



सत्यमेव जयते

**FINAL INVESTIGATION REPORT ON
INCIDENT TO M/s AIR INDIA LTD. AIRBUS A320 AIRCRAFT
VT-ESE, ON 04.10.2017 AT SURAT.**

**OFFICE OF DIRECTOR OF AIR SAFETY (WESTERN REGION)
GOVERNMENT OF INDIA
Mumbai 40099**

FOREWORD

This documentation is prepared based upon the evidences collected during the investigation, opinion obtained from the experts. Investigation has been carried out in accordance with Rule 13 (1) of Aircraft (Investigation Accidents and Incidents) Rules, 2017. The investigation is conducted not to apportion blame or to asses individual or collective responsibility. The sole objective is to draw lessons from this incident which may help to prevent future accident or incident.

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**FINAL INVESTIGATION REPORT ON INCIDENT TO M/s AIR INDIA LTD. A320
AIRCRAFT VT-ESE, ON 04.10.2017 AT SURAT.**

1	Aircraft	Type	AIRBUS A320-231
		Nationality	INDIAN
		Registration	VT-ESE
2	Owner & Operator	M/s AIR INDIA LTD.	
3	Pilot – in –Command	ATPL	
	Extent of injuries	NIL	
4	Date & Time of Incident	04.10.2017 / 0146 UTC	
5	Place of Incident	VASU (Surat Airport, Surat)	
6	Co-ordinates of Incident site	N 21 07.0 ; E 072 44.5	
7	Last Point of Departure	VIDP (Indira Gandhi International Airport, Delhi)	
8	Intended place of landing	VASU (Surat Airport, Surat)	
9	No. of Passengers on board	145	
10	Type of Operation	Scheduled Revenue Flight	
11	Phase of Operation	Landing	
12	Type of Incident	Runway excursion	

SYNOPSIS

On 04.10.2017, M/s Air India Ltd A320 aircraft VT-ESE was operating a scheduled flight AI 493 sector Delhi –Surat. The aircraft took off from Delhi with 145 passengers on-board at approx. 0023 UTC. The flight was uneventful during take -off, climb and cruise.

The aircraft was cleared by Surat Air Traffic Control (ATC) tower to land on runway 22. The runway was displaced by 1000m and the ILS approach procedure for the same was temporarily withdrawn. The GP inoperative procedure for approach with amended Distance v/s Altitude information was published in NOTAM. The aircraft touched down at approx. 0146 UTC. The touchdown was ahead of the displaced threshold and the aircraft stopped at the runway end within the runway strip damaging 01 runway end light and 02 runway threshold lights. The aircraft backtracked on the runway and vacated via taxiway A to stand 03. The crew made an entry of low braking action in the pilot defect report book. During rectification for snag reported in Pilot defect report, the Aircraft Maintenance Engineer did not observe any fault. The aircraft was released for Surat – Delhi sector. During runway inspection by the airport operator, damage to the lights was observed. The occurrence was not reported by the crew.

The Director General of Civil Aviation ordered the investigation by appointing investigator-in-charge under Rule 13 (1) of the Aircraft (Investigation of Accidents and Incidents) Rules-2017 vide Order No. DGCA-15018(01)/6/2017-DAS dated-27th October 2017. The cause of the incident was due to the crew continuing to land although the approach was not stabilized.

1. FACTUAL INFORMATION

1.1. History of Flight

On 04.10.2017 M/s Air India A320 aircraft VT-ESE was scheduled to operate flight AI 493 from Delhi to Surat. At approx. 0023 UTC the airplane took off from Indira Gandhi International Airport, New Delhi (VIDP) to Surat International Airport (VASU), Surat. There were 145 passengers on board. The crew took the briefing from flight dispatch at Delhi prior to operating the flight. Pre-flight walk around inspection was carried out by the crew at Delhi and aircraft was released by an aircraft maintenance engineer, which was accepted by the PIC. There were no snags or technical problem with the aircraft prior to the incident sector. There was no component or system released under Minimum Equipment List (MEL). The flight was under the control of an ATPL holder along with the co-pilot who was a CPL holder.

The actual length of runway 22 at Surat airport is 2905m. The threshold of runway 22 was displaced by 1000m and the available landing distance was 1905m. Due to this the ILS approach procedure for runway 22 was withdrawn and the amended Glide Path -INOP procedure was published. All these information were available vide NOTAM. As per the crew they were aware of the current NOTAM's prior to operating the incident flight.

At approx. 0145 UTC Surat ATC tower cleared AI493 to land on runway 22. The aircraft carried out localizer only approach for RWY 22. During approach the aircraft was continuously having high rate of descend below 2000ft radio altitude (RA) and was high on approach. The aircraft touched down approximately 1300m ahead of the displaced threshold runway 22 leaving a very less margin of 605m to stop the aircraft. Immediately on touchdown, the crew used MAX braking and MAX REV for stopping the aircraft. The aircraft overshoot the runway coming to rest within the runway strip, damaging 01 runway end light and 02 threshold lights of runway 22. Subsequently at 0147 UTC AI493 affirms ATC to have landed on with all operations normal. As per METAR report the visibility at the time of approach and landing was 5 km and no significant trend was reported by Surat ATC.

The crew made a snag entry in the pilot defect report book, stating low braking action. During troubleshooting by AME at Surat for this pilot defect reported, all operations were found normal. Thereafter, the aircraft departed to Delhi. Later on runway inspection by Surat ATC, it was found that the lights of runway 22 were damaged.

No damage to the aircraft or injuries to passengers/crew were reported.

The crew did not report the incident and after transit inspection by AME operated subsequent sector AI 494(STV – DEL), hence CVR for the subject incident was not downloaded.

1.2. Injuries to Persons

Injuries	Crew	Passengers	Others
Fatal	0	0	0
Serious	0	0	0
Minor	0	0	0
None	06	145	

1.3. Damage to Aircraft

There was no damage to the aircraft.

1.4. Other Damage

Damage to runway lights at Surat:

The aircraft overshoot the runway and damaged 01 runway end light and two threshold lights of runway 22 at Surat.





Figure A: Damage to runway lights.

- No tyre markings were reported on the runway.

1.5. Personnel Information

1.5.1 Details of PIC:

Age	50 years
License type	ATPL
Valid up to	29.07.2020
Aircraft Ratings	A320 /A319/A321
Date of Initial Issue As P2 on A320	07.06.2005
Date of Endorsement As P1 on A320	08.04.2009
Medical Valid up to	01.03.2018
FRTO No, valid till	06.10.2022
Date of last IR check	13.06.2017
Date of PPC	13.06.2017
Flying Details (As on 04.10.2017)	
Total Flying Experience As PIC	12683:06 hrs
Total Experience as PIC on type	5451:48 hrs
Flying during Last One year	728:15 hrs
Flying during last 6 months	317:41 hrs
Flying during Last 30 days	63:39 hrs
Flying during last 7 days	20:05 hrs
During last 24 hours	06:28 hrs

1.5.2 Details of Co-Pilot:

Age	38 years
License type	CPL
Valid up to	26.07.2021
Aircraft Ratings	A320, A319
Date of Initial Issue As P2 on A320	25.03.2013
Medical Valid up to	19.05.2018
FRT0 No, valid till	26.07.2021
Date of last IR check	17.05.2017
PPC check	17.05.2017
Flying Details(As on 04.10.2017)	
Total Flying Experience	375:29 hrs
As Co-pilot	125:29 hrs
Flying during Last One year	125:29 hrs
Flying during last 6 months	125:29 hrs
Flying during Last 30 days	61:22 hrs
Flying during last 7 days:	13:35 hrs
During last 24 hours:	03:30 hrs

Both the operating crew were not involved in any serious incident/accident in the past. Both the operating crew had adequate rest as per FDTL requirements prior to the incident flight.

1.6. Aircraft Information

Aircraft Registration	VT-ESE
Manufacturer	AIRBUS
Type of Aircraft	AIRBUS A320
Category	NORMAL
Owner	AIR INDIA LTD
Manufacturing Year	1993
Engine Type	V2500-A1
Engine Serial No.	ESN V0094
C of A validity	04.01.2018 hrs
Airframe Hours. Since New	61433:08 hrs.
Airframe Hours. Since Last C of A	1951:36 hrs.

Last Major Inspection	3A CHECK, 06.07.2017
Last Layover Inspection date	02.10.2017

The aircraft is being maintained as per the maintenance programme consisting of calendar period/flying hours or cycles based maintenance as per the maintenance programme approved by Regional Airworthiness Office, Delhi.

Post Occurrence Maintenance:

Post incident maintenance check on 04.10.2017 at Surat:

The Aircraft Maintenance Engineer carried out troubleshooting of the snag entry in Pilot Defect Report that stated” Low Braking action”, however did not observe any fault.

1. The maintenance post flight report (PFR) did not record any brake related fault warning/failure message.
2. BSCU Ch. 1& 2 test carried out and found satisfactory.
3. Physically brake operations were checked by Aircraft Maintenance Engineer and found normal.

Post incident maintenance check on 05.10.2017 at Delhi:

On 05.10.2017 AMM task for inspection after leaving runway or taxiway was carried out and no damages or abnormalities were reported by the Aircraft Maintenance Engineer.

Further to the above maintenance activities,

- No snag was reported in the next sector Surat – Delhi after the incident.
- There were no reported snags related to brake system 15 days prior to or after the incident.

1.7. Meteorological Information

As per Surat ATC:

Time	0130UTC	0200 UTC
Wind	350/02 KT	020/02KT
Temperature	25 deg C	25 deg C
Cloud	NSC	NSC

Weather	5KM	5KM
Visibility		
QNH	1008	1008

At the time of occurrence, daylight prevailed. No significant trend was reported by the ATC. ATC tape transcript revealed that the weather information was passed by Surat ATC to the aircraft while giving landing clearance. METAR indicated good weather and visibility of 5km.

Weather is not a contributory factor in this incident.

1.8. Aids to Navigation

All on board navigation equipment were functional. The aircraft was flying localizer only approach for runway 22. All required navigation facilities were functioning normally at VASU and no abnormalities were reported by any aircraft. The flight was cleared for localizer only approach from the arrival route.

The Surat airport is equipped with LOC22, GP22, DME/ILS 22, VOR/ DME. On the day of incident due displacement of runway 22 threshold, the ILS approach procedure was temporarily withdrawn.

1.9. Communication

Two way communications was available at Surat Airport. No unserviceability of any communication aid was reported by the ATC or the flight crew.

1.10. Aerodrome Information

The IATA code for Surat International Airport is STV and the ICAO code is VASU. VASU is an international airport located in Magdalla, Surat. The orientation of RWY 04/22 is 043 and 023 degrees respectively. Surat International airport is equipped with Navigational aids like ILS, LOC, DME, VOR etc. The actual length of runway was 2905m. On the day of incident due ongoing maintenance work of runway, threshold of runway 22 was displaced by 1000m, the available landing distance was 1905m. The elevation of displaced threshold was 23ft. The ILS approach procedure for runway 22 was temporarily withdrawn due to temporary displacement of the runway. All these details were published vide Notice to Airmen.

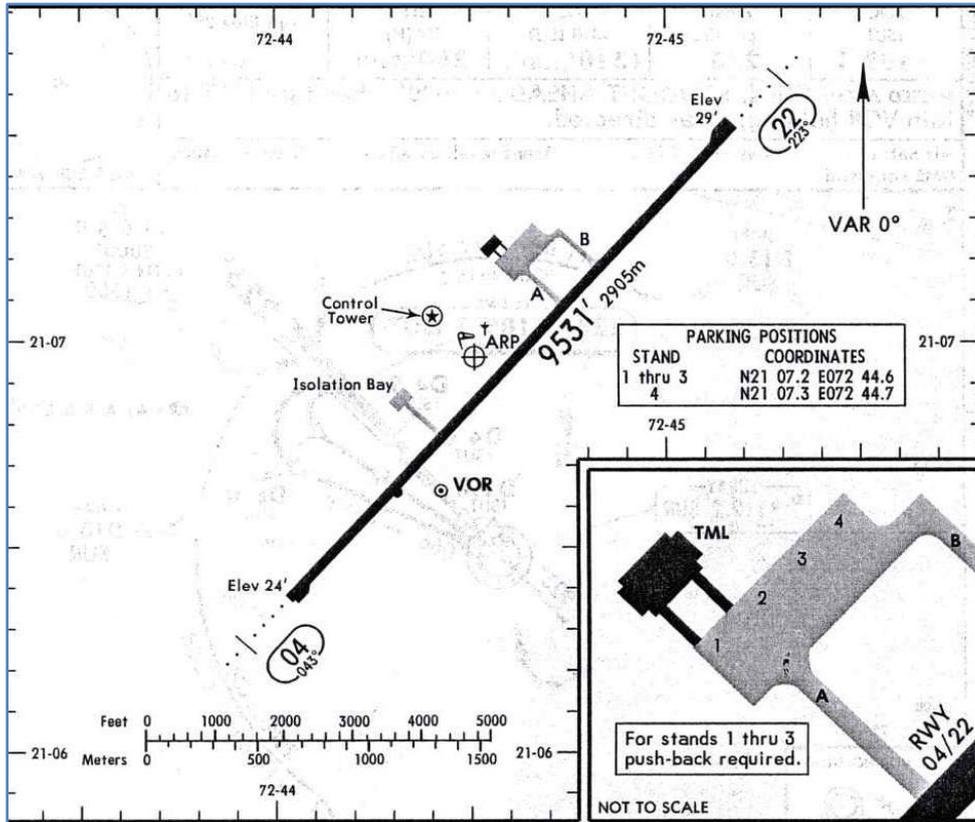


Figure B: Aerodrome chart VASU (Surat Intl Airport)

The declared distances due displacement of threshold of runway 22 is as below:

RWY	TORA(M)	TODA(M)	ASDA(M)	LDA(M)
22	1905	1905	1905	1905
04	1905	1905	1905	1905

1.11. Flight Recorders

The aircraft was equipped with Digital Flight Data Recorder (DFDR) and Cockpit Voice Recorder (CVR). The data from CVR for the incident flight was not downloaded.

1.11.1 CVR Analysis

The crew did not report the incident and after transit inspection by AME operated subsequent sector AI 494(STV – DEL). As the information on the subject incident was not available with the operator, the CVR for the incident flight could not be downloaded. Hence the same was not available for analysis.

1.11.2 DFDR Analysis:

DFDR analysis was carried out and readout of the relevant parameters are provided below:

Time	Radio Height	HEADI NG	Groun d Speed	Calibrat ed Air Speed	Vertical speed	LDG_LH	LDG_NOSE	LDG_RH	PITCH	Roll angle	WIND DIR	Wind speed	Throttle 1 Notch Angle	Throttle 2 Notch Angle	Distance to THR
	feet	DEG	Knots	KTS	ft/min				DEG	DEG	DEG	knots	_THR_NO TCH_1	_THR_NO TCH_2	DME(NM)
1:45:22	1029	226.8	172	146.3	-1470	NO_COMPR	NO_COMPR	NO_COMPR	-2.5	3.9	14.8	22	24.6	24.6	1.99
1:45:28	876	229.2	170	146.3	-1290	NO_COMPR	NO_COMPR	NO_COMPR	-1.4	3.2	9.1	24	24.6	24.6	1.71
1:45:34	746	229.6	168	145.5	-1320	NO_COMPR	NO_COMPR	NO_COMPR	-1.1	2.5	7.7	22	24.6	24.6	1.43
1:45:40	620	229.9	165	145	-1290	NO_COMPR	NO_COMPR	NO_COMPR	-0.7	0.4	10.5	20	24.6	24.6	1.16
1:45:46	459	228.2	163	147	-1410	NO_COMPR	NO_COMPR	NO_COMPR	-1.4	-2.1	16.9	14	24.6	24.6	0.88
1:45:52	314	226.8	161	147	-1320	NO_COMPR	NO_COMPR	NO_COMPR	-1.1	0	27.4	12	24.6	24.6	0.62
1:45:58	185	225.7	158	145.9	-1040	NO_COMPR	NO_COMPR	NO_COMPR	-0.4	1.1	44.3	7	24.6	24.6	0.35
1:46:04	81	224.3	153	147.3	-811	NO_COMPR	NO_COMPR	NO_COMPR	0.4	-2.1	59.1	3	24.6	24.6	0.1
1:46:06	49	223.9	152	146.1	-679	NO_COMPR	NO_COMPR	NO_COMPR	2.8	1.4	35.2	2	24.6	24.6	0.01
1:46:07	38	224.3	150	145.3	-566	NO_COMPR	NO_COMPR	NO_COMPR	1.8	-2.5	35.2	2	24.6	24.6	-0.03
1:46:08	27	223.9	149	143.9	-520	NO_COMPR	NO_COMPR	NO_COMPR	2.8	-0.4	35.2	2	0	0	-0.07
1:46:09	19	223.2	148	143.1	-432	NO_COMPR	NO_COMPR	NO_COMPR	3.9	1.4	74.5	2	0	0	-0.11
1:46:10	14	223.2	146	142.3	-330	NO_COMPR	NO_COMPR	NO_COMPR	4.6	0	74.5	2	0	0	-0.15
1:46:11	10	223.2	144	140.1	-278	NO_COMPR	NO_COMPR	NO_COMPR	3.9	2.5	74.5	2	0	0	-0.19
1:46:12	7	223.9	143	139.3	-218	NO_COMPR	NO_COMPR	NO_COMPR	5.6	-1.1	74.5	2	0	0	-0.23
1:46:13	7	223.6	141	136.4	-150	NO_COMPR	NO_COMPR	NO_COMPR	4.9	-3.2	69.6	2	0	0	-0.27
1:46:14	5	223.2	140	134.9	-105	NO_COMPR	NO_COMPR	NO_COMPR	3.5	0.4	69.6	2	0	0	-0.31
1:46:15	1	223.9	138	132.6	-75	NO_COMPR	NO_COMPR	NO_COMPR	4.6	0.7	69.6	2	0	0	-0.35
1:46:16	-2	224.6	137	131.4	-53	NO_COMPR	NO_COMPR	NO_COMPR	5.3	-1.8	69.6	2	0	0	-0.38
1:46:17	-1	224.3	135	130	-53	NO_COMPR	NO_COMPR	NO_COMPR	3.5	-0.7	17.6	3	0	0	-0.42
1:46:18	0	223.6	134	129.5	-38	COMPRESD	NO_COMPR	COMPRESD	2.5	-0.7	17.6	3	0	0	-0.46
1:46:19	0	223.6	124	127.3	-8	COMPRESD	COMPRESD	COMPRESD	0.4	-0.7	17.6	3	0	0	-0.5

Table1 : Approach and landing

The aircraft's autopilot was disconnected at 1677 ft radio altitude at time 01:44:45 during the approach. The auto throttle was left engaged. The aircraft was configured for flaps FULL landing. The rate of descend is found to be continuously high (above 1000ft/min) up till a radio height of 185 ft as against the stabilization criteria required at 500 ft. During this period, variation in wind speed and wind direction is also observed leading to varying tail wind component. The Vapp was 135 knots. The approach speed is observed to be higher than Vapp throughout the approach. As per NOTAM No.G0560/17 distance v/s altitude information the aircraft should have been at 840ft at 2D, however the aircraft was approx 1029 ft high. The aircraft was continuously high during approach. The flare was initiated by increasing pitch from 1.8 degree at 01:46:07 at 38 ft RA. After 05 seconds the pitch reached to 5.6 degree and the aircraft was at approx 7 ft RA at 01:46:12. Subsequently there are variations in pitch angle and the aircraft floats on the runway for approx 07 seconds. The auto throttle was disconnected at 20ft RA and the thrust lever angle reads zero degree subsequently. The aircraft touched down at approx 01:46:18 on main wheels followed by nose wheel touching down at 01:46:19. After 12sec of initiation of flare, the aircraft touched down on runway approx 1300m ahead of the displaced threshold. Maximum manual braking was applied immediately on touchdown to stop the aircraft. The thrust reversers & speed brakes were deployed on touchdown. The brake

is continuously applied for 14 sec after which the aircrafts ground speed is decelerated to 15knots at 01:46:31.

The aircraft being fast and high during the approach was unstablized. Further the aircraft floating on the runway has lead to the aircraft touching down much ahead of the displaced threshold.

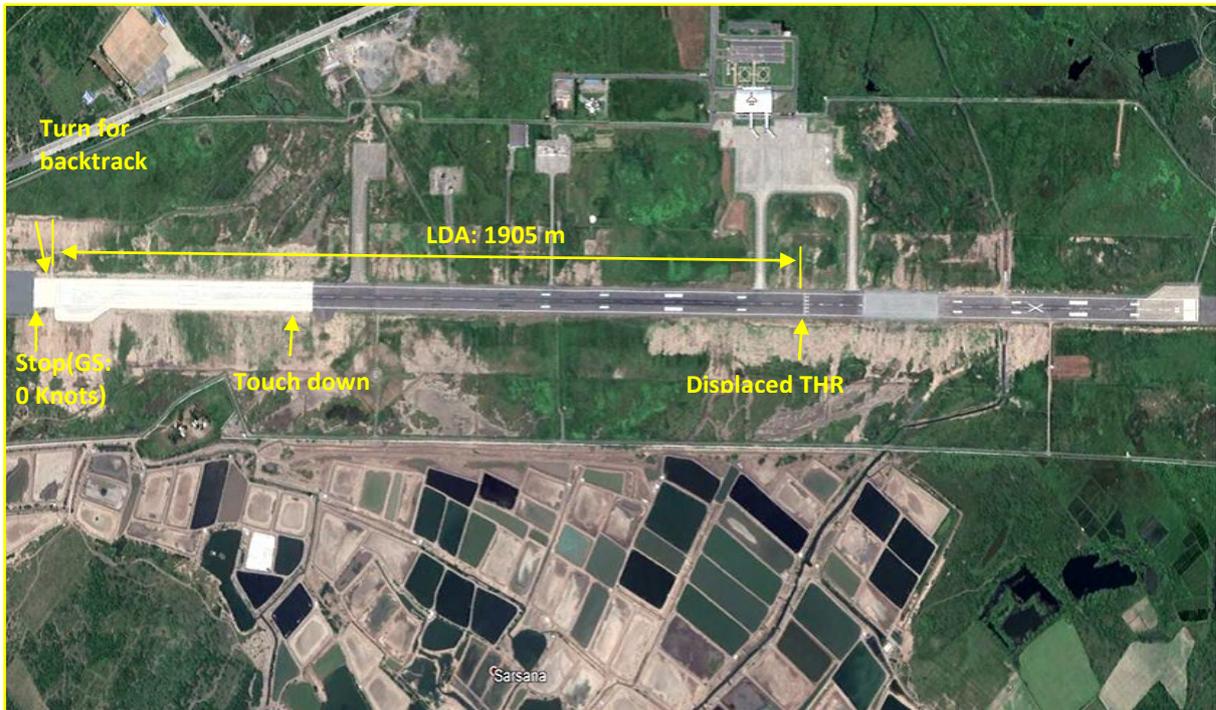


Figure C: Pictorial description of aircraft movement (Approx).

1.12. Wreckage and Impact Information

There was no impact or wreckage.

1.13. Medical and Pathological Information

No injury reported to crew or passenger.

1.14. Fire

There was no fire.

1.15. Survival Aspects

The incident was survivable and no injuries reported to crew and passengers.

1.16. Test and Research

NIL

1.17. ORGANIZATIONAL AND MANAGEMENT INFORMATION:

Air India Limited is a wholly owned company of Government of India established under Companies Act 1953. Air India is headed by Chairman and Managing Director (CMD) and has Board of Directors functioning as Apex Body. The Air India Company is a Scheduled Civilian Airline in India and is it is a National Carrier operating its flights within India and outside India. Air India has a Fleet comprising of B787, B747-400, B-777, A319, A320 and A321 aircrafts at present. Air India Headquarter is located at New Delhi. There is a team of professional of various departments like Flight Safety, Engineering, Operations and training in Air India. The Flight Safety Department is headed by Chief of Flight Safety approved by DGCA. Presently Delhi, Mumbai, Chennai, Kolkata & Hyderabad are the main bases for Air India and there are other line stations. Air India is having 02 Subsidiaries as Air India Express & Air India Regional which have separate permit.

1.18. Additional Information

1.18.1 NOTAM:

The following relevant NOTAM's were issued and valid as on 04.10.2017 at VASU.

NOTAM No: C0970/17 Validity : 28.09.2017 1642 till 31.10.2017 1620

THR RWY 22 displaced by 1000M and ELEV of Displaced threshold 23ft. Pilots to exert caution while landing/Take-off.

NOTAM No: C0967/17 Validity: 28.09.2017 1615 till 31.10.2017 1620

The *declared distances* are as follows:

RWY	TORA(M)	TODA(M)	ASDA(M)	LDA(M)
22	1905	1905	1905	1905
04	1905	1905	1905	1905

NOTAM No: C0968/17 Validity: 28.09.2017 1629 till 31.10.2017 1620

GP RWY 22 not available.

NOTAM no: G0560/17 Validity: 29.09.2017 1055 till 31.10.2017 1530

Refer AIP SUP 19/2014 regarding ILS procedure at Surat airport due to temporary displacement of threshold by 1000 meters, following amendments is made:

1. *ILS procedure is temporarily withdrawn.*
2. Elevation of displaced threshold is 23 ft.
3. *GP IN-OP procedure is amended as follows:*

I) FAF is amended as 4.4D (ILS DME) in place of 4.9D (ILS DME).

ii) Distance / altitude information is amended as follows:

DISTANCE (NM)	4.4D	4D	3D	2D
ALTITUDE (FT)	1600	1470	1150	840

Straight in OCA for GP-Inop procedure is amended as 520 ft in place of 500 ft.

1.18.2 Violations w.r.t DGCA Circular and Operations Manual of M/s Air India

Extract from DGCA operations circular 01 of 2017

An unstable approach is simply an approach that does not meet the criteria for a stable approach established by the aircraft operator.

If the approach is not stable by 1,000 feet AGL or 500 feet AGL (depending on weather conditions), or if the approach becomes unstable below these altitudes, the pilot should initiate a missed approach/go around. The pilot may initiate a go around at any time above or below these altitudes if deemed necessary. It is possible for a pilot to initiate a go around even after touchdown on the runway, but not after the thrust reversers have been deployed.

Extract from M/s Air India Operations Manual Ch.25

Minimum altitude for stabilized approach

If an approach gets destabilized due to any significant deviation it must be stabilized latest by 1000' AGL during an instrument approach, 500' AGL during a visual approach, 300' AGL during a circling approach. **In case the above altitude limitation for stabilization is not achieved the pilot is required to carry out go around.**

1.19. New Investigation Technique

NIL

2. ANALYSIS

2.1 Maintenance:

No snag related to brakes was reported 15 days prior to or after the incident sectors. The aircraft was released for flight on the day of incident in an airworthy condition. From DFDR it is observed that maximum manual braking was applied immediately on touchdown. The brake is continuously applied for 14 seconds after which the aircraft ground speed is decelerated to 15 knots. The crew made a PDR entry of low braking action; however no damages or abnormalities to the aircraft were noticed during inspection after the incident or in subsequent sectors.

2.3 Aerodrome:

The actual length of runway 22 of Surat aerodrome is 2905m. Due to maintenance work of runway, the threshold of runway 22 was displaced by 1000m. The landing distance available was 1905 m. Due to displaced threshold, the ILS approach procedure was temporarily withdrawn and the amended GP-INOP procedure was available. All these information were intimated through Notice to Airmen. The visibility at Surat airport during the time of incident was 5000 m.

2.4 Operational:

Both the operating crew had adequate rest as per Flight duty time limitations prior to operating the incident sector. Also, they had valid license and were medically fit to operate the flight.

The aircraft took off from Delhi to Surat at 00:23 UTC. The takeoff and enroute was uneventful. During approach to Surat aircraft was cleared to carry out a localizer only approach for runway 22. The aircraft was in correct landing configuration. During approach a variation in wind speed and wind direction is observed up till a height of 185ft resulting in varying tailwind components.

The rate of descend is found to be above 1000ft/min up till a radio height of 185 ft as against the stabilization criteria required at 500 ft. The approach speed is observed to be higher than Vapp of 135 knots throughout the approach. The aircraft was at 1029ft at 2DME against 840ft as published in the NOTAM. The aircraft was not stabilized by 500ft RA. The flare was initiated by increasing pitch from 1.8 degree at 01:46:07 at 38 ft RA. After 05 seconds the pitch reached to 5.6 degree and the aircraft was at approx 7 ft RA at 01:46:12. Subsequently there are variations in pitch angle and the aircraft floats on the runway for approx 07 seconds. As per SOP, the auto throttle was disconnected at 20ft RA and the thrust lever angle reads zero degree subsequently. The aircraft touched down approximately 12sec after the initiation of flare. The aircraft touched down on runway at approx 1300m ahead of the displaced threshold.

The aircraft was continuously high and fast during the final approach. The crew continued the approach although the approach was not stabilized by 500ft RA. The g value recorded at touchdown is 1.15 and the landing weight was 60t which are within limits. Immediately on touchdown, maximum manual braking and maximum reversers were used by the PIC to bring the aircraft to stop. The aircraft travelled near to the runway end lights and then initiated the turn to backtrack damaging the runway lights.

Crew resource management could not be checked due non availability of Cockpit voice recorder. As per crew they were aware of all the current NOTAM.

3. CONCLUSION

3.1 Findings:

1. Aircraft was having valid Certificate of Airworthiness (CoA) and Airworthiness Review Certificate (ARC) as on 04.10.2017.
2. No snag related to brake system was reported in the subsequent sectors after the incident.
3. There were no snags related to brake system 15 days prior to or after the incident.
4. The license of both the crew were valid.
5. Medical fitness & FDTL is not a factor to this incident.
6. The visibility at the time of the incident was 5000 m.
7. The actual runway length of RWY 22 at Surat is 2905m. A NOTAM had been issued informing that THR RWY 22 was displaced by 1000m and pilots to execute caution. The landing distance available as per the NOTAM was 1905m.
8. The crew was carrying out localizer only approach for runway 22 and were cleared to land on runway 22 by Surat ATC at, with winds reported as 004/03.
9. At approx. 0147 UTC flight AIC 493 affirms ATC that it landed and further ATC clears the aircraft to back track on runway 22 and vacate via taxiway A to bay 3.
10. The configuration of the aircraft was correct for landing.
11. A variation in wind speed and direction with tail wind component is observed up till 185ft RA.
12. During approach the rate of descend was continuously above 1000ft/min up till 185ft RA.
13. The approach speed was continuously above the Vapp speed of 135knots.
14. The aircraft was at 1029ft RA at 2DME whereas as per requirement it should have been at 840ft RA.
15. The aircraft was not meeting the stabilized condition criteria at 500ft.
16. The aircraft started flare at a height of 38ft RA for 05 seconds, subsequently a variation in pitch angle is observed for up till 07 seconds before touchdown.
17. The auto-throttle was disengaged at 20ft RA.
18. The aircraft touched down 12 seconds after initiation of flare, approx 1300m ahead of the displaced runway threshold. Hence leaving only marginal runway available to stop the aircraft.
19. Maximum braking and MAX reverser were used by the crew after touchdown.
20. The aircraft stops near to the runway end lights and backtracks resulting in damage to runway end light and threshold lights.
21. The decision of the crew to continue an unstablized approach was not in accordance with requirements of the company's operations manual and regulatory requirements.

22. The crew made an incorrect PDR entry stating low braking action. The maintenance post flight report and inspection by AME after the incident did not reveal any brake related snag.
23. The incident was not reported by the crew and hence cockpit voice recorder was not downloaded.

3.2 Causes:

The aircraft continued landing with unstablized approach and prolonged flare resulted into delayed touchdown and subsequent runway excursion.

4. SAFETY RECOMMENDATION

1. M/s Air India may reiterate the safety circular highlighting the incident advising all crew to carry out go around when approach is not stabilised.
2. Any other action as deemed fit by DGCA, HQ with reference to Para 3.2.

Ancy Anto
Assistant Director of Air Safety
Investigator- in-Charge.
Date: 05.11.2020

---End of Report---