	UKN	IGO797	CLIMB TO FL320 NOW
055109	IGO797	UKN	320, IGO797
055146	UKN	IAD583	DESCENT TO FL150 NOW
055146	IAD583	UKN	DESCENT 150 IAD583
055230	IAD583	UKN	HEADING AFTER CC205 IAD583
055243	UKN	IAD583	CONTACT RADAR 127.3
055243	IAD583	UKN	127.3 GOOD DAY IAD583
055243	UKN	IAD583	GOOD DAY
055335	IGO797	UKN	POSITIVE CONTACT WITH BAGDOGRA
055335	UKN		IGO788 CONFIRM?
055335	IGO797	UKN	IGO797
055335	UKN	IGO797	REPORT FOR DESCENT
055335	IGO797	UKN	WILCO
055430	IGO797	UKN	REQUESTING DESCENT
055430	UKN		STATION CALLING KOLKATA
055430	IGO797	UKN	IGO797
055430	UKN	IGO797	DESCENT TO FL250
055430	IGO797	UKN	DESCENT FL250 FOR IGO797
055728	UKN	IGO797	RADAR SERVICE TERMINATED FURTHER DESCENT BELOW 250 IN COORDINATION WITH BAGDOGRA. GOOD DAY
055728	IGO797	UKN	CHANGING OVER TO BAGDOGRA FOR IGO797. GOOD DAY.

1.10 Aerodrome Information

Netaji Subhash Chandra Bose International Airport (IATA: **CCU**, ICAO: **VECC**) is an international airport located in Dum Dum, West Bengal, India, serving the Kolkata metropolitan area. The air traffic services at NSCB International Airport are provided by AAI which includes Aerodrome Control service (ADC/SMC), Approach Control service (APP), Area Control Service (ACC), Terminal Approach Radar (TAR) and Route Surveillance Radar Service (RSR). NSCB International Airport has two parallel **runways** i.e. 01R/19L (11,900ft, 3,627m) and 01L/19R (9,240ft, 2,800m). As the longer one of the two, 01R/19L is generally used for take-offs and landings, and 01L/19R is used primarily as a taxiway. ATS are provided by AAI.

1.11 Flight Recorders

Both the aircraft were installed with Cockpit Voice Recorder (CVR) and Digital Flight Data Recorder (DFDR).

1.12 Wreckage and Impact Information

There was no damage to either of the aircraft.

1.13 Medical and Pathological Information

There was no reported adverse medical condition of the cockpit crew.

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

Both the aircraft were operated by a Scheduled Airlines. The Radar Controllers, RSR-North (Executive Controller & Planning Controller) were under the administrative control of Airports Authority of India which is responsible for Air Traffic Services at NSCB

International Airport, Kolkata including Route Radar Surveillance, Terminal Approach Radar, Area Control Service, Approach Control Service and Aerodrome Control Service.

1.18 Additional information

1.18.1 Traffic Alert and Collision Avoidance System (TCAS)

Both aircraft were equipped with TCAS, which detects potentially conflicting aircraft using secondary surveillance radar transponder signals and provides advice to the flight crews of the aircraft involved. The system's advice is rendered on 2 levels: via Traffic Advisory (TA) and Resolution Advisory (RA). A TA advises the flight crew of potential traffic conflicts, whereas an RA alerts the crew to an actual conflict and provides advice on maneuvers to avoid collision. Both TAs and RAs provide visual and audio alerts as follows: -

- TA provides information on proximate traffic and indicates the relative positions of intruding aircraft. TA is intended to assist flight crew in visual acquisition of conflicting traffic and to prepare pilots for the possibility of an RA.
- RA is divided into two categories: **preventative advisories**, instruct the pilot to maintain or avoid certain vertical speeds; and **corrective advisories**, instruct the pilot to deviate from the current flight path (e.g. "CLIMB" when the aircraft is in level flight).

A TCAS RA is based on a 5-second crew reaction time, unless the advisory is a reversal or there is an increase in strength of the original, in which case it is based on a reaction time of 2.5 seconds. Generally, there are 12 different TCAS RA annunciations, which use both aural commands and visual cues. The most common aural commands are "*climb, climb*" and "*descend, descend*."

The RA "*maintain vertical speed, crossing, maintain*" is a preventive RA: it instructs a flight crew to maintain their current vertical speed and indicates that the aircraft's own flight path will cross that of the intruder.

Aircraft equipped with TCAS, the system will coordinate their resolution advisories. The coordination ensures that complementary advisories are issued to each aircraft. The

crew should promptly but smoothly follow the advisory and never maneuver in the opposite direction.

Visual Display of Traffic and Resolution Advisories

The navigation setting on the Multi-Function Display (MFD) can be configured to show traffic in automatic (pop-up) mode or continuous mode. The automatic mode shows only TA and RA indications, while the continuous mode shows all aircraft traffic, whether or not those aircraft constitute a threat.

During an RA, the primary flight display shows the required rates of climb or descent on the instantaneous vertical speed indicator.

After the transponder is initially selected ON, the TCAS display on the MFD defaults to the automatic mode. To view traffic in continuous mode, the flight crew must press the TCAS button, select the range to 40 NM or below on the electronic flight information system control panel, and ensure that the navigation page is selected to ARC or MAP mode.

1.19 Useful and Effective Techniques

Nil

2. ANALYSIS

Air Asia Flight IAD583 maintaining FL310 and Indigo Flight IGO797, which was climbing to FL320 on a direct track to ONOTO were reciprocal on ATS route W69. IAD583 requested descent near ONOTO. The controller asked IGO797, about its assigned level which was confirmed by IGO797 as FL320. The controller then asked IGO797 to standby due reciprocal (IAD583) traffic. Thereafter, when IAD583 requested for descent the controller asked them to standby as IGO797 was climbing for FL320. IGO797 by that time was already climbing through FL283 and the controller asked them to stop climbing and maintain FL290. The IGO797 confirmed the same and continued maintaining FL290. The controller then instructed IAD583 to descend to FL290 and entered FL290 in data block

also. The Planning Controller also did not notice that the Executive Controller has assigned same level (FL290) to both the aircraft. As both the flights were on the same reciprocal route and were given same flight level, STCA was generated when both aircraft were 17.4 NM and 57 seconds to cross each other. IAD583 was descending passing FL309 and IGO797 had just reached FL290. Even after generation of STCA, there was no immediate corrective action taken by the controller as he got engrossed into analyzing the reason for STCA. Thereafter, on observing the data block for IAD583 he realized that he had given the same flight level (FL290) to IAD583 also. On observing the conflict he immediately instructed IAD583 to turn left heading 090 and instructed IGO797 to turn left heading 270. However, by that time there was breach of separation and both the aircraft received RA which was conveyed to the controller. Both the aircraft then followed RA procedures. Both the aircraft were clear of conflict when IAD583 was climbing past FL297 and IGO797 was descending through FL285.

The minimum separation recorded between IAD583 and IGO797 was:

- At 054822 UTC—5.8 NM horizontal and 200 feet vertical.
- At 054827 UTC—4.9 NM horizontal and 500 feet vertical.
- At 054840 UTC—2.8 horizontal and 800 feet vertical.

After clear of conflict, IAD583 was observed to have continued with the heading 120 which it changed after the instructions given by ATC during conflict with IGO797. Thereafter it entered into conflict with traffic BTN715 (Bhutan Air). On observing conflict, the Planning Controller (in co-ordination with Executive Controller) transmitted instruction to BTN715 to stop climbing and maintain FL270. Thereafter, both the aircraft continued normal navigation.

3. CONCLUSION

3.1 Findings

- Both aircraft Air Asia IAD583 Bagdogra to Kolkata and Indigo IGO797 from Kolkata to Bagdogra were serviceable and airworthy.
- The crew of both involved aircraft were qualified to operate the flight.

- The weather at the time of incident was fine and was not a contributory factor to the incident.
- Air Asia Flight IAD583 was maintaining FL310 and Indigo Flight IGO797, which was climbing to FL320 on a direct track to ONOTO were reciprocal on ATS route W69.
- The Executive Controller asked IGO797 to standby due reciprocal (IAD583) traffic as it was assigned FL320.
- When IAD583 requested for descent, the controller asked them to standby and observed that IGO797 had already passed FL283.
- The controller asked IGO797 to stop climbing and maintain FL290. The IGO797 confirmed the same and continued maintaining FL290.
- The controller then subsequently instructed IAD583 to descend FL290 and same was found entered on data block of IAD583.
- STCA was generated when both aircraft were 17.4 NM and 57 seconds to cross each other, when IAD583 was descending passing FL309 and IGO797 had just reached FL290.
- Even after generation of STCA, there was no immediate corrective action taken by the controller as he got engrossed into analyzing the reason for STCA.
- On observing the data block of IAD583 he realized that he had given the same flight level (FL290) to IAD583 also.
- The Planning Controller also did not notice that the Executive Controller has assigned same level (FL290) to both the aircraft.
- On observing the same the Executive Controller immediately instructed IAD583 to turn left heading 090 and instructed IGO797 to turn left heading 270.
- At 054825 UTC, there was breach of separation and both the aircraft received RA which was conveyed to the controller.
- At 054858 UTC, both the aircraft were clear of conflict when IAD583 was climbing past FL297 and IGO797 was descending through FL285.
- After clear of conflict with IGO797, IAD583 was observed to have entered into conflict with traffic BTN715 (Bhutan Air).

- On observing the conflict, the Planning Controller (in co-ordination with Executive Controller) transmitted instruction to BTN715 to stop climbing and maintain FL270. Thereafter, both the aircraft continued normal navigation.


3.2 Probable Cause


The breach of separation between the two aircraft occurred due to non-adherence of standard separation minima and inadequate surveillance.

4. SAFETY RECOMMENDATIONS

4.1 The Area Executive Controller may be given suitable corrective training covering surveillance & separation techniques and situational awareness.

4.2 Planning Controller may be given suitable corrective training on his charter of duties.


(K. Ramachandran)
Assistant Director, AAIB
Investigator


(Anil Tewari)
Director, AAIB
Investigator- In - Charge

Place: New Delhi

Date: 24 Sep 2019