



FINAL INVESTIGATION REPORT ON SERIOUS **INCIDENT TO SPICEJET DHC-8-402 AIRCRAFT** **VT-SQC** **AT BELAGAVI AIRPORT (VOBM) ON 24.10.2021**

INVESTIGATION TEAM
VT-SQC

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Foreword

In accordance with Annex 13 to the Convention on International Civil Aviation Organization (ICAO) and Rule 3 of Aircraft (Investigation of Accidents and Incidents), Rules 2017, the sole objective of the investigation of an accident shall be the prevention of accidents and incidents and not apportion blame or liability. The investigation conducted in accordance with the provisions of above said rules shall be separate from any judicial or administrative proceedings to apportion blame or liability.

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

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FINAL INVESTIGATION REPORT ON SERIOUS INCIDENT TO SPICEJET
DHC-8-402 AIRCRAFT VT-SQC
AT BELAGAVI AIRPORT (VOBM) ON 24.10.2021

1	Aircraft Type	DHC-8-402
2	Nationality	INDIAN
3	Registration	VT-SQC
4	Owner	Industrial International Aircraft Leasing 1 Limited
5	Operator	Spice Jet Ltd
6	Pilot-In-Command	ATPL Holder
	Extent of Injuries	Nil
7	Co-Pilot	CPL Holder
	Extent of Injuries	Nil
8	Place of Incident	Belagavi Airport (VOBM)
9	Coordinates of Incident	15 51 24.83 N 074 36 19.90 E
10	Last Point of Departure	Hyderabad (VOHS)
11	Intended place of landing	Belagavi (VOBM)
12	Date & Time of Incident	24th of October 2021, 0551 UTC (Approx)
13	Passengers on Board	30
14	Extent of Injuries	Nil
15	Crew on Board	04
16	Phase of Operation	Landing
17	Type of Incident	Landing on an Unassigned Runway

* Please read DHC-8-402 as Q-400

(All timings in the Report are in UTC, unless otherwise specified)

Synopsis

SpiceJet DHC-8-402 was involved in a Serious Incident on 24.10.2021 while operating a flight from Hyderabad to Belagavi. On initial contact with ATC Belagavi, the aircraft was advised to expect the VOR Approach Runway 08. Subsequently ATC cleared the aircraft for the VOR Approach Runway 26. The flight crew carried out the VOR Approach Runway 08 and landed on the unassigned runway 08. There was no damage to the aircraft or any injuries to Crew and Passengers.

The Director General, Aircraft Accident Investigation Bureau (AAIB) ordered an investigation to investigate into the causes of the serious incident under Rule 11 of Aircraft (Investigation of Accidents and Incidents) Rules 2017 vide AAIB order no. INV 12011/5/2021-AAIB dated 26.10.2021 and corrigendum dated 03.02.2022.

1. FACTUAL INFORMATION

1.1 History of the Flight

A DHC-8-402 (Dash 8) aircraft operated by Spice Jet Ltd. was involved in a Serious Incident of Landing on an unassigned Runway on 24.10.2021 while operating a scheduled flight from Hyderabad (VOHS) to Belagavi (VOBM), with 4 Crew and 30 Passengers onboard. This flight was the third sector of the planned 4 sectors to be operated by the flight crew on the day.

The aircraft was initially in contact with Mangalore Control for descent into Belagavi. The flight crew first contacted Belagavi Tower for the latest weather and were advised, Visibility 6 kms/ Tower observed winds 070 degrees 05 knots, RWY 08 in use, number one in approach sequence and to “**expect** VOR RWY 08 via BBM” with no delay.

The flight crew acknowledged the same and changed over from Mangalore Control to Belagavi and requested for further descent, reporting maintaining FL 110 and 15 NMS on radial 070 degrees inbound. The aircraft was cleared to descent to 4600 feet via radial 070 degrees. ATC, Belagavi then informed the aircraft that tower observed winds were 340 degrees 04 knots, which the flight crew acknowledged.

The aircraft was then “cleared for the VOR RWY 26 approach via overhead BBM” by ATC and were asked to call leaving BBM, which the flight crew acknowledged with “Call you leaving”. The flight crew then advised ATC they were entering the holding pattern overhead BBM and were advised to report leaving BBM for the approach RWY 26, which the flight crew acknowledged. The ATC then informed the aircraft that tower observed winds were 020 degrees 04 knots. The aircraft called leaving BBM outbound and were asked to report on final approach track RWY 26, which the crew acknowledged with “Call you establish final approach track 26”. ATC informed the aircraft that winds are variable from 340 degrees to 040 degrees from 03 to 05 knots. The aircraft reported “base turn” and were advised to “report final approach track RWY 26”.

The aircraft then reported “established final approach track”, to which ATC advises “RWY 26 cleared to land”. The flight crew responded with “RWY 26 cleared to land” and request for the PAPI lights at maximum intensity. The aircraft landed on “RWY 08” and is advised to backtrack and vacate the via taxiway Charlie to Stand No.1.

However, the Belagavi ATC did not notify the flight crew that they had landed on an unassigned runway (RWY 08) till the aircraft had parked on Stand No.1. There were no injuries or any damage to the aircraft.

Post which the ATC officer did not advise the flight crew on the RT, instead sent a word with the airline ground staff for the flight crew to contact ATCO. PIC called a few different mobile numbers and was advised by the ATCO that they had probably landed on the unassigned runway, to which the PIC mentioned that he believes that they had landed on the correct runway. Then the ATCO mentioned that they would confirm this by hearing the ATC tape.

The CVR was not removed from the aircraft post the occurrence at Belagavi for the purpose of Investigation as the PIC was not formally informed about the occurrence by the ATCO. Thereafter the PIC started with his work to set up the flight deck for the next sector and requested for start-up in a few minutes with Belagavi ATC and then departed for Hyderabad as per their planned schedule.

1.2 Injuries to persons

NIL

1.3 Damage to aircraft

NIL

1.4 Other Damages

NIL

1.5 Personnel Information

1.5.1 Pilot-in-Command

Pilot-In-Command (Pilot Flying- PF)	
Age	43 years 2 months
License	ATPL
Date of Initial Issue	24-10-13
Valid Upto	23-10-25
Type Endorsements/Aircraft Ratings	PIC (DHC 8 402, C-172, PA-34)

Date of Medical Examination	22-06-21
Validity of Medical Examination	25-12-21
Date of Last IR/PPC check on Aircraft/Simulator	31-08-21
Total Flying Experience	8104.33 Hrs.
Total Experience on Type	7711.51 Hrs.
Total Type Experience as PIC	4000.52 Hrs.
Hours flown in the last 180 days	330:00 Hrs.
Hours flown in last 90 days	259:14:00 Hrs.
Hours flown in last 30 days	80:38 Hrs.
Hours flown in last 7 days	22:17 Hrs.
Hours flown in the last 24 hours	02:49 Hrs.
Rest Period before flight	18 Hrs.

PIC Training Details

TYPE OF TRAINING PILOT IN COMMAND (PIC)	
IR/LR	31-Aug-21
PPC	31-Aug-21
GROUND REFRESHER	12 Jul to 16 Jul 2021
GROUND REFRESHER/MEL/ LOAD & TRIM	
CRM	
DANGEROUS GOODS	16-Feb-21
SEP	12 Jul to 16 Jul 2021
MONSOON/ADVERSE WEATHER	11-May-17
AVSEC	7 to 8 April 2021

1.5.2 Co-Pilot

Co-Pilot (Pilot Monitoring- PM)	
Age	28 Years 10 months
Licence	CPL
Date of Initial Issue	19-11-15
Valid Upto	05-10-25
Type Endorsements/Aircraft Ratings	DHC 8 402
Date of Medical Examination	23-01-21
Validity of Medical Examination	31-01-22
Date of Last IR/PPC check on Aircraft/Simulator	25-08-21
Total Flying Experience	2302.17 Hrs.
Total Experience on Type	2102.17 Hrs.
Total Type Experience as PIC	N/A
Hours flown in the last 180 days	326:00 Hrs.
Hours flown in last 90 days	171:48:00 Hrs.
Hours flown in last 30 days	52:19 Hrs.
Hours flown in last 7 days	08:24 Hrs.
Hours flown in the last 24 hours	02:49 Hrs.
Rest Period before flight	17 Hrs.

Co-Pilot Training Details

TYPE OF TRAINING FOR FIRST OFFICER	
IR/LR	25-Aug-2021
PPC	25-Aug-2021
ENDORSEMENT TRAINING (SYSTEM TRAINING)	13-Sep-2018
SIMULATOR TRAINING	07-21 Aug 2018 FFS I -LOFT (INITIAL TRAINING)

SIMULATOR CHECKS	25-26 Aug 2018 SKILL TEST (INITIAL TRAINING)
RHS TRAINING	NA
GROUND REFRESHER/MEL	14 to 18 June 2021
FAMILIARIZATION	05-Oct-18
CRM	14 to 18 June 2021
DANGEROUS GOODS	7-Sep-21
SEP	14 to 18 June 2021
MONSOON/ADVERSE WEATHER	24-Aug-18
AVSEC	12 to 13 Oct 2021

The flight crew “Flight & Duty Time Limitations” were reviewed and observed to be within the prescribed limits as per company Operations Manual. No Fatigue report was filed by the flight crew nor any issue was brought out by the flight crew regarding fatigue during the interview process.

1.5.3 ACTO Training Details provided by Airports Authority of India

Tower Controller (ATCO1)

Aerodrome Rating	18.12.2019
Approach Rating	18.12.2019

Tower Controller (ATCO2)

Aerodrome Rating	19.08.2020
Approach Rating	19.08.2020

The investigation team reviewed the Shift patterns and Duty hours of the Tower Controllers for Fatigue and Human Factor related issues and found them to be normal.

1.6 Aircraft Information.

1.6.1 DHC-8-402 VT-SQC Aircraft Description.

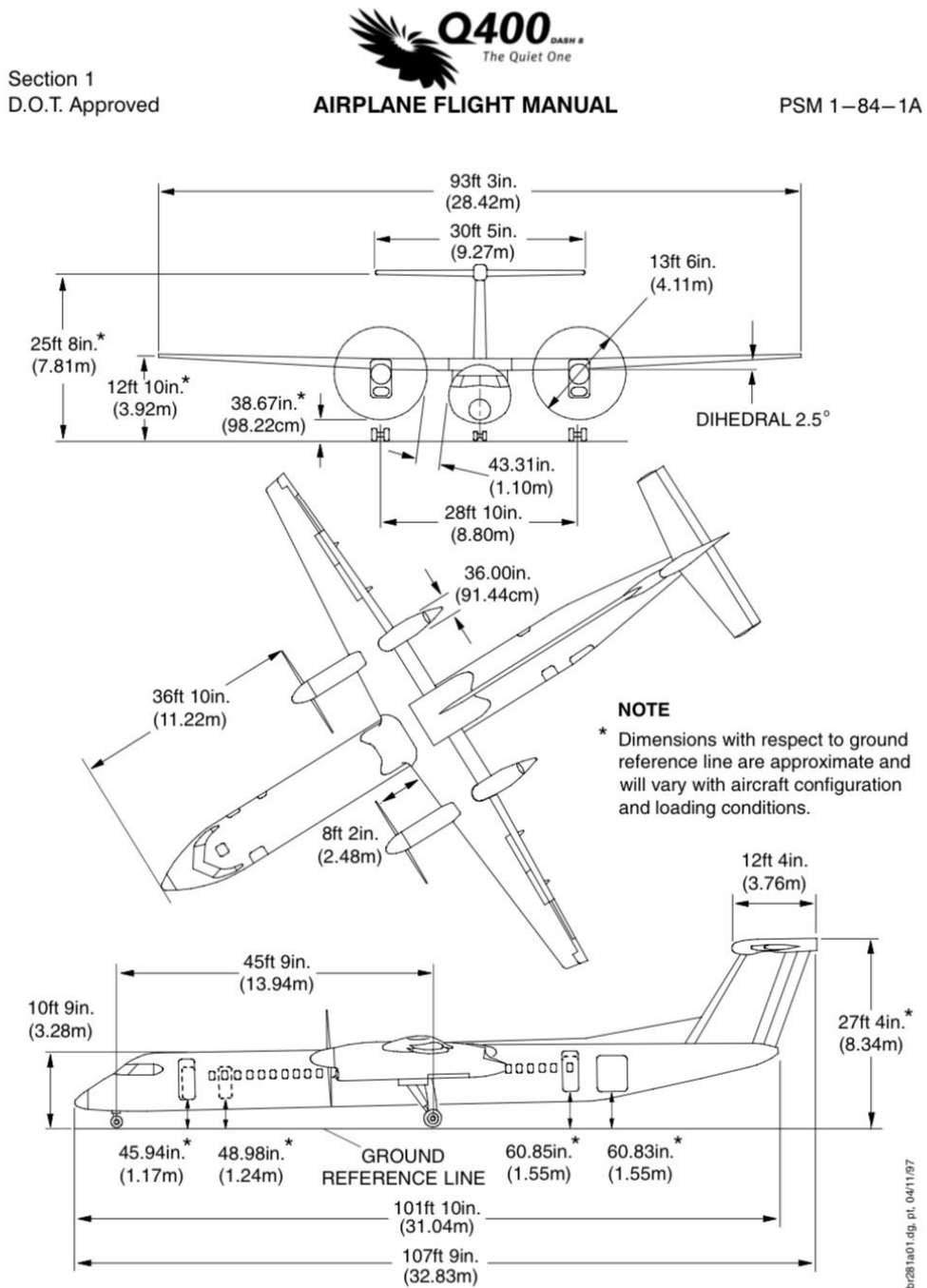
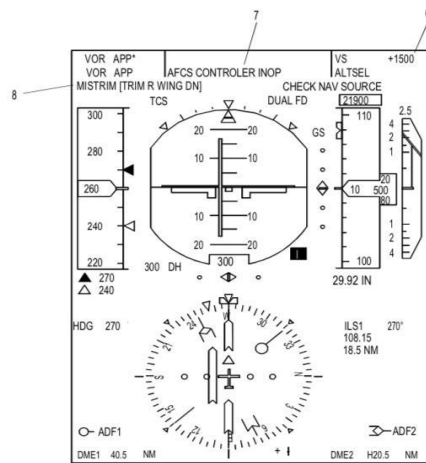
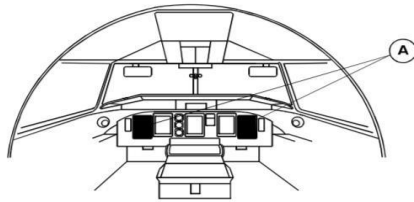


Figure 1-11-1

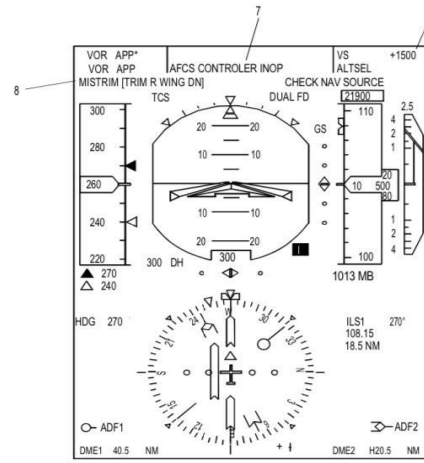
1-11-2

MODEL 402

6 October, 1999



(A)



(A)

Single Cue
(Option - CR 834 CH 00441)

Figure 6.3-8 Primary Flight Display (PFD) Flight Management Annunciations (3 of 5)

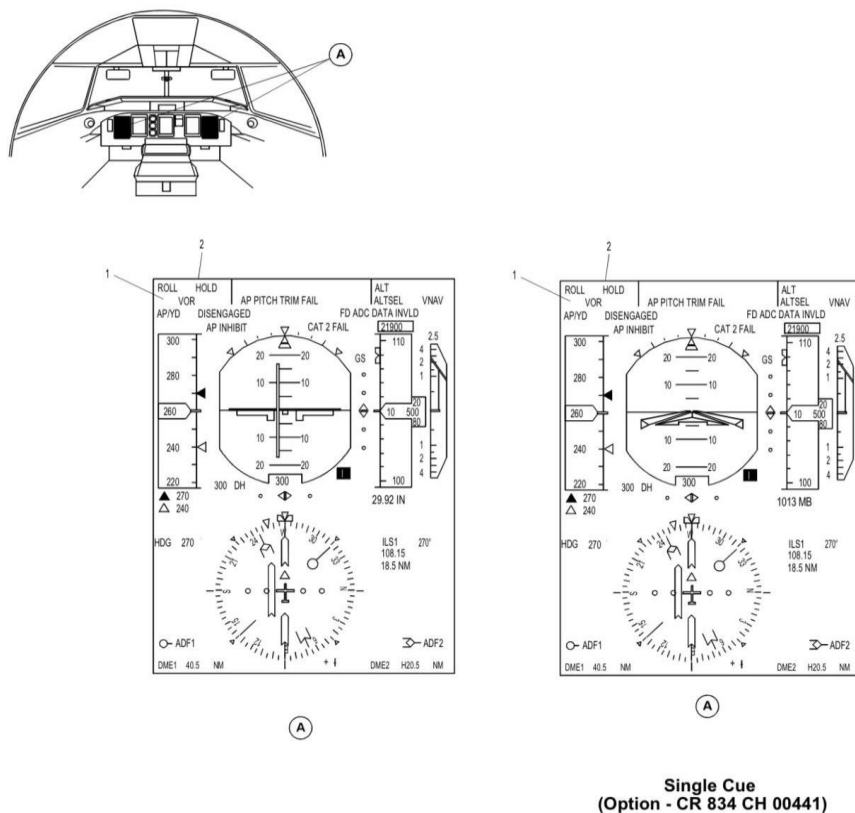


Figure 6.3-6 Primary Flight Display (PFD) Flight Management Annunciations (1 of 5)

AOM DASH 8-Q400

All the pictures have been extracted from the Aircraft Flight Manual and Aircraft Operating Manual. The above diagrams indicate the “Flight Mode Annunciator” indications which a flight crew will see while carrying out a VOR Approach.

1.6.2 Aircraft History.

The details of aircraft DHC-8-402 with registration VT-SQC are given below :

The aircraft bearing MSN 4586 was manufactured in the year 2018 and was registered under category ‘A’ with Certificate of Registration Number 4992/2. The Certificate of Airworthiness Number 7095 under “Normal category” (subdivision Passenger / Mail / Goods) was issued by DGCA on 30.11.18. The specified minimum operating crew is two and the maximum all up weight is 29,574 Kgs. At the time of incident, the Certificate of Airworthiness

and Aero Mobile License A010/103/RLO (NR) was valid. The aircraft was fitted with two PW150A engines.

1.6.3 Aircraft Maintenance

<u>Type of Document</u>	<u>Details</u>	<u>Date of Issue</u>
Certificate of Registration (COR)	4992/2	26.12.2019
Certificate of Airworthiness (COA)	7095	30.11.2018
Airworthiness Review Certificate (ARC)	SJ/ARC/2021/24	29.11.2021
Operator Permit No.	S-16	01.10.2020
MEL	DHC-8-402 Q400 aircraft MEL, Issue-3, Rev-04, August 2020	11.01.2021
Aircraft Station License	A-010/103/RLO(NR)	01.02.2019
Noise Certificate	7095 (NC)	30.11.2018

Technical Specifications:

Aircraft Type	DHC-8-402
Aircraft Manufacturer Serial number	4586
Engine Type	PW 150A
Left hand Engine serial number	PCE-FA1328
Right hand Engine serial number	PCE-FA1329
Propeller Type	R408/6-123-F/17
Left hand Propeller serial number	DAP1310
Right hand propeller serial number	DAP1311

There was no snag pending rectification. The aircraft and its engines were maintained as per the Maintenance Programme consisting of calendar period / flying hours or cycles based maintenance as per maintenance programme approved by DGCA. All concerned Airworthiness Directive, mandatory Service, and DGCA Mandatory Modification on this aircraft and engines have been complied with as on date of incident

1.7 Meteorological information.

On the day of occurrence i.e., 24/10/2021, the following was the weather reported at Belagavi (VOBM):

METAR	0500 UTC	0530 UTC	0600 UTC
Wind Velocity	320/06	360/04	050/04
Visibility	6 Kms	6 Kms	6 kms
Clouds	Sct 1200 Bkn 8000	Sct 1200 Bkn 8000	Sct 1200 Bkn 8000
Temp/Dew Pt	26/19	26/17	26/17
QNH	1019	1019	1018

- **Landing time 0551 UTC**

VT-SQC flight crew had received the following weather (METAR) in-flight from ATC Belagavi : 0500 & 0530 UTC.

BRIEFING FOLDER (VOHS-VOBM) was provided to the flight crew before the flight on 24/10/2021 of SEJ3733 as per company SOP.

1.8 Aids to Navigation.

Navigation Systems on DHC-8-402 VT-SQC

- VOR/DME
- ILS
- GPS
- FMS

Enroute Navigation

- VOR/DME - BBM (112.1 MHz)

Instrument Approaches

- VOR (RWY 08)
- VOR (RWY 26)

1.9 Communications

VT-SQC was always in positive contact with ATC throughout the flight on VHF (Belagavi ATC) and their last contact with ATC was at about 05:50:12 UTC. After the incident, the investigation team had obtained ATC recordings and transcripts from Belagavi ATC. At the time of incident, the crew was in contact with Belagavi tower details of the

channel given in the table below:

Call Sign	Channel
Belagavi Tower	118.350 Mhz

1.9.1 Communication with ATC

The ATC recordings were analyzed. The quality of Communication between the ATC and the Flight Crew was normal. Relevant content of the ATC tape transcript is given below:

**TAPE TRANSCRIPT OF VHF 118.35 MHz (ADC/APP[P] COMBINED)
ON 24-10-2021 BETWEEN 0500 UTC TO 0645 UTC AT BELAGAVI AIRPORT.**

Time	From	To	
05:16:54	SEJ	TOWER	Belagavi SEJ 3733
05:17:01	TOWER	SEJ	SEJ 3733 Belagavi
05:17:08	SEJ	TOWER	Requesting latest weather please
05:17:10	TOWER	SEJ	SEJ3733 Belagavi METAR time of observation 0500 UTC wind 320 degree 06 knots visibility 6 km cloud scattered 1200 ft broken 8000 ft temperature 26 dew point 19 QNH 1019
05:17:25	SEJ	TOWER	QNH 1019 (unreadable)
05:17:35	TOWER	SEJ	SEJ 3733-Belagavi TOWER observed wind 070 degree 05 knots: Runway in use runway 08
05:17:40	SEJ	TOWER	Copied SEJ 3733 call you released
05:17:45	SEJ	TOWER	SEJ 3733 QNH 1019
05:17:45	TOWER	SEJ	QNH 1019
05:17:55	SEJ	TOWER	SEJ 3733 Belagavi QNH read back correct number one in approach sequence read back correct no delay expected expect VOR DME approach runway 08 via BBM
05:18:02	TOWER	SEJ	Copied (further unreadable)
05:33:15	SEJ	TOWER	Belagavi -SEJ 3733 requesting further descend
05:33:20	TOWER	SEJ	SEJ 3733 Belagavi confirm released by Mangalore control
05:33:29	SEJ	TOWER	Affirm mam
05:33:31	TOWER	SEJ	SEJ 3733 Belagavi report level and DME distance inbound BBM
05:33:32	SEJ	TOWER	Maintaining FL 110 15 DME inbound on a radial of 070
05:33:38	TOWER	SEJ	SEJ 3733 Belagavi cleared to BBM via radial 070 continue descend 4600 ft QNH 1019 transition level flight level 70
05:33:52	SEJ	TOWER	transition level fl 70 cleared descend to 4600 ft QNH 1019 cleared to BBM via 070 radial SEJ 3733
05:34:01	TOWER	SEJ	SEJ 3733 Belagavi TOWER observed wind 340 degree 04 knots:
05:34:06	SEJ	TOWER	Copied thank you and confirm descend to 4100 ft
05:34:14	TOWER	SEJ	Negative descend 4600 ft
05:34:15	SEJ	TOWER	Correction 4600 feet copied
05:34:17	TOWER	SEJ	SEJ 3733 Belagavi cleared VOR DME approach runway 26 via BBM report leaving BBM for the approach runway 26
05:34:27	SEJ	TOWER	Call you leaving
05:38:08	TOWER	SEJ	SEJ 3733 report position
05:38:12	SEJ	TOWER	Entering the hold SEJ 3733

**TAPE TRANSCRIPT OF VHF 118.35 MHz (ADC/APP[P] COMBINED)
ON 24-10-2021 BETWEEN 0500 UTC TO 0645 UTC AT BELAGAVI AIRPORT.**

05:38:14	TOWER	SEJ	SEJ 3733 roger report leaving BBM for the approach runway 26
05:38:17	SEJ	TOWER	Call you leaving BBM
05:40:27	TOWER	SEJ	SEJ 3733 TOWER observed wind 020 degree 04 knots
05:40:36	SEJ	TOWER	SEJ 3733
05:42:05	SEJ	TOWER	Leaving BBM outbound SEJ 3733
05:42:13	TOWER	SEJ	SEJ 3733 roger report establish on final approach track runway 26
05:42:18	SEJ	TOWER	Call you establish final approach track 26 SEJ 3733
05:42:28	TOWER	SEJ	SEJ 3733 for your information wind variable from 340 degree to 040 degree from 03 knot to 05 knot
05:42:40	SEJ	TOWER	Winds Copied SEJ 3733
05:45:36	SEJ	TOWER	Base turn SEJ 3733
05:45:41	TOWER	SEJ	SEJ 3733 roger report establish on final approach track runway 26
05:45:44	SEJ	TOWER	Willco
05:46:53	SEJ	TOWER	Establish final approach track SEJ 3733
05:46:59	TOWER	SEJ	SEJ 3733 roger wind 350 degree 02 knots runway 26 cleared to land
05:47:03	SEJ	TOWER	Runway 26 cleared to land SEJ 3733
05:50:12	SEJ	TOWER	Request PAPI is max intensity SEJ 3733
05:51:18	TOWER	SEJ	SEJ 3733 landed 51 backtrack vacate via taxiway Charlie to stand number 1
05:51:27	SEJ	TOWER	Charlie to stand one Sierra Quebec Foxtrot SEJ 3733
05:57:22	TOWER	SEJ	SEJ3733 When able report number of passenger only
05:57:28	SEJ	TOWER	31 correction 30 passenger
05:57:30	TOWER	SEJ	Say again sir
05:57:32	SEJ	TOWER	30 thirty passenger all
06:22:49	SEJ	TOWER	Belgaum SEJ3734 namaskar
06:22:53	TOWER	SEJ	SEJ 3734 Belagavi TOWER namaskar
06:22:55	SEJ	TOWER	Sir requesting start up please and latest weather also
06:23:00	TOWER	SEJ	SEJ 3734 METAR time of observation 0600 wind 050 degree 04 knots visibility 6 km cloud scattered 1200 ft broken 8000 ft temperature 26 dew point 17 QNH 1018 runway 08
6:23:16	SEJ	TOWER	QNH 1018 runway 08 is copied we are souls on board standby sir we call you SEJ 3734
06:23:27	TOWER	SEJ	Roger QNH correct
06:23:30	SEJ	TOWER	We are souls on board 50 correction 50+4 54 souls on board requesting start up
06:23:38	TOWER	SEJ	SEJ 3734 start-up approved runway 08
06:23:40	SEJ	TOWER	Start-up approved runway 08 SEJ 3734
06:28:27	TOWER	SEJ	Belagavi SEJ 3734 requesting taxi please
06:28:32	SEJ	TOWER	SEJ 3734 taxi via Charlie enter backtrack line up runway 08 Time 29

**TAPE TRANSCRIPT OF VHF 118.35 MHz (ADC/APP[P] COMBINED)
ON 24-10-2021 BETWEEN 0500 UTC TO 0645 UTC AT BELAGAVI AIRPORT.**

06:28:39	TOWER	SEJ	Taxi via Charlie enter backtrack line up runway 08
06:30:50	SEJ	TOWER	SEJ 3734 entering active runway 08 and ready to copy clearance
06:30:59	TOWER	SEJ	SEJ 3734 roger clearance SEJ 3734 cleared to Shamshabad via flight plan route FL 230 after departure runway 08 proceed direct to SUGLI climb to flight level 230 departure squawk 0626
06:31:14	SEJ	TOWER	Cleared to Hyderabad flight level 230 after take-off runway 08 direct SUGLI climb to 230 squawk 0626 SEJ 3734
06:31:41	TOWER	SEJ	SEJ 3734 clearance readback correct report ready
06:34:06	SEJ	TOWER	Ready for departure SEJ 3734
06:34:10	TOWER	SEJ	SEJ 3734 line up and wait due coordination
06:34:14	SEJ	TOWER	Standing by sir
06:34:38	TOWER	SEJ	SEJ 3734 wind 020-degree 04 knots runway 08 cleared for take off
06:34:47	SEJ	TOWER	Cleared for take-off runway 08 SEJ 3734
06:38:07	TOWER	SEJ	SEJ 3734 airborne 36 confirm establish direct track to SUGLI
06:38:11	SEJ	TOWER	Affirm sir we are 8 miles out direct SUGLI climbing passing FL 85 for 230
06:38:17	TOWER	SEJ	SEJ 3734 Roger contact 127:55 good day sir
06:38:19	SEJ	TOWER	127:55 good day sir

ATCO SOPs regarding Communication is given in Manual of Air Traffic Services (Part1) (6th Edition, Dated 02 Sept 2021).

Flight crew SOPs regarding communication is detailed in Company Operations Manual Part A (Chapter 5 & Chapter 22).

1.10 Aerodrome information.

1.10.1 Belagavi Airport

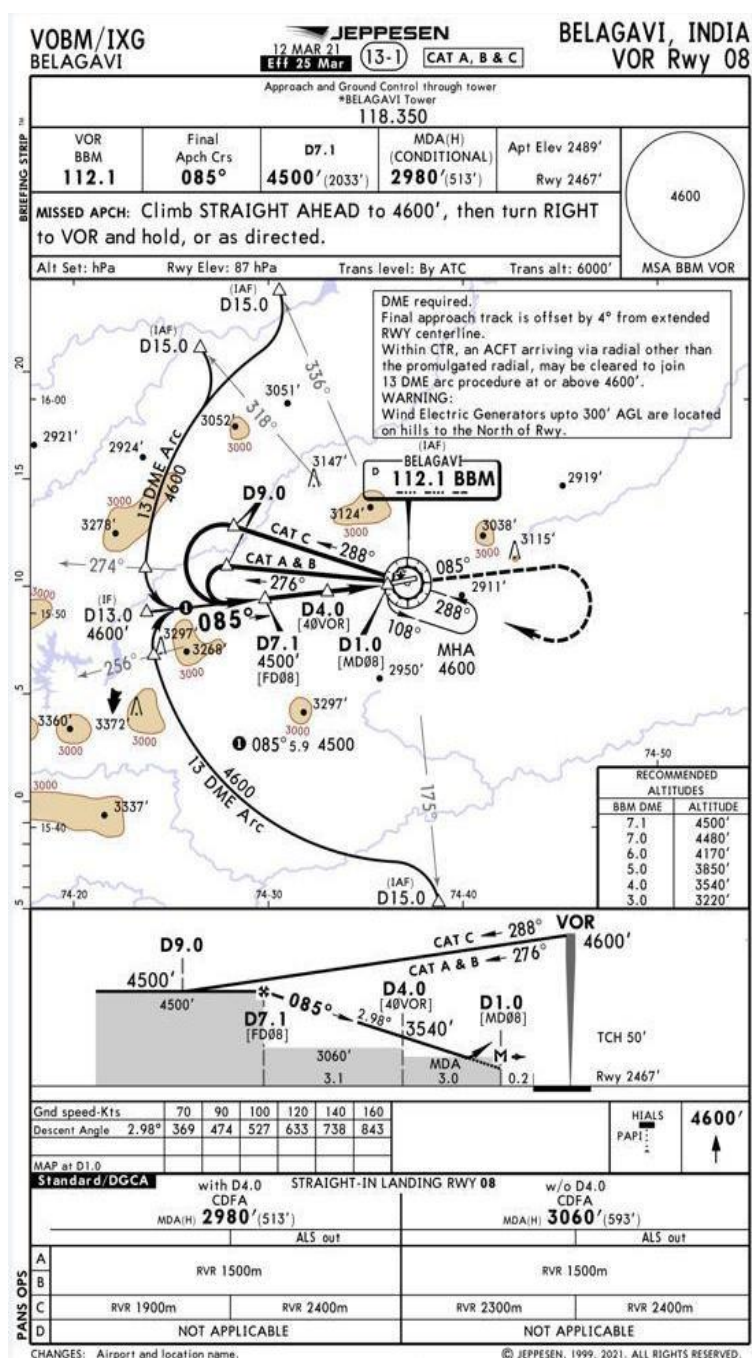
Belagavi is a licenced airport as per the list of “Aerodromes” Licenced in Public Use Category” as per DGCA CAR Section 4, Series F, Part 1 on the DGCA website which was last updated on 26th Feb 2021.

Belagavi Aerodrome is a civil airfield operated by Airports Authority of India. The aerodrome is located 10 kms East of Belgaum, Karnataka. Its ICAO nomenclature is **VOBM**. The aerodrome is used by Scheduled Operators, Non-Schedule and General Aviation. The coordinates of Belagavi Airport are 15 51 30.25 N & 074 37 03.69 E and elevation is 2489 FT

1.10.1.3. RUNWAY INFORMATION FROM AIP INDIA

RUNWAY	APPROACH TYPE	LENGTH & WIDTH	APPROACH LIGHTS	PAPI	RUNWAY LIGHTS
08	VOR 08	2300 x 45 M	SALS	3.0 Degrees	STANDARD
26	VOR 26	2300 x 45 M	CAT I	3.0 Degrees	STANDARD

1.10.1.4: VOR approach chart for RWY 08



1.11 Flight Recorders.

1.11.1. CVR and DFDR

The aircraft was equipped with a Cockpit Voice Recorder (CVR) and fitted with a Digital Flight Data Recorder (DFDR). CVR was not downloaded by the operator post the occurrence hence relevant recording was not available for investigation.

The DFDR data was made available to the investigation team. The DFDR data was analysed by the investigation team. The flight was observed to be normal with use of full automation. The VOR approach was carried with use of LNAV & VNAV which was authorized by the company.

1.12 Wreckage and Impact Information

Not relevant as there was no damage to the aircraft.

1.13 Medical and Pathological Information

1.13.1. Breath-Analyser (BA) examination

The crew reported at Hyderabad Airport on time and had their Preflight Breath-Analyser (BA) declaration given by the flight crew at 0535 IST (PIC) and 0525 IST (Co-Pilot).

Due to Covid-19, DGCA Air Safety had permitted the flight crew to exercise the privilege of their licences by giving a declaration that they were not under the influence of alcohol or psychoactive substances. Hence no "Breath-Analyser" test was carried out except for a declaration.

1.13.2 Medical Status of ATCO 1 & 2 on duty

Information provided by the DATCO regarding their medical history revealed no significant recent medical illness. As per the records, on the day of the occurrence, they were not suffering from any physical or mental illness or ill-being.

1.13.3 Summary of Medical, Pathological and Aeromedical Considerations

As per the records provided, Interviews of the Flight Crew, the ATC personnel, there is no evidence of any subtle or overt incapacitation in either the flight crew or the ATCO 1 or 2 that could have resulted in the serious incident. There is also no apparent underlying medical condition or medications that could have led to a detrimental performance while flying.

1.14 Fire

There was no fire.

1.15 Survival Aspects

The incident was survivable.

1.16 Tests and Research

Nil

1.17 Organizational and Management Information.

1.17.1. Spice Jet

- The aircraft was operated by a DGCA approved aircraft operator holding AOP (S- 16) in Passenger and Cargo Category which was valid till 16.5.2023. The operator carries out its own maintenance as CAR 145 approved organization. There is in-house training facility for the pilots, cabin crew, airport services and engineering.
- As per the requirement of CAR Section 8, Series 0, Part II; Spice Jet had obtained approval from the DGCA for the following post holders:

POST	DATE OF DGCA APPROVAL	REMARKS
Accountable Manager	27/05/2020	-
Head of Flight Operations	16/07/2019	Reinstated as Director Flight Operations on date 29/01/2021
Chief of Flight Safety (COFS)	23/07/2021	-
Head of Engineering	N/A	-
Quality Manager (QM)	28/05/2021	-
Continuous Airworthiness Manager (CAM)	30/07/2021	-

Record of Accidents/ Serious Incidents involving aircraft operated by the organisation from 2017-2021 is given below:

Year	Accident	Serious Incident	Details
2017	Nil	3	VT-SGZ: Runway Excursion VT-SUL: Hard Landing and subsequent Tail strike VT-SUM: Smoke in cockpit and cabin
2018	Nil	Nil	-
2019	1	2	VT-SYK: Runway Excursion (Accident) VT-SGJ: Runway Excursion VT-SUM:Runway Excursion

2020	Nil	3	VT-SZK: Landing on closed Runway VT-SXE: Emergency Descent due uncontrolled pressurisation VT-SUL: Airprox
2021	Nil	4	VT-SQC: Unassigned Runway Landing VT-SZN: Undershoot during landing VT-SUW: Engine Cowling separation VT-SYZ: Pressurization failure

Company Documentation:

A: Operations Manual

Relevant extract from Company's Operations Manual 'A' Chapter 22, **Para A22.1.1: 'Radio Telephone Discipline'** states the following:

Quote

- a. Call-sign to be used for Company operations shall be "SpiceJet XXXX (XXXX shall be flight number).
- d. Use Standard radio phraseology when communicating with ATC.
- e. Both flight crew members shall monitor and confirm ATC clearances to ensure mutual understanding of clearances accepted.
- h. Exercise caution when members of the flight crew are involved in other tasks and may not be monitoring the RT frequency.

Unquote

Relevant extract from Company's Operations Manual 'A' Chapter 22, **Para A22.1.3: ATC Clearances**

The clearance which need to be read back in addition to others listed in Para **A22.1.4** are:

- h. Approach and Landing Clearance
- i. Runway in use

Relevant extract from Company's Operations Manual 'A' **Chapter 23: Departure and Approach Briefings Para 23.7 states:**

Quote

“If the expected type of approach is known and there is no longer holding anticipated, it is recommended that the approach briefing should be completed prior to reaching Top Descent (TOD). Alternately ensure that the briefing is completed before the commencement of the approach. The PIC will ensure that an approach briefing is carried out for each approach by the PF. The PF shall brief PM of the intentions while conducting the approach briefing . Both pilots shall review the approach procedure. All pertinent approach information shall be reviewed, and alternate course considered. The Approach Briefing shall be planned to be completed before commencing descent from cruising level for the approach”.

E) Both pilots shall review the approach procedure. The PM shall set up and cross-check the FMS approach procedure prior to the approach briefing.

Unquote

B: Q-400 Line and Training Guide (QLTG) (Edition 1, Dated 30th Jan 2017):

Spice Jet has issued a “Q-400 Line and Training Guide” (QLTG) to all the Q-400 flight crew as the SOP for the said aircraft (Issued on 30th Jan 2017, Edition 1). The said document has been issued by the Chief Pilot - Line Operations, under the authority of Sr. VP Operations and is **NOT** issued by the manufacturer **NOR** is it a DGCA approved document. QLTG shared with the investigation team was issued on 30th Jan 2017 (Edition 1) and there have been no updates since 2017.

The following Para's of the QLTG are applicable to the said occurrence:

1.13.4	Sterile Cockpit
1.13.5:	Specific Activities Prohibited during Critical Phases of Flight
1.14.4	Flight Management System (FMS)
1.15.1	ATC Clearances
1.15.2	The following shall always be read back
1.24.7	Approach Checklist
1.27.5	Arrival and Approach
1.42	Approach Briefing
1.45	Detailed Procedure before descent
1.46	Approach Procedures
1.53	Detailed Procedure for Non Precision Approach
1.55	Go Around

C: Company Aerodromes Standard Operating Procedures Manual (CASOPM)

The operator has categorised various airfields they operate into with DHC-8-402 type of aircraft in the Company Aerodromes Standard Operating Procedures Manual (CASOPM) as per DGCA OC 02 of 2012 dated 26th September 2012.

Belagavi Aerodromes details are given in SEJ-OPS-50-CASOPM (Page IXG - 3/4/5/ & 6). Belagavi is Categorised as “B” for which company defines “Self Briefing” is required to make themselves aware of the aerodrome details.

CASOPM Appendix II (B14) specifies the following details for flight crew to operate to Belagavi:

	Flying Experience	Simulator	Observation Flights	Supervised Line Flying	Route Check
PIC	150	NIL	NIL	NIL	NIL
Co-Pilot	100	NIL	NIL	NIL	NIL

D: Cross-Checking of Flight Management System (FMS):

A detailed Approach Briefing is required to be carried out as per the operators Company Operations Manual Chapter 23. Para A23.7 (e) *Both pilots shall review the approach procedure. The PM shall set up and cross check the FMS approach procedure prior to the approach briefing.*

E: Company Training Circular TC 1/2021 Dated 12th Feb 2021 and TC 2/2020 dated 22nd July 2020:

Company wide TC 1/2021(Informatory) and TC 2/2020 (Mandatory) has notified all the flight crew that a Non-Precision Approach can be carried out by using LNAV & VNAV modes.

F: DHC-8 402 OPERATIONS CIRCULAR 26/2020 dated 12 Nov 2020 (Valid Until : 31 Jan 2021) - Mitigation of Landing on Wrong Runway.

The Operator suffered a wrong runway landing on their B 737 fleet on 20.1.2020 at Hyderabad. Post which the organization had issued a circular as a mitigation action to all flight crew on the B-737 and DHC-8-402 (Q-400). Refer Appendix.

G: Safety Journal :

The Operator issued an article in their Safety Journal regarding landing on wrong runways in the month of July 2021 (Edition 6) to educate all their flight crew regarding the said occurrence of the B 737 aircraft at Hyderabad.

Learning's as mentioned in the Safety article were as follows:

- a) Importance of adhering to correct flight clearances by the ATC.
- b) Importance of CRM and supervision by Pilot Monitoring.
- c) Awareness of issues arising due to confirmation bias.

H: Occurrence Reporting requirements of SpiceJet:

Chapter 34: 34.0.6 informs the flight crew the list of all **Mandatory Reporting** incidents/occurrences (Appendix 1: A34 A1.2 {a}[iv]).

*“Take-off or landing incidents, including precautionary or forced landings. Incidents such as under-shooting, overrunning or running off the side of runways. Take-offs, rejected take-offs, landings or attempted landings on a closed, occupied or **incorrect runway**. Runway incursions”.*

Further the Accountable Manager has issued a circular **“Timely Reporting of Incidents/Occurrence-For Strict Compliance”**.

I: Training of Flight Crew:

Extract from Operations Manual Part D: “CRM requirement”

Para D1.3.5 Crew Resource Management Training

D1.3.5 Crew Resource Management Training

- (a) Elements of CRM shall be integrated into all appropriate phases of recurrent training; and
- (b) A specific modular CRM training programme has been established such that all major topics of CRM training are covered over a period not exceeding three years, as follows:
 - (i) Human error and reliability, error chain, prevention and detection.
 - (ii) Company safety culture, SOPs, organizational factors.
 - (iii) Stress, stress management, fatigue and vigilance.
 - (iv) Information acquisition and processing, situation awareness, workload management.
 - (v) Decision making.
 - (vi) Communication and coordination inside and outside the cockpit.
 - (vii) Leadership and team behavior, synergy.
 - (viii) Automation and philosophy of the use of automation (if relevant to the type).
 - (ix) Specific type-related differences.
 - (x) Case based studies.
 - (xi) Additional areas which warrant extra attention, as identified by the accident prevention and flight safety programme.

Core Elements	Introductory CRM Course (duration 2 days)	Operator's conversion course when changing type	Operator's conversion course when changing operator	Command course	Recurrent training	
Human error and reliability, error chain, error prevention and detection, human performance and limitations	In depth	In depth	Overview	Overview	Overview	
Company safety culture, SOPs, organisational factors		Not required	In depth	In depth		
Stress, stress management, fatigue & vigilance			Not required			
Information acquisition and processing situation awareness, workload management		Overview				
Decision making						Overview
Communication and co- ordination inside and outside the cockpit						
Leadership and team behaviour synergy						
Automation, philosophy of the use of automation (if relevant to the type)	As required	In depth	In depth	As required	As required	
Specific type-related differences			Not required			
Case based studies	In depth	In depth	In depth	In depth	As appropriate	

Para D 1.3.6.3.2 Line Route Checks

D1.3.6.3.2 Line Route Checks:

- (a) Line Route checks must establish the ability to perform satisfactorily a complete line operation including pre-flight and post-flight procedures and use of the equipment provided, as specified in the Operations Manual.
- (b) The flight crew must be assessed on their crew resource management CRM skills in accordance with a methodology acceptable to DGCA and published in the Operations Manual. The purpose of such assessment is to:
 - (i) Provide feedback to the crew collectively and individually and serve to identify retraining; and
 - (ii) Be used to improve the CRM training system.
- (c) CRM assessment alone shall not be used as a reason for a failure of the route check.
- (d) When pilots are assigned duties as pilot flying and pilot monitoring they must be checked in both functions. The line route check as PF and PM may be completed on different route sectors within a span of 7 days. The date of completion of the route check shall be when both functions have been checked with satisfactory results.
- (e) Line route checks must be completed in an aeroplane.
- (f) Line route checks must be conducted by suitably qualified pilots. The person conducting the line route check shall be trained in CRM concepts and the assessment of CRM skills and may occupy an observer's seat where installed. When a line route check is conducted from the observer's seat, it shall be ensured that the pilot/pilots under check hold valid and current licenses/ratings/ qualification to undertake the flight. In the case of long haul operations where additional operating flight crew are carried, the person may fulfil the function of a cruise relief pilot and shall not occupy either pilot's seat during take-off, departure, initial cruise, descent, approach and landing. His/her CRM assessments shall solely be based on observations made during the initial briefing, cabin briefing, cockpit briefing and those phases where he/she occupies the observer's seat.

Roles, Duties and Responsibilities of Chief Pilot- Training & Standards (DHC-8-402) Operations Manual Part A Para A1.1.7.8.1

A1.1.7.8.1 Role, Duties and Responsibilities of Chief Pilot – Training & Standards (DHC-8-402):

- (a) He is responsible to conduct training of all DHC-8-402 Flight Crew Members in compliance with Operations Manual Part-D (Training).
- (b) Help Post Holder- Training to determine and publish the Training Objectives for Flight Crew.
- (c) Publish the Training Syllabi in coordination with Chief of Training & Standards.
- (d) Liaise with DGCA (Director-Training and Licensing) in matters relating to aircrew training and maintenance of licences.
- (e) Co-ordinate with the Post Holder- Training to plan, co-ordinate and supervise ground, simulator and flight training.
- (f) Ensure each phase of training is conducted strictly as per the Company policy and DGCA regulations.
- (g) Enforce the provisions of OM Part-D (Training).
- (h) Follow up performance deficiencies with corrective training in consultation with Chief Pilot -Line (DHC-8-402).
- (i) Liaise with ground and simulator training facilities.
- (j) Participate in the selection of DEs / TRIs / LTCs / SFIs.
- (k) Prepare necessary forms for training reports.
- (l) Maintain training records of all flight crew.
- (m) Maintain a database of aircrew flying hours, licensing status, qualifications and other relevant data.
- (n) Publish the list of pilots and co-pilots who are authorised to give the Supervised Takeoff and Landing on the Crewnet.
- (o) Co-ordinate licensing and medical requirements with DGCA / AFCME / Chief Medical Officer of the Company.
- (p) Correspond with DGCA / Ministry of Communications for the issue, renewal and endorsement of licences.
- (q) To control and monitor the DHC-8-402 pilots Pre-Flight Inspection training and check, if required.
- (r) Direct the procurement of air tickets, visas, hotel accommodation and transportation for aircrew proceeding on training and for other duty travel.

J. Psychometric Assessment: As per DGCA CAR Section 5, Series F, Part 1, Para 6.2 Proactive Programme, point (h) refers to Pilot recruitment is an important aspect from safety point of view. Operators should assess pilots not only for their flying skills but also for their attitude and compatibility. Careful recruitment is the best investment of an airline for safety.

1.17.2 Airports Authority of India

Manual of Air Traffic Services (Sixth Edition, Dated 2nd Sept 2021) Para 3.20 (Reporting of Occurrences and Investigation Thereof)

Ref Para 3.20.3.2 (f) clearly mentions that “*Landing or attempted landings on a closed or engaged runway, on a taxiway or **unassigned runway***”

1.17.3 Directorate General of Civil Aviation (DGCA)

DGCA Occurrence Reporting Requirement:

A: DGCA CAR Sec 5, Series C, Part 1(Notification of Incidents and Investigation Thereof):

Para 2: Applicability:

“The CAR requirement applies to **All Scheduled**, Non-Scheduled, Aerial work aircraft, State Govt/BSF aircraft & private aircraft operators, flying clubs, aircraft manufacturer, **Aerodrome operators, Air Navigation service provider**, MROs, Ground Handling agents, fuel vendors. This CAR lays down the requirements/ procedures for reporting of occurrences and investigation thereof”.

Appendix A of the CAR (Reportable Occurrences) Item-II

Aircraft Flight Operations A) Operation of Aircraft about “landings on a incorrect Runway.

B:DGCA Air Safety Circular

Relevant extracts of **DGCA Air Safety Circular 2 of 2004 (refer Appendices):**

According to Human Factors Studies this type of mistakes can happen due to fixation with perceived target and/or tunnel vision especially when there are parallel runways/taxiways or Runway with threshold close to each other. Another typical example is at IGI Airport where Runway 10 and 09 are close to each other and Taxiway ‘P’ is also parallel to Runway 28.

To avoid the above it is suggested that the Flight Crew should constantly revalidate and cross check the assumptions with proper concentration during the entire approach sequence.

All operators are advised to bring the above to the Notice of their flight crew with the advise that they should positively identify the correct runway and its orientation and cross check the same with Airborne Radio Aids/Instruments before making the final approach to land.

C: DGCA Operations Circular

Relevant extracts of **DGCA Operations Circular OC 4 of 2011 dated 21st April 2011 (Managing Disruptions and Distractions)** provides guidance on the effect of distractions which may lead to a unstable approach:

Quote

4. Factors involved in Interruptions and Distractions

- **Communication:** Non essential conversations.
- **Head-down activity:** Reading the approach chart and Programming the FMS.

5. Effect of Interruptions or Distractions

The primary effect of interruptions or distractions is a breakdown of the normal flow of ongoing cockpit activities which, in turn, can lead to errors and associated safety problems. An error may occur if the attention of the flight crew is diverted while they are engaged in safety-critical tasks such as following SOPs or doing normal checklists or communications or monitoring or problem solving.

An interruption/distraction often leaves the flight crew with a feeling of being rushed and faced with completing tasks of varying priority. This can result in an increase in workload even when the actual task load is reasonable and steady. As a result, a crew faced with concurrent task demands will typically focus on one or a few tasks while inadvertently ignoring all others. This response is typical of most crew when dealing with excessive workload.

Unless mitigated by effective compensatory techniques, a disruption leading to a lapse of attention can result in:

- Failure to monitor the flight path, possibly leading to an altitude or course deviation or even CFIT.
- **Missing or misinterpreting an ATC instruction** leading to a traffic conflict or runway incursion.
- Omitting an action and failing to detect and correct the resulting abnormal condition or configuration.
- Being “behind the aircraft” because of a task overload due to the combination of flying duties and attention to the interruption or distraction.
- **Non-adherence to SOP.**

1.18 Additional Information

Plan view of SEJ 3733 based on ADSB flight data given in Appendix

1.19 Useful or effective Investigation Techniques.

NIL

2. ANALYSIS

VT-SQC was fitted with a CVR and DFDR. However, the CVR recording was not available to the Investigation Team, due to non-removal of the CVR post landing at Belagavi and also at Hyderabad.

The Analysis is based on the documents, the DFDR analysis, ATC Tape Transcript made available to the Investigation Team in addition to the information shared by PIC, Co-pilot, Chief of Training (Q-400), Chief of Flight Safety, Station Manager of Spicejet and ATCO 1 & 2 during their interaction with the investigation team

2.1 Aircraft Serviceability

During the flight crew interviews, the flight crew confirmed that there were no abnormalities in the aircraft including engines, the thrust produced by the engines were normal and satisfactory. The aircraft performance was satisfactory. There was no maintenance due on the aircraft as on date of incident.

2.2 Organisation

2.2.1 Airports Authority of India

2.2.1.1 Occurrence reporting

In the Manual of Air Traffic Services (Sixth Edition) Para 3.20.3 mentions that in case an aircraft lands on an unassigned runway, the occurrence needs to be reported immediately or within 24 hours at the latest.

However, on review of the ATC tape transcript, the flight crew were not notified by the ATCO 2 regarding landing on the unassigned runway. Post landing the Spice Jet "Station Manager " at Belagavi was contacted by the ATCO 2 to inform the flight crew to call them on the Tower Landline number. Thereafter, the PIC contacted the ATCO1 on the mobile number and then was advised to change to another Mobile number and then followed with a third Mobile number. Then as per the ATCO 2, they had asked the PIC if everything was normal, to which the PIC mentioned that all operations were normal and at that point the ATCO 2 advised the PIC that they had been cleared for RWY 26 and landed on a "unassigned runway 08" and the same was required to be cross-checked through the ATC tapes after the PIC mentioned that they were cleared for runway 08 and SEJ3733 landed on runway 08.

The ATCO1 in the meantime contacted senior (Dy.GM-ATM) and informed him about the occurrence, who in turn advised them that he will be informing his superior in Chennai (GM-ATM) and revert back to them. This process took some time as the Dy.GM-ATM Belagavi contacted GM-ATM Chennai.

Meanwhile, the flight crew to maintain schedule, completed their Pre-flight actions for the next

sector, asked for start-up and departed back for Hyderabad as the PIC was not sure about the unassigned runway landing.

PIC in his interview mentioned the following that the ATCO's had not confirmed to him whether it was an actual case of landing on the unassigned runway or not after landing at Belagavi or on the phone call.

Further, the PIC mentioned that post the aircraft landing at Hyderabad (SEJ 3734), the PIC contacted the Dy.GM (ATM) Belagavi and he was informed about the landing on an unassigned runway.

Station Manager, Belagavi of Spicejet in his statement mentioned that the ATC notified the company at 1330 hrs IST about the unassigned runway landing. therefore, there was a considerable delay in notifying the occurrence to the operator as well as the flight crew.

Statement given by Dy.GM-ATM, Belagavi regarding call logs indicate the following :

1132 IST: Call from PIC to Tower Landline

1134 IST: Call from PIC on Tower mobile. The Tower Controller intimated the PIC that SEJ 3733 had made a landing on the unassigned runway.

1147 IST: Call from ATM In-Charge to PIC in response to two missed calls.

1318 IST: Call from PIC on Tower mobile

1338 IST: Call from PIC to ATM In-Charge after landing at Hyderabad.

However, it was observed that the ATCO1 did not follow proper SOP as per the Manual of Air Traffic Services - Part 1 (6th Edition, dated 02 Sept 2021, Chapter 6: Para 6.6.2) for notifying the flight crew regarding the change in runway.

2.2.1.2 Previous case of Approach on an Unassigned Runway:

In an earlier occurrence in Delhi dated 30.01.2016 (AAIB report 12.02.2018), it was observed that the ATC officers had observed on radar an aircraft (A320) was making an approach for runway 09 (unassigned runway) instead of runway 11 at Delhi, however, no Go-Around or Discontinue Approach was instructed to the flight crew.

Similarly at Belagavi, the ATCO2 had observed SEJ 3733 around 300-400 feet AGL approx. on final approach of runway 08 and had adequate time to instruct the aircraft to Go-Around but permitted the aircraft to continue approach and land on runway 08. During the ATCO2 interview, when the investigation team checked as to why the aircraft was not instructed to "Go-Around" the

ATCO2 mentioned that he believed that it was safe for the aircraft to land on runway 08 as there was no other traffic and the runway was clear as the runway inspection was carried out.

The investigation team opined that once the ATCO observes any unauthorised aircraft operation including aircraft attempting take-off, being aligned with an unassigned runway or taxiway for landing or about to land on an unassigned runway, the aircraft must be instructed to Go-Around by the ATCO unless the aircraft has declared an emergency or flight crew has clearly expressed the requirement to land immediately.

2.2.2 Spice Jet

2.2.2.1 Operations Manual and other Company Documentation:

The investigation team reviewed the various documents of the operator and observed that the information provided to flight crew is scattered in various documents and there are far too many documents a flight crew needs to refer to gather information and may have difficulty locating information when required under high stress situations.

Example: DGCA CAP 8100 (Preparation and Certification of Operations Manual) defines the following:

	Structure of Operations Manual as per CAP 8100	Observations on SpiceJet Operations Manual
Operations Manual Part A	GENERAL	No observation
Operations Manual Part B	AIRCRAFT OPERATING INFORMATION	Not in Operations manual Part B but in Q-400 Line and Training Guide (QLTG) which is not approved by the manufacturer or DGCA office.
Operations Manual Part C	AREAS, ROUTES AND AERODROMES	Not in Operations Manual Part C but CASOPM and Jeppesen
Operations Manual Part D	TRAINING	No observation

*During the flight crew interview, it was observed that there is no clarity as to which is the required document (Company Operations Manual or Aircraft Operating Manual (AOM) or the Company issued QLTG) to be followed as regards to Company SOP.

2.2.2.2 Non adherence to ICAO Phraseology

It is observed that PIC (PM) did not follow the standard ICAO phraseology during RT communications with Belagavi ATC as per Company Operations Manual A Chapter 5 Para A5.1.1 and Chapter 22 Para: A22.1.1 / A22.1.3 / A22.1.4

2.2.2.3 Safety Management System (SMS) in Spicejet

Review of the Accident & Serious incidents of the operator for the last 5 years shows that the operator has been suffering “Serious Incidents” on a regular basis and a deeper study needs to be carried out by interviewing the Accountable Manager, Safety Manager, Head of Operations, flight crew, engineering staff, flight dispatcher’s etc. to understand the underlying causes of such occurrences which could be influenced due to organizational issues, safety culture or any other factor or combination.

SpiceJet has established a SMS program as per the DGCA requirement. The number of reports being received by the Flight Safety department has been gradually increasing over the last few years which is a good indication but proper analysis of such reports can only be fruitful for an organization. As an example: not investigating an occurrence internally with the information available and not issuing an “Interim Mitigation” action is not considered a proactive measure taken by the organization.

One of the main purposes of SMS is to be proactive and action is to be taken before an occurrence takes place. Every company safety report, SOP, circular, occurrence etc. needs to be viewed and analyzed carefully and any observed hazard must be mitigated by the organization. Two unassigned runway landings by the same operator in less than two years is a matter of concern. This indicates that the said occurrence at Hyderabad was not deliberated adequately within the organization and no concrete steps were taken by the training and operations department apart from Flight Ops issuing a circular and the safety department informing the flight crew in their company safety journal. There seems to be no input by the training department to avoid such an occurrence. During discussions with the Chief Pilot Training of Q-400, no action taken could be demonstrated to the investigation team.

During discussions with the Chief of Flight Safety of the operator the investigation team was apprised that the operator does not carry out any internal investigation of such occurrences and waits for the formal report to be published by AAIB before any mitigation action is taken, thereby losing crucial time to bring in “interim mitigation actions” to avoid such serious occurrences. The “Operations Circular” regarding “Mitigation of Wrong Runway Landing” was issued in Nov of 2020 while the occurrence took place in Jan of 2020. This would indicate that the operators “Accident

Prevention and Flight Safety Program "as per Company Operations Manual (Chapter 34) is "Reactive" in nature.

The "Flight Operations Circular" "Mitigation of Landing on Wrong Runway" was issued on 12th Nov 2020. However, the validity of the circular was till 31st Jan 2021. Further post 31st Jan the said information has not been transferred into the "Company Operations Manual" or the QLTG (issued by the Company Dated 30th Jan 2017) which was shared with the investigation team

2.2.2.4 Flight Data Monitoring:

Though the SpiceJet flight data monitoring animation software meets the current regulatory requirements. However, the investigation team reviewed the SpiceJet Flight Data Monitoring and observed that the animation software used by SpiceJet caters for B-737 and Q400 leading to a situation that Flight Deck "Flight Mode Annunciator" indication is mixed and some information like VNAV, flap & landing gear etc. is not available as animation directly but these have to be tracked separately on the side. Further on query, the software does not have the provision of mapping the flight track of an instrument letdown chart. This can increase the workload of the FDM team and may cause important information to be missed.

2.2.2.5 Flight Safety session during Annual Ground Refresher for the flight crew

During the course of the Investigation, it came to light that the "Flight Safety" class conducted during the Annual Ground refresher for the flight crew is not conducted by pilots'. Leading to a situation that the classes are only a formality and no purpose is being solved except to show compliance to the DGCA laid down requirements.

The investigation team opines that the "Flight Safety" class if also conducted by pilots' in the Safety department will surely generate more interest and the discussions will also be more fruitful which can include recent accidents, incidents, ground turn backs experienced in the organization or in any part of the world with the available information. This session can also include de-identified flight data analysis reports etc. and sharing learnings.

However, it must be noted that the DGCA requirement does not clearly lay down the requirement if the "Flight Safety" class must be conducted by a pilot or it can be conducted by a non-pilot.

2.2.2.6 Ground Training of flight crew & Pilot Proficiency Training and Checks in the Simulator

2.2.2.6.1 Ground Training:

During the discussions with the flight crew it was evident that the flight crew were not very

conversant with CRM principles indicating the quality of training being conducted by the operator or the CRM principles are not being transferred from the classroom training session into the simulator session or actual flying.

2.2.2.6.2 Simulator training: The investigation team reviewed the simulator training profiles of Q-400 and observed that during the annual recurrent training, there is no exercise in the profile in which the flight crew are required to join the holding pattern and carry out a full instrument approach to ensure proper orientation of the flight crew wrt to the runway. When the observation was discussed with the Chief Pilot (Training) Q-400, he was unable to show to the investigation team any such training exercise in the profile. He did mention that a “Holding” is required to be demonstrated by the trainee during the “IR/PPC” as per the DGCA laid down performa. However, the investigation team opines that with the number of exercises currently required to be judged by the Designated Examiner (DE) are far too many within the stipulated period of two (2) hours and is difficult for a DE to make a trainee perform a full “Holding Pattern” before conducting an instrument approach and complete the entire profile.

2.2.2.6.3 Psychometric Assessment:

The PIC has never undergone a psychometric assessment at the time of joining or before PIC or Line Training Captain upgrade with the company.

The First Officer had undergone a psychometric assessment as part of the company selection process. However, the said report was never shared with the Flight Ops training team to plan for any support training in the areas which were highlighted during the assessment.

2.3 Flight related information

The said flight was the scheduled “Annual Line Check” for the First Officer, and the First Officer was “Pilot Flying” (PF) for the leg and the PIC (Line Training Captain- LTC) was the “Pilot Monitoring” (PM). The Annual Line Check was scheduled for the Hyderabad-Belagavi-Hyderabad sector.

The investigation team reviewed the Q-400 checklist and observed the following:

DESCENT

Altimeters set
Approach / Landing Briefing review
Cabin Alt Controls set
Ice Protection as req'd

Note: *Before entering icing conditions see page 2.7.*

The “Descent Checklist” requires the flight crew to complete the Approach/ Landing briefing. Therefore, the SEJ 3733 flight crew would have completed their Approach Briefing for VOR runway 08 after receipt of Belagavi ATC confirmation that runway in use was 08 as a part of the weather report (METAR). This was confirmed by the PIC (PM) and Co-Pilot (PF) during their interview with the investigation team.

APPROACH

Altimeters set
Lights as req'd
GPWS Landing Flap select
Fuel Transfer off ■
Tank Aux Pumps 1 and 2 On
Stby Hyd Press and PTU Cntrl On
Hyd Press & Qty check
Passenger Signs on ■
Caution / Warning Lights check
Cabin secure

Note: *Before entering icing conditions see page 2.7.*

- Review of the QLTG Para 1.46, the company policy is to complete the “Approach Checklist” after crossing “Transition Level” and the Approach checklist does not require the flight crew to review the type of approach. Hence the flight crew may have carried out the Approach Checklist while descending passing the Transition Level which was very close to the VOR (BBM) and just before entering the holding pattern for runway 08. Hence the workload and RT communication would have increased for a few moments thereby leading to a situation that the flight crew would have missed the change in runway to 26 from 08.

2.3.1 FMS Cross Check

During the interview the flight crew mentioned that as per SpiceJet SOP, the Pilot-Flying (PF) is required to set up the FMS for the approach and post which the briefing is carried out. However, a review of Company Operations Manual (Para A23.7{e}) and QLTG mentions that the PM will set up the FMS before the Approach Briefing. However, there is no proper procedure for cross-check of the FMS by Pilot-Flying (PF). During the interview as well the flight crew were unable to show the investigation team at what stage the PF cross-checks the contents of the FMS before commencing the approach.

During the interview with the PIC (PM) & Co-Pilot (PF), both confirmed that while in the 'Sterile Cockpit' period, they were involved in discussing the landing made by the Co-Pilot (PF) in the previous leg at Hyderabad. The PIC (PM) was explaining the importance of avoiding a long landing at Belagavi and also the correct way of inserting a 'Hold' in the FMS.

The PIC (PM) mentioned in his interview that some flight crew were unaware about the correct procedure to insert a 'Hold' in the FMS and was therefore demonstrating the same to his First Officer.

These discussions led to a situation that both flight crew did not realize that the runway was changed by the ATCO1 without any notification to the flight crew and were cleared for the VOR approach for runway 26 instead of 08. SEJ 3733 joined the hold over BBM for VOR approach runway 08 and proceeded outbound for the VOR approach 08 as programmed by the PIC (PM).

PIC (PM) in his interview did mention that he was not sure whether the Co-Pilot (PF) or himself had replied to the ATC instructions of the "Approach Clearance" for runway 26.

2.3.2 SOP for Non-Precision Approach

Review of the Line & Training Guide (QLTG) which is used by all Q-400 flight crew as their SOP in Para 1.53 defines the SOP for flying a "Non-Precision Approach", however the procedure does not require the flight crew to "identify" the runway before landing as required by DGCA Air Safety Circular 2 of 2004. Also, the SOP for Non-Precision approach given in Aircraft Operating Manual 2.10-8 is different from the being followed by the company.

The investigation team observed that flight operations related information which is made available to the flight crew is scattered amongst various company documents and are difficult to locate the same by the flight crew in a limited time. Example: QLTG was being used as the 'SOP' for Q-400 used extensively by all flight crew, however the use of LNAV & VNAV for the Non-Precision approach is given in the Q-400 Training Circular (**TC 1/2021 dated 12th Feb 2021**). During discussions, PIC did not recall where the information of LNAV & VNAV could be used for Non-Precision Approach was given.

During the interview the PIC was unable to locate in which company document was the details “How to conduct a Non-Precision Approach using LNAV & VNAV” and the First Officer did locate the Training Circular but after searching in few document like Operations Manual, Aircraft Operating Manual (AOM), various company circulars and then the Training Circular was located.

2.3.3 Non- Adherence to Company Standard Operating Procedures by the Flight Crew

The investigation team reviewed the Flight Data, the animation of the flight data and observed that the flight crew had by and large followed the company SOP wrt flying the aircraft. However, the flight crew during their interview mentioned that they were involved in some non-essential conversation unrelated to the flight during descent and had programmed the FMS for a VOR approach for runway 08 as advised by the ATCO1 initially. They planned their descent accordingly with a hold over VOR (BBM) due to the large variation in their inbound track to the VOR and the outbound track of the VOR 08 approach. Thereafter the flight crew did not detect the change in runway to rwy 26.

It is important to note that the ATCO1 did not specifically advise the SEJ3733 about the “Change in Runway” for arrival as per Manual of Air Traffic Services - Chapter 6 Para 6.6.2.

Thereafter the flight crew continued with the procedure for VOR runway 08. At 0535 UTC, ATCO2 took over controlling the aircraft once the aircraft came overhead and joined the hold. ATCO2 was observed to using correct ICAO Phraseology, however the PIC (PM) was not. Example:

- 1) When the aircraft was cleared for the approach in spite of the ATCO1 clearing the SEJ3733 for VOR runway 26, the PIC (PM) did not mention the runway designator. This was corrected or confirmed by ATCO2.
- 2) While in the holding pattern, the PIC (PM) never informed the ATC they had joined the holding pattern for which runway This was not corrected or confirmed by the ATCO2.
- 3) When SEJ3733 proceeded outbound for the approach, PIC (PM) did not inform ATC the runway they had commenced an approach for.
- 4) ATCO2 advised SEJ3733 to call “SEJ 3733 Roger Report Established on Final Approach Track 26”, at this point the PIC (PM) replied back “Wilco” and thereafter “Established Final Approach Track SEJ3733”
- 5) “Runway 26 Cleared to Land SEJ 3733” ,the PIC (PM) has mentioned the runway designator.

The PIC (PM) was not using proper ICAO Phraseology while doing Radio Telephony while operating SEJ 3733 due to “Fixation to the target and Distraction” and his awareness was low leading to PIC (PM) permitting the Co-Pilot (PF) to continue with the wrong VOR approach I.E. approach for runway 08 instead of VOR approach for runway 26 as cleared by ATC.

The Co-Pilot (PF) at no stage raised any query in this regard and continued to follow the PIC (PM) leading to breakdown of crew resource management (CRM), as he mentioned in his interview that as he was busy doing “Pilot Flying” duties and he did not monitor the ATC instructions.

The flight data indicates that the Co-Pilot (PF) was using automation (AP) to fly the aircraft along with LNAV and VNAV to fly the VOR approach as per company procedure. The Co-Pilot (PF) should have better monitored the ATC instructions in addition to the PIC(PM) as required by the company SOP and raised an alarm when the runway was changed.

2.4 Notification of Occurrence

As per company Operations Manual, this occurrence was required to be informed to the company immediately when the PIC was informed by the ATCO and the DGCA as per the existing guidelines. The flight crew failed to notify the organization. Though as per the flight crew the ATCO1 spoke to PIC at Belagavi after landing (parking) on mobile and informed the PIC about landing on the unassigned runway. However, PIC mentioned that they were cleared for VOR runway 08 and had landed on runway 08. To this the ATCO1 mentioned that they will need to cross-check the ATC tape recordings to confirm the wrong runway landing. Hence the PIC did not report to the company.

The PIC after making the calls to the ATCO & Dy.GM-ATM did not inform the First Officer regarding the concern raised but did mention that ATC had some doubts and was to confirm from the ATC tapes. Thereafter the flight crew got busy preparing for the next leg of the flight.

The flight crew did not inform their company at this stage as they mentioned they were unsure about landing on the unassigned runway. Subsequently they asked ATC for start-up, and the same was permitted by ATC Belagavi and they continued their flight to Hyderabad.

Post landing at Hyderabad the PIC(LTC) completed filling up the DGCA approved “Annual Line Check” form for the First Officer as “Satisfactory”. The PIC then made calls to Dy GM-ATM, Belagavi and it was then that he was notified about the unassigned runway landing. Post this call he also received a call from the company Safety Department stating that he needs to contact the Chief of Flight Safety (SpiceJet). The Chief of Safety also advised them to complete the “Notification” paper work immediately. PIC mentioned in his interview that, as Covid-19 infection was at its peak, he preferred doing the notification process after reaching home to limit his exposure to COVID-19 virus.

Post reaching home, the PIC filed the “Mandatory Occurrence Report”. However, no time has been mentioned by the PIC as to when the report was actually filed. Due to this non-reporting of the occurrence at Belagavi and immediately on being made aware of the occurrence, crucial evidence of the CVR recording was lost due to the CVR downloaded at Belagavi or Hyderabad after landing.

2.5 Previous occurrence of landing on unassigned/closed runway involving company aircraft

It is pertinent to note that in a similar occurrence of “Landing on Unassigned/closed Runway” at Hyderabad by a B-737 (VT-SZK) on 21st Jan 2020 of the operator, again the CVR was not downloaded due to following as mentioned in the AAIB report : “***deliberate haste to complete the remaining sorties resulting in erasing of the relevant CVR recording***” (Refer AAIB report on Wrong Runway Landing of VT-SZK at Hyderabad). This indicates that there is a practice in the organisation to maintain schedule departure time of the next flight leading to not downloading of the CVR on some pretext or the other with blatant disregard to the DGCA requirements. Both the occurrences i.e., B-737 (VT-SZK) and Q-400 (VT-SQC) the aircraft had arrived at Hyderabad wherein the CVR could have been downloaded which would have given the investigators a better picture of how the cockpit was managed by the flight crew, in addition the discussions, distractions during the descent and approach phases of the flight could be looked into. In absence of this crucial information, the investigation team had to rely on the statements made by the flight crew who did not seem to be forthcoming with the information. During the interview of the flight crew the following was observed by the investigation team: - PIC was not aware of the Flight Operations Circular nor the Flight Safety Journal article regarding “ Mitigation of Landing on Wrong Runway”.

-The First officer was not aware of the Flight Operations Circular regarding “Mitigation of Landing on Wrong Runway” but was aware of the Flight Safety Journal article.

Learning’s as mentioned in the company Safety Journal article were as follows post the occurrence stated above:

- A) Importance of adhering to correct flight clearances by the ATC
- B) Importance of CRM and supervision by Pilot Monitoring.
- C) Awareness of issues arising due to confirmation bias.

All the above factors identified in the Hyderabad serious incident as mentioned above were also present in the current occurrence being investigated.

Two unassigned runway landings by the same operator in less than two years is a matter of concern. This indicates that the said occurrence at Hyderabad was not deliberated adequately within the organization and no concrete steps were taken by the training and operations department apart from Flight Ops issuing a circular and the safety department informing the flight crew in their company safety journal. There seems to be no input by the training department to avoid such an occurrence.

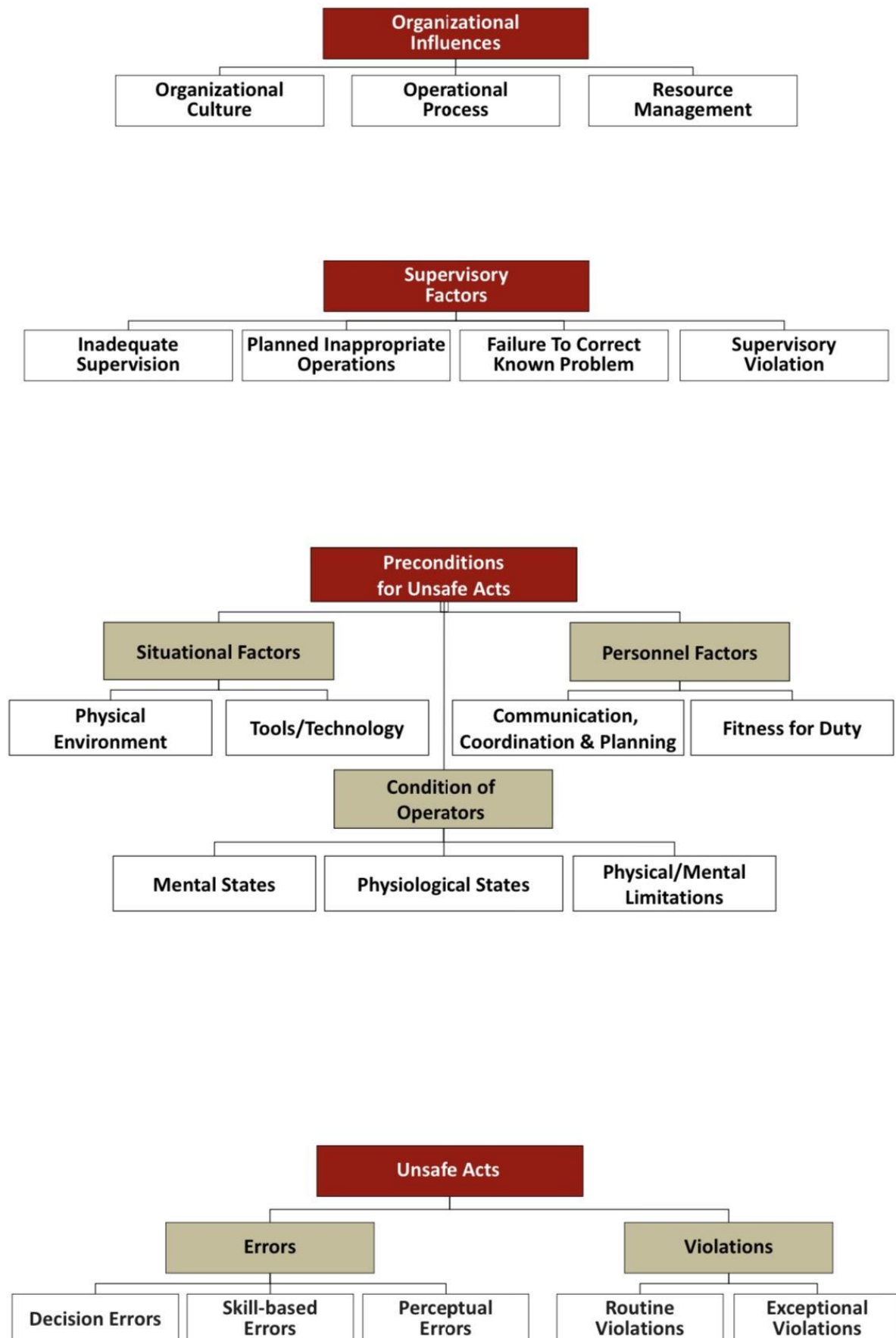
2.6 Human Factors Analysis and Classification System (HFACS)

The Human Factors Analysis and Classification System (HFACS) was developed by Dr. Scott Shappell and Dr. Doug Wiegmann. It is a broad human error framework that was originally used by the US Airforce to investigate and analyse human factors aspects of aviation. HFACS is heavily based upon James Reason's Swiss Cheese Model (Reason 1990) . The HFACS framework provides a tool to assist in the investigation process and target training and prevention efforts. Investigators are able to systematically identify active and latent failures within an organisation that culminated in an accident. The goal of HFACS is not to attribute blame; it is to understand the underlying causal factors that lead to an accident/Incident.

The HFACS framework describes human error at each of four levels of failure:

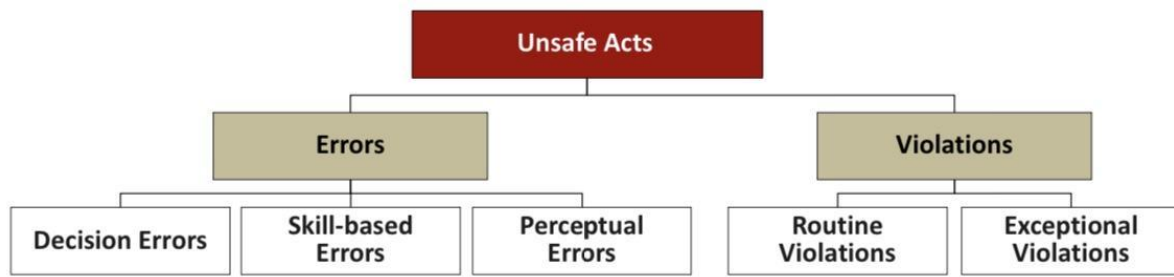
Within each level of HFACS, causal categories were developed that identify the active and latent failures that occur. In theory, at least one failure will occur at each level leading to an adverse event. If at any time leading up to adverse event, one of the failure is corrected, the adverse event will be prevented (Diagram credit to Embry Riddle University).

The Human Factors Analysis and Classification System



HFACS Flowchart

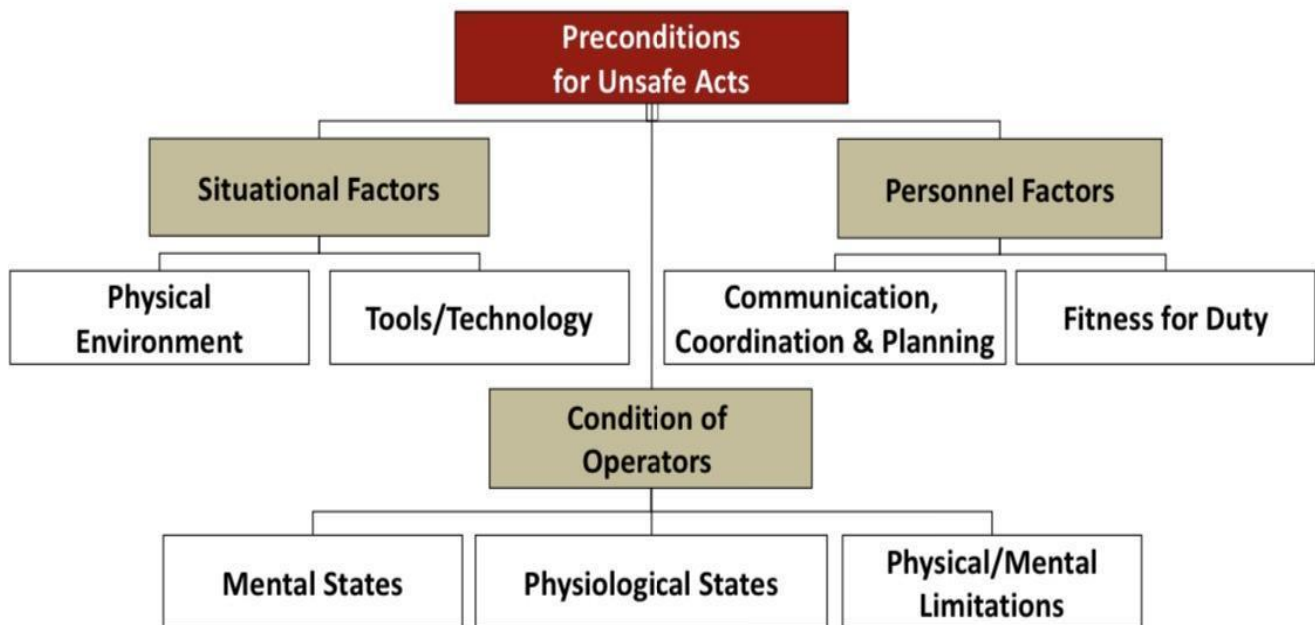
2.6.1 UNSAFE ACTS (ACTIVE FAILURES) :



ERRORS			
	PIC	CO-PILOT	ATCO
DECISION ERROR	NIL	NIL	NIL
SKILL-BASED ERROR	NIL	NIL	NIL
PERCEPTUAL ERROR	Distractions leading to not hearing that the runway had been changed	Distractions leading to not hearing that the runway had been changed	NIL

VIOLATIONS			
	PIC	CO-PILOT	ATCO
ROUTINE VIOLATIONS	NIL	NIL	NIL
EXCEPTIONAL VIOLATIONS	Landing on runway 08 instead of 26	Landing on runway 08 instead of 26	<ul style="list-style-type: none"> Non-Adherence to SOP: Change of Runway not notified to flight-crew Allowing aircraft to land on unassigned runway despite being aware.

2.6.2 PRECONDITIONS FOR UNSAFE ACTS (LATENT FAILURES) :

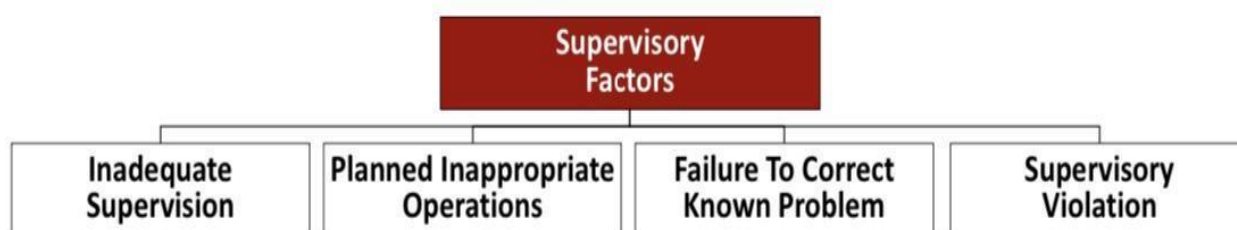


SITUATIONAL FACTORS			
	PIC	CO-PILOT	ATCO
PHYSICAL ENVIRONMENT	NIL	NIL	NIL
TOOLS/ TECHNOLOGY	Did not use the on-board automation (FMS) to enhance their Situational Awareness	Did not use the on-board automation (FMS) to enhance their Situational Awareness	NIL

PERSONNEL FACTORS			
	PIC	CO-PILOT	ATCO
COMMUNICATION, COORDINATION AND PLANNING	Non-essential conversation during descent and initial approach phase of the flight.	<ul style="list-style-type: none"> Non-Assertive behaviour. Non-essential conversation during descent and initial approach phase of the flight. No FMS cross-check. 	<ul style="list-style-type: none"> ATCO1 did not inform the flight crew regarding change of runway. ATCO 2 did not notify aircraft to go around.
FITNESS FOR DUTY	Fit for Duty	Fit for Duty	Fit for Duty

CONDITION OF THE OPERATOR			
	PIC	CO-PILOT	ATCO
MENTAL STATES	Distracted due to organisation issues related to restructuring of working conditions due to COVID-19.	Distracted due to organisation issues related to restructuring of working conditions due to COVID-19.	NIL
PHYSIOLOGICAL STATES	Nil	Nil	Nil
PHYSICAL / MENTAL LIMITATIONS	Nil	Nil	Nil

2.6.3 SUPERVISORY FACTORS (LATENT FAILURES):



INADEQUATE SUPERVISION	Inadequate awareness raised by the training dept of Spicejet wrt to the previous case of "Wrong runway landing".
PLANNED INAPPROPRIATE OPERATIONS	NIL
FAILURE TO CORRECT KNOWN PROBLEM	SOP of Spicejet not requiring runway to be positively identified before landing as per Air Safety Circular of DGCA.
SUPERVISORY VIOLATION	Inadequate deliberation by Spicejet to address the causal factors of wrong runway landings.

2.6.4 ORGANIZATIONAL INFLUENCES:



	Spicejet	Airports Authority of India	REGULATOR
ORGANIZATION AL CULTURE	Weak Safety Culture	Reporting Culture	NIL
OPERATIONAL PROCESS	Not process driven	Hierarchy driven processes	NIL
RESOURCE MANAGEMENT	Limited in the current scenario	No limitations	No Limitations

2.7 Spatial Disorientation

The weather conditions faced by the crew during flight was VMC, there was no on-board equipment failure, weather phenomenon or any of one of the flight crew feeling unwell which could cause Spatial Disorientation to either of flight crew members.

2.8 Cockpit Resource Management (CRM) Aspects with the flight crew.

- **SOP:** Though the flight between Hyderabad and Belagavi may be considered as normal. However, due to “Expectation Bias and Distraction” flight crew continued the approach for the unassigned runway.
- **Communication:** Though the flight crew mentioned that they were busy with non-essential conversation during the descent phase of the flight. However, the communication level wrt to flight related issues was inadequate for either one to point out the error.
- **Decision Making:** The decision to continue with the approach for runway 08 instead of 26 as cleared by ATC.
- **Trans-Cockpit Authority Gradient (T-CAG):** The PIC (PM) being an LTC with the company, was carrying out the Annual Line Check for the Co-Pilot (PF). Hence the Co-Pilot was naturally under subtle pressure due to his previous landing at Hyderabad which was a long landing.

- **Assertiveness:** The Co-Pilot (PM) was not assertive enough to question the decisions of the PIC (PM) and chose to remain silent and agreed with the PIC (PM).
- **Distraction Management:** Due to lack of CVR evidence, the investigation team had to rely on the flight crew statements. During the flight crew interview, the flight crew mentioned that they were distracted due to the non-essential conversation related to unilateral change in working conditions by the organisation during the cruise phase and discussing long landing in the previous sector, insertion of the HOLD in the FMS during descent and while joining the holding pattern. This led to the situation of the flight crew getting distracted and not realizing that SEJ3733 was cleared by ATCO1 for VOR approach runway 26 instead of VOR approach runway 08 as originally informed to them. Had the flight crew not been distracted and were following all SOP related to “Sterile Cockpit”, this change of runway probably would have been detected at least by one flight crew member.
- **Situational Awareness:** The flight crew were situationally not aware that they had been cleared for VOR Runway 26 approach instead of originally planned VOR runway 08 due to “Expectation Bias and Distraction”.
- **Workload Management:** Due to the lack of CVR evidence it is difficult for the investigation team to know how the workload was managed by the Co-Pilot (PF) & PIC (PM).

2.9 Circumstances leading to the incident:

The flight crew had planned to carry out a VOR approach for runway 08 as initially advised by ATCO1. Passing 11000 feet and around 10 DME from BBM, SEJ 3733 was cleared by ATCO1 to carry out a VOR approach for runway 26. The change from runway 08 to runway 26 without ATCO 1 notifying the flight crew. This change of runway the flight crew failed to realize due to FMS programming and other conversation which led them to be distracted. The First Officer (PF) was using the Auto-Pilot (AP) and permitted the aircraft automation to follow the programmed FMS without cross-checking the ATC clearance, leading to a situation of carrying out an approach for runway 08 instead of runway 26.

ATCO2 Cleared SEJ3733 to land on runway 26, which was acknowledged by the PIC (PM). Subsequently SEJ3733 requested for the 'intensity of PAPI' to be increased. At this time the ATCO2 did not observe the aircraft on Final of runway 26 but saw the aircraft on Finals for 08 and hence switched "ON" the PAPI for 08.

ATCO2 observed the aircraft on short finals (between 300-400 feet AGL) for runway 08 while switching on the PAPI for runway 08, and permitted SEJ 3733 to land as the ATCO2 believed that it was safe for the aircraft to land on runway 08.

3. CONCLUSION

3.1. FINDINGS

3.1.1. Spicejet:

- 1) Aircraft was airworthy.
- 2) Flight crew were medically fit and their licences were current to operate the flight.
- 3) Flight crew had given an undertaking that they were not under the influence of alcohol or used any psychoactive substance at Hyderabad before starting their flight duty.
- 4) Flight crew were distracted due to non-essential conversation during different phases of flight leading to carrying out an approach and landing on an unassigned runway.
- 5) PIC(PM) not using ICAO phraseology while communicating with ATC.
- 6) Failure on the part of the organisation to address the causal factors of the previous unassigned runway landing occurrence.
- 7) Company is using a “Q-400 Line and Training Guide” (QLTG) which is not a Manufacturer or DGCA approved document.
- 8) Chief of Training as the DGCA Post Holder did not notify the DGCA office and accepted the “Annual Line Check” of the First officer which the PIC (LTC) had filled as “Satisfactory” after the landing on the unassigned runway.
- 9) Information pertaining to flight operations is scattered over various documents and not easy to locate for the flight crew. E.g. Non-Precision Approach using LNAV/VNAV is not provided in QLTG but provided in a Training Circular.
- 10) SpiceJet Operations Manual Part A & QLTG not requiring the “Pilot Flying” to cross-check the FMS information after being filled by the Pilot Monitoring before commencing the instrument approach.
- 11) Flight crew carried out a VOR approach for runway 08 instead of runway 26 as cleared by the ATC.
- 12) Flight crew did not notify the company regarding “Landing on an Unassigned Runway” at Belagavi.
- 13) The flight crew went ahead to complete the remaining sector without removal of CVR which resulted in non-availability of the CVR recording.
- 14) PIC had never undergone a psychometric assessment until date of the occurrence with the company.
- 15) First Officer had undergone a psychometric assessment with the company as a part of the selection process for the company.

3.1.2. Airports Authority of India

1. The ATCO 1 & 2 were both duly rated and certified for performing his duties as per the DGCA laid down criteria.
2. ATCO 1 & 2 were medically fit as per the DGCA laid down criteria.
3. ATCO1 did not notify SEJ3733 regarding change of runway as required by Manual of Air Traffic Services Chapter 6 Para 6.6.2
4. ATCO2 observed SEJ 3733 on Final Approach of runway 08 instead of runway 26 around 300-400 feet AGL. However, did not instruct the flight crew to Go-Around.
5. Did not notify the flight crew about landing on the unassigned runway on the Radio Telephony after landing/Parking at Belagavi.
6. ATC Belagavi permitted SEL 3734 to depart Belagavi before confirming to flight crew that they had landed on an unassigned runway.
7. There was a considerable delay in reporting of the occurrence.

3.2 Probable cause:

- 1) Flight crew commencing an instrument approach for the unassigned runway (08) due to expectation bias and distraction leading to remaining fixated to carry out a VOR approach for runway 08.
- 2) ATCO2 not advising the flight crew to Go-Around when he observed the aircraft at 300-400 AGL (1-2 NM's) on final approach of runway 08 and thereby knowingly permitting the aircraft to land on runway 08.

3.3 Contributory Factors:

- 1) Non-Adherence to ICAO Radio Telephony Phraseology by the PIC (Pilot Monitoring) while communicating with Belagavi ATC.
- 2) ATCO 1 not informing the flight crew regarding change of runway as per the Manual of Air Traffic Services Chapter 6.
- 3) Co-Pilot (PF) not monitoring the ATC clearance and permitting the aircraft automation to fly programmed FMS approach for runway 08 which was not in conformity with the ATC clearance received.
- 4) Co-Pilot (PF) not cross-checking the FMS and ensuring the FMS meets the ATC Clearance.

4 SAFETY RECOMMENDATIONS.

4.1 Spicejet

- 1) SpiceJet may advise all their flight crew to follow proper ICAO Phraseology while communicating with ATC and other aircraft.
- 2) SpiceJet may advise all flight crew to strictly follow the “Sterile Cockpit” requirements as laid down in company Operations Manual.
- 3) SpiceJet may like to incorporate the information which are made available to flight crew in form of a circular into the Company Operations Manual in a stipulated time period instead of leaving it in the form of circular which has an expiry date. Example: The Flight Operations circular regarding “Mitigation of Wrong Runway Landing”.
- 4) SpiceJet may like to consolidate the flight operations related information for ease of access to flight crew.
- 5) SpiceJet may seek approval of the DGCA office of Q-400 Line and Training Guide (QLTG) as SOP or follow the manufacturer’s SOP as stipulated in the Aircraft Operating Manual (AOM).
- 6) SpiceJet may review their SOP given in QLTG to ensure that the Pilot Flying in addition to Pilot Monitoring, cross-checks the approach briefing is in accordance with the ATC clearance and the FMS programming matches the ATC clearance at all phases of flight including the planned instrument approach.
- 7) SpiceJet may formulate a process for all flight crew to undergo a psychometric assessment at the time of joining the organization or for flight crew already in the organization to undergo at the time of upgrade to PIC or Training Captain.
- 8) Spicejet may ensure that CVR is downloaded and made available as per relevant DGCA CAR.

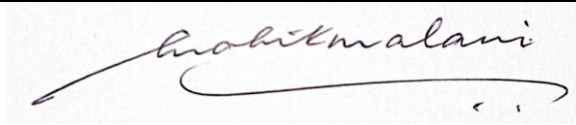

4.2 Airports Authority of India

- 1) AAI may advise all ATCO’s that if they observe any unauthorized aircraft operations like: attempting take-off, aligned with the unassigned runway or taxiway for landing or about to land on an unassigned runway must be instructed to Go-Around or Discontinue Approach by the ATCO unless the aircraft has declared an emergency.
- 2) AAI may advise all ATCO’s to notify the involved flight crew in incase of any violation of ATC instructions at an appropriate time. Example: either before the said flight leaves their control airspace or after landing but surely before parking on Radio Telephony.
- 3) AAI may advise all ATCO’s that all conversation with the flight crew must be carried out on a recorded landline especially post an occurrence for the purpose of investigations and timelines recorded in the ATC log-book.

- 4) AAI may advise all ATCO that once a violation occurs and the flight crew have been notified, the concerned ATCO must complete their occurrence report filing as per their SOP given in Manual of Air Traffic Services.

4.3 DGCA

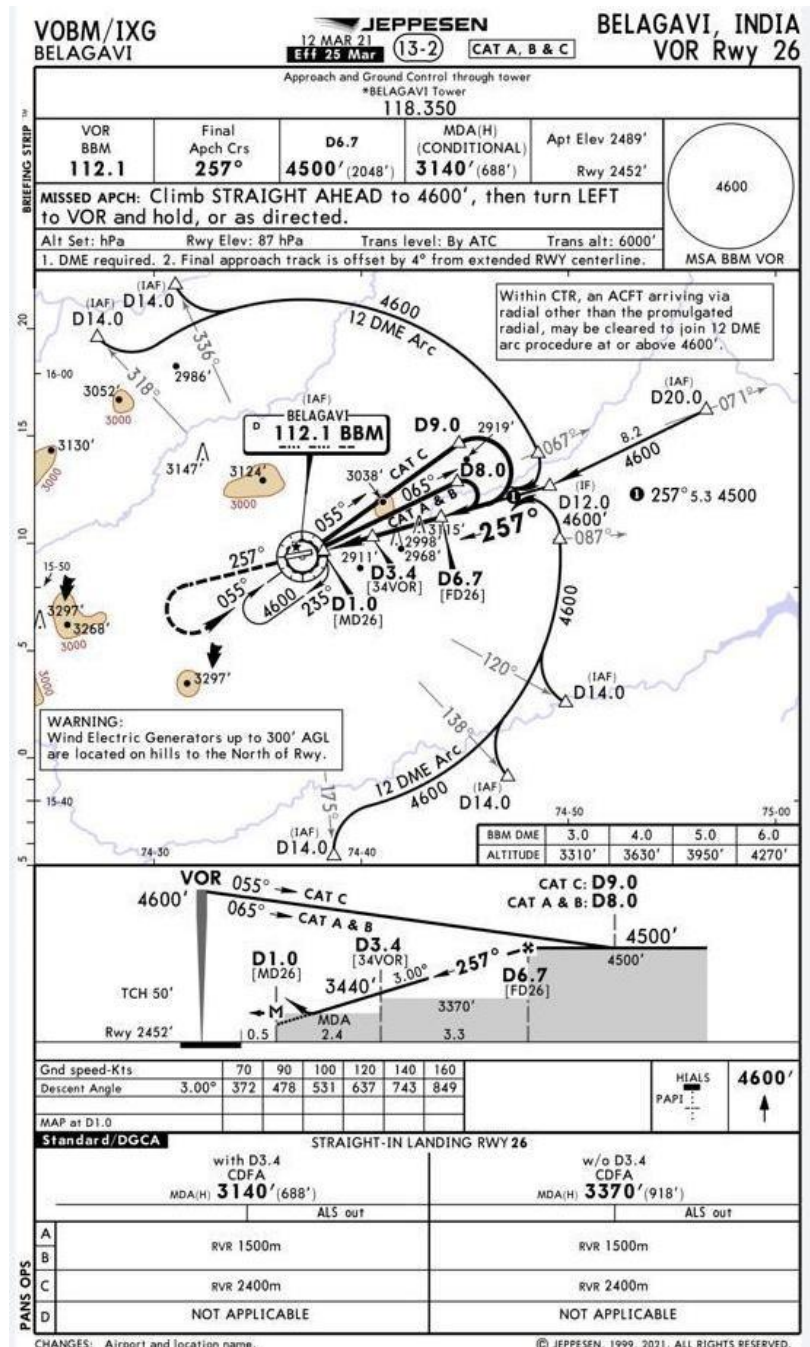
- 1) DGCA may ensure that all operators follows the requirement of downloading the CVR for the purpose of investigation as per DGCA CAR Section 5, Series C, Part I.
- 2) DGCA may ensure SpiceJet uses only DGCA or manufacturer approved documents for flight operations.
- 3) DGCA may ensure SpiceJet promptly carries out an internal investigation and implements “Interim Mitigation Actions” rather than continue to wait for the Final Investigation report.
- 4) DGCA may relook into the number of prescribed exercises being carried out in the IR/PPC within the stipulated period of two hours and carry out a realistic assessment whether all exercises can be carried out or not in two hours. International best practices (EASA, FAA etc.) in this regard may also be reviewed.
- 5) DGCA may like to carryout a study about the underlying causes of the repeated number of cases of Accident/ Serious Incidents involving SpiceJet within a stipulated time period.

	
Capt. Mohit Malani Investigator	Capt. Dhruv Rebbapragada Investigator in Charge

Place: New Delhi
Date: 20-02-2022

Appendices

<u>List of Appendices</u>	
	Letdown Chart for runway 26
	Company Circular on Mitigation of Wrong Runway Landing
	ADS-B Flight Track Information Credit Flight Radar 24) for informatory purpose
	DGCA Air Safety Circular 2 of 2004





DHC-8 402 OPERATIONS CIRCULAR

SEJ- OPS-04-OC-Q

OC 26 / 2020 | 12 Nov 2020

Nature: Mandatory

Valid Until: 31 Jan 2021

SUBJECT: MITIGATION OF LANDING ON WRONG RUNWAY

1. A recently concluded Aircraft Accident Investigation Report attributed the event of landing on a wrong runway to following:
 - a) Pre conceived incorrect belief in the mind of flight crew that specific runway would be available at the time of landing at destination due to closeness with scheduled arrival time and closure time as in NOTAM.
 - b) Flight crew not paying adequate attention to DATIS and not acknowledging the runway in use.
 - c) '**Confirmation Bias**' which is defined as the tendency to interpret new evidence as confirmation of one's existing beliefs or theories. In the specific case although the landing clearance was given and acknowledged for a specific runway, the operating crew maneuvered the aircraft for the runway they believed was in use due to confirmation bias.
 - d) Absence of men/material/vehicle further strengthened the confirmation bias in the operating crew.
 - e) The incorrect maneuver was not adequately monitored by Pilot Monitoring.
 2. It is evident that the hazard of landing on a wrong runway in parallel or near parallel runways would be naturally higher. This tendency would have an even higher probability while conducting non precision CDFA approaches. To obviate such occurrences, following is recommended:
 - (a) Based on NOTAMs, DATIS and ATC clearance, a thorough briefing is to be conducted with emphasis on positive identification of active runway in case of multiple runways which should include:
 - (i) The relative position of threshold with respect to other runway.
 - (ii) The respective displacement from the terminal and taxi-track.
 - (iii) Nomenclature and markings in terms of numerals e.g. 09R vs 09L at BLR.
 - (iv) Orientation aspects such as converging, diverging etc. e.g. RW 27 and RW 28 at DEL.
 - (b) The Pilot Monitoring should expand the instrument scan to include outside visual cues (approach lights and PAPI of the runway assigned) when approaching DA (H) or MDA (H).
 - (c) At minimums, PF should confirm the intended landing RW is insight and identified.
 - (d) On commencement of approach, confirm from ATC about the status of approach lights and PAPI, approaching MDA/DA if approach lights are not insight or aligned with the wrong runway then approach MUST be discontinued.
 - (e) Additionally, it is suggested that centerline should be extended on your MFD on Pink needles for better orientation and identification of assigned R/W.

NOTE: In case of any doubt DISCONTINUE APPROACH.
 3. It is imperative that pilots make use of all visual and instrument references to enhance situational awareness. They should be able to create a comprehensive picture of expectation and achievement of runway recognition to rule out confirmation bias and execute approach and landings on assigned runway.
 4. This is for immediate compliance.
-

● 24 Oct ✈ Hyderabad (HYD)
✈ Belgaum (IXG)

SCHEDULED DEPARTURE
09:35

ACTUAL DEPARTURE
10:17

SCHEDULED ARRIVAL
10:35



Tamás Ispán Ispi

STATUS
Landed 11:23

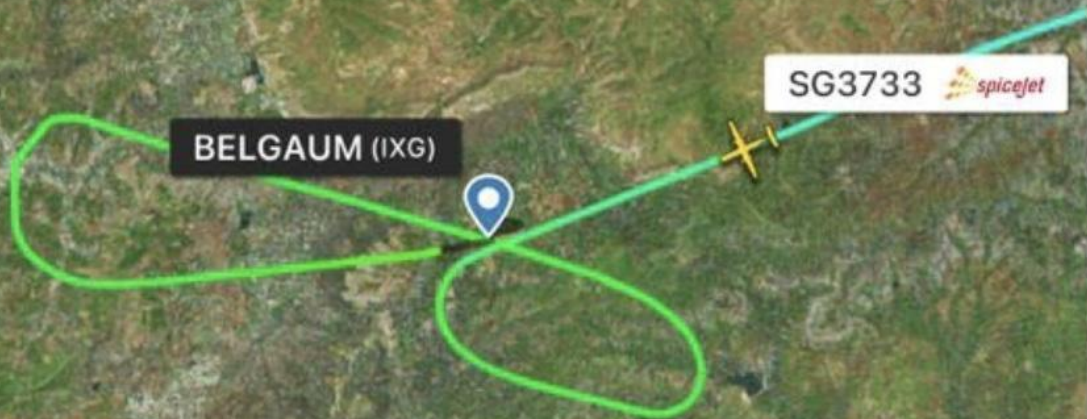
FLIGHT TIME
01:06

AIRLINE
SpiceJet

CALLSIGN
SEJ3733

EQUIPMENT
DH8D (VT-SQC)

AIRCRAFT
De Havilland Canada Dash 8-400



EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash 8-400

CALIBRATED
ALTITUDE

2102 ft

GROUND
SPEED

206 kts

VERTICAL
SPEED



TRACK

212°

Sun, Oct 24, 2021 05:35 UTC





EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash 8-400

CALIBRATED
ALTITUDE

5126 ft

GROUND
SPEED

202 kts

VERTICAL
SPEED



TRACK

219°

Sun, Oct 24, 2021 05:37 UTC





BELGAUM (IXG)

SG3733



EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash 8-400

CALIBRATED
ALTITUDE

1525 ft

GROUND
SPEED

190 kts

VERTICAL
SPEED

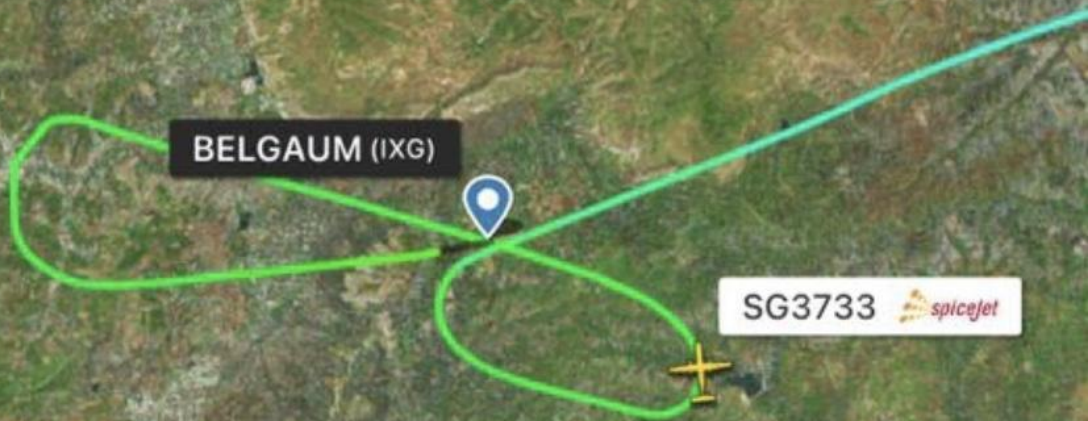


TRACK

177°

Sun, Oct 24, 2021 05:38 UTC





EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash 8-400

CALIBRATED
ALTITUDE

11 150 ft

GROUND
SPEED

172 kts

VERTICAL
SPEED



TRACK

351°

Sun, Oct 24, 2021 05:40 UTC





BELGAUM (IXG)

SG3733 spicejet



EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash 8-400

CALIBRATED
ALTITUDE

11 125 ft

GROUND
SPEED

181 kts

VERTICAL
SPEED



TRACK

291°

Sun, Oct 24, 2021 05:41 UTC





SG3733

BELGAUM (IXG)



EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash 8-400

CALIBRATED
ALTITUDE

1 328 ft

GROUND
SPEED

177 kts

VERTICAL
SPEED



TRACK

266°

Sun, Oct 24, 2021 05:45 UTC





SG3733  M (IXG)



EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash 8-400

CALIBRATED
ALTITUDE

1312 ft

GROUND
SPEED

183 kts

VERTICAL
SPEED



TRACK

178°

Sun, Oct 24, 2021 05:46 UTC





BELGAUM (IXG)

SG3733 spicejet



EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash
8-400

CALIBRATED
ALTITUDE

1350 ft

GROUND
SPEED

162 kts

VERTICAL
SPEED



TRACK

107°

Sun, Oct 24, 2021 05:46 UTC





EQUIPMENT

DH8D (VT-SQC)

AIRCRAFT

De Havilland Canada Dash 8-400

CALIBRATED
ALTITUDE

2525 ft

GROUND
SPEED

121 kts

VERTICAL
SPEED



TRACK

72°

Sun, Oct 24, 2021 05:50 UTC



OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION
NEW DELHI – 110003

AIR SAFETY CIRCULAR 2 OF 2004

Subject: Parallel Runway Approaches-CAUTION.

Recently an aircraft was cleared to land on Runway 19R at Kolkata but landed on Runway 19L (Parallel Runway), which was then closed for repairs. Fortunately there was no damage to the aircraft and airport equipment or injury to any person on board or outside.

According to Human Factors Studies this type of mistakes can happen due to fixation with perceived target and/or tunnel vision especially when there are parallel runways/taxiways or Runway with threshold close to each other. Another typical example is at IGI Airport where Runway 10 and 09 are close to each other and Taxiway 'P' is also parallel to Runway 28.

To avoid the above it is suggested that the Flight Crew should constantly revalidate and cross check the assumptions with proper concentration during the entire approach sequence.

All operators are advised to bring the above to the Notice of their flight crew with the advise that they should positively identify the correct runway and its orientation and cross check the same with Airborne Radio Aids/Instruments before making the final approach to land.

(R.S. Passi)

Asstt Director Air Safety

For Director General of Civil Aviation

To

All Scheduled/Non Scheduled/Private & Government Air Operators

All Flying Training Institutes

Indian Air Force (Flight Safety Directorate)

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