



**FINAL INVESTIGATION REPORT
OF SERIOUS INCIDENT
TO BOEING 737-800
AIRCRAFT VT-SZK
AT HYDERABAD
ON 20/01/2020**

**AIRCRAFT ACCIDENT INVESTIGATION BUREAU
MINISTRY OF CIVIL AVIATION
GOVERNMENT OF INDIA**

FOREWORD

This document has been prepared based upon the evidences collected during the investigation and opinion obtained from the experts. The investigation has been carried out in accordance with Annex 13 to the convention on International Civil Aviation and under Rule 11 of Aircraft (Investigation of Accidents and Incidents), Rules 2017 of India. The investigation is conducted not to apportion blame or to assess individual or collective responsibility. The sole objective is to draw lessons from this Serious Incident which may help in preventing such incidents in future.

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SYNOPSIS

A Serious Incident of landing on closed runway occurred at Hyderabad on 20/01/2020. A scheduled flight from Mumbai to Hyderabad was given a vectoring to land on Runway 09L and establish FAT (Final Approach Track). The aircraft was high on approach, so controller gave vectoring to adjust the rate of descent as requested by the flight crew.

During vectoring, the radar controller again cleared the flight for VOR approach RWY 09L. This was read back correctly by the flight crew. Once the flight was established on FAT, it was handed over to Tower.

After the aircraft came in contact with Tower controller, he gave landing clearance for Runway 09L. This instruction was also read back correctly by the flight crew.

Till VOR (Hyderabad VOR), the flight was approaching for Runway 09L but on reaching overhead VOR, the aircraft started manoeuvring to right for runway 09R and landed on Closed runway 09R.

A NOTAM of runway 09R closure was applicable at that time. At the time of landing on closed runway, leader jeep was on runway for inspection purposes.

This occurrence was classified in the category of serious incident and investigation was ordered to be carried out by Shri. R.S. Passi, Director as Investigator-in-charge and Ms. Kunj Lata, Assistant Director as Investigator.

FINAL INVESTIGATION REPORT ON SERIOUS INCIDENT TO B737-800
AIRCRAFT VTSZK AT HYDERABAD ON 20/01/2020

1.	Aircraft Type	BOEING 737-800
2.	Nationality	INDIAN
3.	Registration	VT-SZK
4.	Owner	WILMINGTON TRUST
5.	Operator	SPICEJET
6.	Pilot – in –Command	ATPL holder
7.	Extent of Injuries	NONE
8.	Co-Pilot	CPL holder
9.	Extent of Injuries	NONE
10.	Place of Incident	HYDERABAD AIRPORT
11.	Co-ordinates of incident Site (Location)	17°13'48"N & 78°25'55"E
12.	Last point of Departure	MUMBAI
13.	Intended place of Landing	HYDERABAD
14.	Date & Time of incident	20.01.2020 & 0957 UTC
15.	Extent of Injuries (Cabin Crew)	NONE
16.	Extent of Injuries (Passenger)	NONE
17.	Phase of Operation	LANDING
18.	Type of Incident:	LANDING ON CLOSED RUNWAY

(ALL TIMINGS IN THE REPORT ARE IN UTC)

1 FACTUAL INFORMATION

1.1 History of the flight

On 20/01/2020, B737-800 aircraft VT-SZK was involved in a serious incident of landing on closed runway while operating flight SEJ467 (Mumbai-Hyderabad). The flight crew did their briefing for Runway 09L (Secondary Runway). Flight took off from Mumbai at 0857 UTC. Its flying time to Hyderabad was 00:57 min.

As per the Flight crew, they monitored ATIS series "T" broadcast, in which visibility was 6KM, Runway in use was "RWY 09L" and the approach was "VOR approach RWY 09L".

At 0940 UTC, the flight came in contact with Approach control. Approach controller gave descent clearance to FL80 and cleared it for VOR approach Runway 09L. The flight was then instructed to intercept Final Approach Track (FAT). This clearance was read back correctly by the flight crew. As the aircraft appeared to be high on approach, the flight crew requested ATC for a heading (vectoring) so that they could re adjust their Rate of Descent (ROD). At 09:52:46 UTC, the flight was recleared as "Turn right heading 060, Cleared for VOR approach runway 09L, Report established final approach track". This was also read back correctly by the flight crew.

After intercepting FAT, controller changed over the aircraft to Tower Controller. The flight came in contact with Tower controller at time 09:52:58 UTC. Tower controller cleared it for VOR approach runway 09L at 0953 UTC, when the aircraft was around 10 NM to touchdown. This instruction was also read back by the flight crew correctly.

Till overhead VOR, the flight was following the track for runway 09L and approach was uneventful. After VOR, the aircraft manoeuvred to right i.e. towards Runway 09R and landed on runway 09R which was closed as runway inspection was in progress. PAPI and lights of Runway 09R were not ON when the aircraft landed on Runway 09R.

When the aircraft was on approach, Leader jeep was on Runway 09R inspecting runway condition before handing over. They saw the aircraft approaching towards them and informed Ground controller "Runway inspection, Madam completed now just now I am seeing that one aircraft is

approaching 09R” on RT. Ground controller informed Tower controller of the same. By that time aircraft was about to touchdown. Controller gave calls to the flight but since it was too low, he did not disturb the flight crew. Aircraft Landed on a closed runway, RWY 09R at 0957 UTC. After landing and vacating through the active runway i.e. Runway 09L, the flight was handed over to Ground Control.

There were no injuries or any damage either to aircraft or ground equipment. After reaching the bay, normal deplaning of passengers was carried out. The runway 09R/27L was handed over at ATC, however, in ATC log book, no entry of Runway handing over or taking over was mentioned.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	NIL	NIL	NIL
Serious	NIL	NIL	NIL
Minor/ None	06	179	NIL

1.3 Damage to Aircraft

NIL

1.4 Other damage

NIL

1.5 Personnel information

1.5.1 Air Traffic Controller (ATCO)

The ATCO manning Hyderabad Radar had Tower Control, Area Control, Approach Control and Radar Control ratings. His last proficiency check was done (Radar Control) on 11.12.2019.

The ATCO manning Hyderabad Tower had Tower Control rating. His last proficiency check was done (Tower Control) on 09.07.2019.

The ATCO manning Hyderabad Ground had Tower Control & Area Control ratings. His last proficiency check was done in Area control (Procedural) on 14.08.2019.

All the above controllers had valid medical(s) and were not involved in any incident earlier.

1.5.2 Flight Crew

1.5.2.1 Pilot-In Command

Age	40 yrs
License	ATPL
Date of Issue	27-Apr-16
Valid up to	26-Apr-21
Date of Class I Medical	25-Dec-19
Valid up to	24-Dec-20
Date of issue FRTOL License	22-Sep-06
FRTOL License Valid up to	21-Sep-21
Endorsements as PIC	B737 700/800/900/700F
Total flying experience	6117:27 Hrs
Total flying experience on type	3542:47 Hrs
Last Flown on type	20-Jan-20
Total experience during last 30 days	65:51 Hrs
Total experience during last 24 Hours	03:38 Hrs
Rest period before flight	22:09 Hrs
Whether involved in Accident/ Incident	NO
Date of latest Flight Checks	23-May-19

1.5.2.2 Co-Pilot

Age	29 years
License	CPL
Date of Issue	11-Sep-14
Valid up to	10-Sep-24
Date of Class I Med. Exam.	23-Oct-19

Class I Medical Valid up to	22-Oct-20
Date of issue FRTOL License	11-Sep-14
FRTOL License Valid up to	10-Sep-24
Total flying experience	769:24 Hrs
Total flying experience on type	546:29 Hrs
Last Flown on type	20-Jan-20
Total experience during last 30 days	53:54 Hrs
Total experience during last 24 Hours	03:38 Hrs
Rest period before flight	53:23 Hrs
Whether involved in Accident/ Incident	NO
Date of latest Flight Checks	22-Aug-19

1.6 Aircraft Information

Aircraft Model	B737-800
Aircraft S. No.	41398
Year of Manufacturer	2014
Name of Owner	WILMINGTON TRUST LTD.
C of R	22-05-2014
C of A	26-05-2014
Category	NORMAL
C of A Validity	VALID
A R C issued on	24-05-2019
ARC valid up to	26-05-2020
Maximum Takeoff weight	79015 KG
Last major inspection	6000 FH (ON 20 NOV 2019)

1.7 Meteorological Information

Meteorological information (METAR) of 0930 UTC indicated Winds as 220 Degree/ 04 Kts, visibility of 6 KMs, temperature of 30 Degree C and QNH of 1016.

The last monitoring of the weather on DATIS by the Flight crew was Metar 'T' information. Thereafter, the METAR was not monitored by them during flight or while landing.

1.8 Aids to Navigation

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

Runway 09L is having VOR approach and Runway 09R has ILS approval.

Frequencies of navigation aids are as below: -

Navigation Aid	Frequency
DVOR	113.8MHZ
LLZ RWY 09R	108.5 MHz
GP RWY 09R	329.9 MHz
LLZ RWY 09L	110.9 MHz
GP RWY 09L	330.8 MHz

This shows that both Runways have different frequencies for LLZ (Localizer)and GP (Glide Path)

1.9 Communications

ATC POSITIONS	CALLED AS	FREQUENCY
Area Control	Hyderabad Control/ Radar	120.95 MHZ
		128.35 MHZ
Tower	Shamshabad TWR	118.45 MHZ
ATIS	----	126.475 MHZ
Emergency	----	121.5 MHZ

Approach/ Radar	Hyderabad APP/Radar	120.25 MHZ 125.55 MHZ
SMC	Shamshabad GND	121.85 MHZ

The aircraft was cleared for Runway 09L in Approach on frequency 120.25 Mhz and landing clearance for Runway 09L Tower on frequency 118.45 Mhz. Leader jeep gave information to Ground on frequency 121.85 Mhz.

(1) TAPE TRANSCRIPT BETWEEN ASR FREQUENCY AND SEJ467

TIME	TO	FROM	TEXT
09:42:15	SEJ467	RADAR	DESCEND TO 3600 FEET. TURN LEFT FIVE DEGREES TO INTERCEPT FINAL APPROACH TRACK RUNWAY 09L. CLEARED FOR "VOR" APPROACH RUNWAY 09L. REPORT ESTABLISHED.
09:42:26		SEJ467	DESCEND TO 3600 FEET. TURN LEFT BY ZERO FIVE DEGREES AND CLEARED TO INTRCEPT FINAL APPROACH TRACK RUNWAY 09L. CALL YOU ESTABLISHED.
09:46:20	RADAR	SEJ467	APPEARS TO BE HIGH. ADJUST YOUR RATE OF DESCENT
09:51:49	SEJ467	RADAR	TURN RIGHT HEADING 060. CLEARED FOR "VOR" APPROACH RUNWAY 09L. REPORT ESTABLISHED ON FINAL APPROACH TRACK.
09:51:57		SEJ467	RIGHT HEADING 060. CLEARED FOR THE, CLEARED TO INTERCEPT FINAL APPROACH TRACK RUNWAY 09L. CALL YOU ESTABLISHED.

(2) TAPE TRANSCRIPT OF TOWER FREQUENCY & SEJ467

TIME	TO	FROM	TEXT
09:53:01	SEJ467	TOWER	GOOD AFTERNOON, RUNWAY 09L CLEARED TO LAND WIND 220 DEGREES 04 KTS
09:53:06		SEJ467	CLEARED TO LAND RUNWAY 09L
09:56:59	SEJ467	TOWER	SIR YOU WERE ASKED TO LAND ON RUNWAY 09L

09:57:15		SEJ467	SIR YOU HAD ASKED TO (PAUSE) CONFIRM FOR 09L
09:57:20	SEJ467	TOWER	THAT'S CORRECT YOU HAVE LANDED ON RUNWAY 09R
09:57:23		SEJ467	WE HAVE CONFIRMED WITH YOU. YOU SAID 09R CLEARED TO LAND RUNWAY 09R
09:58:54	SEJ467	TOWER	AND CONFIRM YOU WERE CLEARED VIA FINAL APPROACH TRACK OR ILS APPROACH
09:58:55		SEJ467	SIR, FINAL APPROACH TRACK VOR RUNWAY 09R

(3) TAPE TRANSCRIPT BETWEEN SMC, LEADER VEHICLE AND SEJ467

TIME	TO	FROM	TEXT
09:54:08	LEADER4	GROUND	LEADER4 GROUND
09:54:13		LEADER4	SIR WE ARE REMOVING CROSS BAR MARKERS FROM 27L
09:56:16	GROUND	AIRSIDE	GROUND AIRSIDE
09:56:20	GROUND	AIRSIDE	RUNWAY INSPECTION, MADAM COMPLETED NOW JUST NOW I AM SEEING THAT ONE AIRCRAFT IS APPROACHING 09R.
09:56:28	AIRSIDE	GROUND	THEY ARE ON 09L
09:56:37	LEADER5	GROUND	CONFIRM RUNWAY CLEAR
09:56:40			AFFIRM MADAM RUNWAY ALREADY CLEAR AND RUNWAY INSPECTION HAS BEEN CLEAR ALL MEN AND MATERIAL CLEAR
09:56:46		GROUND	ROGER
09:56:50	GROUND		CAN WE REMOVE THE CROSS BAR MARKERS FROM 09R

09:56:54		GROUND	STANDBY
09:59:10	GROUND	LEADER4	GROUND LEADER4
09:59:11	LEADER4	GROUND	LEADER4 GROUND
09:59:13	GROUND		CAN WE REMOVE THE CROSS BAR MARKERS FROM 09R
09:59:21	LEADER4	GROUND	APPROVED NOW. YOU CAN REMOVE NOW.
10:00:26	GROUND	LEADER4	CROSS BAR MARKERS HAS BEEN REMOVED MAM AND RUNWAY HANDED OVER TO ATC

1.10 Aerodrome information

IATA code of Rajiv Gandhi International Airport is HYD and ICAO code is VOHS. It is the second Airport in Hyderabad after Begumpet Airport. Commercial flights are operated from Rajiv Gandhi International Airport.

The airport is having two parallel runways. The distance between these two runways is only 225 meters. Thus, they can never be used as Parallel runway. Only one runway can be used at a time. Runway 09L is having VOR only and Runway 09R is equipped with ILS.



FIGURE SHOWING PARALLEL RUNWAYS i.e. RUNWAY 09L AND 09R

Runway 09L/27R is 3707 m long and is 45 m wide. Runway strip is 75 m wide. It has a RESA of 283 m for RWY 09L and 250 m for RWY 27R. The dimensions meet the Code E runway requirements as laid down in CAR Section 4, Series B Part I. Runway 09L has a displaced threshold of 310 m and threshold of runway 27R is displaced by 343 m.

1.11 Flight Recorders

Flight data recorders were installed on the aircraft as per the Requirements. DFDR data was available for investigation. The aircraft operated a flight (two sectors) without removing the CVR. Therefore, relevant CVR recording was not available.

The flight crew as per the operator's procedures contacted the relevant authorities and as he could not get through, contacted single point (contact) number. The message conveyed was that the aircraft was cleared for runway 09R and landed also on 09R but after landing the ATC had told them that the aircraft was cleared for runway 09L. The flight crew showed haste to complete the remaining sorties which got the relevant CVR recording erased and then file a report at Mumbai.

Digital Flight Data Recorder (DFDR):

Relevant DFDR data is given below:

Time (UTC)	DFDR DATA
09:55:26	VOR/ LOC, A/T Disengaged, Altitude : 1090 ft AGL, ROD: 912 fpm, CAS: 152 kts, DME: 3, Selected Heading: 96.7, Capt Heading: 102.3
09:55:33	VOR/LOC, A/P Disengaged, A/T Disengaged, FD Engaged Altitude: 1003 ft AGL, ROD: 784 fpm, CAS: 150 kts, DME: 2 Selected Heading: 96.7, Capt Heading: 105.1,
09:55:46	Aligned to the Runway, Altitude: 817 ft AGL, CAS: 149 kts, ROD: 864 fpm Selected Heading: 96.7, Capt Heading: 97.7,
09:55:58	VOR/LOC, Altitude: 643 ft AGL, ROD: 909 fpm, CAS: 151 kts, DME: 2, Selected Heading: 96.7, Capt Heading: 94.6
09:56:01	At DDA 2480, VOR/LOC, ALT ACQ

	Engaged, Altitude: 614 ft AGL, ROD: 809 fpm, CAS: 151 kts, DME: 1, Selected Heading: 96.7, Capt Heading: 93.5
09:56:03	VOR/LOC, V/S Engaged, Altitude: 600 ft AGL, ROD: 727 fpm, CAS: 153 kts, DME: 1, Selected Heading: 96.7, Capt Heading: 93.2
09:56:14	V/S Engaged, Altitude: 385 ft AGL, ROD: 694 fpm, CAS: 152 kts, DME: 1 Selected Heading: 96.7, Capt Heading: 92.5
09:56:15	Visual Approach, Altitude: 368 ft AGL, ROD: 596 fpm, CAS: 153 KTS, DME: 1 Selected Heading: 96.7, Capt Heading: 92.1
09:56:18	FD A Engaged, Altitude: 349 ft AGL, ROD: 656 fpm, CAS: 158 kts, DME: 0 Selected Heading: 96.7, Capt Heading: 91.4
09:56:19	FD Engaged, Altitude: 327 ft AGL, ROD: 778 fpm, CAS: 156 kts, DME: 0 Selected Heading: 96.7, Capt Heading: 91.1
09:56:40	Aircraft Landed

1.12 Wreckage and Impact Information

There was no damage either to aircraft or any other object.

1.13 Medical and Pathological Information

Both flight crew had undergone pre-flight medical which was satisfactory. BA test result was negative. Air traffic controllers were having valid medical assessment report and were fit to perform their duties on their respective channels.

1.14 Fire

There was no fire.

1.15 Survival Aspects

The serious incident was survivable.

1.16 Tests and Research

NIL

1.17 Organizational and Management Information.

1.17.1 Spicejet Ltd

The aircraft was operated by scheduled Airlines holding a valid SOP S-16.

1.17.2 Hyderabad International Airport Limited

The Hyderabad International Airport is owned and operated by GMR group.

1.18 Additional Information.

1.18.1 Approval of operations for Secondary Runway (09L/27R)

VOHS airport started flight operations with one runway (09/27) and there was a taxiway 'A' parallel to the runway. After carrying out Safety Assessment and risk mitigation VOHS management submitted a proposal to DGCA for converting taxiway 'A' as secondary runway 09L/27R and renaming the existing runway as 09R/27L. After getting satisfied with the risk mitigation, the DGCA gave approval for commissioning of Runway 09L/27R (day VFR) in the 2012.

1.18.2 Safety Assessment of conversion of taxiway 'A' to Rwy 09L/27R.

Runway 09/27 was of dimension 4260 m X 60 m and the parallel taxiway 'A' was of the dimensions 4395 m X 45 m. As such, the taxiway was meeting the requirements for landing of Code E aircraft.

The critical safety hazards considered were: -

- Potential incursion of vehicles and aircraft.
- The inadvertent attempt of an aircraft to take off from the closed runway.
- **The inadvertent attempt by an aircraft to land on runway that is not in use.**

As risk mitigation, following actions were taken: -

- a) 09L/27R RWY marking is different from 09R/27L RWY pattern.
- b) RWY designation markings are different.
- c) RWY changeover procedure SOP.
- d) DATIS (which included only compulsory fields)
- e) NOTAM for closure of RWY 09R/27L.

- f) Surveillance methods available like, ATC will confirm from the Pilot for identification of RWY in use on final.

To implement the above mitigation actions, the following actions were taken: -

- the SOP for coordination between ATC and GMR Airside was laid down.
- Runway Identification instructions were given in ATC Standard arrival chart.
- When RWY 09L/27R is runway in use, following would be ensured: -
 - a) Simple approach lights ON. (Approach lights OFF for runway 09R/27L)
 - b) PAPI ON (OFF for runway 09R/27L).
 - c) Threshold and threshold identification lights ON (OFF for runway 09R/27L).
 - d) Centre line lights ON (OFF for runway 09R/27L).
 - e) ILS RWY 09R/27L OFF
 - f) Runway closed marker (illuminated) positioned at 350 m away from threshold to signify RWY 09R/27L closure.

1.18.3 DATIS- Digital Automatic Terminal Information Services

DATIS is a continuous broadcast of recorded aeronautical information. It is updated every 30 minutes as and when METAR is issued and immediately if any SPECI is issued. The timings broadcasted are in UTC. Every time the DATIS is updated, system picks next letter in English alphabet.

The flight crew can tune to the DATIS frequency and monitor the current weather and trending weather. The compulsory fields available are time, wind, QNH, any trend, Temp/DP, Runway in use, Type of approach etc. There is also a field to enter remarks including cautions, where relevant information can be entered in a plain language. At the time of take off from Mumbai, as per ATIS runway in use was 09L and approach was Radar Vector VOR Approach Runway 09L.

At the time of occurrence, following DATIS message was being broadcasted: -

TIME	TEXT
09:32 UTC	THIS IS HYDERABAD ATIS INFORMATION UNIFORM AT TIME : 0931 EXPECT RADAR VECTOR V O R APPROACH RUNWAY 09 LEFT RUNWAY IN USE 09 LEFT TRANSITION LEVEL FLIGHT LEVEL 80 WIND 220 DEGREES 4 KNOTS VISIBILITY 6 KILOMETRES CLOUD SCATTERED 1 THOUSAND 5 HUNDRED FEET SCATTERED 2 THOUSAND 5 HUNDRED FEET TEMPERATURE 30 DEWPOINT 17
	QNH 1016 HECTO PASCAL'S 0944 HECTO PASCALS FOR PRE DEPARTURE CLEARANCE CONTACT DELIVERY 121 DECIMAL 625 MEGAHERTZ AND AIRCRAFT EQUIPPED WITH ACARS CAN REQUEST CLEARANCE THROUGH DATA LINK NO SIG THIS WAS HYDERABAD ATIS INFORMATION UNIFORM

At the time of landing, as per DATIS, runway in use was 09L.

10:03 UTC	THIS IS HYDERABAD ATIS INFORMATION VICTOR AT TIME : 1002 EXPECT RADAR VECTOR V O R APPROACH RUNWAY 09 LEFT RUNWAY IN USE 09 LEFT TRANSITION LEVEL FLIGHT LEVEL 80 WIND 190 DEGREES 4 KNOTS VISIBILITY 6 KILOMETRES CLOUD SCATTERED 1 THOUSAND 5 HUNDRED FEET SCATTERED 2 THOUSAND 5 HUNDRED FEET TEMPERATURE 30 DEWPOINT 18 QNH 1015 HECTO PASCAL'S 0943 HECTO PASCALS FOR PRE DEPARTURE CLEARANCE CONTACT DELIVERY 121 DECIMAL 625 MEGAHERTZ AND AIRCRAFT EQUIPPED WITH ACARS CAN REQUEST CLEARANCE THROUGH DATA LINK NO SIG THIS WAS HYDERABAD ATIS INFORMATION VICTOR
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At time 1003 UTC, Leader jeep handed over the runway to ATC and Runway in use changed to 09R at 1008 UTC. No caution of any sort was given in DATIS in respect of operations on 09L.

1.18.4 Standard Operating Procedure (SOP)- Activation/Deactivation of Secondary Runway 09L/27R (Instrument Non-Precision Approach Runway)

In order to enumerate actions and responsibilities by the concerned departments of Airside, when runway 09L/27R is in use, an SOP was issued by GMR.

Opening of secondary runway

As per this SOP, the secondary runway 09L/27R was to be declared available for operation only by Airside Operations Leader vehicle carrying out the final secondary runway inspection. The runway could be made available only if the visibility was 3000 m or above. Activation and deactivation of secondary runway was done in coordination with ATC. As per the coordination procedure, ILS of main runway is to be switched off and illuminated runway closure markers are to be placed on either side of main runway at a distance of 350 meters from the threshold. All lightings such as PAPI, Approach and Centreline shall also be switched off.

Opening of Main runway

Once the main runway is fit for operations, the deactivation of secondary runway is initiated by Airside Operations by ensuring the following: -

- a) All the closure markings are removed.
- b) Runway is clear of all men/ material/ equipment.
- c) In coordination with technical Services, the illuminated runway closure marker at either ends of the main runway is removed.
- d) Final inspection is carried out before handing over the runway to ATC. PAPI and other AGL systems are switched ON. PAPI of secondary runway is OFF.

1.18.5 Markings on Runway

Runway markings are given in Annex 14 and also in Civil Aviation Regulation Section 4, Series B, Part I. As per the CAR, for a ***Closed runways and taxiways, or parts thereof***, *closed marking should be displayed on a temporarily closed runway or taxiway or portion thereof, except that such marking may be omitted when the closing is of short duration and adequate warning by air traffic services is provided.*

Thus, the closure marking is to be placed on the runway.

1.18.6 Approach at Hyderabad Airport (Runway 09L)

In Non-Precision Approach, aircraft gets the lateral guidance but not vertical guidance. The aircraft establishes Final Approach track and descent as per the levels published in aeronautical charts. The aircraft descends till overhead VOR facility. When the runway is in sight, the flight crew disengages Autopilot and flies manually. After the aircraft comes overhead VOR, it aligns itself with the runway and lands on the designated runway.

Runway 09L is a Non-Precision Approach. It has its Final Approach Fix (FAF) at 4.6 DME and Final Approach Track (FAT) at 097 degree. Final Approach Fix for approach on 09R is also 4.6 DME. Final Approach Track for both runway 09L & 09R are different. For RWY 09R it is 093 Degree and for RWY 09L it is 097 Degree.

1.19 Useful or Effective Investigation Techniques.

NIL

2.0 ANALYSIS

2.1 General

- The aircraft had a valid Certificate of Airworthiness & valid Airworthiness Review Certificate. There was no snag or defect pending rectification. All maintenance schedules were complied with.
- Both operating flight crew were appropriately licensed and qualified to operate the flight. Their medical(s) were valid on the day of incident.
- Involved ATCOs had appropriate & valid licences/ ratings. They had valid medical certificate(s) to perform their respective duties. All clearances given to Flight crew were correct for Runway 09L and it was read back correctly by Flight crew also.
- The weather at the airport at the time of incident was within operating minima with visibility of 6 kms.

2.2 Mitigation Actions to Avoid Landing on Closed Runway (at Hyderabad)

The airport operator before commissioning of Runway 09L/27R carried out a risk analysis. For the identified major risks, mitigation actions were proposed and submitted to DGCA in 2011. The major risks identified were misidentification of “Runway in use” and inadvertent RWY incursion.

Accordingly, mitigation actions for these risks were proposed which included placing of Illuminated marker at 350m away from threshold for both ends & updating DATIS.

As per ICAO Annex 14 and CAR Section 4 Series B part I, all runway closure markings are to be placed on runway. Flight crew missed the illuminated marker and didn't see any men/ material or jeep on runway.

Updation of DATIS was also proposed as one of the mitigation action. Scrutiny of the DATIS 'T', 'U' & 'V' was carried out and it was found that the fields were the normal one. It appears that while suggesting the updation of DATIS as one of the mitigation action, transmission of a specific caution in the remark field must have been in mind. However, there was no caution or warning.

2.3 Pre-conception about Availability of Runway 09R – Confirmation Bias

Confirmation bias is the tendency of a person in which he sets some information in mind and starts believing it. In this situation, the person

interprets and recalls information in a way that confirms or supports one's prior idea. Confirmation biases contribute to overconfidence in these preset ideas and these can be further maintained or strengthened even if there are contrary evidences. One can take poor decisions due to these biases.

Prior to the operation of subject flight, the flight crew was fully aware that there was a NOTAM of closure of runway 09R/27L at Hyderabad till 1000 UTC. The scheduled arrival time of the aircraft into Hyderabad was 0954 UTC. The closeness of the time of arrival and NOTAM closure time & a little bit of expected delay created a belief in the mind of the flight crew that they will be getting runway 09R on arrival into Hyderabad, although, they carried out the briefing for runway 09L. Later on during descent, approach and final landing, this pre-conception continued to be confirmed due bias as given below: -

- While approaching Hyderabad, the aircraft was having high ROD and requested for vectoring so that they can adjust their ROD. As the flight crew was engrossed in an additional manoeuvre during the critical phase, they have neither discussed the runway in use nor monitored DATIS. Due to the pre conceived idea that runway 09R/27L would be operational, the flight crew continued
- After the orbit, ATC had re-cleared the aircraft for approach on runway 09L, and these instructions were read back correctly by flight crew but once again due to confirmation bias, runway 09L did not register into their mind.
- On finals, crew did not find any men/ material or vehicle on runway 09R which strengthened the belief that runway 09R was available.
- Flight crew neglected illuminated cross marker which was placed 350 m away from the threshold.

2.4 Circumstances Leading to the Incident

During pre-flight briefing, NOTAM that runway 09R was closed till 1000 UTC was discussed among the flight crew. The flight took off from Mumbai at 0857 UTC and the flying time was 00:57 minutes. It was, therefore, clear that at the time of expected arrival runway 09L would have been in use.

DATIS information 'T' was monitored by the flight crew after take-off and noted winds of 160 degree 04 kts, visibility of 6 kms, temp of 31 degree C, QNH 1016 and no significant weather. After that the DATIS was not monitored during the flight or while landing. The flight till top of descent was uneventful. The flight crew carried out briefing for runway 09L and started preparation to descend accordingly. Landing Distance Calculation were made and cross checked by using Onboard Performance Tool for 09L.

The aircraft came in contact with Approach Radar controller at 09:40 UTC while descending and passing FL134. Approach Radar Controller gave descent clearance to 7000 feet. At 09:42 UTC, further descent to 3600 feet was given with instruction to intercept final approach track. Thereafter, the aircraft was cleared for VOR approach runway 09L and asked to report when established on final approach track by the Controller. Final approach track of runway 09L is 097 degrees and on radar display it was seen that the aircraft had established on 09L track.



While at 10900 feet, the flight was on track for runway 09L

As the aircraft was high on approach, ATC advised him that they are high on approach. ATC prompted twice, first at 09:46 UTC and next at 09:48 UTC. At 09:48 UTC, the aircraft was 10 miles to touch down and requested Approach Radar Controller for a heading so that they can adjust their rate of descent. Controller accordingly assisted the aircraft.



At 7500 feet, the aircraft was high on approach and was given vectoring as requested

At 09:52 UTC, controller re-cleared the aircraft for VOR approach runway 09L and was asked to establish on FAT. This instruction was read back correctly by the flight crew.



At 09:51:56 UTC, aircraft was re-cleared for runway 09L after it attained the desired altitude (ATC recording)

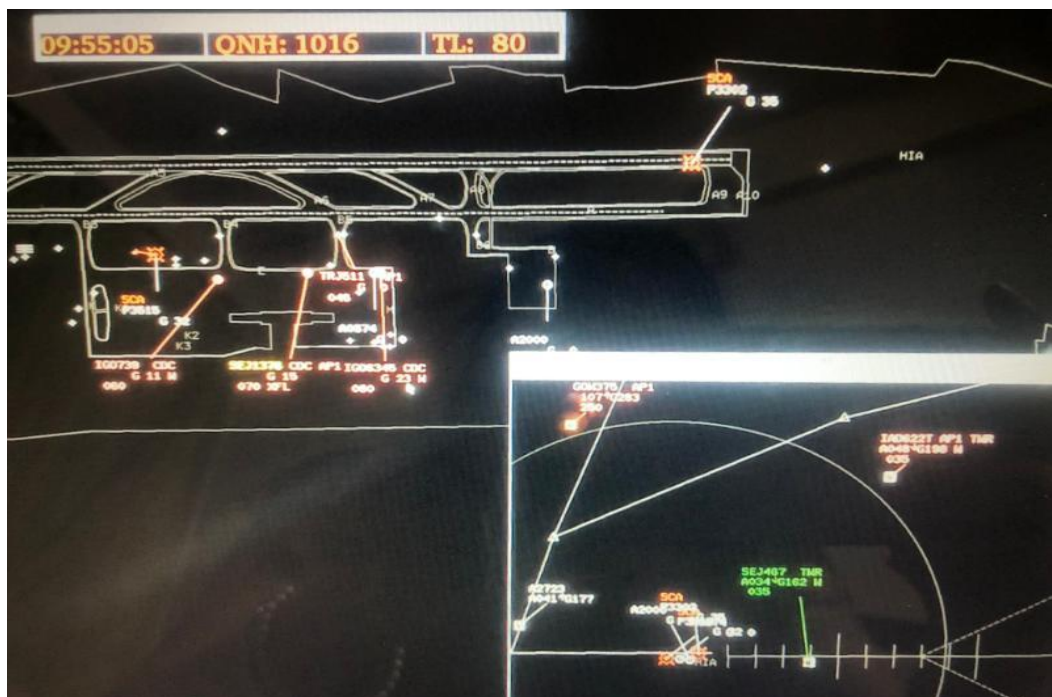
At 09:53 UTC, the aircraft established on FAT. The aircraft thereafter changed over to the Tower Control.

At that time, the cross marker had been removed from runway 27L and the leader jeep proceeded towards runway 09R end to remove the cross marking. When the aircraft was 10 NM, the controller gave landing clearance to aircraft for runway 09L. The flight crew replied as “*Cleared to land Runway 09L*”.

After reaching FAF at 4.6 DME, descent was initiated by the flight crew. At around 1150 feet, Autopilot was disengaged. PF identified runway 09R which was confirmed by the PM.

The crew believed that the runway 09R would be available when they reach Hyderabad as their estimated time of arrival at Hyderabad was very much close (approaching) to the runway opening time. During approach, the crew did not see any men or material on runway 09R. Also, they did not monitor latest DATIS to find out the runway in use.

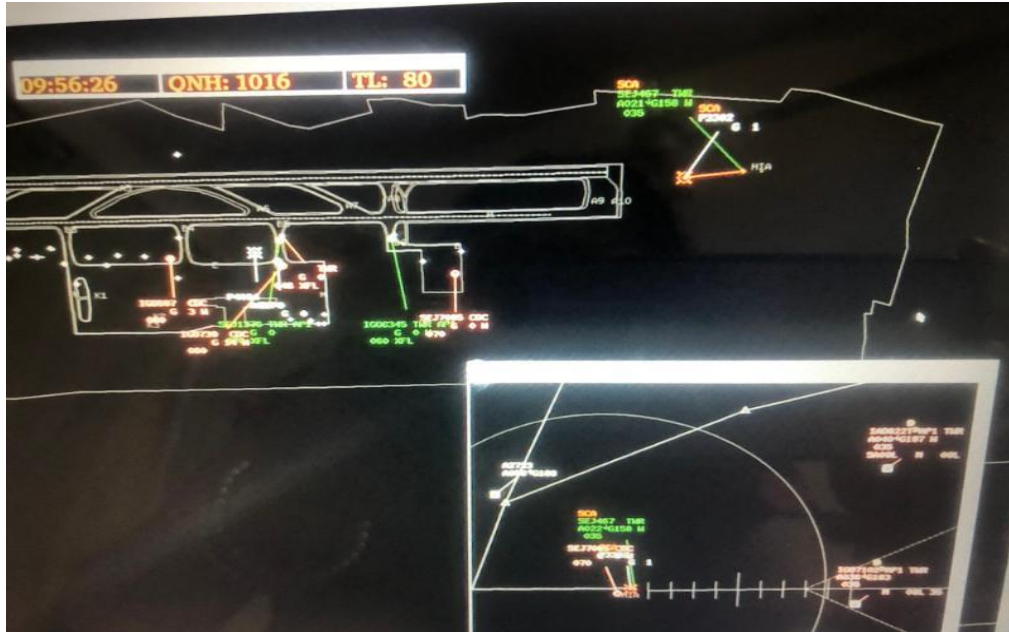
As required, PAPI and edge lights of Runway 09R were OFF when the aircraft was in final phases of landing. When the aircraft was overhead VOR, the flight crew maneuvered the aircraft towards right with the intention to land on runway 09R.



Leader jeep was still on runway, when aircraft was at 04 NM to touch down

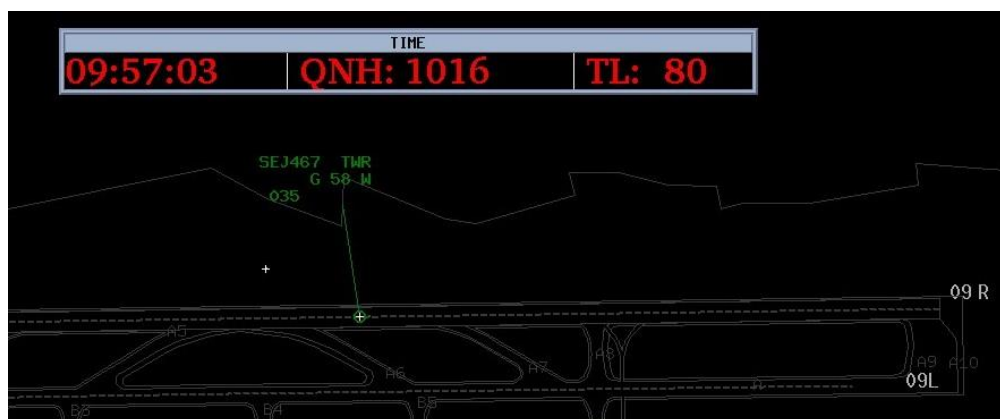
At 09:56 UTC, Leader jeep informed ground controller that “*Runway inspection has been completed just now but he is seeing an aircraft approaching 09R*” to which the Ground controller replied as “*They are on*”

09L". From the tower, it is not possible to identify as to which runway i.e. 09L or 09R, the aircraft is approaching as the distance between these two parallel runways is only 225 m apart. As per the ASMGCS recording, aircraft started maneuvering to right so as to align with the runway 09R.

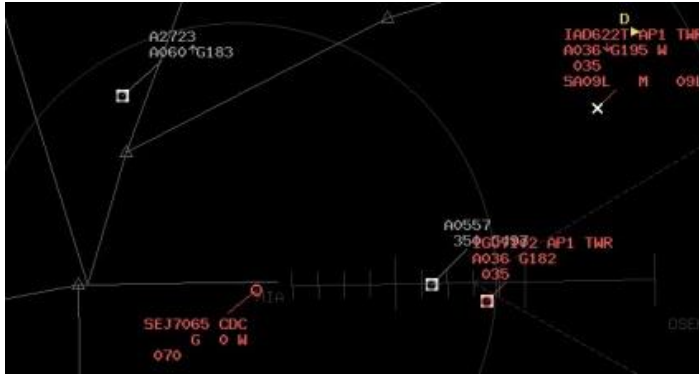


The aircraft started maneuvering to right (as per ASMGCS) after crossing VOR (HIA) to align with runway 09R

As the aircraft was too low, the Ground controller asked the leader jeep if runway 09R was clear, to which leader jeep informed that all men and material are clear of runway. Since the aircraft was too low, tower controller did not disturb the aircraft and the aircraft landed on runway 09 R. At that time, even the succeeding aircraft were given clearance for runway 09L.



Aircraft landed on runway 09R which was still closed as per NOTAM



At time 09:57:03 runway 09L was operational. The succeeding 3rd flight (IAD 622) in the sequence of landing was also cleared for runway 09L

The runway was handed over at 1003 UTC by leader jeep and thereafter made operational by ATC.

RELEVANT TAPE TRANSCRIPT OF TOWER FREQUENCY

TIME	TO	FROM	TEXT
09:53:01	SEJ467	TOWER	GOOD AFTERNOON, RUNWAY 09L CLEARED TO LAND WIND 220 DEGREES 04 KTS
09:53:06		SEJ467	CLEARED TO LAND RUNWAY 09L
09:56:59	SEJ467	TOWER	SIR YOU WERE ASKED TO LAND ON RUNWAY 09L
09:57:15		SEJ467	SIR YOU HAD ASKED TO (PAUSE) CONFIRM FOR 09L
09:57:20	SEJ467	TOWER	THAT'S CORRECT YOU HAVE LANDED ON RUNWAY 09R
09:57:23		SEJ467	WE HAVE CONFIRMED WITH YOU. YOU SAID 09R CLEARED TO LAND RUNWAY 09R

2.5 Non availability of CVR recordings

Landing on a closed runway is a reportable occurrence and requires removal of CVR of which the flight crew was fully aware. The flight crew as per the requirements contacted the relevant authorities and as he could not get through, contacted single point (contact) number. The message conveyed by flight crew was incorrect that the aircraft was cleared for runway 09R and landed also on 09R as after landing it was informed by ATC that the aircraft was cleared for runway 09L. By this time, the flight crew were fully aware that

they have landed on closed runway and showed deliberate haste to complete the remaining sorties resulting in erasing of the relevant CVR recording. In case of no other evidence available, CVR recording was one of the vital evidence to prove that the flight was cleared for which of the runway(s) and flight crew would have made all efforts not to fly subsequent sorties without ensuring that CVR is downloaded. This resulted in non availability of the CVR recording for the investigation purposes.

3.0 CONCLUSION

3.1 Findings

General

- Both pilots had valid licences to operate the flight. The medical of flight crew members and involved controllers was valid. This was the first flight of the day for the flight crew and they were fully rested.
- All communication facilities like VOR, Approach/Tower/Ground frequency were working normal.
- As per the NOTAM available with flight crew, runway 09R was closed till 1000 UTC and runway 09L was operational. The NOTAM was discussed by flight crew during pre-flight briefing at Mumbai.
- PAPI and runway edge lights of Runway 09R were OFF as required.
- Throughout the flight, correct clearances were given by ATC i.e. landing runway 09L and were also correctly read back by the flight crew as 09L.
- The aircraft was high on approach thus requested for a heading to get some extra miles to adjust its level and appropriate assistance was provided by ATC.
- The aircraft was on FAT of VOR approach Runway 09L which is 097 Degrees and was followed till VOR.
- From tower, it is difficult to identify as to which runway, the landing aircraft is approaching because the distance between the two parallel runways is only 225 meters.
- Leader jeep communicated to ground control about aircraft approaching Runway 09R. Without any time lag, it was transmitted to tower. But at that time, the flight was too low and runway 09R was clear of obstacles (though

not cleared for operations), the tower controller did not advise the aircraft to Go-Around.

- The flight crew intentionally and deliberately went ahead to complete the remaining sorties without removal of CVR which resulted in non-availability of the CVR recording for the investigation purposes.
- After completing the next sortie, CVR was switched off at destination.

In addition to the above, following are the findings on the basis of “Root Cause Analysis” of the incident:

Organisation

- Though identified as one of the mitigating actions for avoiding risk of landing on closed runway, the cross marker (white illuminated) was not placed on the runway. This was placed 350 meter away from threshold(s) of runway 09R/27L and skipped the attention of the flight crew.

Preconditions to the Unsafe Act

- There was no specific caution in DATIS as should have been for mitigating the risk of wrong identification of runway & landing thereon.
- During finals, there were no men or material on Runway 09R and the Cross Markers were not on the runway which strengthened the belief in the mind(s) of flight crew that runway 09R is clear for landing.

Unsafe Supervision

- As per IAL procedure, Runway identification shall be for Runway assigned to land. In the present case, Pilot Flying identified Runway 09R instead of 09L, and was “identified” by Pilot monitoring. This action indicated lack of supervision on the part of PM and failure of CRM.

Unsafe Acts

- Flight crew were having pre-set mind (Confirmation Bias) that on arrival to Hyderabad, Runway 09R will be available.
- The flight crew did not monitor the DATIS during cruise and landing which though indicated the runway in use as 09L.
- Just after crossing VOR (HIA), the flight crew manoeuvred the aircraft towards right so as to align with Runway 09R. This incorrect manoeuvre was not monitored/ supervised by the Pilot Monitoring.

3.2 Probable Cause of the Incident

The aircraft landed on closed Runway 09R because of the following: -

- Pre conceived incorrect belief in the mind of flight crew that runway 09R will be available to them at destination due to the closeness with scheduled arrival time and NOTAM closer time.
- Flight crew engrossed in an additional manoeuvre during final approach and not giving due attention to the DATIS broadcasting.
- Due to confirmation bias, despite the landing clearance given for 09L by the ATC and flight crew correctly reading back the same, the flight crew manoeuvred the aircraft and changed track for landing on Runway 09R.
- Absence of men/material/ vehicle on the runway 09R further strengthened the confirmation bias in the mind of flight crew.
- Illuminated cross marker was not available on the runway.
- Pilot Monitoring remaining a mute spectator and not correcting the PIC when runway 09R was identified.

4.0 Safety Recommendations

1. Hyderabad International Airport Limited (HIAL) should ensure that the cross marker is placed on the runway as per the requirements.
2. ATC Hyderabad should add a conspicuous caution in DATIS for the runway in use as mitigation to the risk of aircraft landing on closed runway at Hyderabad.
3. Spice Jet should, as a part of CRM training, emphasise the role of pilot monitoring during landing including correct identification of runway.
4. Spice Jet should carry out systemic and procedural changes for ensuring that in case of serious incidents, the CVR recordings are definitely available for the investigation purposes.



(Kunj Lata)

Investigator

Date: 25.09.2020

Place: New Delhi



(R.S. Passi)

Investigator-in-Charge