



सत्यमेव जयते

**AIRCRAFT ACCIDENT INVESTIGATION BUREAU
GOVERNMENT OF INDIA**

**FINAL REPORT ON SERIOUS INCIDENT INVOLVING
AIRPROX THAT OCCURRED IN DELHI AREA
BETWEEN NCR840, KLM875 AND EVA061
ON 22.12.2018**

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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 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.

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**Final Report on Serious Incident involving Airprox that occurred in Delhi Area
between NCR840, KLM875 and EVA061 on 22.12.2018**

| | | | | |
|-----|-------------------------------|--|---------------------------|---------------------------|
| 1. | Aircraft Type | NCR840, B-744 | KLM875, B77W | EVA061, B77W |
| 2. | Nationality | U.S.A | Netherlands | Taiwan |
| 3. | Registration | N919CA | PHBVB | B16716 |
| 4. | Owner | National Airlines | KLM Royal Dutch Airlines | Information Not Available |
| 5. | Operator | National Airlines | KLM Royal Dutch Airlines | EVA Airlines |
| 6. | Pilot – in –Command | ATPL Holder | Information Not Available | |
| | Extent of Injuries | NIL | NIL | NIL |
| 7. | Co-Pilot | ATPL Holder | Information Not Available | |
| | Extent of Injuries | NIL | NIL | NIL |
| 8. | Place of Incident | DELHI AREA (EAST) | | |
| 9. | Co-ordinates of Incident Site | On ATS route M890 approximately 70NM North-East of Delhi VOR-DME (DPN) | | |
| 10. | Last point of Departure | Bagram | Amsterdam | Suvarnabhumi |
| 11. | Intended place of Landing | Hongkong | Suvarnabhumi | Vienna |
| 12. | Date & Time of Incident | 22 December 2018, 2235 UTC | | |
| 13. | Passengers on Board | Information Not Available | | |
| 14. | Extent of Injuries | NIL | | |
| 15. | Crew on Board | Information Not Available | | |
| 16. | Extent of Injuries | NIL | | |
| 17. | Phase of Operation | ENROUTE | | |
| 18. | Type of Incident: | SERIOUS | | |

(ALL TIMINGS IN THE REPORT ARE IN UTC)

1. FACTUAL INFORMATION

1.1 History of Flight

On 22.12.2018, NCR840 was scheduled to operate a flight from Bagram to Hong Kong. NCR840 was following the ATS route M890 which is a "RNP 10" route from LLK to Solum. At 23:27:35 UTC, NCR840 established VHF contact with ACC(East), while maintaining FL310 on frequency 120.9 MHz, after it was released from ACC (West) frequency of 124.55 MHz.

KLM875 was operating a flight from Amsterdam to Suvarnabhumi. KLM875 was also on ATS route M890 and was in the same direction as NCR840. KLM875 was maintaining FL330 and had established VHF contact with ACC(East) at 23:28:20 UTC. Controller had instructed KLM875 to report at JAL-VOR.

EVA061 was reciprocal traffic to NCR840 and KLM875 on Route M890. It was operating flight from Bangkok to Vienna and maintaining FL320. At 23:32:40 UTC, NCR840 requested ACC (East) for climb to FL 390. Controller informed NCR840 "LEVEL AVAILABLE THREE FIVE ZERO". NCR Acknowledged this transmission and read back "ROGER THREE FIVE ZERO FOR NCR ...". At that time EVA061 was about 40NM from it at FL320 and, KLM875 was at FL330 just above it. Thereafter, controller responded "STANDBY FOR HIGHER".

The crew in NCR840, as per their statement, had just swapped seats and F/O 2 had replaced PIC on LH Seat when F/O 1, who was at controls, initiated climb leaving FL310 for FL350. The PIC who had gone to cabin for some time came back to the observer seat in cockpit and observed a converging aircraft. He instructed F/O 1 and F/O 2 to descend and turn left. Since PIC felt that aircraft response was slower than expected, he reached out from the right-hand observer seat and disconnected the auto throttle and autopilot, while simultaneously reducing thrust and initiating a left descending turn. During this maneuver, the aircraft reportedly encountered other aircraft's wake turbulence. The PIC elected to level off at FL 325 as he believed that altitude would keep the aircraft clear of any traffic.

At 23:33:28 UTC, a 'Predicted Conflict Warning (PCW)' between EVA061 and NCR840 was generated by the ATS automation system, which remained active for about 16 seconds. At 23:33:32 UTC, ATC instructed NCR840 to turn to its left, heading 090°. At 23:33:39 UTC, a Predicted Conflict Warning (PCW) between KLM875 and NCR840 was also generated which remained active for about 11 seconds.

At 233340 UTC, ATC instructed EVA061 to turn to its left, heading 270°, but EVA061 did not acknowledge the call. At 23:33:50, a Current Conflict Warning (CCW) was generated between NCR840 and KLM875 which remained active for 2 minutes and 14 seconds. CCW ceased when standard radar separation of 10 NM was re-established.

Only at 23:34:05, UTC EVA061 had acknowledged and acted as per the repeated transmission of radar controller to turn left on (heading 270°). At 23:34:25 UTC, NCR840 was also instructed again to turn left on heading 090° and to descend to FL320. Transmission was acknowledged by the aircraft. At 23:35:01 UTC, a Current Conflict Warning (CCW) was generated between NCR840 and EVA061 which remained active for about 34 seconds. CCW ceased when standard lateral radar separation of 10 NM was re-established between EVA061 & NCR840.

The standard lateral and vertical separation of 10NM and 1000 feet respectively was breached and reduced to 5.87NM and 600 feet respectively between the NCR840 and EVA061 and, 1.84 NM and zero feet respectively between the NCR840 and KLM875. However, none of the aircraft reported getting any TCAS advisory to ATC.

1.2 Injuries to persons.

| INJURIES | CREW | PASSENGERS | OTHERS |
|-----------------|-------------|-------------------|---------------|
| FATAL | Nil | Nil | Nil |
| SERIOUS | Nil | Nil | Nil |

1.3 Damage to the aircraft.

NIL

1.4 Other damages.

NIL

1.5 Personnel Information.

1.5.1 Pilot-in Command.

1.5.1.1 EVA061.

Details not available.

1.5.1.2 KLM875.

Details not available.

1.5.1.3 NCR840.

| | |
|---|---|
| Date of Birth | : 06 MAR 1964 |
| Nationality | : United States of America |
| License | : ATPL |
| Date of Issue | : 14 JUL 2018, valid until revoked |
| Class I Medical Valid up to | : 31 JUL 2019 |
| Date of issue FRTOL License | : 01 DEC 1997, valid until revoked |
| Endorsements as PIC | : B-737; B-747; B-747-400; B-777; G-1159; G-IV; LR-60; LR-JET; MD-11 |
| Total flying experience | : 16,056 Hrs |
| Total flying experience on type | : 2,746 Hrs |
| Last Flown on type | : 20 DEC 2018 |
| Total flying experience during last 30 days | : 46:10 Hrs |
| Total flying experience during last 24 Hours | : 07:23 Hrs |
| Rest period before flight | : 10 Hrs |
| Whether involved in Accident/Incident earlier | : No |
| Details of English Language Proficiency | : ENGLISH PROFICIENT per License |

1.5.2 Co-Pilot

1.5.2.1 EVA061.

Details not available.

1.5.2.2 KLM875.

Details not available.

1.5.2.3 NCR840.

Co-Pilot 1

Date of Birth : 21 JUL 1965
Nationality : United States of America
License : ATPL
Date of Issue : 15 OCT 2018, valid until revoked
Date of Class I Med. Exam. : 31 DEC 2018
Class I Medical Valid up to : 30 JUN 2019
Date of issue FRTOL License : 02 MAR 2017, valid until revoked
Endorsements as PIC : B-737; B-747-400; CL-65
Total flying experience : 3,681 Hrs
Total flying experience on type : 102 Hrs
Last Flown on type : 18 DEC 2018
Total flying experience during last 30 days : 48:35 Hrs
Total flying experience during last 24 Hours : 00:00 Hrs
Rest period before flight : 27:30 Hrs
Whether involved in Accident/Incident earlier : No
Details of English Language Proficiency : ENGLISH PROFICIENT per License

Co-Pilot 2

Date of Birth : 08 AUG 1989
Nationality : United States of America
License : ATPL
Date of Issue : 05 MAR 2018, valid until revoked
Class I Medical Valid up to : 31 DEC 2019
Date of issue FRTOL License : 23 JAN 2018, valid until revoked
Endorsements as PIC : B-747-400; DC-9
Total flying experience : 3176 Hrs
Total flying experience on type : 617 Hrs
Last Flown on type : 20 DEC 2018
Total flying experience during last 30 days : 21:05 Hrs
Total flying experience during last 24 Hours : 07:23 Hrs
Rest period before flight : 10 Hrs
Whether involved in Accident/Incident earlier : No
Details of English Language Proficiency : ENGLISH PROFICIENT per License

1.5.3 Air Traffic Controller.

| Rating Held | Date of Rating |
|-----------------------------|----------------|
| AREA CONROL SURVEILLANCE | 03.05.2018 |
| ADS / CPDLC | 21.09.2012 |
| AREA CONROL PROCEDURAL /FIC | 16.03.2012 |
| ADC / SMC / ASMGCS | 09.03.2009 |

On day of incident, Air Traffic controller took over duty at 2130 UTC. As per policy laid down by ANS provider, the duty cycle cannot be more than two hours for ATCOs. However, during the period 1730 UTC to 2330 UTC (2300 IST to 0600 IST), the operational duty can extend up to four hours. The duty time of controller was within the operational duty limitation.

1.6 Aircraft Information.

1.6.1 EVA061.

Details not available

1.6.2 KLM875.

| | |
|----------------------------|-----------------------------|
| Aircraft Model | B777-300ER |
| Aircraft S. No. | 36145 |
| Year of Manufacturer | 2008 |
| Name of Owner | KLM Royal Dutch Airlines |
| C of R | 7205 Issue date 19 Dec 2008 |
| C of A | 7205 Issue date 17 Feb 2009 |
| Category | Large Aeroplane |
| C of A Validity | Unlimited |
| Any MEL/MMEL/Deferred Snag | n/a |

1.6.3 NCR840.

| | |
|----------------------------|---|
| Aircraft Model | B-747-428 BCF |
| Aircraft S. No. | 25302 |
| Year of Manufacturer | OCT 1991 |
| Name of Owner | WELLS FARGOTRUST CO NA TRUSTEE |
| C of R | N919CA |
| C of A | DAR-700794-SW |
| Category | TRANSPORT |
| C of A Validity | 31 OCT 2020 |
| Any MEL/MMEL/Deferred Snag | M25-57-0102; M25-57-0102; M28-21-0105; M31-31-0201; M32-11-0101; M36-12-0201; M74-00-0101 |

1.7 Meteorological information.

Not Available.

1.8 Aids to navigation.

VOR DME and NDB are installed enroute, which give the direction and distance from the facilities. Boeing family is equipped with all modern equipment on board for navigation purposes.

1.9 Communication.

Two-way communication was maintained between aircraft and ATC. No communication failure was reported, however, there was delay in acknowledgement by EVA061.

| TIME UTC (HHMMSS) | UNIT | TRANSMISSIONS |
|-------------------|--------|--|
| 232728-232738 | NCR840 | DELHI NATIONAL CARGO EIGHT FOUR ZERO WITH YOU, FLIGHT LEVEL THREE ONE ZERO |
| 232814-232834 | KLM875 | DELHI CONTROL KLM EIGHT SEVEN FIVE FLIGHT LEVEL THREE THREE ZERO ESTIMATING 'LKN' TWO THREE FIVE FOUR. |
| 233234-233245 | NCR840 | DELHI CONTROL NATIONAL CARGO EIGHT FOUR ZERO IS REQUESTING THREE NINER ZERO. |
| | RADAR | STANDBY. |
| 233256-233310 | RADAR | NATIONAL CARGO EIGHT FOUR ZERO LEVEL AVAILABLE THREE FIVE ZERO. |
| | NCR840 | ROGER THREE FIVE ZERO FOR NATIONAL CARGO THREE ZERO.... THREE FOUR ZERO. |
| | RADAR | STANDBY FOR HIGHER. |
| | NCR840 | STANDING BY NATIONAL CARGO EIGHT FOUR ZERO. |
| 233332-233344 | RADAR | NATIONAL CARGO EIGHT FOUR ZERO TURN LEFT HEADING ZERO NINE ZERO. |
| | NCR840 | LEFT HEADING ZERO NINER ZERO NATIONAL CARGO EIGHT FOUR ZERO. |
| | RADAR | EVA ZERO SIX ONE TURN LEFT HEADING TWO SEVEN ZERO. |
| 233348-233349 | RADAR | EVA ZERO SIX ONE RADAR. |
| 233354-233411 | RADAR | EVA ZERO SIX ONE DELHI RADAR. |
| | EVA061 | EVA ZERO SIX ONE GO AHEAD. |
| | RADAR | LEFT HEADING TWO SEVEN ZERO IMMEDIATELY DUE TRAFFIC. |
| | EVA061 | LEFT HEADING TWO SEVEN ZERO EVA ZERO SIX ONE. |
| | RADAR | NATIONAL CARGO EIGHT FOUR ZERO TURN LEFT HEADING ZERO NINER ZERO IMMEDIATELY. |
| 233417-233418 | RADAR | NATIONAL CARGO EIGHT FOUR ZERO RADAR. |

| | | |
|---------------|--------|---|
| 233421-233453 | RADAR | NATIONAL CARGO EIGHT FOUR ZERO RADAR TURN LEFT HEADING ZERO NINER ZERO STOP CLIMB AT FLIGHT LEVEL THREE TWO ZERO. DESCEND LEVEL THREE TWO ZERO. |
| | NCR840 | ROGER THREE TWO ZERO LEFT ZERO NINER ZERO NATIONAL CARGO EIGHT FOUR ZERO. |
| | RADAR | AFFIRM DESCEND TO FLIGHT LEVEL THREE TWO ZERO. TURN LEFT HEADING ZERO NINER ZERO. |
| | NCR840 | RIGHT, THREE TWO ZERO, ZERO NINER ZERO NATIONAL CARGO EIGHT FOUR ZERO. |
| | RADAR | EVA ZERO SIX ONE TURN LEFT HEADING TWO SEVEN ZERO IMME...IMMEDIATELY. |
| | EVA061 | EVA ZERO SIX ONE WE ARE TURNING LEFT HEADING TWO SEVEN ZERO. |
| | RADAR | IMMEDIATELY, AFFIRM DUE TRAFFIC. |
| | EVA061 | EVA ZERO SIX ONE COPIED. |

1.10 Aerodrome Information.

The concerned flights were over flying Indian Airspace.

1.11 Flight recorders.

Details not available

1.12 Wreckage and impact information.

NIL

1.13 Medical and pathological Information.

NIL

1.14 Fire.

NIL

1.15 Survival aspects.

Incident was survivable

1.16 Tests and research.

NIL

1.17 Organizational and Management Information.

ANS Services in the Indian airspace is provided by Airport Authority of India (AAI). AAI has issued Manual of Air Traffic Services (MATS) for standardization and quality assurance in every sub-system of Air Traffic System, while maintaining harmony with the ICAO Standards and Recommended Practices.

Para 3.21.3 of MATS Part 1, lays down procedure for preservation of records for investigation purpose in case of accident and is quoted below.

"3.21.3 Preservation of Records

3.21.3.1 Immediately following an aircraft accident all documents (viz. log book, flight progress strips, meteorological reports/forecasts etc.) and recordings (viz. VHF/Radio transmissions, intercom, Radar recording, telephone communications etc.) relating to the accident shall be preserved for investigation purpose.

3.21.3.2 All ATC/CNS documents relating to the aircraft accident shall be segregated sealed and shall be handed over to DGCA Officers who shall determine the adequacy of action as deemed appropriate and may seal any other documents etc. pertinent to the investigation of the accident as any of the material could be of use to the investigating authority.

3.21.3.3 Such records shall not be disclosed or made available to anybody for purposes other than accident investigation."

Airport Authority, however, failed to preserve the recordings in interactive mode from Radar after the incident.

Chapter 12 of MATS lays the standard phraseologies to be used by the Air Traffic Controllers. As per Para 12.13.3, Standard phraseology shall be used in all situations for which it has been specified. Only when standardized phraseology cannot serve an intended transmission, plain language shall be used. It further gives examples for use of term "STANDBY" which is quoted from MATS as follows: -

"As it is impossible to issue specific guidelines for all situations, the controller should his/her language skill to transmit in plain language which best describes his/her intentions. For example:

- a) "**STANDBY FOR FL360**" is to be avoided and only "**STANDBY**" should be used.*
- c) "**STANDBY FOR DEPARTURE**" is to be avoided and only "**STANDBY**" or "**HOLD POSITION**" should be used.*
- d) "**STANDBY TO CROSS RUNWAY**" is to be avoided and only "**STANDBY**" or "**HOLD POSITION**" or "**HOLD AT HOLDING POINT**" should be used*

1.18 Additional Information.

1.18.1 Flight Tracks.

Flight Tracks were plotted using data from the Delhi Radar. The tracks can be seen in the figure below: -

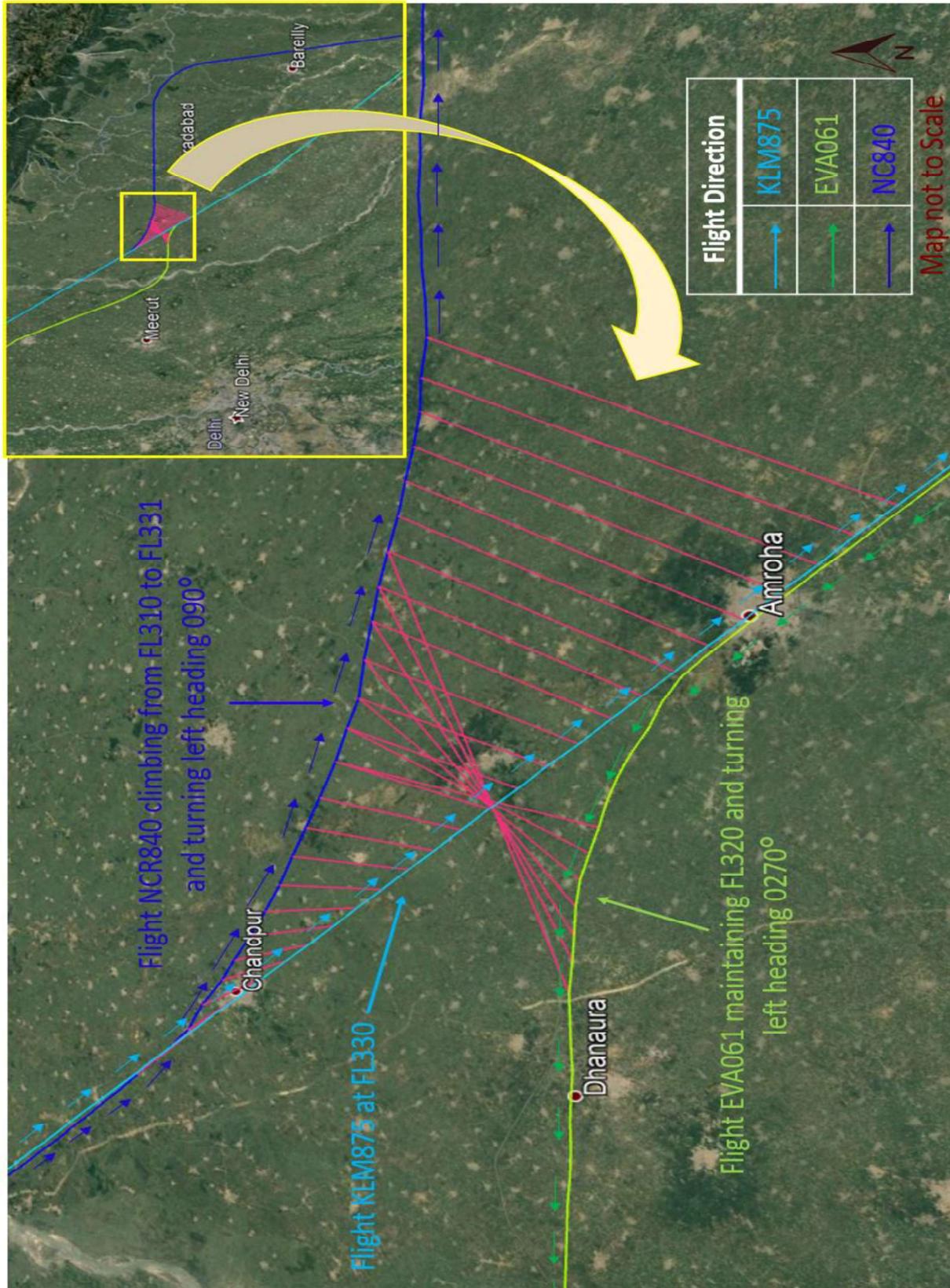


Figure 1: Flight Track superimposed on map.

The Lateral Separation between NCR840 and KLM875 at 23:34:19 UTC can be seen as 1.84 Nm while Vertical Separation was 0 Feet, in the Figure 2 below: -

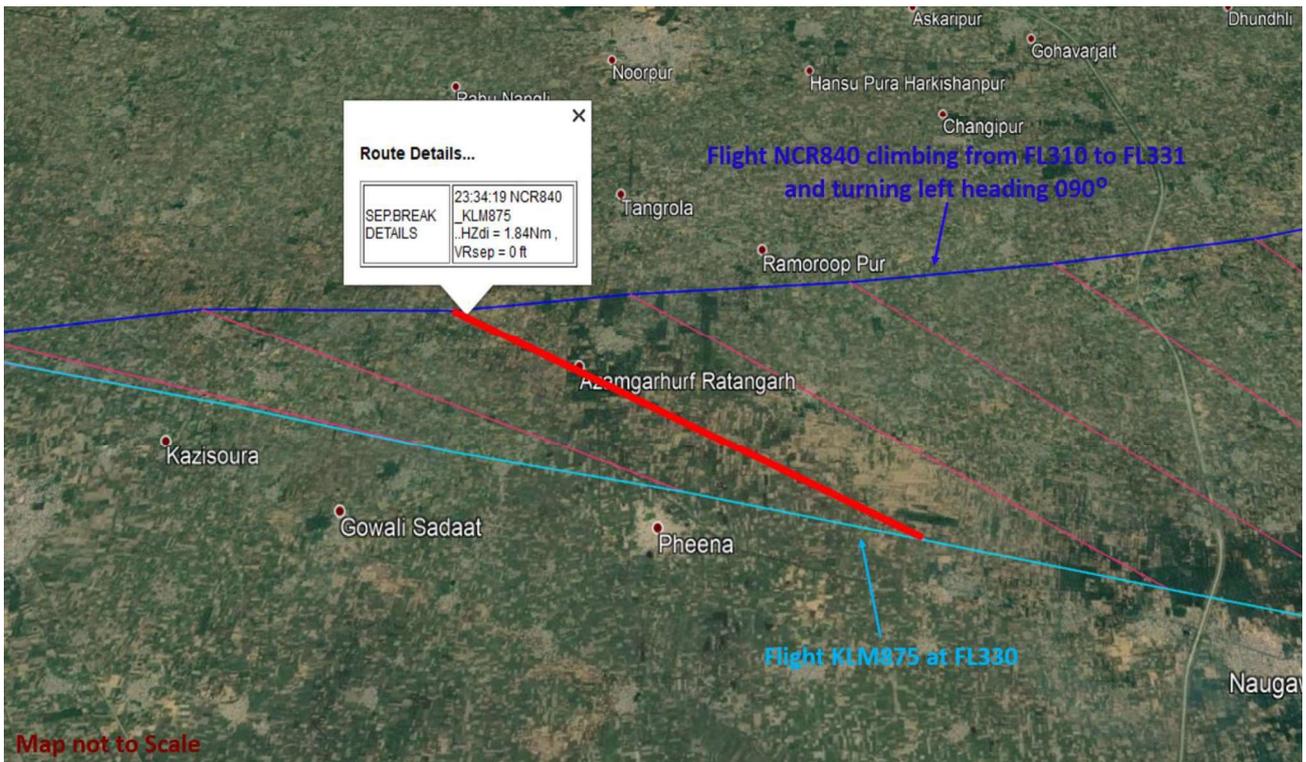


Figure 2: Separation between NCR840 and KLM875

The Lateral Separation between NCR840 and EVA061 at 23:35:09 UTC can be seen as 5.87 Nm while Vertical Separation was 600 Feet, in the Figure 3 below: -

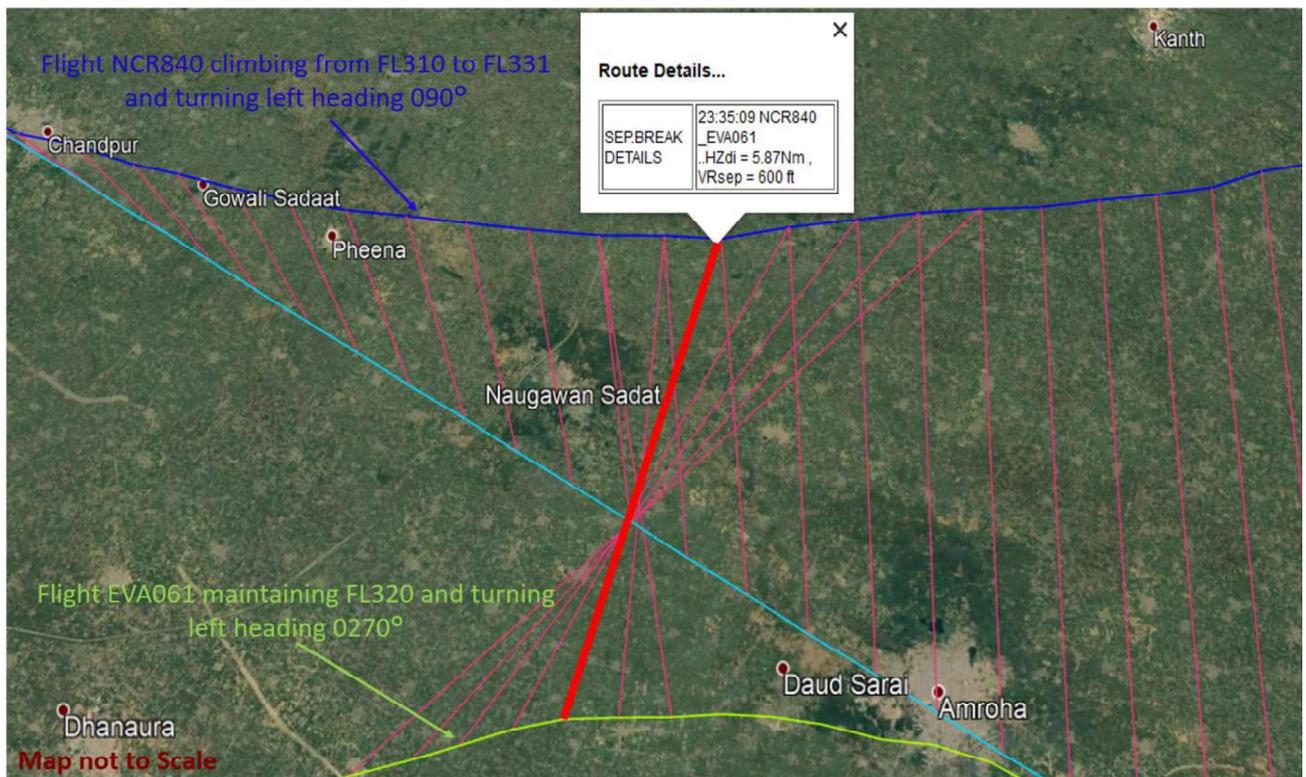


Figure 3: Separation between NCR840 and KLM875

1.18.2 Radar Snapshots.

The radar snapshots for the incident were obtained from Delhi ATC and are shown in the trailing figures.

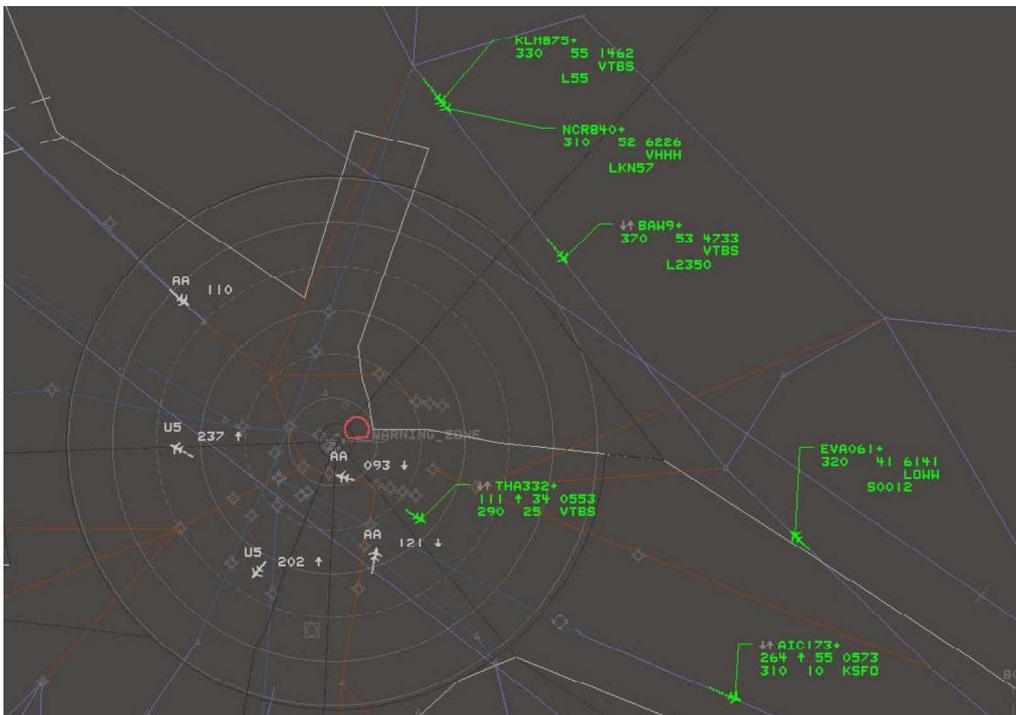


Figure 4: 23:27:11 UTC

The radar snapshot of time 23:27:11 UTC and 23:32:41 UTC shown in Figure 4 and 5, shows NCR840 maintaining FL310 and KLM875 maintaining FL330. EVA061 is maintaining FL320 flying in reciprocal direction to NCR840 and KLM875.

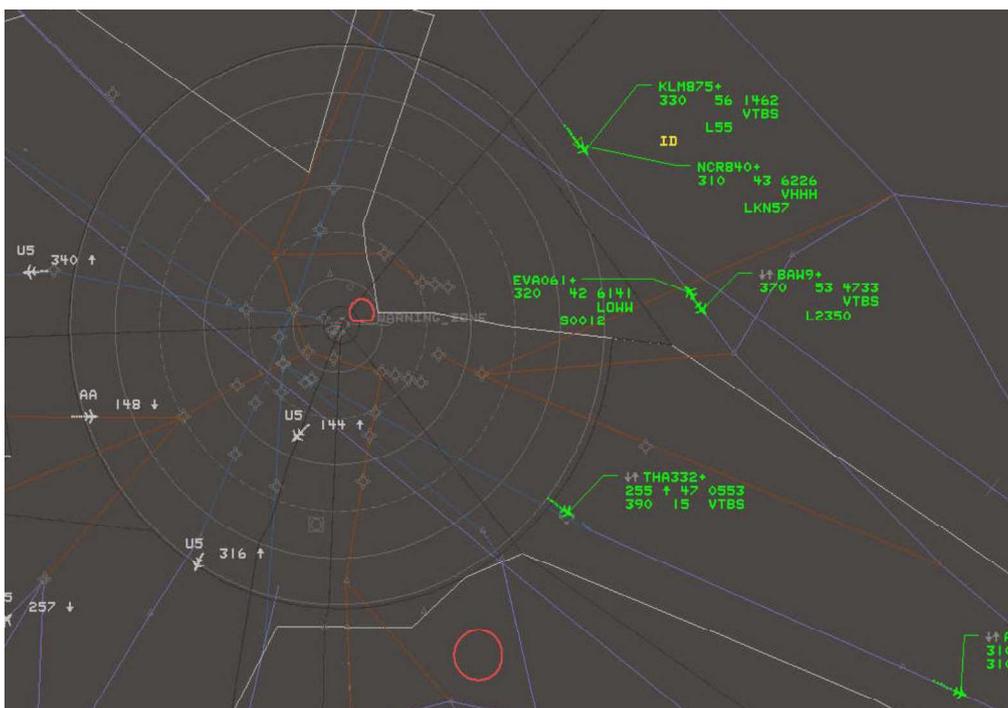


Figure 5: 23:32:41 UTC

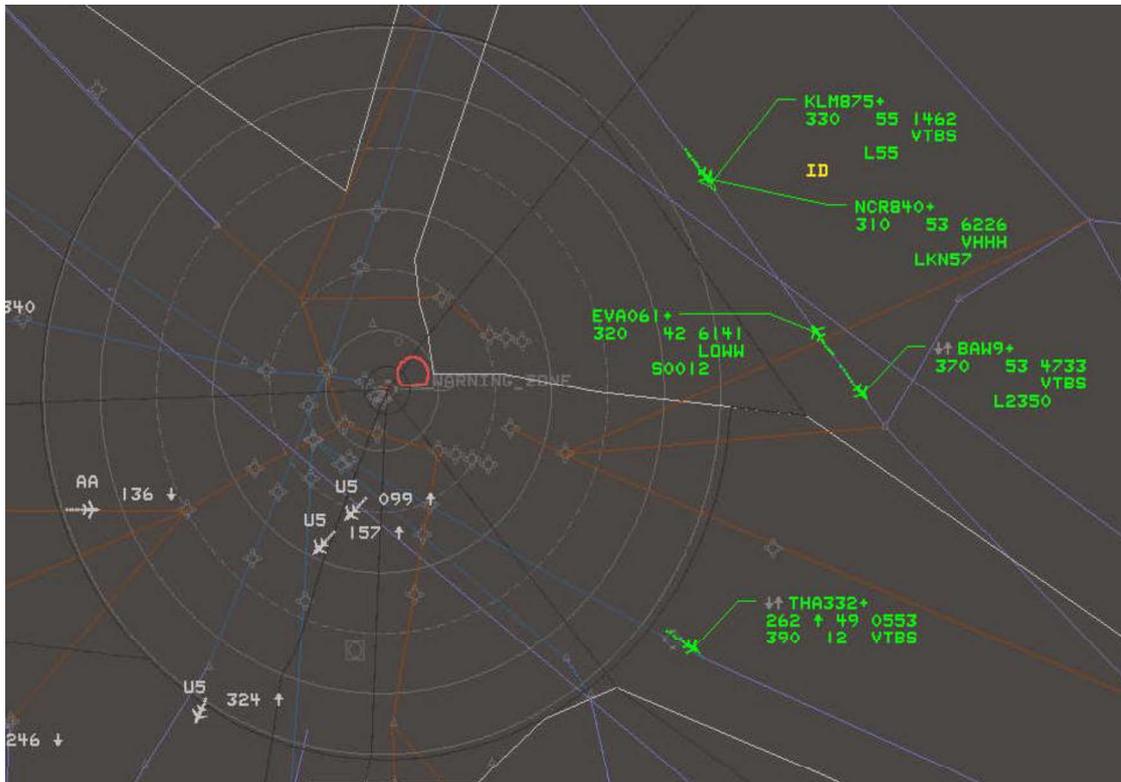


Figure 6: 23:33:12 UTC

At 23:33:12 UTC, KLM875 was just above NCR840 at FL 330 and FL310 respectively, as per the radar snapshot shown in Figure 6.

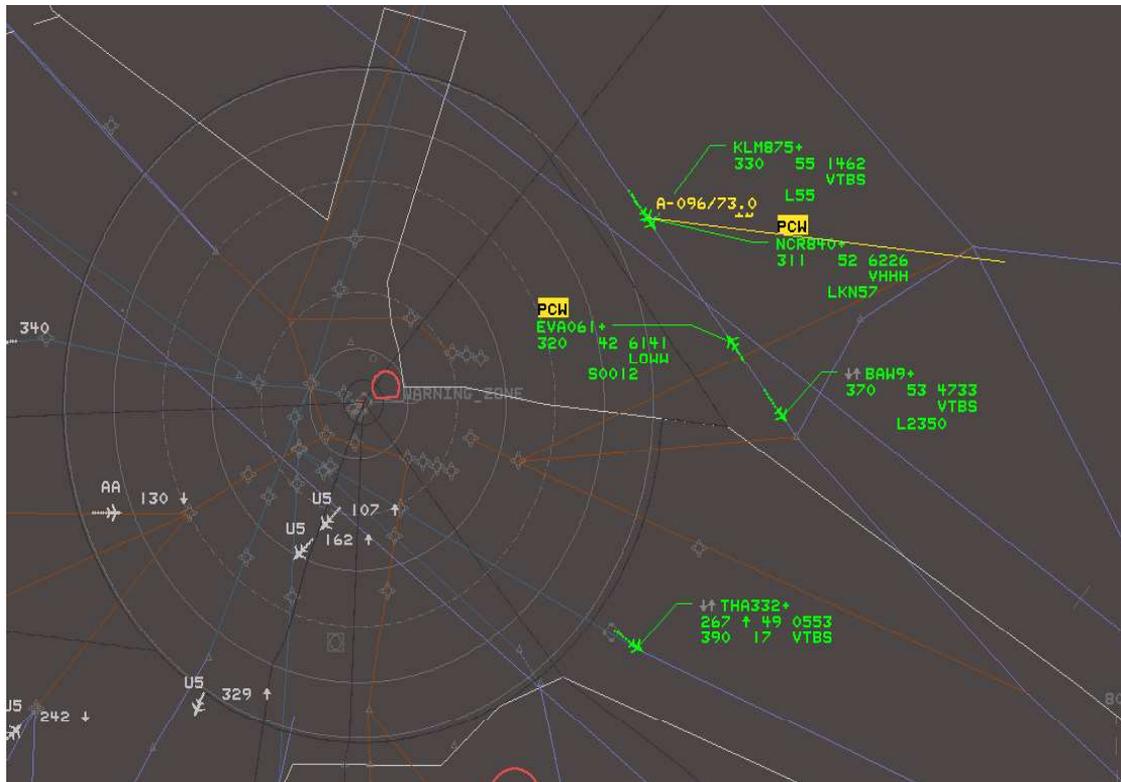


Figure 7: 23:33:28 UTC

In radar snapshot of time 23:33:28 UTC shown in Figure 7, NCR840 can be seen commencing climb. PCW is generated between NCR840 and EVA061.

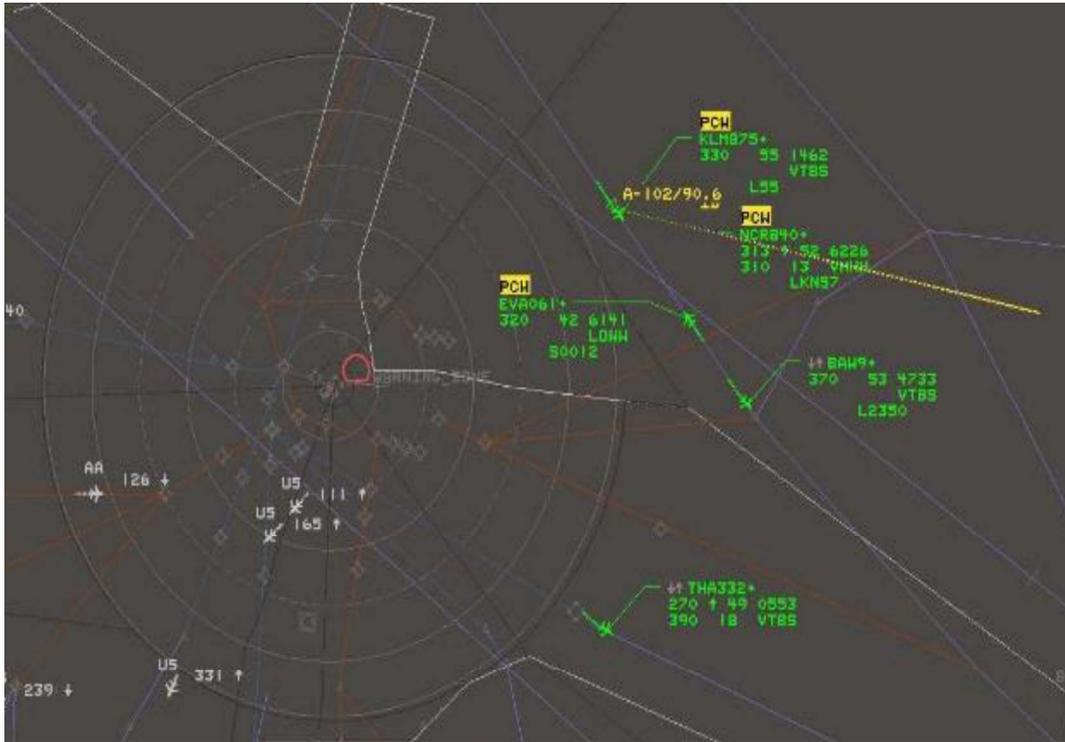


Figure 8: 23:33:38 UTC

In radar snapshot of time 23:33:38 UTC shown in Figure 8, NCR840 can be seen as climbing and having reached FL313. PCW is also seen generated between NCR840 and KLM875.

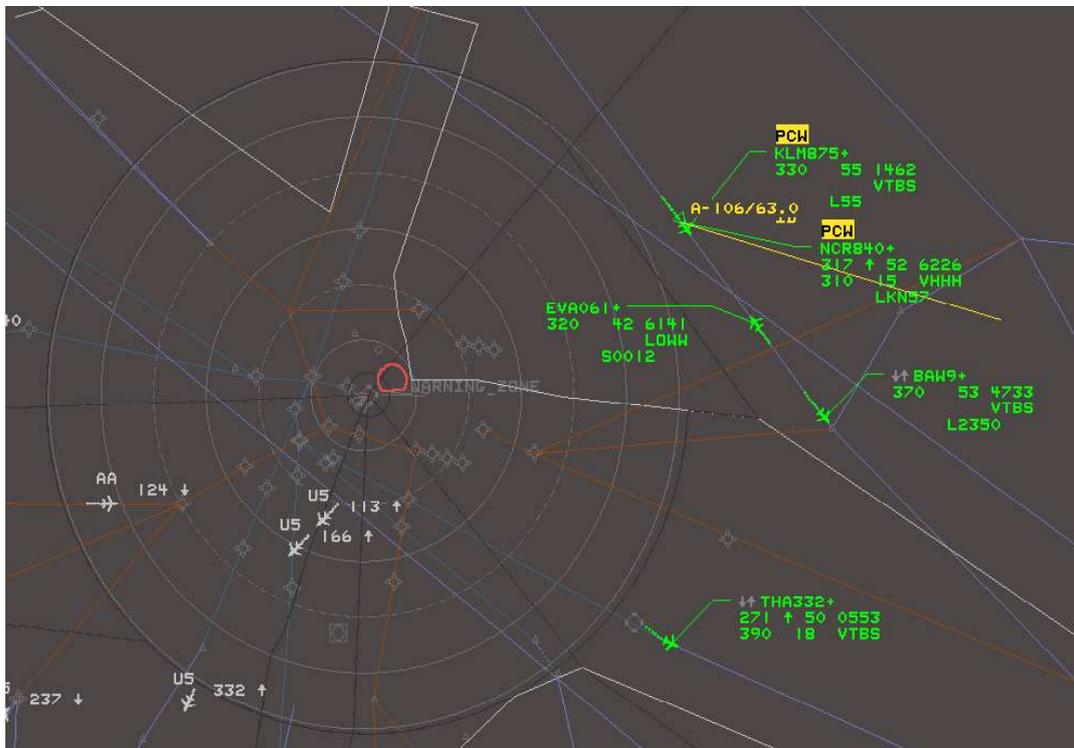


Figure 9: 23:33:44 UTC

In radar snapshot of time 23:33:44 UTC shown in Figure 9, NCR840 can be seen as climbing and having reached FL317. PCW between NCR840 and EVA061 is not seen any more.

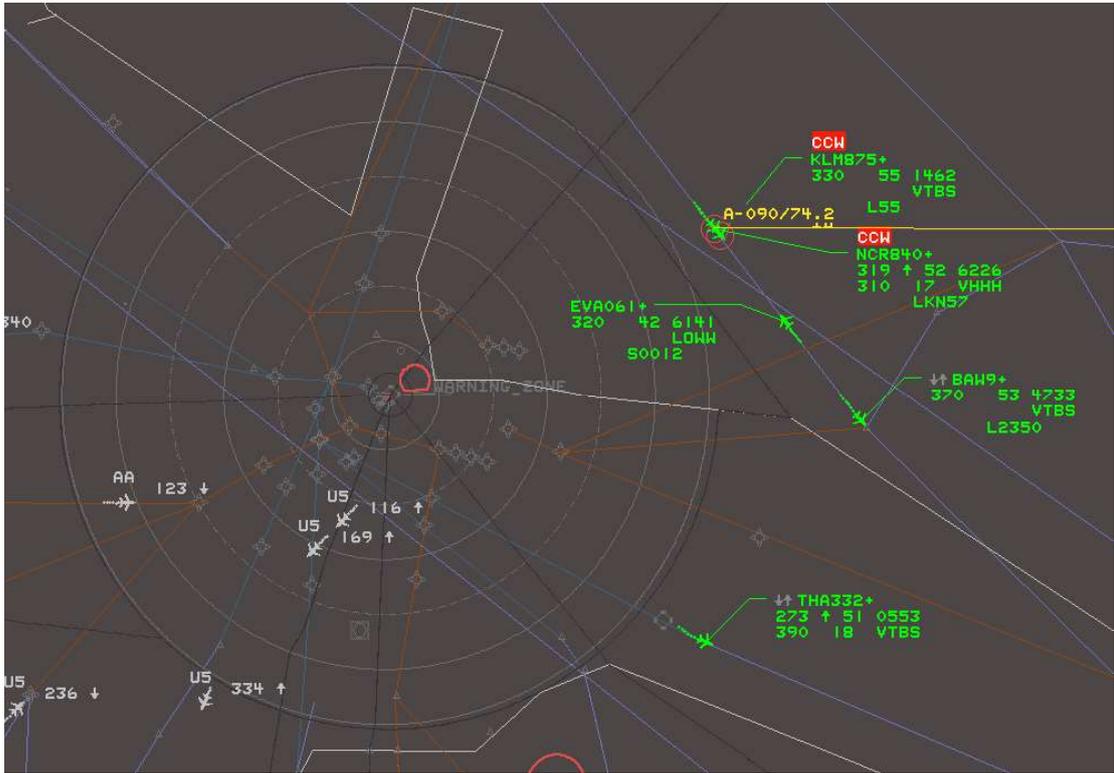


Figure 10: 23:33:50 UTC

In radar snapshot of time 23:33:50 UTC shown in Figure 10, NCR840 can be seen as climbing and having reached FL319. CCW is seen generated between NCR840 and KLM875.

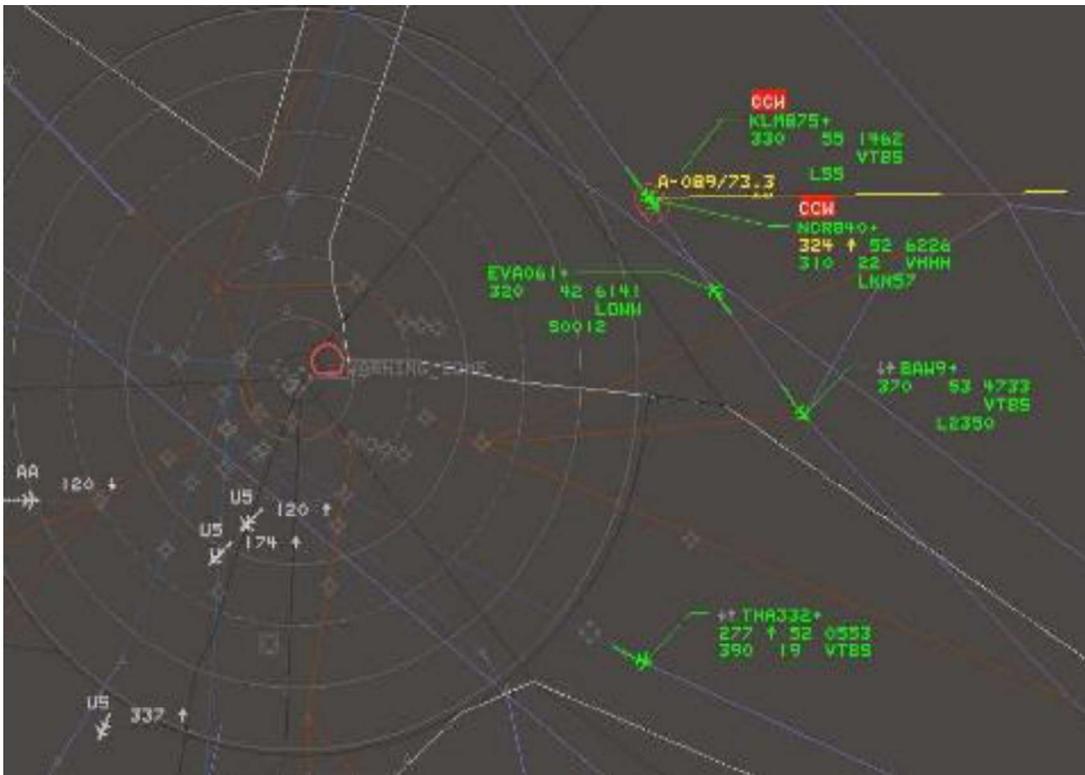


Figure 11: 23:34:01 UTC

In radar snapshot of time 23:34:01 UTC shown in Figure 11, NCR840 can be seen as climbing and having reached FL324. CCW continues between NCR840 and KLM875.



Figure 12: 23:34:38 UTC

In radar snapshot of time 23:34:38 UTC shown in Figure 12, NCR840 can be seen as climbing and having reached FL331, but visibly turning left. CCW continues between NCR840 and KLM875.



Figure 13: 23:35:00 UTC

In radar snapshot of time 23:35:00 UTC shown in Figure 13, NCR840 can be seen having descended to FL328 and maintaining heading 090°. EVA061 is also seen turning left to maintain heading 0270°. CCW continues between NCR840 and KLM875 and is also generated for NCR840 and EVA061.

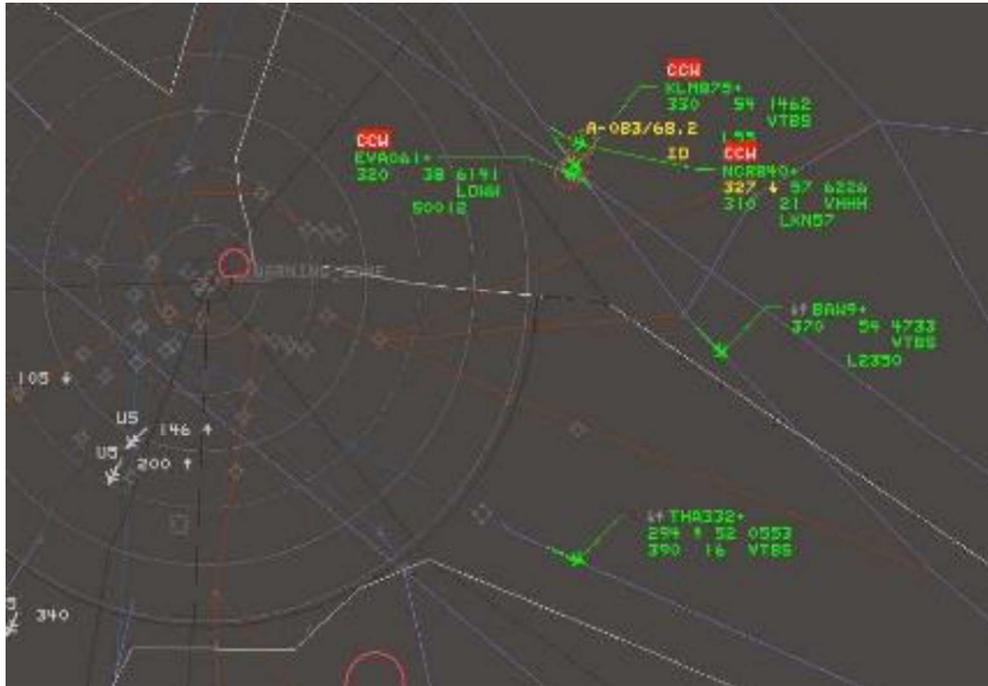


Figure 14: 23:35:03 UTC

In radar snapshot of time 23:35:03 UTC shown in Figure 14, CCW between NCR840 and KLM875 as well as CCW between NCR840 and EVA061 persists. NCR840 can be seen having descended to FL327 and both NCR840 and EVA061 continue left heading.



Figure 15: 23:35:16 UTC

In radar snapshot of time 23:35:16 UTC shown in Figure 15, CCW between NCR840 and KLM875 as well as CCW between NCR840 and EVA061 persists. NCR840 can be seen having descended to FL326 and both NCR840 and EVA061 continue left heading.



Figure 16: 23:35:43 UTC

In radar snapshot of time 23:35:43 UTC shown in Figure 16, CCW between NCR840 and KLM875 persists but CCW between NCR840 and EVA061 is resolved. NCR840 can be seen having descended to FL325 and both NCR840 and EVA061 continue with left heading. CCW had ceased when standard separation of 10 NM was re-established between EVA061 and NCR845.

1.19 Useful or Effective Investigation Techniques.

Nil

2 ANALYSIS.

NCR840 flying on route M890, established VHF contact with ACC (East) on 120.9MHz Frequency at 23:27:35 UTC, and was maintaining FL310. KLM875 which was maintaining FL330 on the same route reported to ACC (East) at 23:28:20 UTC. EVA061 was reciprocal traffic on the route maintaining FL 320.

At 23:32:40 UTC NCR840 requested for climb to FL390 while EVA061 was 40 NM from it and KLM875 was just above at FL330. Controller asked NCR840 to "STANDBY". However, at 23:32:56 UTC controller informed NCR840 "... LEVEL AVAILABLE THREE FIVE ZERO". This information was interpreted by NCR840 as clearance for climb to FL 350. NCR840

acknowledged, and read back by saying "ROGER THREE FIVE ZERO FOR NCR...". Thereafter controller instructed "STANDBY FOR HIGHER".

The information about availability of FL350 without asking for intention of NCR840 or a clear call for action left a gap in communication with a chance for misinterpretation. The standard phrase for giving clearance for climb as per MATS would be "CLIMB TO (Level)". Controller did not give clearance using standard phraseology, instead ".....*LEVEL AVAILABLE THREE FIVE ZERO*" in plain language was used to provide information to NCR840, which it had not requested. Due to "**Confirmation Bias**" NCR840 interpreted this information as availability of FL350 for it and permission to climb. The read-back (In Plain Language) by NCR840, "*ROGER THREE FIVE ZERO FOR NCR...*" clearly indicates that NCR840 had misunderstood the advice. The controller was required to ascertain that the clearance or instruction has been correctly acknowledged by listening to the read-back. The controller did not correct NCR840 and rather gave instruction "STANDBY FOR HIGHER", which further strengthened the misunderstanding as it was understood by NCR840 to be "STANDBY" instruction for FL390.

The B747-400 aircraft (NCR840) is equipped with TCAS display on the Navigation Display. The TCAS display would have indicated the traffic just 2000 feet above the aircraft at FL330 (KLM875). The crew should have been aware of the proximity of the traffic by monitoring their Navigation Display. As NCR840 started climbing, Predicted Conflict Warning between EVA061 and NCR840 was triggered at 23:33:28 UTC just as NCR840 climbed to FL311. Controller instructed NCR840 to turn left, heading 090°.

The PIC of NCR840 who had swapped seat with Co-Pilot 2, and was seated on observer seat, had meanwhile disconnected the auto throttle and autopilot, while simultaneously reducing thrust and initiating a left descending turn. While the actions of the PIC of NCR 840 may have increased separation between the aircraft, the inability of the crew on seat to carry out the desired actions are not understood. The control intervention from the observer seat and the reported wake turbulence encountered have the potential to result in an unacceptable flight path.

Controller also instructed EVA061 to turn to its left, heading 0270°, but same was not acknowledged by EVA061. At 233339 UTC PCW between KLM840 and NCR840 was also triggered. NCR840 continued to climb and at 23:33:50 UTC, a CCW was triggered between NCR840 and KLM875 while NCR840 was at FL319.

NCR840 continued to climb and reached FL331 before it began to descend after being instructed by controller to descend to FL320 at 23:34:25 UTC. The PIC of NCR840, who was at that time on the observer seat, reached over and disconnected the autopilot and manually initiated a descending turn.

EVA061 acknowledged the repeated transmission of controller to turn left heading at 23:34:05 UTC and initiated left turn. At 23:35:00 UTC, CCW was generated between NCR840 and EVA061, while NCR840 was at FL328.

The sequence of events is tabulated below.

| Time UTC | Event | Predicted Conflict Warning | | Current Conflict Warning | | |
|----------|--|-------------------------------|--|-------------------------------|--|-------------------------------|
| 23:27:35 | NCR840 established contact with ACC (E) | | | | | |
| 23:28:20 | KLM875 established contact with ACC (E) | | | | | |
| 23:32:40 | NCR840 requested FL390 | | | | | |
| 23:33:28 | 'Predicted Conflict Warning (PCW)' between EVA061 and NCR840 was generated by the automation system and remained active for about 16 seconds. | PCW between EVA061 and NCR840 | | | | |
| 23:33:35 | The controller instructed NCR840 to turn left on heading 090°. | | | | | |
| 23:33:38 | 'Predicted Conflict Warning (PCW)' between KLM875 and NCR840 was generated which remained active for about 11 seconds. | | | | | PCW between KLM875 and NCR840 |
| 23:33:40 | At 233340 UTC, EVA061 was instructed to turn left on heading 270° but EVA061 did not respond. | | | | | |
| 23:33:42 | | | | | | |
| 23:33:49 | | | | | | |
| 23:33:50 | 'Current Conflict Warning (CCW)' was generated between NCR840 and KLM875 and remained active for 2 minutes and 14 seconds. | | | CCW between NCR840 and KLM875 | | |
| 23:34:05 | EVA061 acknowledged the repeated transmission of radar controller to turn left on (heading 270°) | | | | | |
| 23:34:25 | NCR840 was again instructed to turn left on heading 090° and to descend to FL320. | | | | | |
| 23:35:00 | 'Current Conflict Warning (CCW)' was generated between NCR840 and EVA061 and remained active for about 34 seconds. | | | | | |
| 23:35:34 | | | | | | |
| 23:36:04 | | | | | | |

3. CONCLUSIONS.

3.1 Findings.

- 3.1.1 The crew of NCR840 were having appropriate licenses, ratings and valid medical.
- 3.1.2 Air Traffic Controller had valid ratings.
- 3.1.3 Traffic density with ACC(E) was low, with 06 aircraft in the sector.
- 3.1.4 The communication facilities and frequency 120.9 MHz were reported to be working normal.
- 3.1.5 NCR840 was maintaining FL310 and had requested for FL 390.
- 3.1.6 Controller used plain language without any call for action, while informing NCR840 about availability of FL350.
- 3.1.7 Crew of NCR840 misunderstood the controller's call as clearance for climb and read-back in plain language, without seeking clarification.
- 3.1.8 Controller did not correct the crew and rather used phrase "STANDBY FOR HIGHER" which further strengthened the confirmation bias.
- 3.1.9 Crew of NCR840 did not factor that there was another aircraft just 2000 feet above them on TCAS when they perceived a clearance to climb 4000 feet to FL350.
- 3.1.10 While the actions of the PIC of NCR 840 may have increased separation between the aircraft, the inability of the crew on seat to carry out the desired actions are not understood. The control intervention from the observer seat and the reported wake turbulence encountered have the potential to result in an unacceptable flight path.
- 3.1.11 KLM 875 was not issued any ATC instructions and maintained their assigned Flight Level and Flight Path. EVA 061 was issued an ATC clearance for a left turn and the same was complied with.

3.2 Probable Cause of the Incident.

The probable cause of incident was incorrect use of plain language while passing information to aircraft, which led to "Confirmation Bias" and incorrect understanding of the ATC advisory.

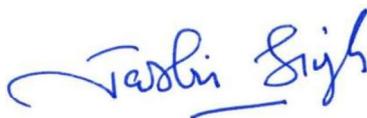
Lack of Situational Awareness amongst NCR840 crew was a contributory factor.

4 RECOMMENDATIONS.

4.1 Airport Authority of India should apprise its Controllers regarding use of standard phraseology and correct usage of plain language while on duty.

4.2 Airport Authority of India should ensure that Radar data is preserved and made available to AAIB for investigations and MATS is amended accordingly.

4.3 The Operator for NCR840 should assess the need for crew action training required by the crew on seat, as control intervention from a pilot not in the seat may result in an unacceptable flight path.



Jasbir Singh Larhga
Investigator-in-Charge



Capt. Gaurav Pathak
Investigator



Kunj Lata
Investigator

Place : Delhi

Date : 18.01.2020