

Oman Transport Safety Bureau (OTSB)

Final Report

TCAS Resolution Advisory between Etihad Airways - Airbus 320-232 and Boeing 787-9 Dreamliner in Muscat FIR

OTSB Case File No: AIFN001.02.2026

Operator: Etihad Airways

Make and Model of The Aircraft: Airbus 320-232

Nationality and Registration Marks: United Arab Emirates, A6 - EIM

Operator: Etihad Airways

Make and Model of The Aircraft: Boeing 787-9 Dreamliner

Nationality and Registration Marks: United Arab Emirates, A6 - BLX

Location of the Occurrence: Muscat FIR, in the vicinity of TOLDA

(22°40'14.75" N) (058°37'11.03"E) and (22°40 '01.85" N) (058°36'54.18"E)

State of Occurrence: Sultanate of Oman

Date and Time of Occurrence: 06th February 2026, 18:47:55 UTC

Date of Publication: 26th August 2026

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Purpose of the Investigation

The investigation was conducted by the Air Accident Investigation Section of the Oman Transport Safety Bureau (OTSB) pursuant to Civil Aviation Law 76/2019 Chapter 10, and in compliance with the Civil Aviation Regulation CAR-13.011 - Aircraft Accident & Incident Investigation & Reporting Procedures. The investigation was in conformance with the standards and recommended practices in Annex 13 - Aircraft Accident and Incident Investigation to the Convention on International Civil Aviation Organization (ICAO).

The sole objective of the investigation of an accident and incident is to prevent future aircraft accidents and incidents and not to apportion blame or liability.

Oman Transport Safety Bureau issue the Final Report in accordance with the national and international standards and industry best practice. therefore, concerned parties are invited to review this report and provide their significant and substantiated comments.

The Final Report will be publicly available at:

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

Oman Transport Safety Bureau

Ministry of Transport Communications and Information Technology

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Abbreviation	Description
°	Degree
AAI	Air Accident Investigations
ATPL	Airline Transport Pilot License
ALT	Altitude
ANSIC	Air Navigation Service Incident Coordination
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATS	Air Traffic Services
AWY	Airway
BEA	Bureau d'enquêtes et d'analyses pour la sécurité de l'aviation civile
CAA	Civil Aviation Authority
CAL	Civil Aviation Law
CFL	Cleared Flight Level
CSN	Cycles Since New
CVR	Cockpit Voice Recorder
EY	Etihad Airways
FIR	Flight information Region
FL	Flight level
FO	First Officer
FPL	Flight Plan
FPM	Feet Per Minute
FT	Feet
GCAA	General Civil Aviation Authority
ICAO	International Civil Aviation Organization
IIC	Investigator-in-Charge
Knots	KTS
LPC	License Proficiency Check
MCT	Muscat
MODE S	Selective / Mode Select
NM	Nautical Mile
OPC	Operator Proficiency Check
OTSB	Oman Transport Safety Bureau
PF	Pilot Flying
PM	Pilot Monitoring
RA	Resolution Advisory
RDR	Radar
ROC	Rate of Climb

ROD	Rate of Descent
RT	Radiotelephony
RXO	Specialist Ophthalmological Examination
TCAS	Traffic Collision Avoidance System
UTC	Universal Time Coordinate
VLD	Valid only with correction for defective distant vision
WPT	Waypoint

Indra System Safety net Alert Abbreviation		
STCA	Short Term Conflict Alert	"Yellow" Prediction "Red" Violation
AW	Minimum Safe Altitude Warning (MSAW)	
W	RVSM	
LB	Level Burst	"Yellow" CFL not matching AFL "Red" CFL not matching Mode-S flight level
HG	Heading conformance	
MC	Medium Term Conflict Detection	
RO	Route off	
SQ	SSR Code Conformance alert	

Synopsis

Oman Transport Safety Bureau (OTSB) was notified of the serious incident by Directorate General of Air Navigation (DGAN) through OTSB email on 08th February 2026 at 07:36 PM Local Time (LT). The incident occurred on 06th February 2026 at 18:47:55 UTC over Muscat FIR in the vicinity of waypoint (WPT)TOLDA.

The Air Traffic Control Officer (ATCO) providing air navigational services in Bravo sector instructed the flight crew of ETD7AN, Airbus 320-232, Registration A6-EIM to descend from FL360 to FL340 and to expedite reaching due to converging faster traffic over waypoint (WPT) TULBU aircraft VOZ001, B777 at FL360 flying from Middle Sector WPT EMURU and the flight crew of ETD7AN readback, but the readback was not clear. The ATCO did not request the flight crew to repeat the readback.

The Bravo Sector ATCO reported that while aircraft ETD476, Boeing 787-9 Dreamliner, Registration A6-BLX was maintaining FL330 from Central Sector and on opposite direction aircraft ETD7AN in Bravo Sector was on descent from FL360 to FL320, yellow Short-Term Conflict Alert (STCA) and Level Bust (LB) indication warning were activated and MODE S showed that aircraft ETD7AN was descending to FL320. The ATCO instructed the flight crew of ETD7AN to stop descending and to level off at FL340 and turn 50 degrees to the right but there was no response from flight crew of ETD7AN.

Due to no response from the flight crew of ETD7AN, the ATCO repeated the clearance three times then the flight crew of ETD7AN replied. The ATCO instructed the flight crew of ETD7AN to maintain FL 340 and turn right 50 degrees and again there was no response. At this time, aircraft ETD7AN was on descent passing through FL332 and the flight crew of ETD476 maintaining FL330 reported TCAS RA and Bravo ATCO acknowledged. Later, the flight crew of ETD7AN called the ATCO by stating "ETD7AN we had TCAS RA resume navigation toward?" Then ATCO instructed aircraft ETD7AN to proceed direct to WPT TULBU.

Both aircraft continued to their destinations and landed safely with no further incidents.

Following the review of the occurrence, the OTSB classified the occurrence as a serious incident and the Director of OTSB appointed investigator in charge (IIC) and investigation team to institute and conduct investigation. The following parties were notified:

- State of Design and Manufacturer, of Airbus France-Bureau d'enquêtes et d'analyses pour la sécurité de l'aviation civile French Safety Investigation Authority (BEA), France.
- State of Design and Manufacturer, Boeing, National Transportation Safety Board (NTSB); United States of America (USA).
- International Civil Aviation Organization (ICAO).
- State of Operator, and Registry, United Arab Emirates (UAE) General Civil Aviation Authority- Air Accident Investigations (GCAA-AAI), U.A.E.

- Sultanate of Oman Civil Aviation Authority (CAA).

An investigation team was appointed and investigation was conducted in conformance with the ICAO Annex13, CAR 13 and OTSB Investigation procedures. The Sultanate of Oman is the State of Occurrence. The following parties were involved in the investigation through their appointed accredited representatives and advisers:

- State of Design and Manufacturer, Airbus France-Bureau d'enquêtes et d'analyses pour la sécurité de l'aviation civile (BEA), France.
- State of Design and Manufacturer, Boeing, National Transportation Safety Board (NTSB); United States of America (USA).
- State of Operator and Registry, United Arab Emirates (UAE) General Civil Aviation Authority- Air Accident Investigations (GCAA-AAI).

This Final Report issued on 26th August 2026 and it is made public at the below link:

www.mtcit.gov.om

Unless otherwise mentioned, all times in this report are UTC. Local Time in The Sultanate of Oman is UTC plus +4 hours. Photos and figures used in this report were obtained from, U.A.E GCAA-AAI, Directorate General of Meteorology (DGMET) and DGAN and adjusted from the original for the sole purpose of improving the clarity of the report. Modifications to images used in this report are limited to cropping, magnification, file compression, or enhancement of colour, brightness, contrast or insertion of text boxes, arrows or lines.

1. FACTUAL INFORMATION:

1.1 History of Flight:

1.1.1 On the 6th of February 2026, Etihad Airways aircraft ETD7AN with registration marks A6-EIM, an Airbus 320-232 departed from Jaipur International Airport (VIJP), India on an international scheduled flight with intended destination Zayed International Airport (OMAA), United Arab Emirates. While aircraft ETD476 with registration marks A6- BLX Boeing 787-9 Dreamline was maintaining Flight Level 330 (FL330) from central sector departed from Zayed International Airport (OMAA) on an international scheduled flight with intended destination Soekarno Hatta Intl Airport (WIII).

1.1.2 According to the radar playback, there were 17 aircraft under the control of Bravo Sector Air Traffic Control Officer's (ATCO) control which was within Bravo Sector's capacity which is 25 aircraft. The Bravo sector position was split into Bravo Executive position and Bravo Planner position. Aircraft ETD7AN was in Bravo sector flying on Airway (AWY) L444 maintaining FL360 and ETD476 was in Central sector flying on opposite direction from AWY N318 maintaining FL330, both aircraft were approaching waypoint WPT TOLDA.

1.1.3 At 18:45:38 after Bravo ATCO entered the Cleared Flight Level (CFL), FL340 on the radar display for aircraft ETD7AN while still maintaining FL360 to descend to FL340, a safety net Medium Term Conflict Detection (MC) was activated between aircraft ETD7AN and aircraft QTR8A, which was still in Central sector maintaining FL350 as shown in the box in figure 1 below.



Figure1 shows MC between ETD7AN maintaining FL360 and QTR8A maintaining FL350 (Source: DGAN).

1.1.4 At 18:46:12, Bravo Sector ATCO instructed the flight crew of ETD7AN to descend from FL360 to FL340 and to expedite reaching due to converging faster traffic over waypoint (WPT) TULBU aircraft VOZ001, B777 at FL360 flying from Middle Sector WPT EMURU. At 18:46:18, the flight crew of ETD7AN readback, but the readback was not clear and the ATCO did not request the flight crew to repeat the unclear readback. At 18:46:12, ATCO instructed the flight crew of ETD7AN to descend to FL340 due to traffic and to expedite. At 18:46:18, there was unclear read back from the flight crew of ETD7AN.

1.1.5 At 18:46:38 aircraft ETD7AN commenced the descent vacating FL360 at ROD of 400FPM as shown in figure 2 below.



Figure 2 shows ETD7AN started descending leaving FL360 with ROD of 400FPM (Source: DGAN).

1.1.6 At 18:47:18 another safety net level bust (LB) was activated on aircraft ETD7AN while on descent passing through FL345 with ROD of 2900FPM meanwhile ETD476 was maintaining FL330 as shown in figure 3 below. The LB was activated due to discrepancy between the FL entered by the flight crew of ETD7AN on the aircraft FMS and the CFL entered by the ATCO on the radar display.



Figure 3 shows LB on ETD7AN while on descent to FL340 passing FL345 with ROD of 2900FPM (Source: DGAN).

1.1.7 The Yellow STCA was activated on the radar display at 18:47:22 as aircraft ETD7AN was on descent passing through FL343 with a ROD of 3100FPM and aircraft ETD476 was maintaining FL330. At 18:47:24, the yellow STCA window indicated another conflict between UAE404

maintaining FL310 and ETD7AN descending to FL340 at 3100FPM as shown in figure 4 below. Then at 18:47:26, the yellow STCA between ETD7AN and ETD476 was deactivated.

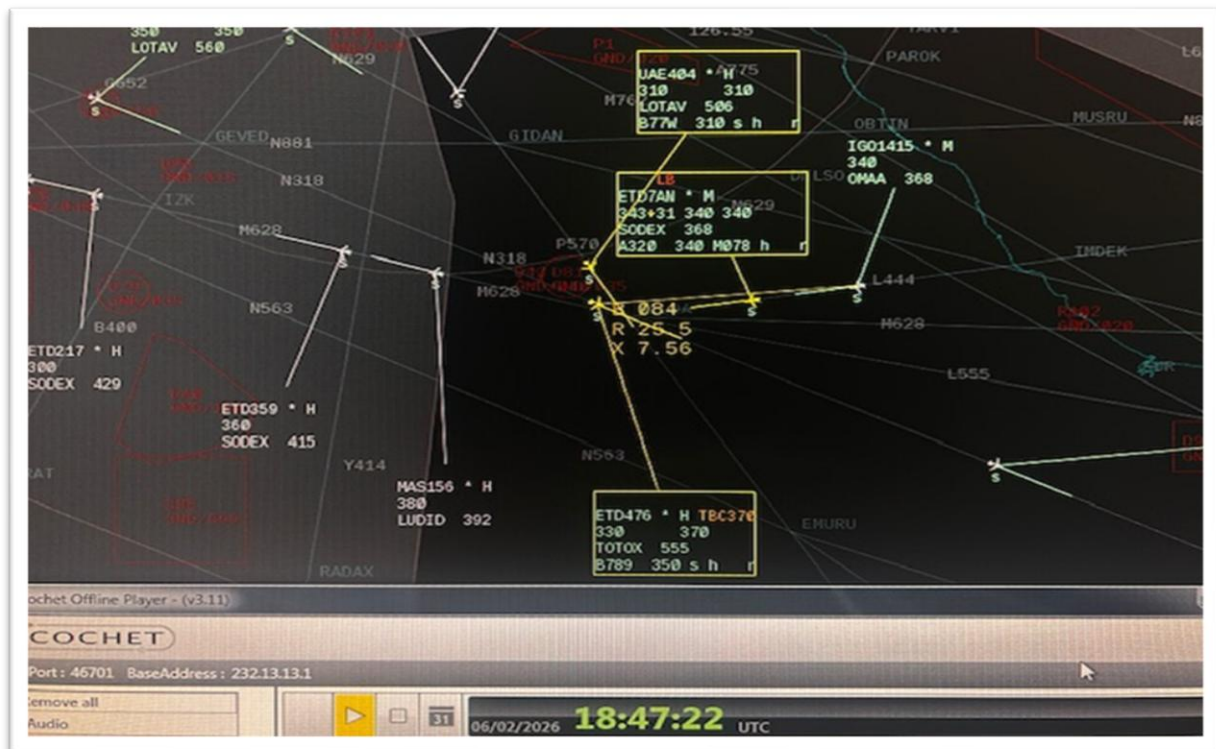


Figure 4 shows yellow STCA on aircraft ETD7AN while on descent passing through FL343 with ROD 3100 FPM and ETD476 maintain FL330 and also between ETD7AN and UAE404 maintaining FL310 (Source: DGAN).

1.1.8 At 18:47:25, Mode S on the radar display indicated that ETD7AN was descending to FL320 as per the aircraft Flight Management System (FMS) as shown in figure 5 below.

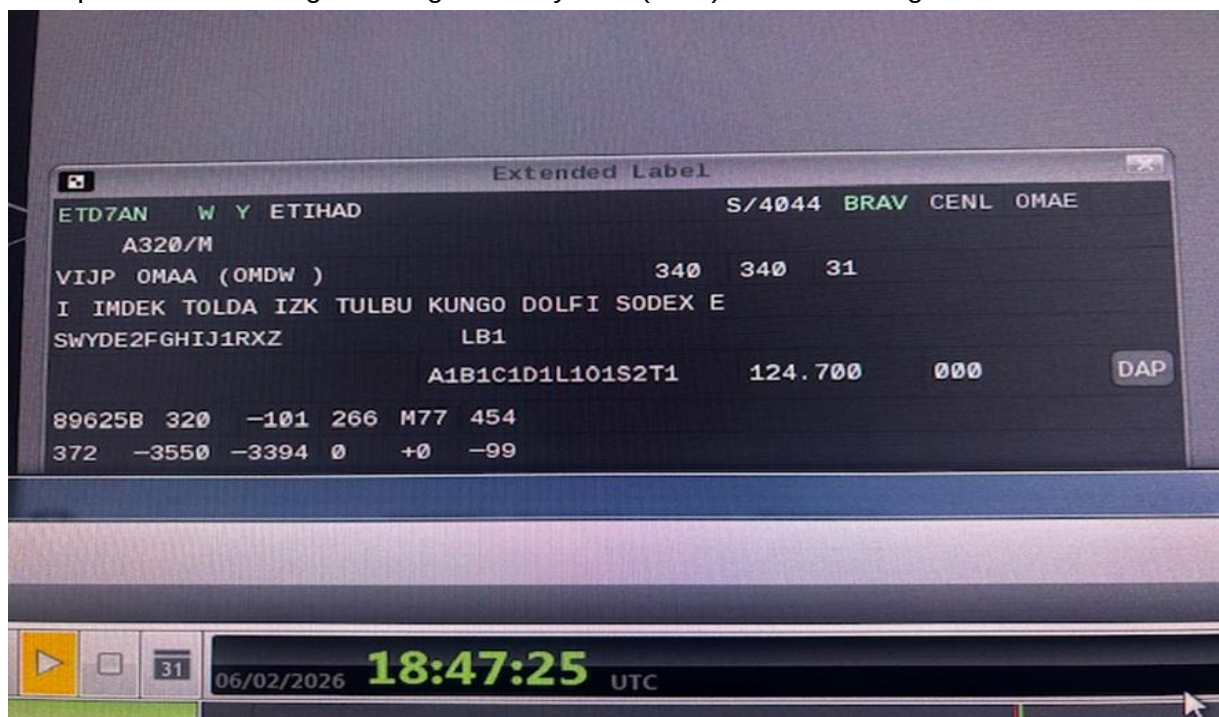


Figure 5 shows aircraft ETD7AN Mode S indicating the aircraft descending to FL320 (Source: DGAN).

1.1.9 At 18:47:27, ATCO called the flight crew of ETD7AN to maintain FL340, but there was no readback. At 18:47:33, ATCO repeated the clearance twice instructing the flight crew of ETD7AN to turn right 50 degrees, turn right 50 degrees and maintain level 340 but there was no response from flight crew of ETD7AN.

1.1.10 At 18:47:43, ATCO again called the flight crew of ETD7AN for the third time and the flight crew responded by stating "7AN go ahead". At 18:47:48, ATCO instructed the flight crew of ETD7AN to maintain FL340 and to turn right 50° and there was no response. At 18:47:51 yellow STCA window deactivated displaying conflicts between aircraft ETD7AN descending through FL332 with a ROD1200FPM and ETD476 maintaining FL330 and at the same time the yellow STCA continued displaying conflict between ETD7AN and UAE404 maintaining FL310 as shown in figure 6 below.

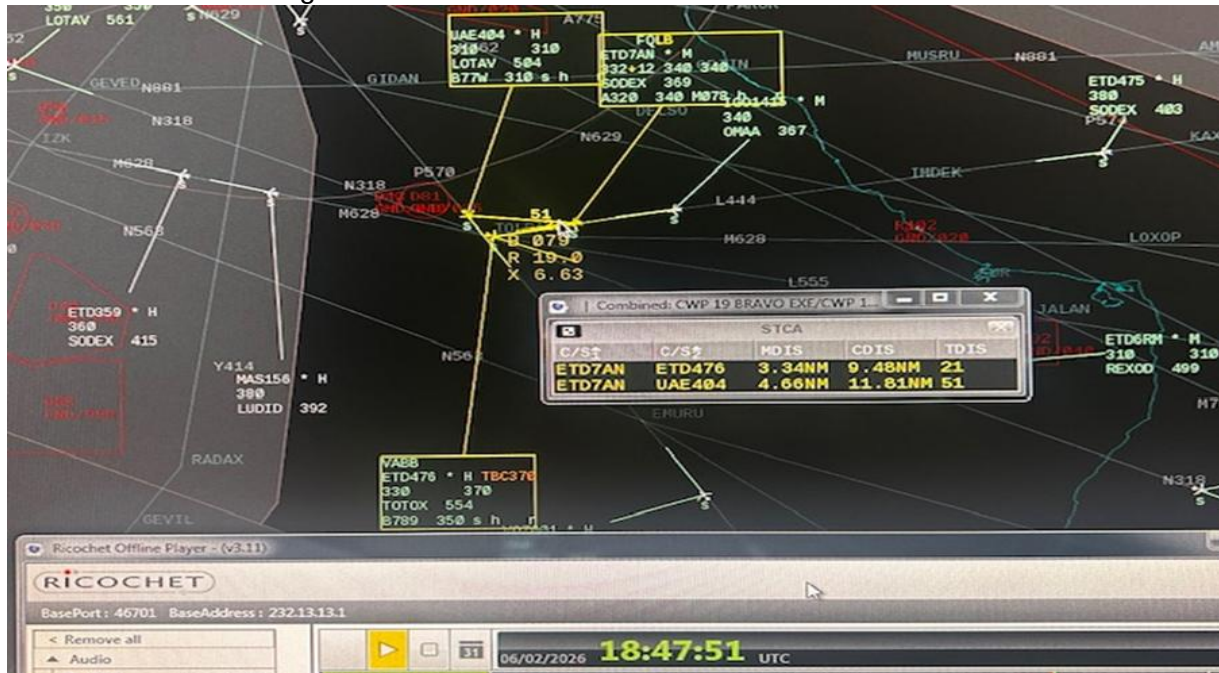


Figure 6 shows yellow STCA displaying conflict between ETD7AN descending through FL332 ROD 1200FPM and ETD476 maintaining FL330 and between ETD7AN and UAE404 maintaining FL310 (Source: DGAN).

1.1.11 At 18:47:55, the yellow STCA alert between ETD7AN and UAE404 was cleared out of the radar screen as the rate of descent reduced significantly from 3100 FPM to 500 FPM, and the yellow STCA remained between conflicting aircraft ETD7AN descending through FL332 with ROD of 500FPM and ETD476 maintaining FL330 with a distance of 8.55 NM. At this time, the flight crew of ETD476 reported TCAS RA and the ATCO acknowledged as indicated in figure 7 below. At 18:48:04 ATCO instructed All stations standby.

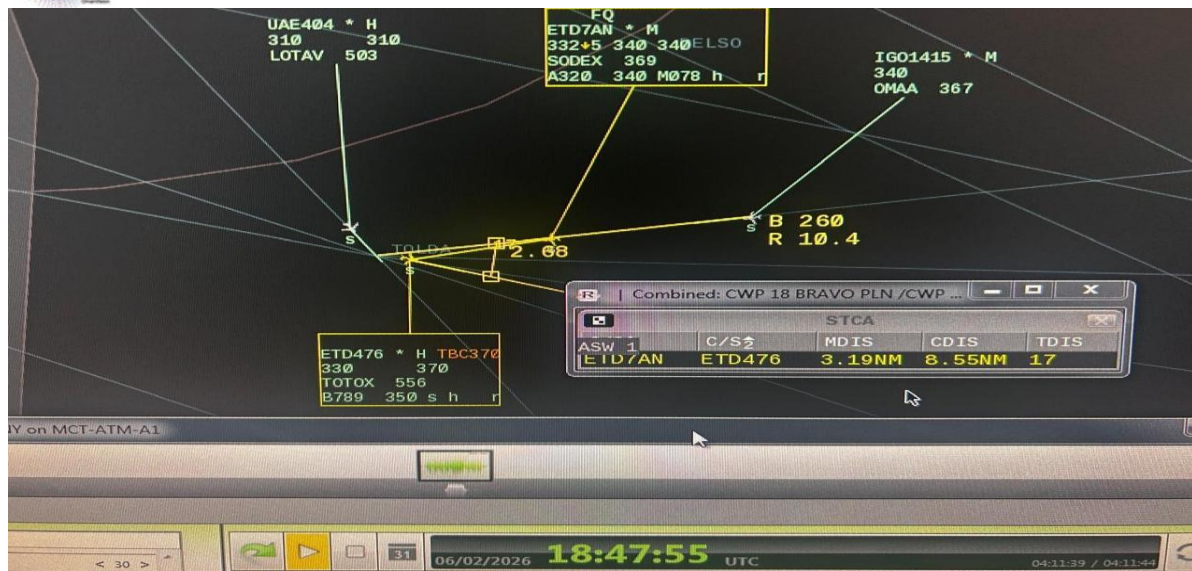


Figure 7 shows TCAS RA between ETD476 maintaining FL330 while ETD7AN was descending through FL332 with ROD of 500FPM on opposite direction and the distance between the two aircraft is 8.55NM (Source: DGAN).

1.1.12 At 18:48:01, MC activated between ETD7AN maintaining FL333 and ETD476 maintaining FL330. The current distance between the two aircraft reduced to 6.56NM as shown in figure 8 below.

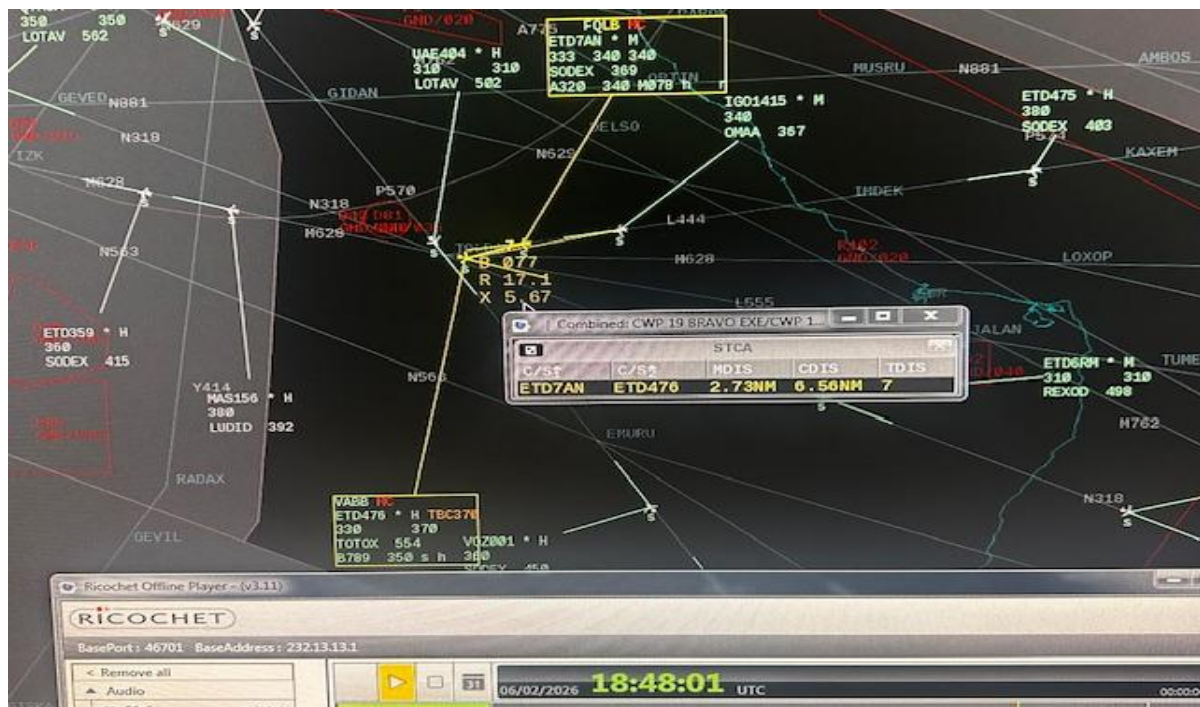


Figure 8 shows MC between ETD7AN maintaining FL333 and ETD476 maintaining FL330 when the current distance between the two aircraft reduced to 6.56NM (Source: DGAN).

1.1.13 At 18:48:07, Radar display shows ETD7AN and ETD476 while reacting to TCAS RA, ETD7AN climbing passing through FL335 at ROC1300FPM while ETD476 descending passing through FL329 at ROD 900FPM as shown in figure 9. The distance between the two aircraft was 5.73NM.



Figure 9 shows ETD7AN and ETD476 while reacting to the TCAS RA (Source: DGAN).

1.1.14 At 18:48:10, the distance between ETD7AN and ETD476 reduced to 4.86 NM and vertical separation reduced to 600FT, MC and red STCA warnings were activated on the radar screen on both aircraft while aircraft ETD7AN was climbing passing through FL335 for FL340 with ROC 1300FPM and aircraft ETD476 was descending passing through FL329 with ROD 900 FPM as indicated in figure 10 below.

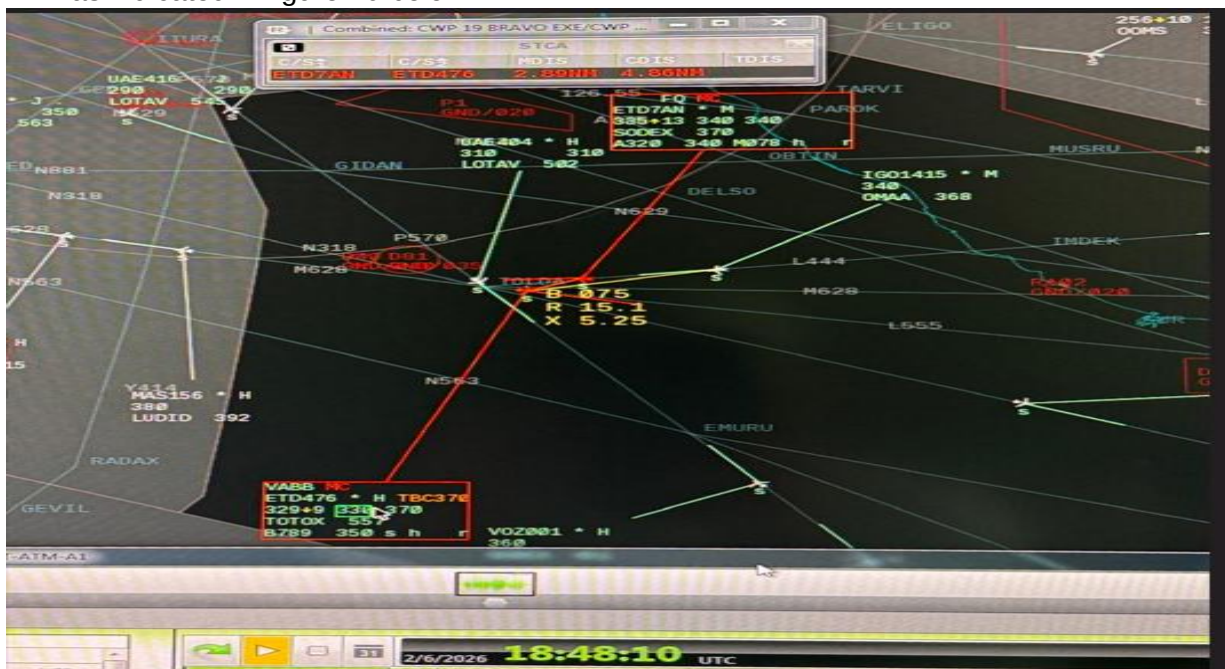


Figure 10. shows MC and red STCA warning for both aircraft ETD7AN and ETD476 and the distance between both aircraft was 4.86NM (Source: DGAN).

1.1.15 At 18:48:11, the flight crew of ETD476 reported to ATCO that they are descending due to traffic RA. At 18:48:26, ATCO acknowledged by stating "ETD476 Roger".

1.1.16 At 18:48:17, the Red STCA was deactivated between the two aircraft as the vertical separation was exceeded 1300FT while ETD7AN was climbing to FL340 passing through FL338 at ROC1600FPM and ETD476 descending to FL320 passing through FL325 at ROD 1900FPM as shown in figure 11 below.



Figure 11 shows the Red STCA deactivated between the two aircraft as the vertical separation was 1300FT as ETD7AN was climbing to FL340 at ROC1600FPM and ETD476 descending to FL320 at ROD 1900FPM (Source: DGAN).

1.1.17 At 18:48:29, the flight crew of ETD476 reported to ATCO that they were clear of traffic and resuming FL330 and ATCO acknowledged.

1.1.18 At 18:48:33, the conflict display window was deactivated from radar screen after ETD7AN and ETD476 passed each other as shown in figure 12 below.



Figure 12 shows conflict display deactivated from the radar screen as both aircraft passed each other (Source: DGAN).

1.1.19 At 18:48:43, the flight crew of ETD7AN reported to ATCO that they had TCAS RA by stating "ETD7AN we had TCAS RA resume navigation toward?" and the ATCO responded to the flight crew of ETD7AN that the instruction was to descend to FL340 and not FL320.

1.1.20 After the TCAS RA, the following communications were exchanged between the ATCO and the flight crew of ETD7AN:

18:48:49 BRAVO ATCO: ETD7AN the instruction was to descend 340 not 320

18:48:55 ETD7AN: Yeah sir, we copied 340 and acknowledge 340,320 only

18:49:03 BRAVO ATCO: ETD7AN say again?

18:49:06 ETD7AN: I copied ahh...

18:49:09 BRAVO ATCO: you copied 340 but you descend 320 confirm?

18:49:12 ETD7AN: --un clear--, descend level 320

18:49:17 BRAVO ATCO: ETD7AN the transmission instruction was to descend 340

18:49:23 ETD7AN: 7AN copied ahh... descend to level 320 sir,320

1.1.21 The First Officer (FO) of aircraft ETD7AN, stated that during cruise at FL360 the aircraft control was handed over by the Captain before the Captain left the cockpit for the restroom break and the Operator's Operation Manual "absence from flight deck" procedure was applied. The FO was briefed by the Captain accordingly and resumed the role of both the PF and PM whilst the Captain was away. According to the FO, the ATCO instructed the flight crew of ETD7AN to descend from FL360 to FL320 due to traffic and to expedite descent. The FO readback (unclear) the clearance, set FL320 on the Flight Control Unit (FCU), and initiated the descent in OPEN DESCENT MODE in compliance with ATCO's instructions. Also, Captain stated that, during this time the Cabin Director (CD) was in the cockpit serving food that was ordered by the FO before the occurrence.

1.1.22 The FO of ETD7AN stated that, while on descent passing through FL340, ATCO called and advised that the cleared level was FL340, not FL320. The FO further stated that as the aircraft was descending through FL340, a TCAS TA occurred, which subsequently escalated to a TCAS RA commanding a CLIMB to FL335, TCAS RA was followed. Once clear of conflict, the ATCO then cleared aircraft ETD7AN to climb and maintain FL340 meanwhile, the Captain who was on rest break just came back to the cockpit and took over control as PF and completed the memory item manoeuvre, while climbing to FL340.

1.1.23 According to the Bravo ATCO on planner position, the ATCO was advised by the ATCO Planner to instruct the flight crew of ETD7AN to expedite the descent from FL360 to FL340 due to faster traffic VOZ001 B777 flying from the middle sector at FL360. The ATCO planner didn't hear the read-back from the flight crew of ETD7AN.

1.1.24 The ATCO planner further stated that when both the ATCO planner and the Radar ATCO noticed aircraft ETD7AN on the radar screen passing FL340 and continuing descent, the ATCO attempted to achieve vertical or horizontal separation by instructing the traffic to stop at FL340 and turn 50° to the right but there was no response. Meanwhile, aircraft ETD7AN was encountering TCAS RA due to conflicting aircraft ETD476 at FL330.

1.1.25 ATCO stated that the frequency in use 126.55 MHz was serviceable but sometimes unclear Transmitting / Receiving (Tx/Rx). The flight crew of ETD7AN was given instruction to descend from FL360 to FL340 in order to avoid conflict with the faster traffic VOZ001 coming from AWY P570 Middle sector at the same FL360. The readback from the flight crew of ETD7AN was received by the ATCO which was believed to be FL340. The ATCO stated that the middle number was unclear when the flight crew of ETD7AN readback the cleared flight level. ATCO heard 3 and 0 but not the number in the middle which didn't give the ATCO the right read back from the flight crew.

1.1.26 ATCO stated that both ATCO and Planner noticed the yellow and red STCA, MC and LB warning indications on the radar screen while observing aircraft ETD7AN descending to FL320. ATCO immediately instructed the flight crew of ETD7AN to level off at FL340 and turn right 50°, no acknowledgment was received from flight crew of ETD7AN and the ATCO repeated the transmission again twice. At the time, the aircraft ETD7AN was on descent passing through FL340 with a high rate of descent, Red STCA was observed. The flight crew of ETD7AN acknowledged the ATCOs call. Later the crew of ETD7AN reported that they had TCAS RA.

1.1.27 The Supervisor stated while sitting on Supervisors' desk, when he was informed about the serious incident by one of the ATCOs, immediately went to the Bravo ATCO position. The Bravo planner was playing back the audio in order to review the read back and it was found that the readback from flight crew ETD7AN on the frequency was unclear as they could not hear the Cleared Flight Level (CFL) readback. The supervisor further stated that Bravo ATCO informed Supervisor that the flight crew of ETD7AN was instructed to descend to FL340 however the flight crew of ETD7AN was seen descending through FL340 to FL320.

1.1.28 The supervisor further stated that he asked Bravo ATCO if he was okay to continue as per the procedures and he responded "Yes". The Supervisor sat behind the ATCO and monitored his work for 15 minutes. Then the Supervisor took over the Bravo Planner position and later again the Supervisor asked Bravo ATCO again if he was happy to continue working and he responded again "Yes".

1.2. Injuries to Persons

1.2.1 Aircraft A6-EIM (ETD7AN)

Injuries	Pilot	Crew	Pass	Total on Board	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	2	4	160	166	-
Total	2	4	160	166	-

Note: Other means people on the ground.

1.2.2 Aircraft A6-BLX (ETD476)

Injuries	Pilot	Crew	Pass	Total on Board	Other
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	3	9	289	301	-
Total	3	9	289	301	-

Note: Other means people on the ground.

1.3 Damage to Aircraft

1.3.1 No damage to both aircraft was reported.

1.4 Other Damage

1.4.1 No other damages were reported.

1.5 Personnel Information

1.5.1 A6-EIM (ETD7AN) Captain

Nationality	Indian		
Medical Validity	26 th July 2026	Licence Type	ATPL-A
Licence Validity	27 th July 2033	Type Endorsed	A320
Ratings	A320		
English Language Proficiency	Level	5	
	Issue Date	28 th September 2023	
	Expiry Date	27 th September 2029	
LPC Issue Date	15 th January 2026	OPC Issue Date	15 th January 2026
LPC Expiry Date	31 st January 2027	OPC Expiry Date	31 st July 2026
Restrictions	Nil		

Flying Experience:

Total Hours	12511
Total Flying Hours on Type	6425
Total Flying Hours as Captain	6275
Total Past 24 Hours	3:11
Total Past 7 Days	19:57
Total Past 30 Days	75:37
Total Past 90 Days	172:14

1.5.1.1 The PF was issued an Airline Transport Pilot license - (ATPL- A) by the UAE- GCAA and rated for A320. The license was valid at the time of the serious incident. The PF has level 5 English Language proficiency with an expiry date of 27th September 2029.

1.5.1.2 The PF was issued a Class (one) 1 medical certificate with an expiry date of 26th July 2026.

1.5.2 First Officer - FO

Nationality	Spanish		
Medical Validity	26 th March 2027	Licence type	ATPL-A
Licence Validity	25 th June 2032	Type Endorsed	A320
Ratings	A320		
English Language Proficiency	Level	5	
	Issue Date	01 st June 2023	
	Expiry Date	31 st May 2029	
LPC Issue Date	16 th November 2025	OPC Issue Date	16 th November 2025
LPC Expiry Date	30 th November 2026	OPC Expiry Date	30 th June 2026
Restrictions	Nil		

Flying Experience:

Total Hours	6600
Total Flying Hours on Type	3023
Total Flying Hours as First Officer	3023 (1132 with EY)
Total Past 24 Hours	3:11
Total Past 7 Days	23:22
Total Past 30 Days	76:26
Total Past 90 Days	179:02

1.5.2.1 The FO was issued an Airline Transport Pilot License A (ATPL-A) by the UAE-GCAA and rated for A320. The license was valid at the time of the serious incident. The PM has level 5 English Language proficiency with an expiry date of 31st May 2029.

1.5.2.2 The FO was issued a Class (one) 1 medical certificate with an expiry date of 26th March 2027.

1.5.3 A6-BLX-(ETD476) - Captain

Nationality	Greek		
Medical Validity	06 th October 2026	Licence Type	ATPL-A
Licence Validity	08 th October 2032	Type Endorsed	B777-B787
Ratings	A320-A330-B777-B787		
English Language Proficiency	Level	5	
	Issue Date	15 th September 2022	
	Expiry Date	14 th September 2028	
LPC Issue Date	29 th November 2025	OPC Issue Date	29 th November 2025
LPC Expiry Date	30 th November 2026	OPC Expiry Date	30 th June 2026
Restrictions	Nil		

Flying Experience:

Total Hours	12064
Total Flying Hours on Type	3342
Total Flying Hours as Captain	6159
Total Past 24 Hours	None
Total Past 7 Days	08:38
Total Past 30 Days	69:58
Total Past 90 Days	195:45

1.5.3.1 The Captain was issued an Airline Transport Pilot License A- (ATPL-A) by the UAE-GCAA and rated for A320-A330 -B777-B787. The license was valid at the time of the serious incident. The Captain has level 5 English Language proficiency with an expiry date of 14th September 2028.

1.5.3.2 The Captain was issued a Class (one) medical certificate with an expiry date of 6th October 2026.

1.5.4 First Officer - FO

Nationality	Emarati		
Medical Validity	29 th August 2026	Licence type	ATPL-A
Licence Validity	11 th January 2034	Type Endorsed	B777, B787
Ratings	A320, B777, B787		
English Language Proficiency	Level	5	
	Issue Date	14 th January 2025	
	Expiry Date	03 rd January 2031	
LPC Issue Date	08 th September 2025	OPC Issue Date	08 th September 2025
LPC Expiry Date	30 th September 2026	OPC Expiry Date	31 st March 2026
Restrictions	Specialist Ophthalmological Examination (RXO)		

Flying Experience:

Total Hours	7045
Total Flying Hours on Type	3461
Total Flying Hours as First Officer	3451
Total Past 24 Hours	None
Total Past 7 Days	None
Total Past 30 Days	55:18
Total Past 90 Days	161:01

1.5.4.1 The Captain was issued an Airline Transport Pilot License A (ATPL-A) by the UAE - DGCAA and rated for A320 - B777-B787. The license was valid at the time of the serious incident. The Captain has level 5 English Language proficiency with an expiry date of 3rd January 2031.

1.5.4.2 The Captain was issued a Class (one) 1 medical certificate with an expiry date of 29th August 2026 with Specialist Ophthalmological Examination (RXO) limitation which require the pilot to undergo regular, specialized eye exams by an eye specialist.

1.5.5 Cabin Director of **A6-EIM (ETD7AN)**

Nationality	Moroccan		
Medical validity	10 th May 2026	Licence type	Cabin Crew
Licence validity	13 th June 2032	Type endorsed	N/A
Ratings	A320, A330, A340, A380, B777, B787		

Flying Experience:

Total Hours	8663:38
Total Flying Hours on Type	367:48 in A320 & 1769:46 for all A320/321
Total Past 24 Hours	03:11
Total Past 7 Days	06:44
Total Past 30 Days	77:36
Total Past 90 Days	186:33

1.5.5.1 The CD license was initially issued on 15th June 2016 and will expire on 13th June 2032.

1.5.5.2 The CD has a valid Cabin Crew Medical Class certificate with expiry date of 10th May 2026 with no limitation.

1.5.6 Bravo Air Traffic Controller (ATCO)

Nationality	Malaysian		
Medical valid	15 th February 2027	Licence type	Air Traffic Controller
Licence valid	31 st July 2030	Type endorsed	Yes
English Language Proficiency (ELP)	Level	4	
	Expiry Date	01 st July 2028	
Ratings	ACP, ACS		
Restrictions	VDL		

1.5.6.1 The ATCO license was initially issued on 2nd July 2025 and will expire on 31st July 2030.

1.5.6.2 The ATCO was issued with English language proficiency with level 4 and will expire on 1st July 2028. The proficiency check was conducted on 29th June 2025.

1.5.6.3 The last ATC Proficiency Rating Checks were conducted on 29th June 2025.

1.5.6.4 The ATCO has a valid Class three (3) medical certificate with expiry date of 15th February 2027 with "Correction for defective distant vision and carry a spare set of spectacles (VDL) limitation.

1.5.7 Planner - Air Traffic Controller (ATCO):

Nationality	Omani		
Medical valid	17 th March 2027	Licence type	Air Traffic Controller
Licence valid	30 th June 2030	Type endorsed	Yes
English Language Proficiency (ELP)	Level		4
	Expiry Date		06 th May 2027
Ratings	ACP, ACS		
Restrictions	Nil		

1.5.7.1 The Planner ATCO license was initially on 30th June 2015. The license revalidation was issued on 17th June 2025 and will expire on 31st July 2030. The ATCO license was initially issued on 30th June 2015 and will expire on 30th June 2030

1.5.7.2 The Planner ATCO was issued with English language proficiency with level 4 and will expire on the 1st July 2028. The proficiency check was conducted on 27th December 2025.

1.5.7.3 The last ATC Proficiency Rating Checks were conducted on 27th December 2025.

1.5.7.4 The Planner ATCO has a valid Class three (3) medical certificate with expiry date of 17th March 2027 with no limitations. The renewed medical certificate was issued on 09th February 2026.

1.6. Aircraft Information

1.6.1 The Airbus A320-232 is a specific variant of the A320 family, known for its fuel efficiency and passenger capacity. It is a short-to-medium range, narrow-body, commercial passenger twin-engine jet airliner. The A320-232 is a popular choice for airlines due to its versatility and efficiency.

Airframe Information: A6-EIM (ETD7AN)

Manufacturer/Model		Airbus SE / A320-232	
Serial Number		04077	
Year of Manufacture		12 th October 2009	
Total Airframe Hours (At Time of Serious Incidents)		55271:08	
Last Inspection (Date & Hours)		06 th February 26	55267:42
Last Inspection Airframe Cycles (CSN)		22648	
Airframe Hours Since Last Inspection		55267:42	
Type of inspection preformed		Aircraft Transit Check	
CRS Issue Date		06th February 2026	
C of A (Issue Date & Expiry Date)	04 th November 2009	24 th October 2026	
C of R (Issue Date)		04 th November 2009	
Operating Category		Passenger Aircraft	
Type of Fuel Used		JET A-1	

Engine 1:

Manufacturer/Model	International Aero Engines AG (IAE) / IAE V2500	
Serial Number	V17831	
Part Number	V2527A5	
Hours Since New	32202:32	
Hours Since Overhaul	6120:53	
Hours since last shop visit	6120:53	
Cycles Available Before Next Shop Visit	2613	
Oil type	BPT02197	

Engine 2:

Manufacturer/Model	International Aero Engines AG (IAE) / IAE V2500	
Serial Number	V17359	
Part Number	V2527A5	
Hours Since New	34803:26	
Hours Since Overhaul	8011:14	
Hours since last shop visit	8011:14	
Cycles Available Before Next Shop Visit	1812	
Oil type	BPT02197	

1.6.2 The Boeing 787-9 Dreamliner is a long-range, wide-body twin-engine jet known for its high fuel efficiency, using 20–25% less fuel than the aircraft it replaces. As a stretched version of the 787-8, it carries 250–330 passengers, features a 50% composite structure, large dimmable windows, and advanced cabin technology for better passenger comfort.

Airframe Information: A6-BLX (ETD476)

Manufacturer/Model	Boeing Company / B787 – 9	
Serial Number	39665	
Year of Manufacture	31 st January 2019	
Total Airframe Hours (At Time of Serious Incidents)	31708:05	
Last Inspection (Date & Hours)	06 th February 2026	31699:23
Last Inspection Airframe Cycles (CSN)	4729	
Airframe Hours Since Last Inspection	31699:23	
Type of inspection preformed	Daily	
CRS Issue Date	06 th February 2026	
C of A (Issue Date & Expiry Date)	11 th February 2019	10 th February 2027
C of R (Issue Date)	11 th February 2019	
Operating Category	Passenger Aircraft	
Type of Fuel Used	JET A-1	

Manufacturer/Model	GE Aerospace / GENX
Serial Number	956798
Part Number	GENX1B74-75P2G01
Hours Since New	41818:54
Hours Since Overhaul	19230:25
Hours since last shop visit	19230:25
Cycles Available Before Next Shop Visit	20
Oil type	BPT02197

Manufacturer/Model	GE Aerospace / GENX
Serial Number	956661
Part Number	GENX1B74-75P2G01
Hours Since New	38277:24
Hours Since Overhaul	13721:17
Hours since last shop visit	13721:17
Cycles Available Before Next Shop Visit	990
Oil type	BPT02197

1.7.1 According to Oman Directorate General of Meteorology (DGMET) office, satellite image was observed with no Significant weather condition over MCT FIR. Medium and high clouds were observed during the time (1645UTC), close to the time of the serious incident. Strong wind was expected southwest to west (25055kt to 27065kt) from FL320 to FL360 in the upper air, maybe Jetstream was associated. Also, forecasting, no weather condition as shown in the Muscat Terminal Area Forecast (TAF) and no pilot reports were received. Therefore, no warning was issued over the area of the serious incident. The flight plan of the ETD7AN did not show any significant weather conditions. Figure13 shows weather conditions at the location of serious incident location.

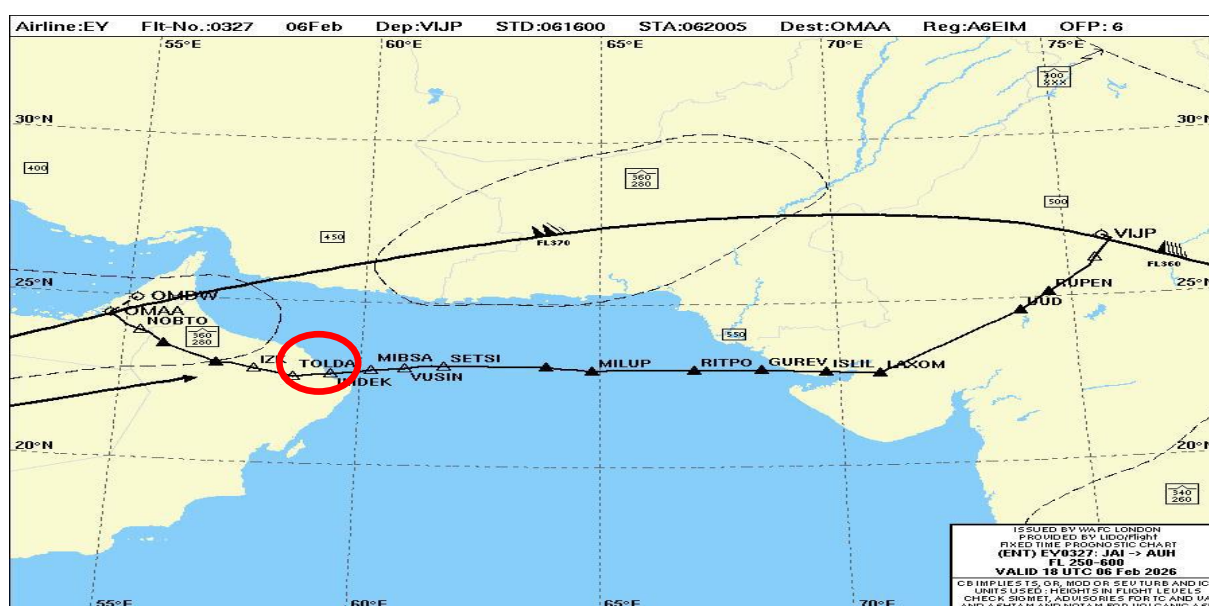


Figure 13. shows weather image of the weather at the location of the serious incident (Source: DGMET).

1.8. Aids to Navigation

1.8.1 Both aircraft were equipped with standard navigational equipment as approved by the GCAA - UAE. There were no defects reported or records indicating that the navigation system was unserviceable prior to the serious incident.

1.9. Communication

1.9.1 Both aircraft were equipped with a standard communication system as approved by the GCAA - UAE. There were no defects reported or records indicating that the communications system was unserviceable prior to the serious incident.

1.9.2 The communication between the ATCO and the flight crew was normal with sometime unclear transmission and receiving, which reduced the clarity of the instruction to the PM.

1.10. Airport Information

1.10.1 Not Applicable to this serious incident as it occurred during cruise.

1.11. Flight Recorders:

1.11.1 Both aircraft were fitted with the Digital Flight Data Recording (DFDR), Flight Data Monitoring (FDM) and the Cockpit Voice Recording (CVR). OTSB relied on the ATC records in this investigation and therefore there was no need to download DFDR and CVR.

1.12. Wreckage and Impact Information

1.12.1 Not relevant to the serious incident.

1.13. Medical and Pathological Information

1.13.1 Not relevant to the serious incident.

1.14. Fire

1.14.1 Not relevant to the serious incident.

1.15. Survival Aspects

1.15.1 Not relevant to the serious incident.

1.16. Tests and Research

1.16.1 Not relevant to the serious incident.

1.17. Organizational and Management Information

1.17.1 Etihad (Air Operator):

1.17.1.1 Both aircraft were scheduled as International passenger flight.

1.17.1.2 Both aircraft ETD7AN and ETD476 were scheduled for International passenger flight. The operator, Etihad Airways was issued an Air Operating Certificate (AOC) by the State of Registry and State of Operator, UAE-GCAA, issued on 25th June 2025 with an expiry date of 31st October 2027. The certificate authorized the operator to perform Air carrier operations as specified in the operator's operations specifications, in accordance with the operations manual and UAE Civil Aviation Regulations.

1.17.1.3 The operator Etihad Airways, aircraft ETD7AN bearing registration A6-EIM was operating under lease agreement with SINOC leasing WNG II AIRCRAFT LEASING 17 LIMITED (Airbus A320-232 is a leased aircraft from Ireland) who are the owners of the aircraft.

1.17.1.4 The Operator, Etihad Airways has implemented Safety Management System (SMS), whereby occurrences are reported to the relevant authorities as and when they occur and they are reviewed, categorized, classified and investigated to identify the need for any gaps, risk assessment and risk management, remedial action that are required to be taken by the organization.

1.17.2 Directorate General Air Navigation (DGAN):

1.17.2.1 The service provider, DGAN have implemented Safety Management System (SMS) which includes all its ATS units, whereby occurrences are reported to the relevant authorities as and when they occur and they are reviewed, categorized, classified and investigated to identify the need for any gaps, risk assessment and management remedial action that are required to be taken by the organization.

1.18. Additional Information:

1.18.1 The following information was extracted from MUSCAT ACC MATSOP: RADIO COMMUNICATION PROCEDURES & CONTINGENCIES, Chapter5, pages 2015 & 216. (SOURCE: DGAN).

2. Read-back/Hear-back Requirements.

2.1. Definition:

2.1.1. Read back is defined as a procedure whereby the receiving station repeats a received message or an appropriate part thereof back to the transmitting station so as to obtain confirmation of correct reception. (ICAO Annex 10 Vol II).

2.1.2. ICAO requirements for the Read-back of clearances and safety-related information:

	CHAPTER 15	ACC MATSOP
	RADIO COMMUNICATION PROCEDURES & CONTINGENCIES.	Edition 3.0

2.1.3. ICAO Annex 11 requires that the flight crew shall read back to the air traffic controller safety-related parts of ATC clearances and instructions which are transmitted by voice. The following items shall always be read back:

- ATC route clearances;
- clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any runway; and
- runway-in-use, altimeter settings, SSR codes, level instructions, heading and speed instructions and, whether issued by the controller or contained in ATIS broadcasts, transition levels.

2.1.4. Other clearances or instructions, including conditional clearances, shall be read back or acknowledged in a manner to clearly indicate that they have been understood and will be complied with.

2.2. Readback of Air-Ground Voice Communications:

2.2.1. The ACC controllers shall:

- listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back;
- When issuing clearances, instructions, or information, ensure acknowledgment by the pilot. If no acknowledgment is received, attempt to re-establish contact;
- If readback is incorrect or incomplete, make corrections as appropriate.

1.18.2 The following information was extracted from Etihad Airways: Operation Manual, Part A General, Flight Procedures, Chapter 8.3.10.1 Crew members at their stations & 8.3.10.1.1 Absence from flight deck:

	OPERATIONS MANUAL PART A GENERAL Flight procedures	Chapter: 8.3 Page: 62 of 128 Rev: 40 Date: 15 Oct 2025
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- Be aware that if the autopilot is engaged, intentional disconnection can complicate the scenario, and the autopilot will, in most cases, facilitate the recovery.
- Try to avoid large rudder deflections that can create important lateral accelerations, which could then generate very large forces on the vertical stabiliser that may exceed the structural resistance. Although some recent aircraft types are protected by fly-by-wire systems, typically, the use of the rudder does not reduce the severity of the encounter nor does it improve the ease of recovery.
- Make use of specific guidance in the OM-B where available.

8.3.9.4 Helicopters

When hovering or air taxiing, a helicopter directs a forceful blast of air downwards which then rolls out in all directions. For wake turbulence separation purposes, helicopters air taxiing across runways are considered to be a departure from that intermediate point of the runway.

8.3.10 Crew members at their stations

8.3.10.1 Flight crew

Flight crew members are to occupy their assigned duty stations from the time the aircraft first starts to move at the beginning of its flight until it is established in the level cruise, and from the time it begins its descent on approaching the destination until the aircraft is stationary on its allocated parking stand at the end of the flight.

During all other phases of flight, each flight crew member required to be in flight deck shall remain at his station, unless his absence is necessary for the performance of his duties, or for physiological needs, provided at least one suitably qualified flight crew member remains at the controls of the aircraft at all times.

Flight crew members shall not vacate an aircraft control seat below 20,000 ft. AAL for the purpose of transferring duties to another flight crew member.

Only company qualified flight crew members on duty may sit on any pilot's seat during flight.

8.3.10.1.1 Absence from flight deck

When a flight crew member needs to leave the flight deck the remaining flight crew member shall:

- be seated at his duty station
- adjust his seat to ensure that all flight controls can be reached with unobstructed access
- secure his seatbelt and shoulder harness
- wear headset for communication with ATC
- assume responsibility and control of the aircraft
- maintain constant vigilance, alertness and high situational awareness
- avoid asking for vertical or lateral changes from the assigned flight path
- avoid unnecessary paperwork and remain heads up
- not accept to be served crew meals

ETIHAD AIRWAYS – UNITED ARAB EMIRATES

1.19. Useful or Effective Investigation Techniques

1.19.1 None.

2. ANALYSIS

2.1 General:

From the available evidence, the following analysis were made with respect to this serious incident. This shall not be read as apportioning blame or liability to any organization or individual.

2.1.1 The two aircraft involved in the serious incident are operated by Etihad Airways. The operator was properly licensed by the GCAA UAE at the time of the serious incident. Both aircraft have TCAS procedures in place and were executed by the flight crew efficiently following the TCAS alert.

- 2.1.2 There were no anomalies identified with the safety culture of reporting occurrences by the operator. OTSB investigation team concluded that the organizational factor of Etihad Airways was not a factor into this serious incident.
- 2.1.3 The investigation focused on the sequence of events that led to the loss of separation between the two aircraft and the subsequent Traffic Collision Avoidance System (TCAS) Resolution Advisory (RA).
- 2.1.4 At the time of the occurrence, aircraft ETD7AN was operating under ATCO instructions within controlled airspace. The ATCO issued a clearance for the flight crew of ETD7AN to descend to FL340, however the PF who was also PM interpreted the FL340 as FL320. It is worth mentioning that even during the playback, the readback was not clear. The investigation determined that the readback from the FO of ETD7AN was unclear and the ATCO did not confirm with the flight crew the readback.
- 2.1.5 The descent action by the flight crew of ETD7AN resulted in reducing the prescribed minimum from 1000FT to vertical separation of 200 FT between aircraft ETD7AN and opposite direction aircraft ETD476. Meanwhile, the horizontal separation was 8.55NM closing and both aircraft TCAS detected the conflict and triggered RA. The flight crew of both ETD7AN and ETD476 responded and followed the TCAS RA as required by the operator's operational procedures, executing the appropriate vertical maneuvers and reported TCAS RA to ATCO as shown in figure 14.

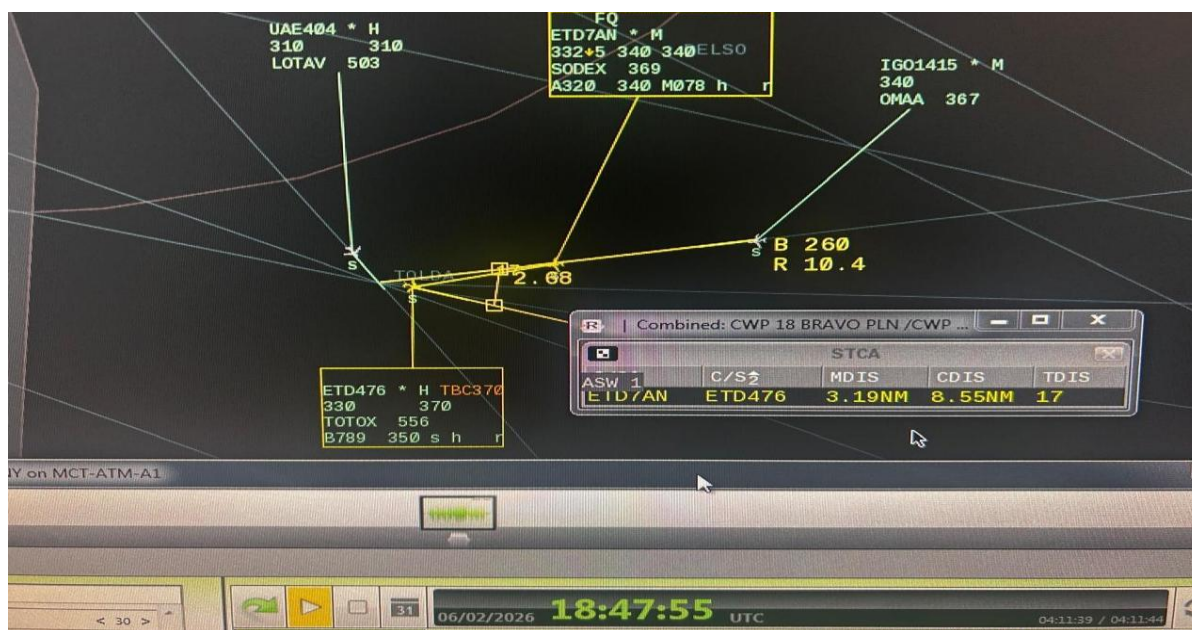


Figure 14. shows TCAS RA was reported between ETD476 maintaining FL330 and opposite direction ETD7AN descending through FL332 with ROD of 500FPM with a vertical separation of 200FT (Source: DGAN)

- 2.1.6 Figure 15 below shows red STCA between ETD476 descending through FL327 with ROD 1600FPM and ETD7AN climbing through FL336 with ROC of 1600FPM with a vertical separation of 900FT and horizontal distance of 4.12NM.

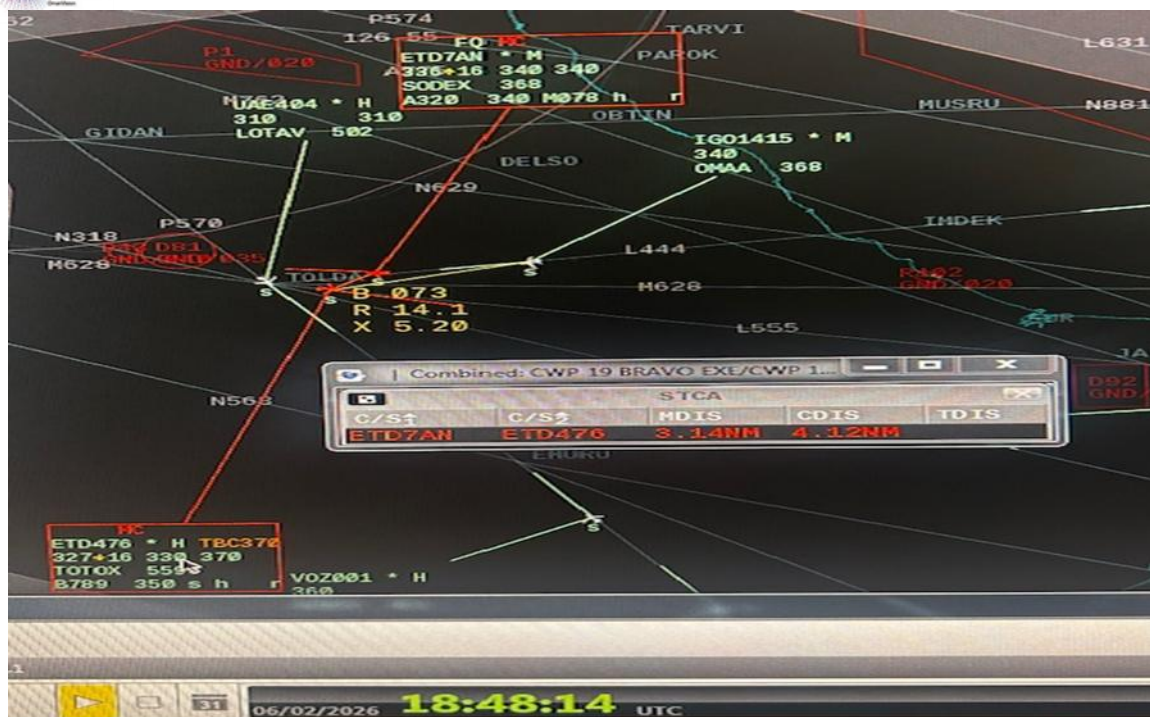


Figure 15. shows red STCA between ETD7AN climbing through FL336 with ROC of 1600FPM with a vertical separation of 900FT and ETD476 descending through FL327 with ROD 1600FPM (Source: DGAN).

2.1.7 At 18:48:17 the vertical separation exceeded 1000FT as ETD7AN was climbing through FL338 with ROD of 1600FPM and ETD476 was descending through FL325 with ROD of 1900FPM. The response to the TCAS RA restored safe separation between the aircraft ETD7AN and ETD476. The investigation determined that TCAS operated as designed as one of the remaining safety barrier and prompt flight crew response to the coordinated TCAS RAs restored separation and cleared both aircraft out of conflict.

2.2 Flight operations:

2.2.1 Flight crew Qualifications

2.2.1.1 The flight crew of both ETD7AN and ETD476 were properly licensed to operate the aircraft and their medical records with no significant limitations. At the time of the incident, both flight crews' medical certificates were valid for the flights conducted. No issues were observed regarding the rest period of both flight crews. The flight crews of both aircraft were well rested prior to conducting the operation of the incident flight.

2.2.2 Operational procedures:

2.2.2.1 The flight crew of ETD7AN followed established procedures when they received TCAS RA warning, there was no deviation from laid down procedures for reacting on TCAS RA. The flight crew of ETD476 also followed the established procedures and reported TCAS RA to the ATCO.

2.2.2.2 The FO of ETD7AN took over the aircraft full control as the Captain left the cockpit for the rest room. The FO, received instructions from ATCO to descend from FL360 to FL340 and to expedite reaching FL340. The FO of ETD7AN readback, but the readback was unclear to the ATCO. The FO stated that the descent instruction received from the ATCO was FL320. The FO readback was "--un clear--, ETD7AN". The readback was not clear and the ATCO did not confirm the readback from the FO. The investigation team established from the radar/audio playback that the cleared flight level was FL340 and that the readback was not clear.

2.2.2.3 When the ATCO contacted the flight crew of ETD7AN to level off at FL340, and turn right 50 degrees, there was no readback and aircraft ETD7AN while passing through FL343 descending at ROD 3100FPM.

2.2.2.4 According to the ATC transcript analysis, from the time (at 18:46:18) the flight crew of aircraft ETD7AN commenced with the descent to FL320 to the time the flight crew received a TCAS RA at 18:47:55, it was less than two minutes, and this was collaborated by the statement from the FO.

2.2.2.5 The FO who was also tasked with Captain's roles at the time of the incident, stated that the CFL instruction issued by the ATCO was FL320, however after aircraft ETD7AN was clear of conflict, the response from the FO of ETD7AN to ATCO regarding the CFL instruction given indicated that the FO was not sure whether the CFL instruction was for FL340 or FL320. This was noted in the following communication between the FO of ETD7AN and the ATCO:

At the time 18:48:49 BRAVO ATCO: ETD7AN the instruction was to descend 340 not 320

At the time 18:48:55 ETD7AN: Yeah sir, we copied 340 and acknowledge 340,320 only

2.2.3 Weather:

2.2.3.1 The flight crew of ETD7AN and ETD476 did not observe any cloud on the weather radar system, and or any deviation from flight plan. Weather was considered to be fine at the time and location of the serious incident and neither of the flight crew reported severe weather or challenges prior and post to the serious incident, as a result, the OTSB investigation team concluded that weather was not a factor into the serious incident.

2.2.4 Air Traffic Control:

2.2.4.1 The Bravo ATCO held a valid license with Class 3 valid medical certificate at the time of the serious incident. The ATCO exercised the privileges of the ATCO's license as required by CAR.ATCO.A.015 which states that, "the exercise of the privileges granted by a license shall be dependent on the validity of the license, ratings, endorsements including English Language Proficiency (ELP) and the medical certificate".

2.2.4.2 The FO of ETD7AN interpretation of the CFL FL340 to mean FL320 which led to initiating a descent to a wrong FL320, resulting in a level bust, yellow STCA indicating an initial conflict between aircraft UAE404 maintaining FL310 and ETD7AN descending through FL343 at a 3100 FPM to FL320, and subsequent loss of separation with aircraft ETD476 maintaining FL330 which led to activation of TCAS RA in both aircraft ETD7AN and ETD476 and followed by red STCA. The occurrence highlights the critical importance of precise and standardized radiotelephony phraseology to avoid ambiguity and ensure that both ATCO and flight crew share the same understanding of intentions and clearances in order to avoid flight crew operating at uncleared flight level. The ATCO did not achieve a positive control by clarifying and confirming the unclear readback of the cleared flight level from the flight crew of ETD7AN who was descending from FL360 to FL320 instead of CFL FL340.

2.2.5 Communications:

2.2.5.1 The Radar and Communication Radiotelephony were in normal and serviceable operation. Although radiotelephony communications were serviceable, during the audio playback the flight crew of ETD7AN readback was not heard clearly by the ATCO. From the audio playback OTSB investigation team could not confirm the readback by the FO of ETD7AN as it was not clear. The frequency was clear with other aircraft around the same vicinity with no reports of communications issues. Therefore, OTSB investigation team concluded that Radar and Communication Radiotelephony between ATCO and aircraft ETD7AN was not clear at the time the flight crew readback. This action was a factor to the serious incident.

2.2.6 Aids to navigation:

2.2.6.1 The navigational systems onboard both the aircraft was found to be serviceable and operated as required at the time of the serious incident. Therefore, OTSB investigation team concluded that the navigational aids were not a factor to the serious incident.

2.2.7 Aerodrome:

2.2.7.1 The serious incident occurred during cruise, therefore, OTSB investigation team concluded that the aerodrome analysis is not applicable to the serious incident.

2.3 Aircraft:

2.3.1 Both aircraft ETD7AN and aircraft ETD476 were issued with valid CoA and CoR. The maintenance records of both aircraft did not reveal any abnormality in the maintenance standard requirements. Both aircraft were certified and maintained in accordance with existing regulations and approved procedures. There were no pre-existing defects or conditions that contributed to the serious incident. The OTSB investigation team concluded that both aircraft maintenance and serviceability was not considered a factor to this serious incident.

2.4 Human Factors:

2.4.1 The serious incident of loss of separation involving aircraft ETD7AN and aircraft ETD476 was influenced by several human factors affecting both the flight crew of ETD7AN and the ATCO.

2.4.2 As for the flight crew of ETD7AN, the Captain who was the PF had to leave the cockpit requiring bathroom, therefore the FO was handed over the control of the aircraft and became both the PF and PM in compliance with the Operator Operation procedures. The FO interpreted the ATCO's CFL instruction to descend to FL340 as FL320. During audio playback, the ATCO's instruction was clear, however the readback from the FO was not clear and the ATCO did not confirm the unclear readback from the flight crew. The interpretation of the ATCO's instruction of the CFL was compounded by the FO divided attention being occupied with ATCO's communication, monitoring while performing the functions of the PF and PM including lack of cross-checking as the FO was the only flight crew member in the flight deck leading to possible distraction and degraded situational awareness. According to the following ATC transcript analysis and audio playback:

18:48:49 BRAVO ATCO: ETD7AN the instruction was to descend 340 not 320

18:48:55 ETD7AN: Yeah sir, we copied 340 and acknowledge 340,320 only

18:49:03 BRAVO ATCO: ETD7AN say again?

18:49:06 ETD7AN: I copied ahh...

18:49:09 BRAVO ATCO: you copied 340 but you descend 320 confirm?

18:49:12 ETD7AN: --un clear--, descend level 320

18:49:17 BRAVO ATCO: ETD7AN the transmission instruction was to descend 340

18:49:23 ETD7AN: 7AN copied ahh... descend to level 320 sir,320

The FO of aircraft ETD7AN was confident that ATCO's CFL was FL320, however after aircraft ETD7AN was clear of conflict, the response from the FO of aircraft ETD7AN to ATCO regarding the CFL instructions given indicated that the FO was not sure of the cleared flight level.

2.4.3 As for the ATCO's, the ATCO stated that the middle number was not clearly heard when the FO of ETD7AN readback the CFL at the time 18:46:18. ATCO heard 3 and 0 but not the number in the middle which didn't give the ATCO the full readback from the FO. The ATCO did not confirm the readback from the flight crew.

2.4.4 The CFL issued to aircraft ETD7AN was entered on Radar system by the ATCO at time 18:45:38, the unclear readback from FO of aircraft ETD7AN was at the time 18:46:18 and the Level Bust (LB) alert appeared on the radar at the time 18:47:18. The ATCO responded by contacting the flight crew of ETD7AN three times, at 18:47:27, to maintain FL340 and at 18:47:33, repeated the instruction to maintain FL340 and further instructed the aircraft ETD7AN to turn right 50°, but there was no response from flight crew of ETD7AN. Then at 18:47:43 ATCO repeated the call for flight crew of ETD7AN by stating "ETD7AN MCT" and the flight crew responded by stating "7AN go ahead". At 18:47:48: the ATCO stated "Maintain level 340, 340, turn right 50 degrees", but again there was no response from the flight crew of ETD7AN. At 18:47:51 yellow STCA window displayed with double conflicts between ETD7AN descending through FL332 at ROD1200FPM and ETD476 maintaining FL330, and between ETD7AN and UAE404 maintaining FL310. At 18:48:04 ATCO transmitted all station to standby in order to clarify the instruction given to the flight crew of ETD7AN.

2.4.5 OTSB investigation team concluded that factors resulted from human performance limitations as per the following:

For the ATCO not confirming the readback from the FO of ETD7AN and assuming that the readback was the correct cleared flight level. For the FO as the PM who was also PF of ETD7AN was experiencing task distraction due to the workload being as both PF and PM and possible distraction in the flight deck as a result of CD presence in the jump seat before and during the serious incident. These human factors could have collectively led the FO of ETD7AN to not copying the correct instructed flight level and hence executing the descent with a high rate of descent to FL320 instead of FL340 which resulted in the loss of separation between aircraft ETD7AN and aircraft ETD476 and triggered TCAS RA for both aircraft. There was limited time for both, the controller to stop the flight crew of ETD7AN from descending through FL340 and the flight crew to react to the ATCO instructions due to the high rate of descent.

2.5 Survivability:

2.5.1 The OTSB investigation team concluded that the serious incident was survivable due to the fact that both aircraft were installed with TCAS system, as such the TCAS system was triggered in both aircraft ETD7AN and aircraft ETD476 and appropriate response actions were taken by both aircraft flight crew which restored separation and cleared both aircraft out of conflict.

3. CONCLUSION

3.1 General

From the available evidence, the following findings, causes and contributing factors were made with respect to this serious incident. These shall not be read as apportioning blame or liability to any organization or individual.

To serve the objective of this investigation, the following sections are included in the conclusion heading:

- **Findings** — are statements of all significant conditions, events, or circumstances in this serious incident. The findings are significant steps in this serious incident sequence, but they are not always causal or indicate deficiencies.

3.2 Findings:

- 3.2.1 The flight crew of ETD7AN were properly licensed to conduct the flight. Their licenses were valid and issued by the UAE GCAA.
- 3.2.2 The flight crew of ETD476 were properly licensed to conduct the flight. Their licenses were valid and issued by the UAE GCAA.
- 3.2.3 The aircraft A6-EIM was properly registered and issued with CoA by GCAA-UAE and was valid at the time of the serious incident.
- 3.2.4 The aircraft A6-BLX was properly registered and issued with CoA by UAE GCAA and was valid at the time of the serious incident.
- 3.2.5 The ATCO was issued with ATC license to take ATS responsibilities by the Sultanate of Oman CAA and was valid at the time of the serious incident.
- 3.2.6 There was no evidence that incapacitation or physiological factors affected the flight crew of both aircraft and ATCO's performance.
- 3.2.7 Flight ETD7AN and flight ETD476 were operating under Instrument Flight Rules (IFR) in controlled airspace under the jurisdiction of Muscat Flight Information Region (MCT FIR).
- 3.2.8 When the descent clearance was received and executed by the FO, there was only one flight crew member present in the cockpit of aircraft ETD7AN, as the Captain had left for physiological needs.
- 3.2.9 The absence of the Captain of ETD7AN reduced the opportunity for cross-checking and verification of the ATC clearance before the descent was initiated to the wrongly copied flight level.
- 3.2.10 When the separation reduced below the prescribed minimum of 1000 FT which was 200FT, both aircraft's TCAS detected the conflict and issued RA. The flight crew of both ETD7AN and ETD476 responded and followed the TCAS RA as required per the operator's SOP, executing the appropriate vertical maneuvers.
- 3.2.11 The ATCO issued a descent clearance to the flight crew of ETD7AN to FL340 and the readback was not clear.
- 3.2.12 The ATCO did not achieve a positive control by clarifying and confirming the unclear readback of the cleared flight level from the flight crew of ETD7AN who was descending from FL360 to FL320 instead of CFL FL340.
- 3.2.13 Mode S display indicated that ETD7AN was descending to FL320 as per the aircraft Flight Management System (FMS).
- 3.1.14 When LB alert appeared, the ATCO responded by contacting the flight crew of ETD7AN three times, but there was no response.
- 3.2.15 The communications exchange between the ATCO and the FO of ETD7AN regarding the cleared flight level instructions given, showed uncertainty from the FO about the cleared flight level copied by the FO.

- 3.2.16 The ATCO believed that the readback from the flight crew of ETD7AN was FL340, however during the playback the FO readback was not clear.
- 3.2.17 The ATCO did not clarify and confirm the readback from the FO of ETD7AN. The ATCO only heard the first and last number (3 and 0) of the flight crew readback.
- 3.2.18 The ATCO instructed the flight crew of ETD7AN to stop the descent at FL340. At this time aircraft ETD7AN was already below FL340 due to the high rate of decent.
- 3.2.19 The Supervisor ATCO checked with ATCO if was able to continue ATCO's tasks and the ATCO confirmed.
- 3.2.20 The FO of ETD7AN initially stated that there were no issues with the radio frequencies and transmission, but later the FO confirmed that there was some background noise.
- 3.2.21 The FO of ETD7AN interpreted the assigned flight level FL340 and initiated a descent from FL360 to FL320.
- 3.2.22 The readback process/procedures between the ATCO and the FO of ETD7AN who was at the same time PM and PF did not effectively detect the incorrect flight level cleared.
- 3.2.23 Possible radio communication interference may have made ATCO's instructions issued to the flight crew of ETD7AN unclear which resulted in wrong flight level interpretation.
- 3.2.24 Both flight crew of aircraft ETD7AN and aircraft ETD476 complied with the TCAS RA instructions, resulting in the restoration of safe separation which prevented the potential midair collision.
- 3.2.25 No injuries to passengers or crews and no damage to either aircraft.

3.3 Cause:

- 3.3.1 The FO of ETD7AN interpreted the ATCO's CFL instruction of FL340 as FL320 and descended to FL320, combined with an unclear readback that was not challenged by the ATCO, allowing the aircraft to descend below its cleared level while there was a conflicting opposite direction aircraft ETD476 maintaining FL330 resulting in a loss of separation and activation TCAS RA.

3.4 Contributing Factors:

- 3.4.1 The high rate of descent which reached a maximum of 3400FPM.
- 3.4.2 Workload and lack of cross-check may have contributed due to the PM being alone in the cockpit.
- 3.4.3 Possible distraction by the CD presence in the flight deck before and during the serious incident while it was occupied by a single flight crew member of aircraft ETD7AN.
- 3.4.4 The Radar and Communication Radiotelephony was not clear when the FO of aircraft ETD7AN readback ATCO's instruction for CFL.

4. SAFETY RECOMMENDATIONS:

4.1 General

The safety recommendations listed in this report are proposed according to paragraph 6.8 of Annex 13 to the Convention on International Civil Aviation and are based on the conclusions listed in heading 3 of this report. The OTSB expects that all safety issues identified by the investigation are addressed to the receiving States and organizations/entities.

4.2 Safety Recommendations

4.2.1 Operator Etihad Airways:

- 4.2.1.1 The Operator has taken the following safety actions post the serious incident:
- 4.2.1.2 The FO of ETD7AN referred to training for enhancement in TCAS RA manoeuvre competency.
- 4.2.1.3 Flight Ops issued a Company NOTAM advising pilots of radio congestion and inherent risks over Muscat FIR.
- 4.2.1.4 Flight Safety Message (FSM 09/2025) for airspace congestion and flight crew countermeasures was revised.
- 4.2.1.5 The topic of Airspace risks and RT Discipline was raised in Flight Safety Insights (FSI Feb'26 issue).

4.2.2 Directorate General Air Navigations (DGAN) – Civil Aviation Authority (CAA):

- 4.2.2.1 As per MUSCAT ACC MATSOP: RADIO COMMUNICATION PROCEDURES & CONTINGENCIES, Chapter 5, para 2.2.1 The ACC controllers shall:
 - a. listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back;
 - c. If readback is incorrect or incomplete, make corrections as appropriate.
- 4.2.3 The ATCO did not confirm the readback from the flight crew of ETD7AN, DGAN has taken the following safety actions:
 - 4.2.3.1 The ATCO was counselled and advised to remain vigilant when receiving readbacks, particularly those involving climb or descent clearances.
 - 4.2.3.2 The ATCO was further reminded to verify all readbacks whenever they are unclear or when any ambiguity or frequency distortion is observed.
 - 4.2.3.3 This occurrence has been shared with the training team to be included as an awareness case study and lesson learned during all upcoming refresher sessions.

5. APPENDICES:

- 5.1 None.

This report is issued by:

Acting Director of Oman Transport Safety Bureau (A/DOTSB)