

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 to apportion blame or liability.

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

ABBREVIATIONS

AAIB	Aircraft Accident Investigation Bureau
ACC	Area Control
ADC	Aerodrome Control
APP	Approach Control
ATC	Air Traffic Controller
ASR	Approach Control Surveillance Approach Radar
ATPL	Airline Transport Pilot License
CCW	Current Conflict Warning
CPDLC	Controller Pilot Data Link Communication
CPL	Commercial Pilot License
DFDR	Digital Flight Data Recorder
DME	Distance Measuring Equipment
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rule
NM	Nautical Miles
PCW	Predicted Conflict Warning
SMGCS	Surface Movement Guidance and Control System
TCAS RA	Traffic Collision Avoidance System- Resolution Advisories
TCAS TA	Traffic Collision Avoidance System- Traffic Advisories
UTC	Co-ordinated Universal Time
VHF	Very High Frequency
VOR	VHF Omnidirectional Range

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1.	Aircraft Type	AIRBUS A320	AIRBUS A320
2.	Nationality	INDIAN	INDIAN
3.	Registration and Call sign	VT-IFP, IGO779	VT-ITP, IGO6505
4.	Owner	INTERGLOBLE AVIATION LTD	
5.	Operator	INTERGLOBLE AVIATION LTD	
	Pilot – in –Command	ATPL HOLDER	ATPL HOLDER
6.	Extent of Injuries	NIL	NIL
	Co-Pilot	QUALIFIED ON TYPE	QUALIFIED ON TYPE
7.	Extent of Injuries	NIL	NIL
8.	Place of Incident	HAL BENGALURU AIRSPACE	
9.	Co-ordinates of Incident Site (Location)	NEAR WAYPOINT UGABA ON RADIAL 206 BIA VOR.	
10.	Last point of Departure	COIMBATORE	BENGALURU
11.	Intended place of Landing	SHAMSHABAD	COCHIN
12.	Date & Time of Incident	10/07/2018 AT 1728 UTC	
13.	Extent of Injuries	NIL	NIL
14.	Phase of Operation	ENROUTE	ENROUTE
15.	Type of Incident	AIRPROX	

(ALL TIMINGS IN THE REPORT ARE IN UTC)

SYNOPSIS

Serious Incident of breach of separation between two aircraft of M/s InterGlobe Airlines Ltd IGO779 (Type- A320, Registration- VT-IFP) from Coimbatore to Shamshabad and IGO6505 (Type- A320, Registration- VT-ITP) from Bengaluru to Cochin occurred in HAL Airspace on 10/07/2018.

IGO779 was climbing to FL360 for Shamshabad on route W43. IGO6505 was climbing to FL280 for Cochin and was on direct routing to CIB (VOR of Cochin). Initially when the controller gave climb to both aircraft, vertical separation between the two aircraft was more than 5000 Feet. But it was observed that IGO6505 was climbing at a rate of approx. 3000 feet per min, which reduced the required separation between IGO779 and IGO6505. At the time of incident, IGO779 was at FL273 and IGO6505 was at FL275. Both aircraft got RA and followed RA maneuvering. The minimum separation between the aircraft was 300 feet vertically and 4 NM lateral separation.

The occurrence was classified as a “Serious Incident” in accordance with the Aircraft (Investigation of Accidents and Incidents) Rules, 2017. DG, AAIB ordered an investigation into this occurrence vide Order AV.15020/05/2018-AAIB dated 12/07/2018. In accordance with the provisions of Annex 13, Initial notification of the occurrence was sent to ICAO on 13/07/2018.

A corrigendum was issued vide AAIB Order dated 28/05/2019 appointing Ms. Kunj Lata, Assistant Director as Investigator-in-Charge and Mr. Dinesh Kumar, Air Safety Officer as an Investigator to investigate into the cause of the incident.

1.FACTUAL INFORMATION

1.1HISTORY OF FLIGHT

On 10/07/2018, IGO779 was scheduled to operate a flight from Coimbatore to Shamshabad and was following ATS route W43. IGO6505 was scheduled to operate the flight from Bengaluru to Cochin and was following ATS route W118.

IGO779 came in contact with HAL Radar Controller at 1719 UTC. It was passing flight level 125 for FL150. Radar controller gave a climb to FL300. IGO6505 came in contact with HAL Radar controller at 1720 UTC. It was maintaining FL110. Radar controller gave climb to FL280 and instructed to proceed direct to reporting point APGUN.

At 1722 UTC, Radar controller gave climb to IGO779 to FL340 and further climb to FL360.

At 1724 UTC, Controller gave direct routing to CIB (Cochin VOR) to IGO6505 and a climb to FL320. Controller while giving climb did not give traffic information to both aircraft. After giving climb instruction to IGO6505, Radar Controller was busy with other traffic in his radar scope.

The vertical separation between the two involved aircraft was approximately 5000 feet when the radar controller gave climb to IGO6505. Desired separation reduced between IGO779 and IGO6505 as the climb rate of IGO6505 was higher than the prescribed rate in DGCA Operations Circular 7 of 2010. Statement of flight crew of IGO6505 states that “Being short sector decided to start preparing for approach early”.

TCAS RA occurred at 1728 UTC. IGO779 reported “IGO779 IS LEVELING OUT DUE TCAS RA 276” and enquired about the reciprocal traffic. ATC informed

“COMPANY IGO6505”. After IGO779 got TCAS RA and following RA maneuvering, Controller was giving avoiding clearance to aircraft.



CIRCLE SHOWING PLACE OF INCIDENT

FIGURE SHOWING INITIAL POSITION OF AIRCRAFT AND PLACE OF INCIDENT

The minimum separation between the aircraft was 300 feet vertically and 4 NM lateral separation.

1.2 INJURIES TO PERSONS

There were no injuries.

1.3 DAMAGE TO THE AIRCRAFT

NIL

1.4 OTHER DAMAGES

NIL

1.5 PERSONAL INFORMATION

1.5.1 Pilot-in-Command and Co-Pilot

Both Flight crew of the concerned flights held valid licenses and were qualified to operate the flight.

Details of Flight Crew of IGO6505:

Crew Details	License Details	Total Flying Hrs. at the time of incident	Whether involved in Incident	Last Flight prior to the incident flight
PIC	ATPL	11602:03	NIL	09.07.18/ BOM-DEL- BOM
FO	CPL	436:28	NIL	09.07.18/ BOM-DEL- BOM

Details of Flight Crew of IGO779:

Crew Details	License Details	Total Flying Hrs. at the time of incident	Whether involved in any Incident	Last Sectors prior to the incident flight
PIC	ATPL	5538:59	NIL	08.07.2018 HYD-MAA, MAA-PNQ, PNQ- MAA, MAA-HYD
FO	ATPL	2564:27	NIL	07.07 2018 HYD-BLR, BLR-COK, COK- BLR, BLR-HYD

NOTE: *Both Flight Crew of IGO6505 after occurrence of serious incident underwent session of counselling to emphasize the requirement of Operational circular 07 of 2010.*

1.5.2 ATC Controller

(a) The Radar Controller was rated for the following ATC units at HAL Airport:

- (i) Tower Control
- (ii) Approach Control
- (iii) Area Control
- (iv) Air Traffic Surveillance Services Course.
- (v) Radar Control

(b) The controller was not involved in any incident in past.

(c) Revalidation of Radar Rating:

The concerned Radar controller underwent OJT from 24th September 2018. After that a Comprehensive Assessment was done on 15 November 2018 with a remark “Considered to be ready for Assessment by board”. The Controller rating was reinstated after an external rating board on 19/01/2019.

NOTE: *Radar controller is performing his duties on Radar.*

1.6 AIRCRAFT INFORMATION

Airbus-A320 Aircraft

The Airbus A320 family consist of short to medium range, narrow, twin-engine passenger jet airlines. The A320s are also named A320ceo (current engine option) following the introduction of the A320neo (new engine option). The aircraft family can accommodate up to 236 passengers and has a range of 3,100 to 12,000 km (1,700 to 6,500 nm), depending on model.

1.8 METEOROLOGICAL INFORMATION

Weather was not a contributory factor.

1.9 AIDS TO NAVIGATION

All Automation Systems, VHF channel and ATS surveillance system at HAL Airport were reported to be working normal.

HAL airport is installed with DVOR (Digital VHF Omnidirectional Range) collocated with DME (Distance Measuring Equipment). Nomenclature assigned is BBG and is working on 115.5 Mhz frequency.

1.10 COMMUNICATION

HAL Tower and HAL Approach / Area service is being provided on 24hr basis, 365 days.

The concerned aircraft was in two way communication at all times with HAL radar on 127.7 Mhz frequency.

ATC Radar Tape transcript Radar on frequency 127.7 Mhz.

TIME (UTC)	CALL SIGN	TRANSMISSION
17:19:20	ATC	Roger
17:19:44	IGO779	HAL IGO779
17:19:49	ATC	IGO779 HAL Radar good evening
17:19:52	IGO779	Good evening. Passing level 125 for 150. Squawk 2760 released by Coimbatore
17:19:59	ATC	IGO779 Identified continue climb FL 300
17:20:03	IGO779	Continue climb FL300 IGO779
17:20:25	ATC	IGO779. Report estimate LATID
17:20:31	IGO779	Stand by
17:20:34	IGO779	IGO779 Estimate LATID time 1748
17:20:39	ATC	Roger

17:20:41	IGO6505	Radar IGO6505 Namaskar
17:20:45	ATC	IGO6505 HAL Radar Namaskar. Identified. Confirm at 110
17:20:50	IGO6505	I confirm IGO6505
17:20:52	ATC	IGO6505 proceed direct APGUN continue climb FL 280
17:20:58	IGO6505	Proceed direct to APGUN. Continue climb to FL 250, confirm IGO6505
17:21:04	ATC	FL 280
17:21:05	IGO6505	280 IGO6505
17:21:20	ATC	IGO779 Continue climb flight level 340
17:21:24	IGO779	Continue climb 340 IGO779
17:22:25	IGO6505	IGO6505 proceed direct CIB
17:22:32	ATC	proceed direct CIB IGO6505
17:24:51	ATC	IGO6505 Continue climb FL320
17:24:58	IGO6505	We are okay with F1280 IGO6505
17:25:02	ATC	Roger
17:27:33	ATC	IGO779 continue climb FL360
17:27:37	IGO779	Continue climb F1360 IGO779
AT 17:28:33 RA OCCURRED BETWEEN IGO779 AND IGO6505		
17:28:39	IGO779	IGO779 is leveling out due TCAS RA 276
17:28:47	ATC	IGO779 turn right heading 040
AFTER RA RECEIVED ATC GAVE AVOIDING ACTION		
17:28:53	IGO779	Stand by IGO779
17:29:14	IGO779	HAL radar IGO779 requesting details of Reciprocal Traffic
17:29:26	IGO779	Bangalore IGO779 Clear of conflict continuing climb to FL360, request details of reciprocal traffic
17:29:36	ATC	Reciprocal is IGO6505
17:29:40	IGO779	Come again IGO779
17:29:43	ATC	Company IGO6505
17:29:47	IGO779	Company IGO6505 IGO779
17:29:51	ATC	Affirm.
17:29:52	ATC	IGO 6505 contact Trivandrum 125.95 Good Day
17:29:52	IGO6505	125.95
17:34:31	ATC	IGO 779 contact Chennai Control 118.9
17:34:31	IGO779	Thank You Good Day

1.11 AERODROME INFORMATION

The Aerodrome is manned by Hindustan Aeronautical Ltd. Air Traffic Services are provided to all aircraft at HAL Airport, Bangalore and to associated airspace VO(R) 181(A), VO(R) 181(B), VO(R) 181(C) and VO(R) 181(D).

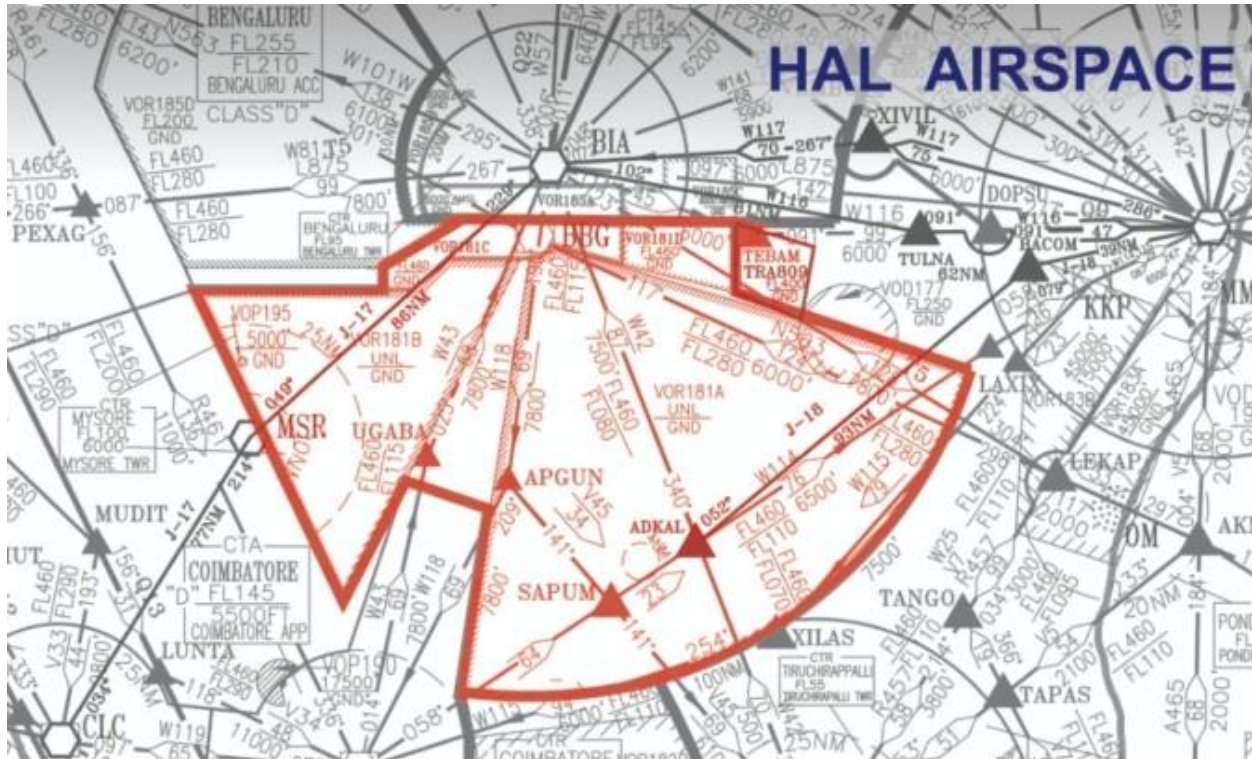


FIGURE SHOWING JURISDICTION OF HAL ATC CONTROL

Runway Orientation at HAL Airport:

Runway 09 / 27 = 3306 x 61 m

Communication systems installed at Airport:

Service Designation	Call Sign	Channel
PAR	HAL PRECISION	119.5 Mhz
APP	HAL APPROACH	127.7 Mhz
TWR	HAL TOWER	123.5 Mhz
ATIS	HAL INFORMATION	128.25 Mhz
RADAR	HAL RADAR	122.7 Mhz
RADAR	HAL RADAR	127.7 Mhz

During serious incident, both aircraft were in contact with HAL RADAR at 127.7 Mhz.

1.12 FLIGHT RECORDERS

CVR and DFDR were downloaded. The recorders revealed the following observations:

Cockpit Voice Recorder (CVR):

1. Radar Controller instructed IGO779 “climb to FL360” and IGO6505 “climb to F280”.
2. RA triggered on both flights with an instruction of “*level off*” to IGO779 and “*Climb*” to IGO6505.

Digital Flight Data Recorder (DFDR):

1. RA got triggered for IGO779 at 17:28:26 UTC. At that time altitude recorded was 27492 ft. Later it was clear of conflict at an altitude of 27572 ft at 17:28:59 UTC.
2. After 2 sec from IGO779, IGO6505 got RA. At the time of RA the altitude of IGO6505 was 27728 ft. Later it was clear of conflict at a level of 28416 ft at 17:28:58 UTC.
3. Rate of climb recorded by DFDR of IGO779 while the aircraft was climbing between FL260 and FL280 was approx. 1500 to 1600 feet per minute. The selected level observed was FL360.
4. Rate of Climb recorded by DFDR of IGO6505 while the aircraft was climbing between FL260 and FL280 was approx. 3000 feet per minute. The selected level observed was FL280.

1.13 WRECKAGE AND IMPACT INFORMATION

There was no damage.

1.14 MEDICAL AND PATHOLOGICAL INFORMATION

Flight crew of both flights had undergone alcohol test which was found satisfactory.

1.15 FIRE

There was no fire.

1.16 SURVIVAL ASPECTS

The incident was survivable.

1.17 TESTS AND RESEARCH

Nil

1.18 ORGANIZATIONAL AND MANAGEMENT INFORMATION

HAL BANAGALORE ATC:

Bangalore Airspace has two organizations which provides Air Traffic Services. They are Airports Authority of India (AAI) and Hindustan Aeronautics Limited (HAL).

HAL ATC Unit is under Airport Services Center Division, Hindustan Aeronautics Limited (Bangalore Complex). It provides services to all aircraft including its associated airspace VO(R) 181(A), VO(R) 181(B), VO(R) 181(C) and VO(R) 181(D).

Initially, the HAL airport was used for flying and testing for defense purposes. Subsequently, around 1980s, commercial flights also started using HAL Airport, Bangalore.

HAL ATC extends its services not only to test flying of military aircraft but also supports test flying and experimental flying and future prototype programs of national importance pertaining to various government agencies like ADA, ASTE of Indian Airforce, NAL, and CABS.

Air Traffic Controllers at HAL are trained from Training facility of AAI and Indian Air Force.

Approach Control Service is provided to the satellite airfields viz. Salem, Hosur, Mysore, Jakkur, Yelahanka and Bengaluru International Airport.

Area Control Services is provided to all civil and military flights over flying HAL Airspace and also to sector flying, test flying, demonstration flying, familiarization flying.

A HAL Tower and HAL Approach / Area service is being provided on 24hr basis, 365 days.

INTERGOBAL AVITION Ltd. - INDIGO:

Indigo is an Indian Airlines based in Gurugram. It has a fleet of Airbus A320 and ATR. Training facility of Indigo for flight crew is at Gurugram, Haryana.

1.19 ADDITIONAL INFORMATION

DGCA Operations Circular 7 of 2010

Para 6 of DGCA Operation Circular 7 of 2010 defines the maximum rate of climb or decent which the aircraft has to follow during its climbing or descending phase.

The Para is stated below:

“High Vertical Rate (HVR) Encounters - Operators should specify

procedures by which an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, may do so at a rate less than 8 m/sec (1 500 ft/min) throughout the last 300 m (1 000 ft) of climb or descent to the assigned level. These procedures are intended to avoid unnecessary airborne collision avoidance system (ACAS II) resolution advisories in aircraft at adjacent levels. Detailed information on HVR encounters and guidance material concerning the development of appropriate procedures is contained in Attachment II to this Part.*

Note: Certain Airspaces/ Terminal areas may require lower rates”.

In this case, IGO6505 exceeded rate of climb specified in the DGCA Circular. DFDR of IGO6505 reveals that the rate of climb between FL260 to FL280 was approximately 3000 feet per minute while IGO779 was climbing at a rate of 1500 to 1600 feet per minute. IGO6505 was climbing at a rate twice than the IGO779.

1.20 USEFUL OR EFFECTIVE INVESTIGATION TECHNIQUES

Nil

2.0 ANALYSIS

On 10/07/2018, Serious Incident occurred between two M/s InterGlobe Aviation Ltd (Indigo) aircraft in HAL Bangalore Airport at 1728 UTC.



FIGURE SHOWING IGO6505 CLIMBING PASSING FL243 AND IGO779 CLIMBING PASSING FL258.

At 17:22:25 UTC, IGO6505 was instructed to proceed direct to CIB (Cochin VOR). Statement of flight crew of IGO6505 states that “*Being short sector decided to start preparing for approach early*”.

After giving clearance to IGO6505, controller was busy with other traffic in his jurisdiction. Since the time controller gave climb to both involved aircraft, the vertical separation was more than 5000 feet. Controller did not monitor the rate of climb and the level passing. It appears that the Controller presumed that the required separation existed between the aircrafts and did not observe that IGO6505 was approaching towards IGO779 at faster rate.

Rate of climb of IGO779 was approximately 1500 to 1600 feet per minute while Rate of climb of IGO6505 was approximately 3000 feet per minute. Rate of

climb of IGO6505 was more than the prescribed rate due to which the vertical separation reduced.

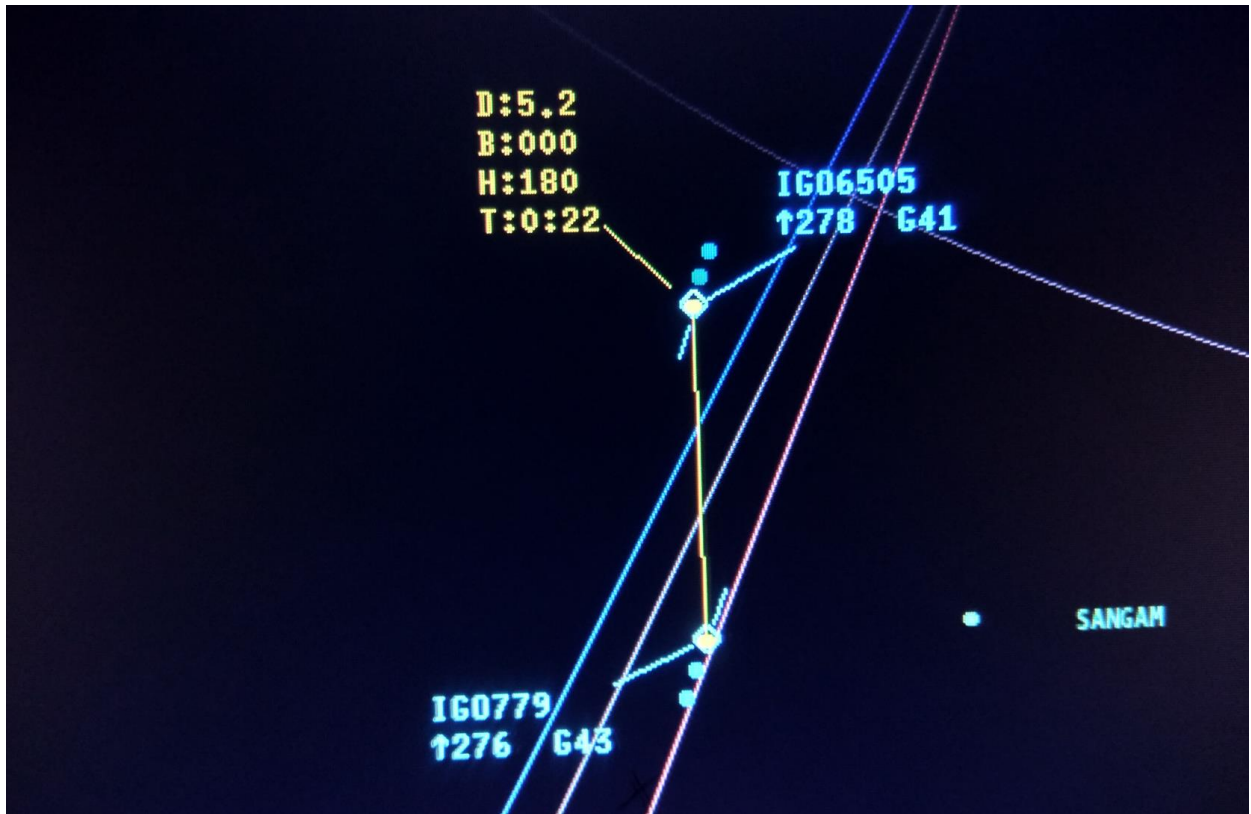


FIGURE SHOWING REDUCE IN SEPARATION MINIMA AND WITHIN 22 SEC THE SEPARATION WILL BE ZERO.

By the time controller observed that the separation is breaching, IGO779 reported TCAS RA. At 1728 UTC, IGO779 reported “IGO779 IS LEVELING OUT DUE TCAS RA 276”. After IGO779 informed ATC about TCAS RA, ATC gave avoiding heading. Which is also not as per the laid down ATS procedure. If the aircraft is following RA maneuvering, as per standard procedure ATC shall not give any instruction to the aircraft. Once the aircraft is clear of RA and reported “Clear of Conflict”, then only ATC can give further instruction. There was no conversation with IGO6505 after conflict. At 1729 UTC, ATC changed over IGO6505 to Trivandrum ATC unit. At 1734 UTC, ATC changed over IGO779 to Chennai

Control.

As per DFDR, RA triggered on flight IGO779 at the recorded altitude of 27492 ft. After 2 sec, RA triggered on flight IGO6505 when the recorded altitude shows 27728 ft. On flight IGO779, level off RA was triggered and on flight IGO6505 climb RA was triggered.

3. CONCLUSIONS

3.1 FINDINGS

- i. Radar Controller instructed IGO779 to climb to FL360 and other company aircraft IGO6505 to climb to F280.
- ii. After giving climb to both aircraft, Radar Controller was busy with other traffic.
- iii. RA triggered on both flights with an instruction of “*level off*” to IGO779 and “Climb” to IGO6505.
- iv. While climbing to assigned FL280, IGO6505 maintained a rate of climb 3000 feet per minute which was a violation of company SOPs and DGCA CAR guidelines.
- v. HAL Bengaluru Radar Controller gave traffic avoiding heading to IGO779 at TCAS warning which is not as per the laid down ATS procedures.
- vi. Radar Controller missed to pass information to both aircraft regarding nearby traffic.
- vii. The minimum separation between both aircraft reduced to 300 feet vertically and 4 NM laterally.

3.2 PROBABLE CAUSE

- a. Crew of IGO6505 maintained a high rate of climb, which was also the violation of DGCA Operations Circular 7 of 2010, while attaining Flight Level assigned by ATC.

Contributory Factor

- b. Lack of surveillance by Radar controller.

4. SAFETY RECOMMENDATIONS

NIL, as the training and counselling sessions have been imparted to the flight crew and radar controller and they have been reinstated on their duties by their respective organizations.



Kunj Lata
Investigator In-Charge



Dinesh Kumar
Investigator