

**FINAL INVESTIGATION REPORT
M/S BLUE DART AVIATION LTD
B757-200 AIRCRAFT VT-BDM AT
MUMBAI ON 09 JUNE 2010**

INDEX

PARA. SL. NO.	CONTENTS	PAGE
	Glossary	i
	Synopsis	2
1	Factual Information	2
1.1	History of the Flight	2
1.2	Injuries to Persons	3
1.3	Damage to aircraft	4
1.4	Other Damages	4
1.5	Personnel Information	4
1.6	Aircraft Information	5
1.7	Meteorological Information	6
1.8	Aids to Navigation	6
1.9	Communication	6
1.10	Aerodrome Information	6
1.11	Flight Recorder	6
1.12	Wreckage and Impact Information	7
1.13	Medical and Pathological Information	7
1.14	Fire	7
1.15	Survival Aspects	7
1.16	Tests and Research	7
1.17	Organisational and Management Information	8
1.18	Additional information	8
1.19	Useful or Effective Investigation Techniques	8
2	Analysis	8
2.1	Serviceability and Performance of the Aircraft	8

2.2	Operational Analysis	9
2.3	Non Availability of Center Line Lights	11
2.4	Weather and Runway Condition	11
2.5	Runway Inspection Procedure at MIAL	11
2.6	Damages to Tyre (Analysis)	12
3	Conclusion	12
3.1	Findings	12
3.2	Probable Cause of the Incident	15
4	Recommendations	15

LIST OF APPENDICES

Subject	Appendix No
Photograph of damaged runway edge lights	01
Pictorial Runway light indication	02
Photograph of aircraft tyre damages	03
Grid Map of Runway	04
CVR Transcript	05
Flight Data Recorder Digital data of BOM - BLR sector	06
FOQA Report	07
Flight Data Recorder Summary	08
Graphical path of aircraft with scale & index	09

FINAL INVESTIGATION REPORT OF INCIDENT TO
M/S BLUE DART AVIATION LTD B-757-200 AIRCRAFT
VT-BDM AT MUMBAI ON 09th JUNE 2010.

- a) Aircraft
Type/Model : Boeing 757-200
Nationality : Indian
Registration : VT-BDM
- b) Owner/Operator : M/s Blue Dart Aviation Ltd
- c) (i) Pilot in Command : Captain ATPL
(ii) First Officer : Line Pilot CPL
- d) Date and Time of Incident : 09th June, 2010, 05:15 IST
- e) Last point of departure : Mumbai
- f) Last point of intended landing : Bangalore
- g) Place of Incident : Mumbai Airport(R/W-27)
Lat N 19° 05' 19"
Long E 72° 52' 33"
- h) Type of Operation : Scheduled Cargo Operation
- i) Phase of operation : During take off roll
- j) Type of incident : Damages to RW edge lights
during take off roll
- k) Persons on board : Crew :2, Pax :NIL
Total POB:2
- l) Extent of Injuries : Nil

(All timings in the report in IST)

Synopsis

On 08/09 June 2010 Blue Dart Aviation aircraft Boeing 757 VT-BDM scheduled to operate BD-201(Sector- Kolkata-Delhi-Mumbai-Bangalore). The flight from Kolkata till arrival at Mumbai was uneventful. On arrival at Bangalore the Engineer observed that there were damages to the RH wheels (No. 3, 4, 7 and 8). There were also damages to the No. 3 wheel brake assembly and one of the grease nipples in No. 3 wheel was deformed.

The information was conveyed to Bangalore International Airport Ltd (BIAL) apron control for check of RW for FOD. After a check of RW at Bangalore no damages were noticed to the installations or equipment. BIAL relayed the information of tyre damages to Mumbai International Airport Ltd (MIAL). After a RW inspection, MIAL reported that total of 15 RW edge lights were damaged. Subsequently during investigation the Commander confirmed that incorrect lineup on the right side of the RW instead of center while take off roll could have caused damage to some of the lights towards the N1 and N4.

The incident occurred at 05:15 hours. There was no injury to Pilots. The weather was clear. There was no fire/smoke.

1. FACTUAL INFORMATION

1.1. History of the Flight

Blue Dart Aviation aircraft Boeing 757-200 VT-BDM was operating Flight No BD-201 on 08/09 June 2010 from Kolkata-Delhi-Mumbai-Bangalore. The flight departed on schedule from Kolkata at 2225 hrs and was uneventful till Mumbai. The crew had obtained 60 hours of rest on commencement of the flight. They were medically examined at Kolkata including Alco Sensor Checks and were found fit to undertake the flight.

At Mumbai, the aircraft taxied out from Bay No G-4 via Papa, Echo, and was cleared to proceed to holding point N1 for RW 27. The flight was cleared to line up after an arrival of Kuwait Airways Boeing 777 aircraft.

The Captain was PF and the FO was Pilot Monitoring for the departure. While lining up, the Captain lined up on the right of centerline of the RW. The FO promptly drew the attention of the Captain by stating that the centerline was on the left. This was acknowledged by the Captain. On being cleared for take off the thrust levers were opened by the Captain and the aircraft commenced its roll. The FO at this stage called out to the

Captain that he was on the right, twice in quick succession. The Captain carried out a correction to the left to return to the centerline. The take off was continued with and the aircraft took off at 05:15 hours at the correct speed and carried out a standard departure. The flight to Bangalore i.e climb, cruise, decent and approach were normal. The aircraft carried out an uneventful landing with FO as PF. The aircraft taxied to the Bay at 0645 hours.

On arrival at the Bay, the Engineer observed that there were damages to the RH wheels. No. 3 main wheel tyre was deflated. There were deep incisions on No.3, 4 & 8 main wheel tyres and reverted rubber on No. 7 tyre. No. 3 brake assembly had signs of FOD and grease nipple was deformed.

This information was immediately conveyed to BIAL apron control who carried out a check of the RW for FOD. Since no abnormality was noticed on the RW, BIAL relayed the information of the damaged tyres to MIAL at 0730 hours. At 0830 hours information was received from MIAL that RW inspection was carried out and few RW edge lights were damaged. A subsequent report indicated that a total of 15 RW edge lights of RW 27/09 were damaged, nine towards the north side between N1 and N4 and six on the southern side between taxiway E1 and intersection. The incident occurred at 05:15 hours. Prior to the incident the RW was inspected at 05:06 hrs. There was no injury to Pilots. The weather was fine. There was no fire/smoke

During the inspection of the RH wheels at Bangalore, the No. 3 main wheel tyre was deflated with a deep cut of 3” on the inboard side of the tyre sidewall. There was a deep transverse cut of 1” length on the No.4 main wheel tyre outboard shoulder. Reverted rubber on both shoulders of No.7 main wheel tyre was seen. There were small glass pieces embedded at various location quantities about 6 on the No. 8 main wheel tyre crown area. There was minor hit to the brake rod attachment point and one of the grease nipple found deformed.

1.2 Injuries to Persons:

Injuries	Crew	Passengers	Others
Fatal	Nil	Nil	Nil
Serious	Nil	Nil	Nil
Minor	Nil	Nil	Nil
None	Nil	Nil	Nil

1.3 **Damage to aircraft** : No. 3, 4, 7 and 8 wheels and No.3 brake assembly as indicated in Para 1.1

1.4 **Other Damages:** Nil

1.5 **Personnel Information**

Pilot-in-Command : Check Pilot, Male, Aged 58 yrs
Licence : ATPL issued on 18.12.1997 valid up to 09.12.11.
Aircraft Rating : B-757-200 renewed on 29.11.2006 (Endorsement date)
Instrument Rating : 14.04.10 renewed on 03.05.2010
FRTO : 5282 valid up to 19.12.2012
Medical Certificate : Class I renewed on 25.01.2010 and valid until 24.07.2010.
Date of Last Line Check : 21.04.2010
Date of Last CRM Training : 02.07.2009

Flying Experience:

Total all types : 8160:00 hours
Total on type : 1539:15 hours
Total in last 28 days : 45:45 hours
Total in last 7 days : 11:15 hours
Total in last 24 hours : 05:50 hours
Rest Period Prior to duty : 60:10 hours

The pilot has flown a total 3021:00 hrs while serving with the Indian Air Force on various fighters and trainer aircraft in the capacity of a qualified flying instructor during his service of 24 yrs till 30 .09 1996. The pilots civil flying experience has been as under:

B-200 BEEHCRAFT: 670:00
P68C 510:10
B737.200 2413:40

B757.200 1533:15

The pilot has been flying in command on the B757.200 since 22.11.2006. He has been approved as check pilot w.e.f 19.01.2009. The pilot had not been involved in an incident/accident attributable to pilot error to date.

Co Pilot : Line Pilot, Male, Aged 40 years
Licence : CPL issued on 18.03.2007 valid up to 07.03.12
Aircraft Rating : B757-200 renewed on 20.03.08 (endorsement date)
Instrument Rating : 08.02.2010 renewed on 24.02.2010
FRTO : 7732 valid up to 17.03.2012
Medical Certificate : Class I renewed on 19.04.10 and valid until 18.10.10.
Date of Last Line Check : 25.03.2010
Date of Last CRM Training : 12.04.10

Flying Experience:

Total all types : 1664:10 hours
Total on type : 898:10 hours
Total in last 28 days : 39:30 hours
Total in last 7 days : 12:00 hours
Total in last 24 hours : 05:50 hours
Rest Period Prior to duty : 60:10 hours

1.6. **Aircraft Information**

Name of Operator : Blue Dart Aviation Ltd
Aircraft Type : Boeing 757-200
Registration Marking : VT-BDM

Date of Manufacture : 10.11.1995
Validity of Certificate of Airworthiness : 25.10.2011

Total Flying Hrs / Cycles since manufacture as on 09.06.10 : 41806:09 hours / 15060 cycles

Last periodic inspection completed of system : Daily Inspection

Date of Last Periodic Inspection : 08.06.2010

Total Flying Hrs / cycles at Last periodic inspection : 41801:14 hours / 15057 cycles

- 1.7 **Meteorological Information** : The weather report as per the METAR of 08 June at 2212Z was, winds calm, visibility of 4 kilometers in haze, 3 to 4 octas cloud at 2000 feet, 5 to 7 octas cloud at 10000 feet, temperature 29 degrees centigrade, dew point 26 degree C, no significant weather till 1005Z.

At the time of take off there was a light drizzle and the RW was wet.

- 1.8 **Aids to Navigation** : All aids were serviceable
- 1.9 **Communication** : Two way RT contact was satisfactory between the ATC and the aircraft on all channels.
- 1.10 **Aerodrome Information** : Mumbai 27 runway is 11312 feet (3448 meters) long and 147.6 feet (45 meters) wide. The distance from centre line lights to the RW edge lights is 83.64 feet (25.5 meters). The distance from RW edge to RW edge lights is 9.84 feet (3 meters). The distance between two RW edge lights is 98.4 feet (30 meters). There is a NOTAM for the non availability of the centreline lights for RW 27 since 29.04.2010.

1.11 **Flight Recorder**

The SSFDR fitted on the aircraft is from M/S HONEYWELL. Part No 890-4700-042 and the serial No is 11535.

As per the SSFDR data, the aircraft had a normal start up. The aircraft entered the RW from N1 taxi-track for line up at an average speed of 5.9 knots. The aircraft was brought to a halt prior to take

off. The aircraft lined up for take-off at 23:44:30 hours on a heading 270.7 degree. The aircraft rolled on a direction between 270.7 degrees and 269.9 degrees for 944 feet. Thereafter, the data indicates deflection of rudder to the left at 23:44:55 hrs at a speed of 77 knots commencing at a distance of 1065 feet. Immediately thereafter right correction is seen at 91 knots with a reversion to a direction of 270 degrees. The aircraft at this stage was at a distance of 2781 feet from wheels roll. Thereafter the aircraft had maintained a steady heading and was airborne at a distance of 4523 feet from wheels roll. No asymmetry in EPR was noticed during the take-off roll. A max reading of -0.119 g was noticed on the lateral axis at 23:44:57 Hrs.

The aircraft took off at 23:45:14 Hrs and the landing gear was retracted at 23:45:19 Hrs. During landing the aircraft recorded a vertical acceleration of 1.72 g which is within FOQA limits. VHF communication was active and rest of the parameters recorded was logical during the entire period of flight.

CVR : The aircraft was fitted with a L3 communication CVR. Part No 2100-1020-00 and serial No 000199416.

The CVR transcript reveals that while lining up, the FO drew the attention of the Captain to indicate that he was starboard of centre line which was acknowledged by the Captain. When the take off roll was commenced, the FO called out twice in quick succession that the aircraft was on the right. Thereafter, 80 knots call was given by the FO followed by the call for V1 and rotate.

- 1.12 **Wreckage and Impact Information** : There was impact damage to 15 RW edge lights as reported by MIAL. Nine on the right edge between N1 and N4 and six at the left edge between E1 and intersection. MIAL/AAI/ATC was not aware of the broken/unserviceable lights until informed through BIAL.
- 1.13 **Medical and Pathological Information** : The Captain and FO had undergone Pre flight Medical at Kolkata which included also sensor checks. There was no abnormality.
- 1.14 **Fire** : Not applicable
- 1.15 **Survival Aspects** : Not Applicable
- 1.16 **Tests and Research** : Not Applicable

- 1.17 **Organisational and Management Information:** Blue Dart Aviation Ltd is Scheduled Air Transport (Cargo) Operator, has current valid operators permit and at present operates services to / from Chennai, Bangalore, Mumbai, Delhi, Calcutta, Hyderabad and Ahmedabad. The Head Office is at Chennai Airport. At present the fleet comprises three B 737-200 aircraft and four B757-200 aircraft. The Main Base of Blue Dart Aviation Ltd is Chennai. Sub Bases are Delhi and Bangalore. Kolkata, Hyderabad and Ahmedabad are layover stations. Mumbai is a Transit station.
- 1.18 **Additional Information** RW inspection at Mumbai was carried out at 05:06 hrs. Qatar 201 and KAC 301 took off and landed respectively prior to departure of BD-201. There were no report from ATC of any abnormality during the take off of BD-201. Also no aircraft had reported any damage to RW edge lights from 05:15 hrs to 07:47 hrs.
- 1.19 **Useful or Effective Investigation Techniques:** Nil.

2. **ANALYSIS**

- 2.1 **Serviceability and Performance of the Aircraft:** The aircraft had a valid Certificate of Airworthiness. It was maintained by Blue Dart Aviation as per maintenance schedule. All relevant DGCA and manufacturer MODs for airframe and the engine were complied with. Scrutiny of the snag register did not reveal any snag relevant to the incident. The last CRS (Certificate of Release to Service) issued on 09.06.10 and valid on the day of incident. Engineering document scrutiny did not reveal any carried forward snag. Transit AME and check carried out on 09.06.10 at Mumbai confirmed there was nil defect on the aircraft. After departure from Mumbai the aircraft landed at Bangalore.

The AME noticed that the No. 3 wheel was deflated with a deep cut on the inboard side of the tyre sidewall. There were damages to No.4, 7 and 8 wheels with small glass pieces embedded in No.8 tyre. There was a minor hit to the brake rod attachment point. There were no damages on LH wheel 1, 2, 5 and 6.

Load and Trim sheet of the sector revealed that the aircraft operated with an **8172 Kg** under load. The landing weight was **87082 Kg s** and % MAC was **25.054 %**. The % MAC was within the limits (11% to 34%) indicating that the Center of Gravity was within limits.

Hence aircraft and its performance is not a contributory factor to this incident.

2.2 **Operational Analysis**

The CVR and SSFDR analysis and questions put forth to the crew revealed that the flight from Kolkata to Delhi and Delhi to Mumbai was uneventful and there were no flight exceedances.

Path of Aircraft. The Captain was the PF and FO was Pilot Monitoring. The aircraft taxied out from Bay No. G-4 via Papa, Echo and November 01 and held at holding point N1. The aircraft lined up after being cleared by ATC. The aircraft entered the RW from N1 taxi-track for lineup at an average speed of 5.9 knots. The aircraft was brought to a halt prior to take off. The lineup was on the right of the RW. The FO drew the attention of the Captain and stated that the centerline was on the left which the Captain acknowledged. The Captain in his statement has indicated that he was aware he was on the right but had decided to make a correction during the take off roll as he did not want to lose any RW length towards realigning considering wet conditions of the RW.

The lineup was on the beginning of the RW. The Captain had initially used the yellow taxi markings for lineup which he later discontinued. It is possible that at this stage he was unable to assess the extent to which the aircraft had moved right of centerline.

On being cleared for take off, as the thrust levers were engaged, the FO called out that he was on the right. This was done twice in quick succession. As the aircraft started to accelerate, it drifted further to the right as the nose wheel was deflected to the right as stated by the Captain. The aircraft rolled on a direction between 270 degrees and 269.6 degrees for 944 feet.

At this stage from a heading of 269.6 degrees, a sharp correction to the left was made at a speed of 77 knots commencing at a distance of 1065 feet. There was a direction change from 269.6 degrees to 265.4 degrees in a span of two seconds. Immediately thereafter right correction is seen at 91 knots with a reversion to a direction of 270 degrees in eight seconds. The aircraft at this stage was at a distance of 2781 feet from wheels roll. Thereafter the aircraft had maintained a steady heading and was airborne at a distance of 4523 feet from wheels roll.

The path of the aircraft in terms of time, distances both forward and lateral and directional changes have been plotted using the SSFDR data.

The exact displacement of the aircraft from the centerline towards the right could not be established. However, from the crew statement and correlating the damage to the right main wheels it is quite possible that right hand wheels were very close to the RW edge at commencement.

The graphical plot reveals a straight path till 327 feet from wheels roll where a slight deflection to the right is seen. This could be attributable to the nose wheel being offset during the initial roll. The aircraft is seen rolling straight till 1065 feet wherein a sharp deflection has been made to the left followed by a correction to the right. At 2709 feet the aircraft is straight on heading of 270 degrees to 271 degrees and has maintained straight till lift off with a slight deflection to the right after take off.

From the graph the lateral distances have been plotted and the following conclusions can be drawn.

The width of the RW is 147.6 feet. If the aircraft was on the edge of the RW during the take off roll, it would have further drifted to the right at 327 feet. It is possible that during this phase the right wheels may have gone over a few runway edge lights till a distance of 1065 feet. Thereafter the aircraft deviated to the left from 269.6 degrees to 265.4 degrees and then gradually reverted to right 270 degrees. During these corrections the maximum displacement of the aircraft is 64 feet to the left.

The RW edge lights are placed 9.8 feet outward from the edges of the RW. If the right wheels were on the RW edge lights, after the completion of the corrections, the right wheels would be placed 19.6 feet right of centerline (73.8 feet centerline + 9.8 feet = 83.6 feet – 64 feet = 19.6 feet)

The B-757-200 has a wheel track of 24 feet. This would place the left wheel a further 24 feet to the left. This would mean that the left wheel is 4.4 feet left of the centerline. This is the maximum lateral displacement at a distance of 2709 feet. Thereafter the aircraft maintained straight on a heading of 270 to 271 degrees till take off.

The damage to the lights on the left edge of the RW between E1 and intersection of the RW could not be established as the SSFDR data indicates that the maximum deflection of the aircraft was 64 feet to the left during the correction with the left wheel only 4.4 feet left of the centreline. Also there was no damage at all to the left wheels and the undercarriage. Furthermore, damage to the six RW edge lights on the left were not in a sequential order. There were damages to a row of three lights followed by three unbroken lights and damage to the subsequent row of three lights.

The crew was scheduled 60 hours of rest prior to the flight. Reduction of alertness levels of flight crew could not be ascertained by any means.

- 2.3 **Non Availability of Center Line Lights.** The center line lights at Mumbai were not available. However, this has not been available since 29 April 2010 and a NOTAM for the same is in place which was known to the crew. There are adequate lights and markings at the beginning of the R/W to assist the Pilot in alignment and hence absence of the Center Line lights is not a contributing factor for an incorrect alignment.

There is no turning pad on RW 27. Taxiway N1 is facilitating the entry into the RW 27 and there was no work in progress on Taxiway N1.

- 2.4 **Weather and Runway Condition.** At the time of take off there was a light drizzle and the RW was wet. The Captain had stated that he was aware that he was on the right of center Line and has decided to correct for it during the take off roll as he did not want to lose any RW length towards realignment considering the wetness of the RW.

This reasoning is considered incorrect. A Pilot is always expected to align the aircraft with the Centerline before take off and if he is not satisfied a request for realigning can be made.

At an ATOW of 92.4 tons, it was possible to execute a take off from intersection N3 or N4 of RW 27. Therefore adequate RW length was available for realignment with the centerline.

During take off roll and after take off, the flight crew did not experience any abnormality and they made an uneventful landing at Bangalore.

The landing at Bangalore including the deceleration was normal which was executed by the First Officer. The crew did not feel any abnormality during the landing roll. It is possible that the No.3 tyre deflated gradually during landing.

- 2.5 **Runway Inspection procedure at MIAL:** The inspection of the RW Lights by MIAL was initiated only after receipt of information from BIAL at 07:35 hours. Till then MIAL had not noticed nor aware of any damage to the RW lights. According to MIAL the RW inspection is carried out only twice a day one in the early hours in the morning and one towards the evening.

- 2.6 **Damages to Tyre (Analysis)**. No. 3 main wheel tyre was deflated with a deep cut of 3" on the inbound side of the tyre sidewall. However the tyre immediately behind it i.e.No.7 had no marks of incision and had reverted rubber on both sides. It is possible that the No. 3 tyre was deflated on landing and as the load was taken up by No. 7 tyre it resulted in reverted rubber on both sides. There were incisions to the No. 4 tyre and small glass pieces were embedded in the no. 8 tyre. There was a minor impact to no. 3 brake rod attachment point and one of the grease nipple was found deformed.

There were no damages to the left wheels / brake assembly or any other part of the aircraft.

3. **CONCLUSION**

3.1 **Findings:**

- 1 Aircraft had a valid Certificate of Airworthiness and a valid CRS. There was no evidence of any defects or malfunction in the aircraft which could have contributed to the incident.
- 2 The CG of the aircraft was within the prescribed limits.
- 3 The commander had a total flying hours of **8160** hrs of which **1539:15** hrs were on type. First Officer had a total flying experience of **1664:10** hrs and **898:10** on type.
- 4 The crew had flown the previous sector Kolkata to Delhi and Delhi to Mumbai without any event.
- 5 Pilots were not under the influence of alcohol. The alco sensor check was carried out at Kolkata at **21:07** and **21:09 hrs** respectively.
- 6 The aircraft carried out a line up on RW 27 from taxi holding N1.
- 7 The aircraft entered the RW from N1 taxi-track for lineup at an average speed of 5.9 knots. The aircraft was brought to a halt prior to take off.
- 8 While lining up the Captain made use of the yellow taxi line markings initially. At some stage he deviated from the yellow line and aligned himself to the right of centerline.

- 9 He was not able to assess the exact displacement from the centerline probably because he was not using any visual cues on the RW. i.e. markings and lights.
- 10 The FO was aware that the aircraft was on the right of the centerline and indicated the same to the Captain.
- 11 The Captain had acknowledged the same but decided not to realign since he did not want to lose any RW distance considering the wetness of the RW. He had decided to make a correction on the take off roll. He was affected by a distraction which he does not recall.
- 12 In his judgment he was aligned only 15 – 20 feet to the right of the centerline and hence did not feel that the aircraft would drift to the extreme edge on the take off roll before corrections were made.
- 13 On commencement of roll, the aircraft drifted further to the right as the nose wheel was offset to the right. The FO called out to the Captain that he was on the right. FO was aware that the aircraft was significantly to the right of centerline. As a good CRM practice if he was more emphatic and assertive at this stage, it would have alerted the Captain that he was well to the right.
- 14 During the take off roll till a distance of 900 to 1065 feet it is possible that the aircraft has damaged the RW edge lights as reported by MIAL.
- 15 Initially nose steer was used at low speed to keep the nose wheel straight followed by the rudder.
- 16 A sharp correction to the left followed by right was executed which brought the aircraft back to the centerline. Thereafter the aircraft maintained straight till take off.
- 17 Maximum lateral displacement to the left was 64 feet with the left wheel 4.4 feet left of centerline.
- 18 The evidence from the SSFDR data does not support that the aircraft drifted to the left edge of the RW at any time during the take off roll. There were also no damages to the left wheels and undercarriage.

- 19 Damages to the six RW edge lights on the left were not in a sequential order. There were damages to a row of three lights followed by three unbroken lights and damage to the subsequent row of three lights.
- 20 ATC had not reported any abnormality during take off of BD-201.
- 21 No aircraft had reported any damages of the RW lights after the departure of BD-201 from 05:15 hrs to 07:47 hrs.
- 22 There is no turning pad on RW 27. Taxiway N1 is facilitating the entry into the RW 27 and there was no work in progress on Taxiway N1.
- 23 The center line lights at Mumbai were not available. However, this has not been available since 29 April 2010 and a NOTAM for the same is in place which was known to the crew.
- 24 At Bangalore RW inspection was carried out and no abnormality was noticed.
- 25 At Mumbai the MIAL carried out RW inspection on receiving information from BIAL between 07:47 hrs to 08:56 hrs and noticed the RW edge lights were damaged.
- 26 Prior to the incident the Mumbai RW was inspected at 05:06 hrs.
- 27 The crew was given sufficient rest (60 hours) prior to operation of the flight. However the level of alertness could not be judged by any means.
- 28 MIAL/AAI/ATC was not aware of the broken/unserviceable lights until informed through some external agency ie BIAL in this particular case.

- 3.2 **Probable Cause of the Incident:** The cause for the incident is incorrect lineup by the Captain on the right side of the RW instead of the Center even after being informed by the FO.

CONTRIBUTORY FACTORS

An error in judgement / assessment in determining the extent of displacement to the right of centerline while lining up.

Inadequate CRM practices both by the Captain and FO. Lack of assertion on the part of the FO in emphasizing the displacement of the aircraft to the Captain. Inadequate attention on the part of the Captain towards inputs from the FO.

4. **RECOMMENDATIONS**

- Appropriate action may be taken in view of lapses on the part of the flight crew.
- Incident may be brought to all concern highlighting the consequences of distraction in cockpit during critical phase of flight.
- MIAL/AAI(ATC) should review the procedure of runway inspection and ensure that same is followed meticulously.

Place: Chennai
Date: 12th July 2010

(S Durairaj)
Inquiry Officer (VT-BDM)