سلطنة عُمان
وزارة النقل والاتصالات وتقنية المعلومات
Sultanate of Oman
Ministry of Transport, Communications and Information Technology

Oman Transport Safety Bureau

Preliminary Report

OTSB Case File No: AIFN-005/07/2024

Runway Excursion (RE) at Muscat International Airport (OOMS) on Runway 08L

Operator: Cham Wing
Make and Model: Airbus A320-231
Nationality and Registration Marks: Syrian, YK-BAE
Location of the Occurrence: MCT, 23°35′36″N 058°17′04″E
State of Occurrence: Sultanate of Oman
Date of Occurrence: 18th July 2024, 22:40 UTC
Date of Publication: 15th August 2024

Table of Contents ……..……1-2

Purpose of the Investigation

The investigation was conducted by Oman Transport Safety Bureau pursuant to Civil Aviation Law (CAL) 76/2019 Chapter 10, and in compliance with the Civil Aviation Regulation CAR-13 -, Sub Part CAR 13.070: Instituting and Conducting of Investigations as State of Occurrence, Accidents or Incidents in the Sultanate of Oman.

The sole objective of the investigation is to prevent future aircraft accidents and incidents and not to apportion blame or liability. Oman Transport Safety Bureau issued this preliminary Report in accordance with the National and International standards, and Industry best practice.

Unless otherwise mentioned, all times in this report are Coordinated Universal Time (UTC). Local Time in The Sultanate of Oman is UTC plus (+) 4 hours. Photos and figures used in this report were taken from different sources and adjusted from the original for the sole purpose of improving clarity of the report.

This Report will be publicly available once published at: http://www.mtcit.gov.om

Abbreviations Descriptions

AAIS	Air Accident Investigation Section
AME	Aircraft Maintenance Engineer
AMSL	Above Mean Sea level
AFL	Actual Flight Level
AAI	Air Accident Investigations
ANSIC	Air Navigation Service Incident Coordination
AOC	Air Operating Certificate
ATC	Air Traffic Control
ATCO	Air Traffic Controller
AWY	ATC Airway
BEA	Bureau d'enquêtes et d'analyses pour la sécurité de l'aviation civile
CAA	Civil Aviation Authority
CAL	Civil Aviation Law
CVR	Cockpit Voice Recorder
DAM	Damascus International Airport
DFDR	Digital Flight Data Recording
ECAM	Electronic Centralized Aircraft Monitor
FDM	Flight Data Monitoring
FIR	Flight information Region
FL	Flight level
FO	First Officer
FOD	Foreign Object Debris
FPL	Flight Plan
FPM	Feet Per Minute
Ft	Feet
G/S	Ground Speed
ICAO	International Civil Aviation Organization
IIC	Investigator-In-Charge
IR	Infrared

KTS	Knots
LGCIU	Landing Gear Control and Interface Unit
LPC	License Proficiency Check
MATSOP	Manual of Air Traffic Standard Operating Procedures
MCT	Muscat
MSG	MeteoSat-9 Second Generation
NCM	Night time Cloud Microphysics
ND	Navigation Display
NM	Nautical Mile
NWS	Nose Wheel Steering
OOMS	Muscat International Airport
OPC	Operator Proficiency Check
OTSB	Oman Transport Safety Bureau
PF	Pilot Flying
PFD	Primary Flight Display
PM	Pilot Monitoring
QAR	Quick Access Recorder
RDR	Radar
REV	Reverser
QRH	Quick Reference Handbook
ROC	Rate of climb
ROD	Rate of descent
RWY	Runway
RVSM	Reduced Vertical Separation Minima
RWY	Runway
SEP	Separation
SCCM	Senior Cabin Crew Member
SOP	Standard Operating Procedures
SQK	Squawk
VMC	Visual meteorological conditions

Synopsis

Oman Transport Safety Bureau (OTSB) was notified of the occurrence by the Sultanate of Oman Civil Aviation Authority (CAA) -Directorate General of Air Navigation (DGAN), Air Navigation Service Incident Coordination (ANSIC) through OTSB email on the 20th July 2024 at 08:06 UTC. The incident occurred on the 18th July 2024 at 22:40 UTC.

On the 18th July 2024 at 19:32 UTC, Cham Wing aircraft SAW781 with registration marks YK-BAE, an Airbus A320-321 departed from Damascus International Airport (DAM), Syria on an international scheduled flight with intended destination Muscat International Airport (OOMS), Oman, Muscat.

The Air Traffic Controller (ATCO) reported that on the 18th July 2024 aircraft SAW781 has landed on Runway 08L at 22:41. After landing and while vacating the runway, the crew of aircraft SAW781 reported a loss of nose wheel steering and that the aircraft started drifting to the left of the centerline. The Captain of aircraft SAW781 also mentioned that they managed to reset the steering and did not require any assistance to move the aircraft.

The flight crew of aircraft SAW781, reported that the touch down and landing roll was smooth however during the deceleration the flight crew of aircraft SAW781 observed the Landing Gear Control and Interface Unit (LGCIU) 1 faults and Nose Wheel Steering (NWS) fault indications on the Electronic Centralized Aircraft Monitor (ECAM). The aircraft then started drifting to the left of the center line of Runway 08L.

After aircraft SAW781 vacated Runway 08L, Oman Airports Operations proceeded immediately to the runway (RWY) and conducted the runway inspection. No Foreign Object Debris (FOD) were found, however there were tires markings between Y5 and Y6.

The Oman Air maintenance engineers inspected the tires and informed the crew of aircraft SAW781 that due to the damages sustained on the tires they should be replaced immediately before the next flight. The tires were replaced, the LGCIU and NWS systems were reset and necessary tests were carried out and found satisfactory. The aircraft SAW781 was cleared and considered serviceable by the Oman Air Aircraft Maintenance Engineer (AME) and released back to service in order to fly back to Damascus International Airport (OSDI).

The OTSB instituted an investigation and classified the occurrence as a Serious Incident requiring investigation. The following parties were notified:

- State of Design and Manufacturer of Airbus A320-321 France-Bureau d'enquêtes et d'analyses pour la sécurité de l'aviation civile (BEA), French Safety Investigation Authority.
- International Civil Aviation Organization (ICAO).

- State of Operator and Registry-Syria Civil Aviation Authority (CAA)
- Sultanate of Oman Civil Aviation Authority (CAA)

In line with OTSB Investigation procedures, the Director of OTSB appointed an Investigator-In-Charge (IIC) and an investigation team to assist the IIC with the investigation. The following investigation authorities are involved in the investigation by appointing accredited representatives and advisor to the investigation:

- State of Design and Manufacturer of Airbus A320-321 France-Bureau d'enquêtes et d'analyses pour la sécurité de l'aviation civile (BEA), French Safety Investigation Authority
- State of Operator and Registry-Syria Civil Aviation Authority (CAA)

After the investigation is completed, OTSB will release and publish the Final Report. The Final Report will be made public at the below link:

http://www.mtcit.gov.om.

1. Factual Information.

1.1. History of the Flight.

1.1.1. On the 18th July 2024 at 19:32 UTC, Cham Wing aircraft SAW781 with registration marks YK-BAE, an Airbus A320-321 departed from Damascus International Airport (OSDI), Syria on an international scheduled flight with intended landing destination at Muscat International Airport (OOMS), Muscat, Oman.

1.1.2. At the time 22:27:53 the flight crew of aircraft SAW781 reported to Muscat radar Air Traffic Controller (ATCO) that they were routing to MCT at Flight Level (FL)166 descending to FL160 with a rate of descent (ROD) of 2200 Feet Per Minute (FPM). Muscat radar ATCO readback acknowledging SAW781 at FL160.

Figure 1: showing aircraft SAW781 at FL166 descending to FL160 when the flight crew first contacted MCT radar (Source: ANSIC)

1.1.3. At the time 22:27:56, the radar controller then contacted Muscat approach controller and handed over aircraft SAW781 who provided the QNH 993 and cleared the flight crew of aircraft SAW781 to descend to altitude 7,000 ft direct to ITLAK. At the time 22:28:04, the flight crew of aircraft SAW781 read back and acknowledged.

1.1.4. At the time 22:28:30, aircraft SAW781 was at 50 miles descending through FL156, with a rate of descent (ROD) of 2500 Feet Per Minute (FPM) and a ground speed (G/S) of 397 knots (KTS).

1.1.5 At the time 22:32:15, approach controller instructed the flight crew of aircraft SAW781 to descend to altitude 3,000 ft and cleared aircraft SAW781 for the ILS RWY08L and to report establish.

1.1.6 At the time 22:32:18, the flight crew of aircraft SAW781 acknowledged the instruction from approach controller to descend to altitude 3,000 feet (ft) clear ILS Approach RWY08L and to report to the approach controller when established. At the time 22:32:57, approach controller instructed the flight crew of aircraft SAW781 that in case of missed approach keep the RWY heading (HDG) and climb to altitude of 3,000 ft. At the time 22:33:01, the flight crew of aircraft SAW781 acknowledged.

1.1.7 At the time 22:33:07, aircraft SAW781 was at 25 miles descending through altitude 5700 ft, with ROD of 1800 FPM and a G/S of 302 KTS.

1.1.8 At the time 22:35:57, the flight crew of aircraft SAW781 established contact with MCT TWR ATCO that they were 12 miles from OOMS and have established ILS for RWY 08L.

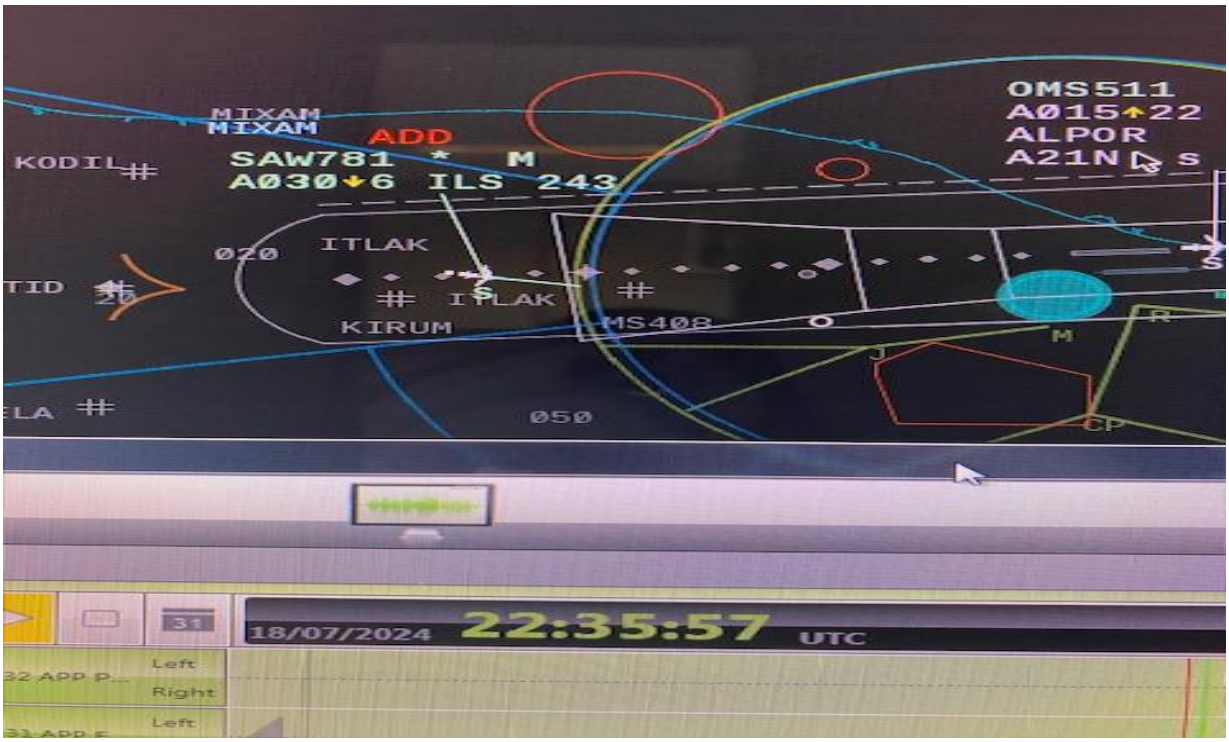

Figure 2: showing aircraft SAW781 established ILS RWY 08L (12 miles) from MCT (Source: ANSIC)

1.1.9. At the time 22:36:31, aircraft SAW781 was at 10 miles from OOMS descending through altitude 2900 ft, with ROD of 900 FPM and a G/S of 221 KTS.

1.1.10 At the time 22:38:03, aircraft SAW781 was at 5 miles from OOMS descending through altitude 1600 ft, with ROD of 800 FPM and a G/S of 165 KTS.

1.1.11 At the time 22:40:30, aircraft SAW781 landed on RWY 08L

1.1.12 According to the Flight Data Management (FDM) recording the aircraft touched down at the time 22:39:53 at a heading of 083 in Runway 08L. At the time 22:40:43 and aircraft speed is 49 knots, the crew lost rudder authority and the aircraft started veering off to the left of Runway 08L center line. Then the aircraft came to a complete stop at the time 22:41:00 on a heading 065° which is 18° to the left of Runway 08L centre line.

1.1.13 At the time 22:40:03, the reverse (REV) thrust indication came on and went off at the time 22:41:07 which lasted for 64 seconds. As per the FDM recording, at the time 22:41:16 the aircraft was observed moving to the right towards taxiway Y6. At the time 22:41:24, the crew of aircraft SAW781started taxing again by using differential power to keep the aircraft SAW781 straight while taxiing.

1.1.14 During the turn to the right towards Y6 taxiway, the flight crew of aircraft SAW781 used the left-hand throttle power to move the aircraft SAW781 from the parking position and steer it to the right to continue taxiing to the stand. At the time 22:41:39, the aircraft SAW781 was observed on heading 106° on the FDM taxiing towards taxiway Y6. At time 22:42:44 the aircraft was moving directly towards Y6 taxiway on heading 175° and flaps were moved to up position.

1.1.15 There were two aircraft OMA281 and aircraft IGO1274 which were held short off the runway for more than 10 minutes waiting for departure due to the runway inspection following aircraft SAW781 incident.

1.1.16 The Captain of aircraft SAW781 reported after the incident that, the departure flight from Damascus was normal. The take-off, cruise, approach with good weather. The landing on OOMS Runway 08L was reported to be smooth and safe however, during the deceleration the flight crew of aircraft SAW781 observed on Electronic Centralized Aircraft Monitor (ECAM) the Landing Gear Control and Interface Unit (LGCIU) 1 fault and Nose Wheel Steering (NWS) fault indications. The aircraft then started drifting to the left of the center line of Runway 08L.

1.1.17 The Captain took control from the First Officer (FO) in an attempt to compensate the drift by using the rudder pedals with no success even after trying the normal braking. The Captain then opted to revert back to alternate braking by requesting the FO to set NWS switch to off position. The aircraft SAW781 stopped just outside the left edge of Runway 08L, parking brake was applied and NWS was reset as per the Quick Reference Handbook (QRH). Since everything was normal, the flight crew of aircraft SAW781 taxied the aircraft to vacate the runway to their allocated gate.

1.1.18 The FO officer reported after the incident, that following the ECAM messages on LGCIU and NWS, the crew tried to use the rudder but the effect was very minimum and the aircraft was drifting to the left with force and the normal braking was not working effectively. However, after using the alternate brake system the aircraft SAW781 stopped on the runway. After arriving at

the gate, the crew of aircraft SAW781 called the maintenance team to check the aircraft SAW781.

1.1.19 During the interview, the Senior Cabin Crew Member (SCCM) stated that when the aircraft began to descend towards Muscat International Airport. They prepared the cabin for landing, passengers fastened their seatbelts, galleys and lavatories were secured. All cabin crews sat in their seats (seat belts and shoulder harness fastened). The SCCM reported to the captain that the cabin is secure and ready for landing. The aircraft SAW781 landed normally then stopped at the runway. After approximately 45 seconds the aircraft SAW781 continued normal taxi to the gate. Once the aircraft SAW781 came to the complete stop, doors were disarmed, and checked with the captain on ECAM as usual.

1.1.20 The SCCM further stated that, a representative from Oman Airports Safety authorities at OOMS came and requested to see the Captain. Then he went down to check the wheels with maintenance team. The maintenance team after inspecting the tires, informed the crew of aircraft SAW781 that due to the damages sustained on the tires, they should be replaced. While they were changing the tires, the crew went to the lounge to get rest.

1.1.21 Following the tires replacement by the Aircraft Maintenance Engineers (AME), both the LGCIU and NWS were reset and the system check was found satisfactory after the tests. The aircraft SAW781 was certified and released to serviceable and flown back to Damascus International Airport (OSDI).

1.2 Injuries to Persons

Injuries	Pilot	Cabin Crew	Passengers	**Total on Board**	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	**-**	-	**-**	-
No Injuries	2	4	133	**139**	-
Total	2	4	133	**139**	-

Note: Other, means people on the ground.

1.3. Damage to Aircraft.

1.3.1 Damage was limited to the tires.

Figure.3

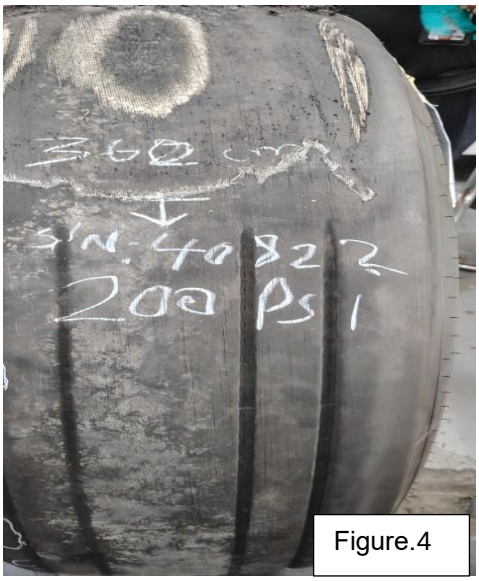

Figure.4

Figure 3 and 4: Showing damages sustained on the right main tires

1.4. Other Damage.

1.4.1 No other damages were reported

1.5. Personnel Information:

1.5.1 **Captain**:

Nationality	Syrian		
Medical validity	Expiry: 02-08-2025	Licence type	Airline Transport Pilot Aeroplane
Licence validity	Expiry: Valid for life	Type endorsed	A320
Ratings	Instrument Rating, Multi-Engine, A320		
English Language Proficiency	Level 6. Expiry Date: TBA		
LPC Issue Date	05-06-2024	OPC Issue Date	05-06-2024
LPC Expiry Date	30-06-2025	OPC Expiry Date	31-12-2024

Flying experience:

Total hours	8485:00
Last 24 hrs	07:00
Last 7 days	12:20
Last 30 days	68:05
Last 90 days	114:45

1.5.2 **First Officer:**

Nationality	Syrian		
Medical validity	Expiry: 30-04-2025	Licence type	Commercial Pilot Aeroplane
Licence validity	Expiry: Valid for Life	Type endorsed	Yes
Ratings	Instrument Rating, Multi-Engine, A320		
English Language Proficiency	Level 5. Expiry date: 30th April 2030		
LPC Issue Date	03-06-2024	OPC Issue Date	03-06-2024
LPC Expiry Date	30-06-2025	OPC Expiry Date	31-12-2024

Flying experience:

Total hours	1928:00
Last 24 hrs	07:00
Last 7 days	07:00
Last 30 days	07:00
Last 90 days	117:50

1.5.3 **Senior Cabin Crew Member (SCCM):**

Nationality	Syrian		
Medical validity	Expiry: 06-06-2025	Licence type	Cabin Crew
Licence validity	Expiry: 15-04-2025	Type endorsed	Yes
Ratings	TBA		
English Language Proficiency	TBA		
Latest Line Check Issue and Expiry Date	Issued on 10-10-2023 and Expires on 31-10-2024		

Flying experience:

Total hours	2921:15
Last 24 hrs	00:00
Last 7 days	11:20
Last 30 days	64:05
Last 90 days	166:20

1.5.5 **Air Traffic Controller:**

Nationality	Omani		
Medical validity	3rd October 2024	Licence type	Air Traffic Controller
Licence validity	31st December 2026	Type endorsed	YES
Ratings	ADC, APP RDR	LPR	Level 5

1.5.6 Aircraft Maintenance Engineer (AME):

Nationality	Omani		
Licence type	Aircraft Maintenance Engineer		
Licence valid	10th March 2026	Type endorsed	Yes
Ratings	Airbus A320 to A321 and Airbus A320 to A319		

1.5.6.1 The AME licence was initially issued on 12 May 2007. The licence is valid from 5 June 2024 to 10 March 2026 with A & C/B1 categories.

1.6 Aircraft Information:

1.6.1 The Airbus A320 family is a series of narrow-body airlines developed and produced by Airbus. The A320 was launched in March 1984, first flew on 22 February 1987, and was introduced in April 1988 by France. The first member of the family was followed by the stretched A321 (first delivered in January 1994) The A320 is 37.6 m (123 ft) long and can accommodate 150 to 186 passengers. The 44.5 m (146 ft) A321 offers 185 to 230 seats. The Airbus Corporate Jets are modified business jet versions of the standard commercial variants. The 320-232 has IAEv2500 engines.

Airframe Information:

Manufacturer/Model	Airbus A320-321	
Aircraft Type	A320-231	
Serial Number	0322	
Year of Manufacture	23/09/1992	
Total Airframe Hours (At Time of Incident)	67897 FH	
Last Inspection (Date & Hours (TSN))	65795 FH	17/11/2023
Last Inspection Airframe Cycles (CSN)	34083 FC	
Hours Since Last Inspection	2144 FH	
Type of inspection preformed	C check	
C of A (First/initial Issue Date)	17/11/2023	
C of A (Expiry Date)	16/11/2024	
C of R (Issue Date) (Present Owner)	08/11/2017 (MARS AEROPARTS TRADING FZE)	
Type of Fuel Used	MOBIL JET A1	
Operating Category	II-Transport (passenger)	
Previous Accidents	None	

1.6.2 On the 8th April 2023, the Syrian CAA approved the Authorisation to issue the Operator Cham Wings Airlines with Minimum Equipment List (MEL).

1.6.2.1 The operator reported the following incidents as per their MEL:

(a) On the 18th April 2024, the operator reported and opened defect regarding LAF ACC FAULT F/CTL without closing date up to the date of the incident,

(b)On the 16th June 2024, the operator reported DMC #1 Inoperative which was closed on the 3rd July 2024 and extended to the 6th July 2024,

(c)On the 19th June 2024, ENG #2 Thrust Reverser deactivated and closed on the 23rd June 2024,

(d) On the 24th June 2024, ENG#2 Thrust Reverser deactivated and closed on the 14th July 2024,

(e) On the 25th June 2024, brake fan system partially available “FAN 1 and 2 deactivated” and was opened at the time of the incident,

(f) On the 26th June 2024, ENG#1 ignition system had a fault and was closed on the 29th June 2024,

(g)On the 29th June 2024, ENG#1 ignition system had a fault and was closed on the 16th July 2024 and then extended to the 19th July 2024,

(h) On the 8th July 2024, ENG#1 Thrust Reverser deactivated and closed on the 10th July 2024,

(i) On the 15th July 2024, ENG#2 Thrust Reverser deactivated and was opened at the time of the incident.

(j) On the 18th July 2024, ENG#1 IGN had a fault and was opened at the time of the incident.

1.6.2.2According to the above records there were 4 open defects at the time of the incident:

(a) LAF ACC FAULT F/CTL,
(b) Brake fan system partially available “FAN 1 and 2 deactivated,
(c)ENG#2 Thrust Reverser deactivated,
(d) ENG#1 IGN had a fault.

Engine 1:

Manufacturer/Model	IAE V2500-A1
Serial Number	V0011
Part Number	V2500-A1
Hours Since New	52216 FH
Hours Since Overhaul	8131 FH
Hours since last shop visit	8131 FH
Cycles Available Before Next Shop Visit	5348 FC
Oil type	MOBIL JET OIL II

Engine 2:

Manufacturer/Model	IAE V2500-A1 CFM/ LEAP-1A33
Serial Number	V0223
Part Number	V2500-A1
Hours Since New	46845 FH
Hours Since Overhaul	2745 FH
Hours since last shop visit	2745 FH
Cycles Available Before Next Shop Visit	3599 FC
Oil type	MOBIL JET OIL II

1.7 Meteorological Information:

1.7.1 The weather information below is from the Meteorological Routine Aerodrome Report (METAR) on the 18th July 2024 at 22:50 UTC:

Wind Direction	VRB	Wind Speed	02 kts	Visibility	CAVOK
Temperature	35°C	Cloud Cover	Sky Clear	Cloud Base	Sky Clear
Dew Point	24°C	QNH	0993 HPA		

Satellite Image

The Night time cloud microphysics RGB (NCM) and 10.8um infrared (IR) satellite images of the MeteoSat-9 Second Generation (MSG) show no significant clouds only high clouds are present over Sultanate of Oman on Muscat area before (2200Z, 2215Z, 2230Z) and after the time of incident (2245Z, 2300Z). As such, Visual meteorological conditions (VMC) prevailed during the time of accident.

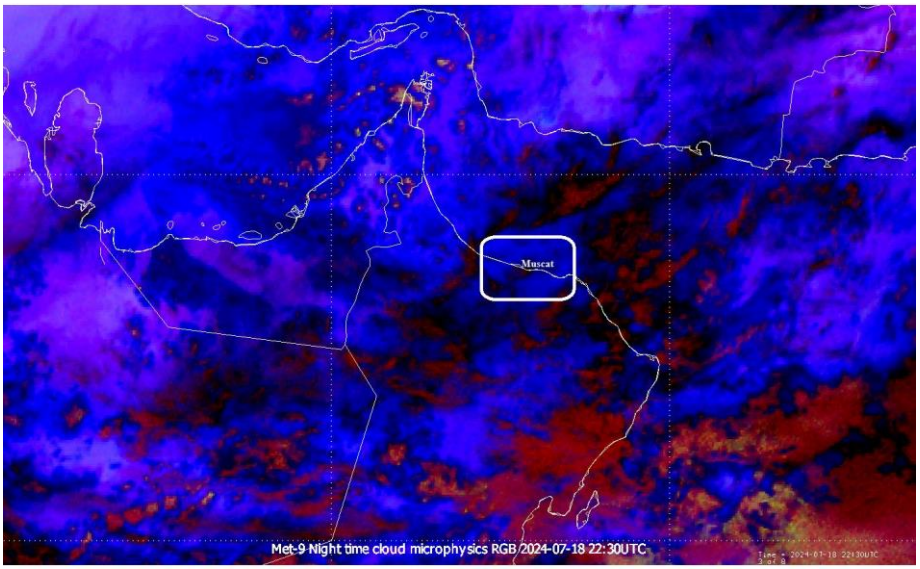

Figure 5: showing satellite image at the time 2230Z on the 18th July 2024

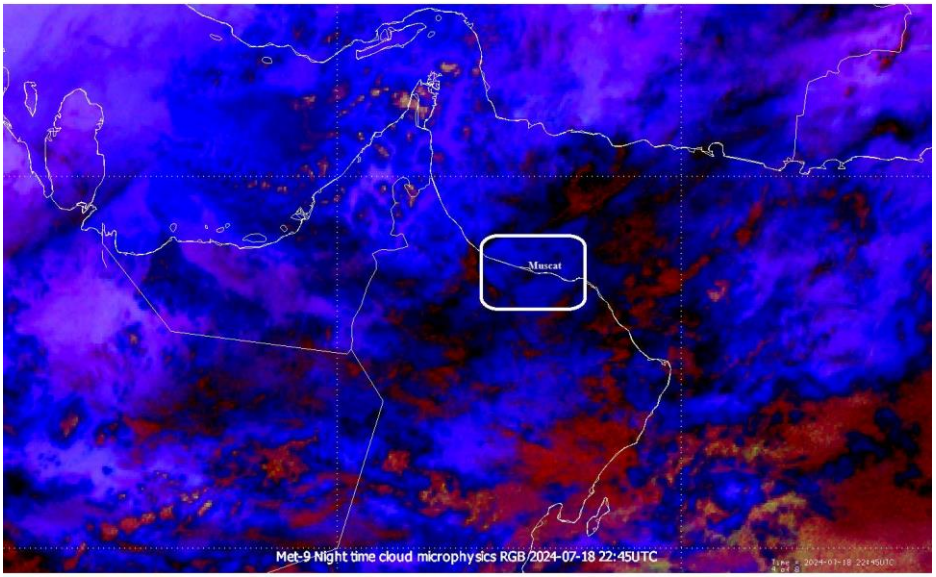

Figure 6: showing satellite image at the time 2245Z on the 18th July 2024

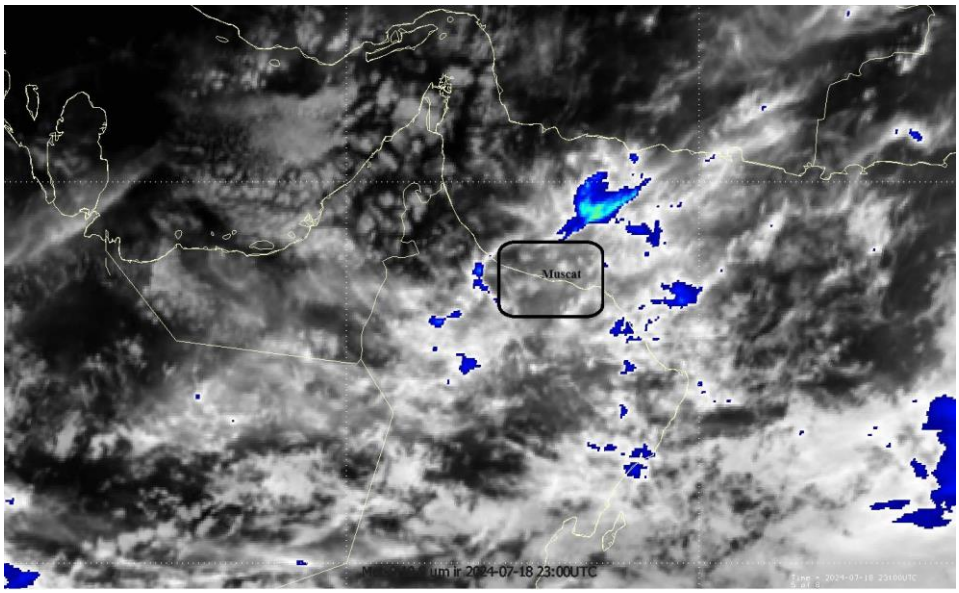

Figure 7: showing IR satellite image at the time 2245Z on the 18th July 2024

Conclusion: No significant weather was observed during the time of the incident.

1.8 Aids to Navigation.

1.8.1 The aircraft was equipped with standard navigational equipment as approved by the Syrian CAA. There were no records indicating that the navigation system was unserviceable prior to the serious incident.

1.9 Communications.

1.9.1 The aircraft was equipped with a standard communication system as approved by the Syrian CAA. No defects that could render the communication system unserviceable were recorded before the flight.

1.10 Aerodrome Information.

1.10.1 Departure Aerodrome:

ICAO designation	Damascus International Airport (OSDI)
Aerodrome co-ordinates	N33 24.7 E36 30.83
Aerodrome elevation	2020’
Runway designations	23L/05R
Runway dimensions	3600m / 45m
Runway used	23L
Category for Rescue Fire Fighting	9
Approach facilities	RNAV APP
Aerodrome status	Licensed Airport (Open)

Destination Aerodrome:

ICAO designation	Muscat International Airport (OOMS)	
Aerodrome co-ordinates	23°35′36″N 058°17′04″E	
Aerodrome elevation	25 feet (ft)mean sea level (MSL)	
Runway designations	08R/26L	08L/26R
Runway dimensions	4080 x 60 M	4000 x60 M
Runway used	08L	
Category for Rescue Fire Fighting	CAT 10	
Approach facilities	ILS, RNP, VOR, Runway Lights, PAPI’s	
Aerodrome status	Licensed Airport (Open)	

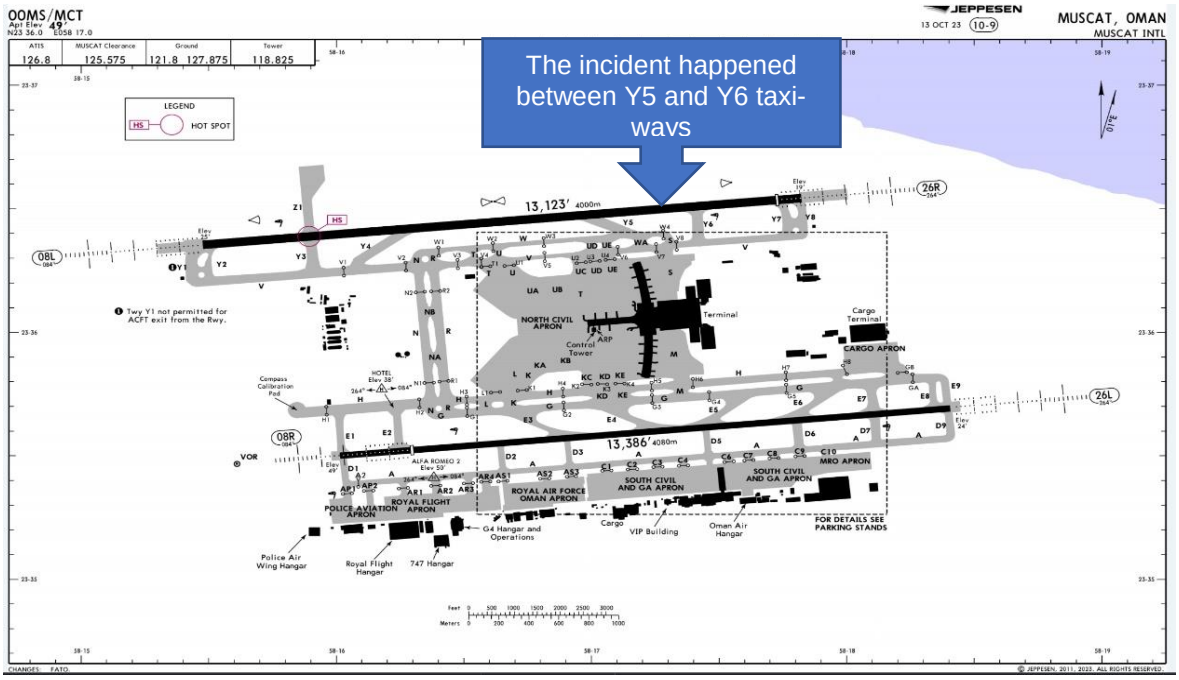

Figure 8: showing OOMS layout and where the incident happened

1.11 Flight Recorders.

1.11.1 The aircraft was fitted with the Digital Flight Data Recording (DFDR), Flight Data Monitoring (FDM) and the Cockpit Voice Recording (CVR). OTSB will be relying on Flight Data Monitoring (FDM) and other flight information data such as Air Traffic Services (ATC) communication records to assist in the investigation.

1.12 Wreckage and Impact Information.

1.12.1 The aircraft landed smoothly and normally on Runway 08L. During rolling out and deceleration, approximately 3.1 kilometers (KM) from the threshold, the aircraft then started drifting to the left of Runway 08L center line and stopped just after the runway edge line. The incident occurred between taxiway Y5 and taxiway Y6.

Figure 9: showing the first touchdown tire marks on Runway 08L

Figure 10 showing the tire marks before the aircraft veered off to the left of Runway 08L

Figure 11: showing Left-Hand Main Undercarriage tire marks veering to the left of Runway 08L.

Figure 12: showing tires marks turning to the left of Runway 08L edge

Figure 13: showing tire marks outside the left edge of the runway and back into the runway, this was at the time the aircraft turning to the Right Towards Taxiway Y6

1.13 Medical and Pathological Information.

1.13.1 Not relevant to the occurrence.

1.14 Fire.

1.14.1 Not relevant to the occurrence.

1.15 Survival Aspects.

1.15.1 To be discussed in the final report.

1.16 Tests and Research.

1.16.1 To be discussed in the final report.

1.17 Organizational and Management Information.

1.17.1 Aircraft SAW781 was operating as a scheduled international passenger flight.

1.17.2 The operator, Cham Wings Airlines was issued an Air Operating Certificate (AOC) by the State of Registry and State of Operator, The Syrian Civil Aviation Authority, CAA. The certificate was issued by the CAA on 7 May 2024 with and expiry date of 10 May 2025. The certificate certifies that the Cham Wings Airlines is authorized to perform commercial air operations; as defined in the operations specifications, in accordance with operations manual and all the Syrian Civil Aviation Regulations. The aircraft had a valid Certificate of Airworthiness which was issued on 17 November 2023 with and expiry date of 16 November 2024 at the time and date of the incident. The aircraft had a valid Certificate of Registration which was issued on 8 November 2017.

1.18 Additional Information

1.18.1 Cham Wings Airlines: A318/A319/A320/A321 **FLIGHT CREW OPERATING MANUAL**

PROCEDURES NORMAL PROCEDURES

STANDARD OPERATING PROCEDURES - LANDING

FOR MANUAL LANDING

AP..... OFF PF

FLARE

- **AROUND 30 ft RA:**

In stabilized approach, the flare height is approximately 30 ft
FLARE..... PERFORM PF
ATTITUDE..... MONITOR PM
THRUST LEVERS.....IDLE PF
L2 Move the thrust levers to idle, and begin a gentle progressive flare to enable the aircraft to touch down without a prolonged float.
If autothrust is engaged, it automatically disconnects when PF sets both thrust levers to the IDLE detent.
At 20 ft, an automatic "RETARD" callout will trigger, as a reminder.
L1 Note: The ground spoilers extension is inhibited if:

- Both thrust levers remain above the idle detent, or
- One thrust lever is above idle and one thrust lever is at idle detent.

FLARE
 AROUND 30 ft RA:
In stabilized approach, the flare height is approximately 30 ft.
FLARE..... PERFORM PF
ATTITUDE..... MONITOR PM
THRUST LEVERS.....IDLE PF
L2 Move the thrust levers to idle, and begin a gentle progressive flare to enable the aircraft to touch down without a prolonged float.

If autothrust is engaged, it automatically disconnects when the flight crew sets both thrust levers to the IDLE detent.
At 20 ft, an automatic "RETARD" callout will trigger, as a reminder.
L1 Note: Ground spoilers extension is inhibited if one or more thrust levers remain above the IDLE detent.

AT TOUCHDOWN

- **As soon as the main landing gear touches down:**

DEROTATION.....INITIATE PF
ALL THRUST LEVERS.....REV MAX or REV IDLE PF

L2 The flight crew must select reverse thrust immediately after landing gear touchdown.
The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:
- An emergency
- The deceleration is not as expected
- A failure affects the landing performance
- A long flare or a long touchdown
- An unexpected tailwind.

A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the flight crew can easily control this pitch up.
As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.
L1 GND SPLRS.....CHECK/ANNOUNCE PM

L2 Check that the WHEEL SD page displays the ground spoilers extended after touchdown.
If no ground spoilers are extended:
- Check that all thrust levers are set to IDLE detent.
- Set both thrust reverser levers to MAX REV, and fully press the brake pedals.

L1 Note: If ground spoilers are not armed, ground spoilers extend at reverser thrust selection.
REVERSERS.....CHECK/ANNOUNCE PM
L2 - Check that the ECAM E/WD displays the expected reverser deployment (i.e. REV).
- If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight
crew should consider adapting the available deceleration means to stop the aircraft.
L1 DIRECTIONAL CONTROL.....MONITOR/ENSURE PF
L2 - Ensure directional control. Use the rudder pedals for directional control.
- During rollout, avoid sidestick inputs (either lateral or longitudinal)
- If the flight crew encounters directional control problems, they should reduce the thrust to REV
IDLE until directional control is satisfactory.

L1 Do not use the nosewheel steering control handle before reaching taxi speed.

- **If autobrake is selected:**

AUTOBRAKE.....MONITOR PM

L2 During all the rollout, the PM monitors the blue light on the autobrake panel, and calls out if the autobrake mode disengages.

L1 Note: If no ground spoilers are extended, the autobrake will not activate.

If landing without autobrake:

BRAKES.....AS RQRD PF

L2 - Although the green hydraulic system supplies the braking system, if pedals are pressed rapidly, a brake pressure indication appears briefly on the BRAKE PRESS indicator.
- Braking may begin before the nosewheel has touched down, if required for performance reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel has touched down.

L1 DECELERATION.....CHECK/ANNOUNCE PM

L2 The flight crew feels the deceleration. The flight crew checks the speed trend on the PFD to confirm the deceleration.

AT 70 KT

SEVENTY KNOTS.....ANNOUNCE PM
BOTH THRUST LEVERS.....REV IDLE PF
L2 It is recommended to reduce thrust when passing 70 kt. However, high levels of reverse thrust may be used in order to control aircraft speed in the case of an emergency.
L1

CAUTION	Avoid the use of high levels of reverse thrust at low airspeed, unless required due to an emergency. The distortion of the airflow, caused by gases re-entering the compressor, can cause engine stalls that may result in excessive EGT.

AT TAXI SPEED

REVERSERS.....STOW PF
L2 - When the aircraft reaches the taxi speed, and before it leaves the runway, stow the reversers.
- On snow-covered grounds, the reversers should be stowed when the aircraft speed reaches 25 kt.
- When deselecting the reversers, be careful not to apply forward thrust by moving the thrust levers beyond the FWD IDLE position.

L1

CAUTION	Except in an emergency, do not use the reverse thrust to control the aircraft speed while on taxiways.

L2 On taxiways, the use of reversers, even restricted to idle thrust, would have the following effects:
- The engines may ingest fine sand and debris that may be detrimental to the engines and airframe systems.
- On snow–covered areas, snow will recirculate into the air inlet, and may cause an engine flameout or rollback.

BEFORE 20 KT
AUTO BRK.....DISENGAGE PF
L2 Disengage the autobrake to avoid some brake jerks at low speed.
The flight crew should use brake pedals to disengage the autobrake.

AUTOLAND

The following items must be performed in addition to previous Refer to PRO-NOR-SOP-AP PROACH USING LOC G/S.

AT 350 FT RA
LAND ON FMA.....CHECK/ANNOUNCE PF
ILS/GLS □ /MLS □ COURSE ON PFD.....CHECK PF

L2 If the ILS / GLS □ course pointer and the runway track differ by more than 5 °, perform a go-around, or a manual landing if visual references are sufficient.

AT 40 FT RA
FLARE ON FMA.....CHECK/ANNOUNCE PM
L2 If the FMA does not display FLARE, perform a go-around, or a manual landing if visual references are sufficient.
L1 FLARE.....MONITOR PF

AT 30 FT RA
THR IDLE ON FMA.....CHECK PM
THRUST IDLE.....CHECK PM
L2 Monitor thrust reduction.

AT 10 FT RA
L2 An automatic "RETARD" callout triggers.
L1 THRUST LEVERS.....IDLE PF
L2 The autothrust disconnects.
L1 LATERAL GUIDANCE.....MONITOR PF
L2 Monitor the lateral guidance by using external references.

AT TOUCHDOWN
Note: In the case of NWS or Anti-Skid failure, set the AP OFF at touchdown.
ROLL OUT ON FMA.....CHECK/ANNOUNCE PM
BOTH THRUST LEVERS.....REV MAX or REV IDLE PF
L2 The flight crew must select reverse thrust immediately after main landing gear touchdown.

The flight crew must immediately select REV MAX, if any of the following occurs at any time during the landing:
- An emergency
- The deceleration is not as expected
- A failure affects the landing performance
- A long flare or a long touchdown
- An unexpected tailwind.

A small pitch up may occur during thrust reversers deployment before nose landing gear touchdown. However, the auto-flight system will control this pitch up.
As soon as the flight crew selects reverse thrust, they must perform a full-stop landing.
L1 GND SPLRS.....CHECK/ANNOUNCE PM

L2 Check that the WHEEL SD page displays the ground spoilers extended after touchdown.
If no ground spoilers are extended:
- Check that all thrust levers are set to IDLE detent
- Set both thrust reverser levers to MAX REV, and fully press the brake pedals.

L1 Note: If ground spoilers are not armed, ground spoilers extend at reverser thrust selection.

REVERSERS.....CHECK/ANNOUNCE PM
L2 - Check that the ECAM E/WD displays the expected reverser deployment (i.e. REV)
- If reverser(s) do not deploy as expected, one of the main deceleration means is lost. The flight crew should consider adapting the available deceleration means to stop the aircraft.

L1 DIRECTIONAL CONTROL.....MONITOR/ENSURE PF

L2
- Monitor directional control, if the rollout is automatic
- Ensure directional control, if rollout is manual. Use rudder pedals for directional control.
- During rollout, avoid sidestick inputs (either lateral or longitudinal)
- If the flight crew encounters directional control problems, they should reduce the thrust to REV IDLE until directional control is satisfactory.

L1 Do not use the nosewheel steering control handle before reaching taxi speed.

 If autobrake is selected:

AUTOBRAKE.....MONITOR PM
L2 During all the rollout, the PM monitors the blue light on the autobrake panel, and calls out if the autobrake mode disengages.

L1 Note: If no ground spoilers are extended, the autobrake will not activate.
 If landing without autobrake:
BRAKES.....AS RQRD PF

L2- Although the green hydraulic system supplies the braking system, if pedals are pressed rapidly, a brake pressure indication appears briefly on the BRAKE PRESS indicator
- Braking may begin before the nosewheel has touched down, if required for performance

reasons. However, when comfort is the priority, the flight crew should delay braking until the nosewheel has touched down.
L1 DECELERATION.....CHECK/ANNOUNCE PM
L2 The flight crew feels the deceleration. The flight crew checks the speed trend on the PFD to confirm the deceleration.

AT 70 KT
SEVENTY KNOTS.....ANNOUNCE PM
BOTH THRUST LEVERS.....REV IDLE PF
L2 It is better to reduce thrust when passing 70 kt. However, high levels of reverse thrust may be used in order to control aircraft speed in the case of an emergency.

L1

CAUTION	Avoid the use of high levels of reverse thrust at low airspeed, unless required due to an emergency. The distortion of the airflow, caused by gases re-entering the compressor, can cause engine stalls that may result in excessive EGT.

BEFORE 20 KT
AUTO BRK.....DISARM PF
L2 Disarm autobrake before 20 kt to avoid some brake jerks at low speed.
The flight crew should use brake pedals to disarm the autobrake.

END OF ROLL OUT
REVERSERS.....STOW PF
L2 - When the aircraft reaches the taxi speed, and before it leaves the runway, stow the reversers.
- On snow-covered grounds, the reversers should be stowed when the aircraft speed reaches 25 kt.
- When deselecting the reversers, be careful not to apply forward thrust by moving the thrust levers beyond the FWD IDLE position.

L1

CAUTION	Except in an emergency, do not use the reverse thrust to control the aircraft speed while on taxiways.

L2 On taxiways, the use of reversers, even restricted to idle thrust, would have the following effects:
- The engines may ingest fine sand and debris that may be detrimental to the engines and airframe systems.
- On snow–covered areas, snow will recirculate into the air inlet, and may cause an engine flameout or rollback.

L1 AP.....OFF PF
L2 Disengage the APs at the end of the roll out (before leaving the runway at the latest)

1.19 Useful or Effective Investigation Techniques.

1.19.1 To be discussed in the final report.

2. Analysis

2.1 To be discussed in the final report.

3 Conclusions

3.1 General

The investigation is on-going and OTSB will be looking into other aspects of this serious incident investigation which may or may not have safety implications.

3.2 Findings

3.2.1To be discussed in the final report.

3.3 Causes and Contributing Factors

3.3.1 To be discussed in the final report.

4 Safety Recommendations

4.1 Although the Investigation is still on-going. Based on the aforementioned factual information, OTSB is anticipating issuing safety recommendations in due course.