



GCAA

دولة الامارات العربية المتحدة
الهيئة العامة للطيران المدني
UAE General Civil Aviation Authority

AAIS Case Reference: 08/2012

AIR ACCIDENT INVESTIGATION SECTOR

UPDATED PRELIMINARY

SERIOUS INCIDENT INVESTIGATION REPORT

TCAS RA – AIRPROX (Loss of Separation)

5nm west of Dubai International Airport
United Arab Emirates
22nd April 2012

**General Civil Aviation Authority
of
United Arab Emirates**



SERIOUS INCIDENT

NAME OF THE OPERATOR : 1. Air Arabia
 2. Fly Dubai

MANUFACTURER : 1. Airbus
 2. Boeing

AIRCRAFT MODEL : 1. A320-214
 2. B737-800

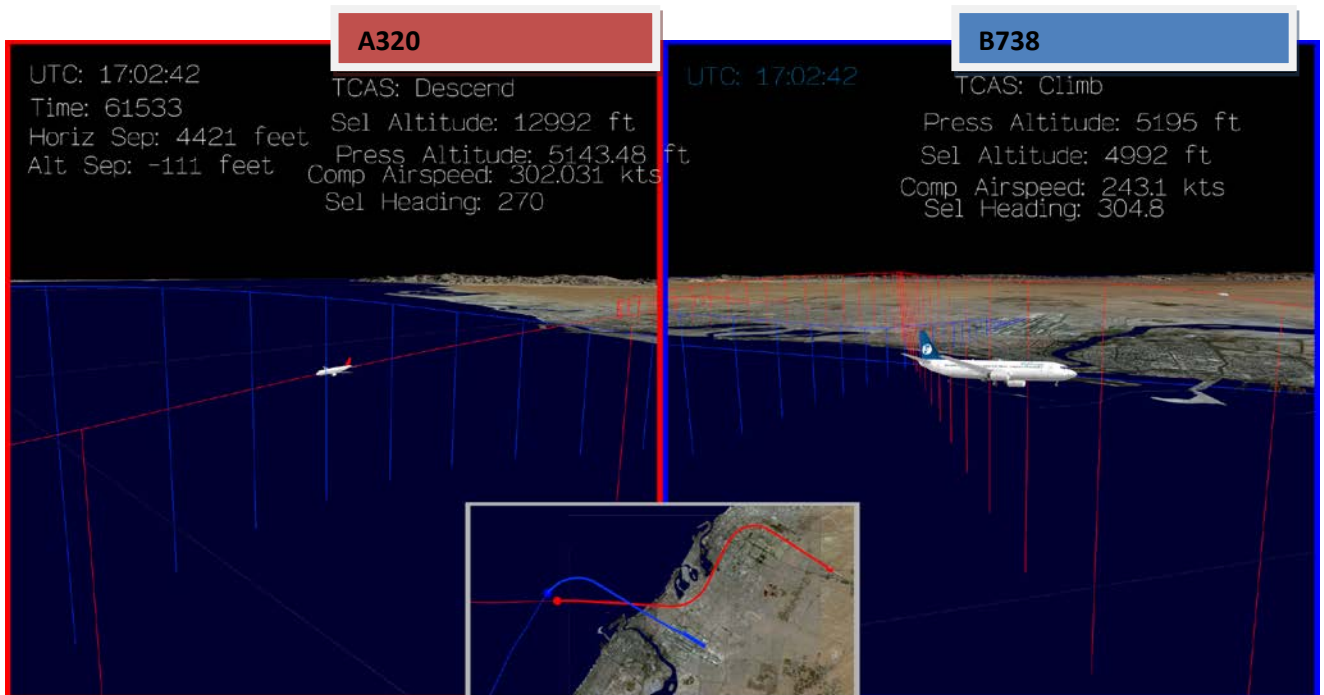
STATE OF REGISTRY : UAE

REGISTRATION : 1. A6-ABS
 2. A6-FDK

STATE OF OCCURANCE : UAE

LOCATION : 5nm west of Dubai International airport

DATE & TIME : 22nd April 2012, 21:02:41 LT



Notes:

1. All times in the report are Local Time (Local time "LT" in UAE was UTC+ 4h)
2. The word "Aircraft" in this report implies the aircraft involved in the serious incident
3. The word "Team" in this report implies the Investigation Team

OBJECTIVE

This investigation is performed in accordance with the UAE Federal Act No 20 (1991), promulgating the Civil Aviation Law, Chapter VII, Aircraft Accidents, Article 48, CAR Part III Chapter 3 and in conformity with Annex 13 to the Convention on International Civil Aviation.

The object of this safety investigation is to prevent aircraft accidents and incidents by identifying and reducing safety-related risk. The GCAA AAIS investigations determine and communicate the safety factors related to the transport safety matter being investigated.

Reports are publicly available from:

<http://www.gcaa.gov.ae/en/epublication/pages/investigationreport.aspx>

It is not a function of the GCAA AAIS to apportion blame or determine liability.

The information contained in this preliminary report is derived from the factual information gathered during the ongoing investigation of the occurrence. Later interim reports or the final report may contain altered information in the case that new evidence appears during the ongoing investigation that requires changes to the information depicted in this report.

Any specific safety issues identified during the course of the investigation will be advised to all parties through the GCAA Safety Recommendations (SR) procedure.

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ABBREVIATIONS

A	Aeroplane
AAIS	UAE GCAA Air Accident Investigation Sector
ACAS	Airborne Collision Avoidance System
ACC	Area Control Center
AFM	Aircraft Flight Manual
AIRPROX	Aircraft Proximity
AMM	Aircraft Maintenance Manual
AMO	Approved Maintenance Organization
AMS	Approved Maintenance Schedule
amsl	above mean sea level
ANS	Air Navigation Service
ANSP	Air Navigation Service Provider
ATC	Air Traffic Control
ATCO	Air Traffic Controller
ATPL	Air Transport Pilot License
AVSA	Adjust vertical speed adjust
B737-800	B738
CAAP	Civil Aviation Advisory Publication
CAR	UAE Civil Aviation Regulation
CAR-OPS	UAE Civil Aviation Regulation – Flight Operation
CAT	Category
CAVOK	Cloud and Visibility OK
CG	Centre of Gravity
C of A	Certificate of Airworthiness
COM	Communication



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CRM	Crew Resource Management
CVR	Cockpit Voice Recorder
Cm	centimetre
CMR	Certificate of Maintenance Review
CPL	Commercial Pilot License
DAR	Digital Aids Recorder
DFDR	Digital Flight Data Recorder
DI	GCAA's Duty Investigator
DXB DEP	Dubai ATC Departure
EICAS	Engine Indicating and Crew Alerting System
ELP	English Language Proficiency
FAA	Federal Aviation Administration
FDIMU	Flight Data Interface Management Unit
FDR	Flight Data Recorder
GCAA	United Arab Emirates General Civil Aviation Authority
GMR	Ground Movement Radar
hrs	hours
ICAO	International Civil Aviation Organization
IIC	Investigator In Charge
ILS	Instrument Landing System
JAA	Joint Aviation Authorities
kg	kilogram
KIAS	Knots Indicated Air Speed
Km	kilometers
LDA	Landing Distance Available
Ldg	Landing
LH	Left Hand



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LT	Local Time
m	metres
mb	millibars
MHz	Mega Hertz
MSI	Major Structural Inspection
MSN	Manufacturer Serial Number
No.	Number
OK	all correct
OMDB	Dubai International Airport
OMDW	Al Maktoum International Airport
OMSJ	Sharjah International Airport
QNH	barometric pressure adjusted to sea level
RH	Right Hand
SN	Serial Number
SOP	Standard Operating Procedures
STCA	Short Term Conflict Alert
TCAS	Traffic Collision Avoidance System
TCAS RA	Traffic Collision Avoidance System Resolution Advisory
TO	Take Off
TSO	Time Since Overhaul
TSN	Time Since New
UAE	United Arab Emirates
USA	United States of America
UTC	Co-ordinated Universal Time
VHF	Very High Frequency
VOR	Very High Frequency Omnidirectional Range (Navigation System)

SYNOPSIS

On 22nd April 2012, 5nm west of Dubai Airport, two aircraft registered and operated by UAE based airlines, and which were under the control of Dubai Departure ATC, responded to the onboard TCAS system of a TCAS RA alert and took evasive maneuvering action. Both airline crews responded as required and avoided any mishap and thereafter continued the journey to their intended destinations, without further incident.

There were no reports of injury or damage to aircraft or crew and passengers.

The GCAA's DI was informed by Dubai ATC on the same day of the event, 22nd of April 2012(at 21:15LT). Thereafter GCAA AAIS formed and dispatched an Investigation Team (Team), which commenced the investigation. The following day the States of the Manufacturers (France & USA), were notified and assigned Accredited Representatives to the investigation. In addition ICAO was notified. The UAE GCAA will lead the investigation and will issue the final report.

1 FACTUAL INFORMATION

1.1 History of the Flight

On 22nd April 2012, at 21:02:41L, two aircraft on schedule flights had to take evasive maneuvering action to avoid a mishap.

The two aircraft involved in the AIRPROX, which occurred 5nm west of Dubai International Airport (OMDB), were an Airbus A320 that departed at 20:58L from Sharjah International airport (OMSJ) en route to Istanbul, Turkey (LTBA) and a Boeing B737-800 (B738) that departed at 21:00L from Dubai International Airport (OMDB) en route to Doha, Qatar (OTBD).

The crew of the A320 contacted Dubai Departures Air Traffic Control after departing from Sharjah airport runway 30 and was instructed to continue straight ahead while cleared to climb to 5000ft. After this, DXB DEP issued a series of instructions, including a turn left onto a heading of 210 degrees for sequencing, subsequently requesting a good rate of climb up to 5000 ft. Some 30 seconds later, the crew is instructed to maintain maximum speed of 250 kts and to track direct to RANBI. The time at this point was 21:00:30L.

Shortly thereafter, a handover between controllers was conducted at Dubai ATC Departures, which meant that another person was communicating with the aircraft on the radio for the traffic instructions.

At 21:01:06L, the crew of the B738 contacted DXB DEP after departing from Dubai airport runway 30R and was instructed to climb to altitude of 5000 ft.

At 21:01:31L, the A320 crew was then instructed to increase speed to 300 kts and shortly thereafter, the B738 crew was given by the DXB DEP a left turn onto heading of 210 degrees with a comment from the controller "delaying action through the RANBI gate." DXB DEP also restricted the B738 to a maximum speed of 250 knots.

At 21.01.54 DXB DEP initiated a telephone call to the UAE ACC Controller for operational coordination of another, non- related, aircraft. During this call the ACC controller highlighted to DXB DEP that separation was about to be lost between the A320 and the B738.

DXB DEP immediately issued avoiding action to the crew of the A320 with an instruction to turn onto a heading of 270 degrees and further issued information advisory on the conflicting traffic and instructed the A320 crew to climb to 13000ft.

Shortly after at 21:02:33, the B738 crew was told to turn right onto a heading of 280 degrees. The crew on the B738 read back the right turn instruction and then interrupted their transmission to inform DXB DEP that they had a TCAS RA (Resolution Advisory) warning and informed DXB DEP that they were climbing as commanded by the aircraft TCAS system. Traffic information was then relayed to the B738 crew from DXB DEP.

17 seconds after this, the crew on the A320 also informed DXB DEP that they had a TCAS RA warning and were descending as instructed by the aircraft TCAS system. This was acknowledged by DXB DEP.

At 17.03.14 the crew on A320 advised DXB DEP they were returning to their original assigned altitude of 13000ft and heading of 270. Four (4) seconds later DXB DEP advised the crew of the B738 that they were clear

of traffic and to climb to 13000 ft and are to remain on their current heading of 210 which was reconfirmed by the B738 crew.

Shortly after the occurrence, the DXB DEP Controller manning the position during the event handed over control to another controller.

During the maneuvering instructions passed to both aircraft, the minimum vertical and lateral separation was not maintained and this started to occur at approximately 21:01:45. The situation was identified by DXB DEP. In addition from the DFDR data of both aircraft it was indicated that the aircraft TCAS systems alerted first the B738 crew at 21:02:41 to climb and at 21:02:50 the A320 crew were also alerted by its TCAS system to descend.

Both aircraft continued their journeys to their intended destinations without any further incidents. However, both crews did inform DXB DEP that they will file a TCAS RA incident report.

1.1.1 Radar Snapshots of the AIRPROX

Note : The range scale varies between snapshots. These snapshots are taken from the GMR recording and do not accurately represent exactly what the controller saw at the time of the incident.



FIG 1.

Figure showing when the incoming DXB DEP identifies the B738 aircraft and instructs the crew to climb to altitude 5000 feet. The A320 is currently at 5000 feet.

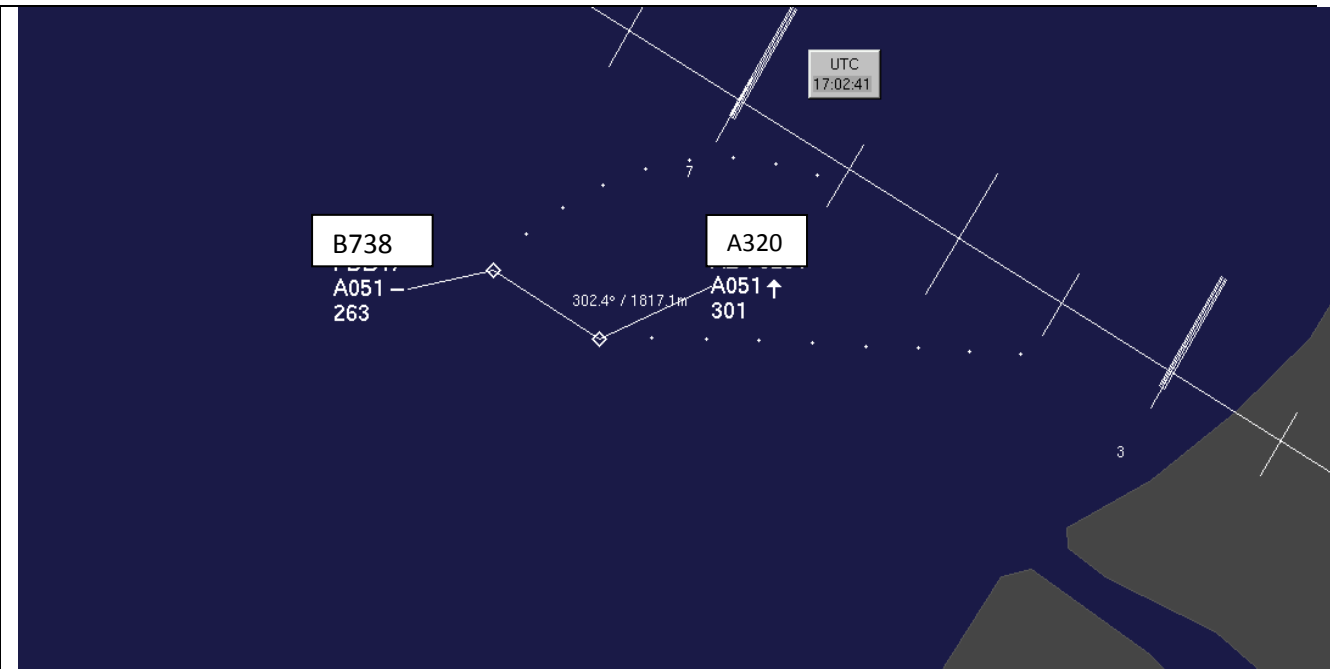
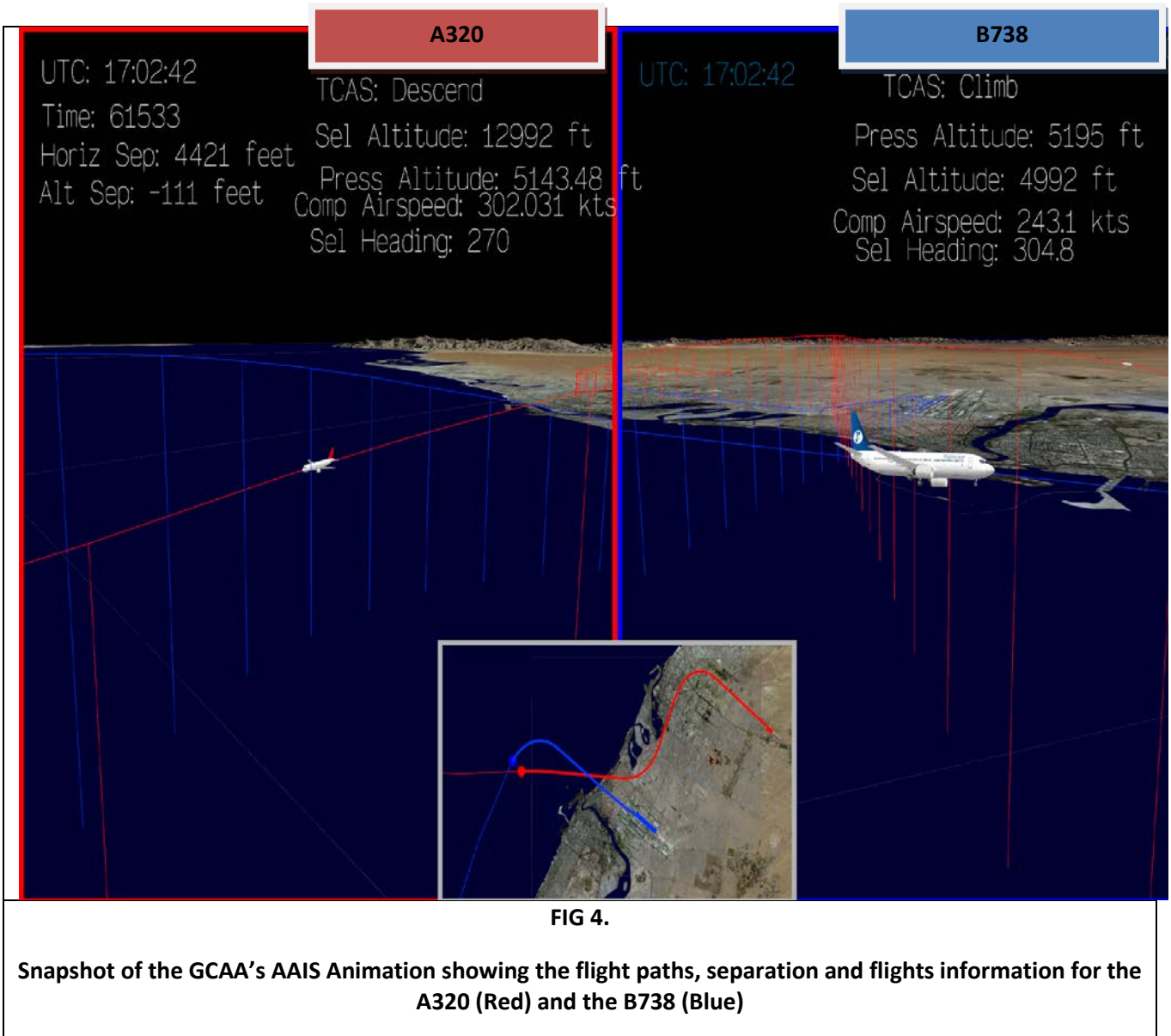


FIG 2.
 The crew on the B738 reported to DXB DEP of a TCAS RA Climb command. The A320 TCAS commands them to Descend.



FIG 3.
 The A320 passes behind the B738. Vertical displacement = 700ft, lateral displacement = 2614ft.

1.1.2 GCAA AAIS Animation snapshot of the AIRPROX (does not show the minimum separation)



1.2 Injuries to Persons

The crew/passenger head count for each Aircraft:

1st Aircraft - A320: Crew 6 and Passengers 147. Total of 153

2nd Aircraft- B738: Crew 6 and Passengers 94. Total of 100

Injuries	Flight Crew	Cabin Crew	Passengers	Other	Total
Fatal	-	-	-	-	-
Serious	-	-	-	-	-
Minor	-	-	-	-	-
None	4	8	241	Nil	253
Total	4	8	241	Nil	253

1.3 Damage to Aircraft

Both aircraft did not sustain any damage.

1.4 Other Damage

There was no damage sustained by other objects and there was no damage to the environment.

1.5 Personnel Information

1.5.1 The Crew information for the 1st Aircraft on the A320

Captain:

Date of birth	13/09/1964
GCAA License No.	ATPL 34686
Class & Validity of medical	Class 1 31/12/2012
Flying Experience	
Total all flying hours	17300
Total flying hours on A320	6400
Total last 28 days	60.77
Total last 24 hours	8.72
Line & Proficiency check	Line Check valid till 31/01/2013 Proficiency Check valid till 30/06/2012
English Language Proficiency	Level 6

The First Officer (Cadet Pilot):

Date of birth	24/04/1986
GCAA License No.	MPL 26366
Class & Validity of medical	Class 1. Valid till 31/12/2012
Flying experience	
Total all flying hours	279.63
Total flying hours on A320	279.63
Total last 28 days	87.62

Total last 24 hours	8.7
Line & Proficiency check	Proficiency Check valid till 30/06/2012
English Language Proficiency	Level 6

1.5.2 The Crew information for the 2nd Aircraft on the B738

Captain:

Date of birth	20 th February 1958
UAE GCAA License#	GCAA ATPL 33481
Class and validity of medical	Class 1. Valid till 28 th February 2013
Flying experience	
Total all types	12,600
Total Command on all types	1,800
Total on type	7,100
Total last 30 days	64:55
Total last 24 hours	04:30
Line and proficiency check	Line Check: 17 th April 2011 Proficiency Check: 13 th March 2012
English language proficiency	Level 6

The First Officer (Cadet Pilot):

Date of birth	26 th May 1987
UAE GCAA License#	GCAA CPL 44200
Class and validity of medical	Class 1. Valid till 12 th July 2012

Flying experience	
Total all types	412:47
Total Command on all types	70
Total on type	186:47
Total last 30 days	41:58
Total last 24 hours	04:30
Line and proficiency check	Line Check: 07 th April 2012 Proficiency Check: 15 th October 2011
English language proficiency	Level 4

1.5.3 The Dubai Departures Air Traffic Controller

The DXB ATC controller was an experienced individual, with the necessary licences and training to perform the function of departures controller.

On the day of the incident, it was his third day for duty, but first afternoon shift of a DDAANN (D- Day, A- Afternoon, N- Night) cycle. His first two day shifts were normal and on his first afternoon shift, he reported half an hour earlier due to a briefing required for a DART (Dubai Approach Relocation and Transition) rehearsal between Dubai Airport (OMDB) and Al Maktoum Airport (OMDW).

The morning of the afternoon shift was unusually busy for the controller but he was able to arrive on time for the DART briefing. Due to the morning activities, his rest cycle was not the norm, however, he felt that he could have performed his duties normally.

The rehearsal for the DART was in place on the same day of the serious incident which required handover of some ATC functions and staffing from Dubai ATC to Al Maktoum Airport. The seating plan for the controllers at Dubai Airport was arranged based on the staffing level for the DART rehearsal

At 2100L he was moved from the Planner position to the Departure position to start the staff rotation on to new positions. There was a verbal handover between him and the outgoing controller and mentioned was made of the A320 flight. His departure from the Planner position would have also required a handover to the oncoming Planner which was not occupied at the time he took over the Departures position.

The AIRPROX event took place approximately 3 minutes after he assumed duty at the Departures position.

1.6 Aircraft Information

1.6.1 Aircraft General Information – 1st Aircraft A320

The Airbus A320 is narrow-body aircraft with a retractable tricycle landing gear and are powered by two wing pylon-mounted turbofan engines . This low-wing cantilever monoplane has a conventional tail unit with a single vertical stabilizer and rudder. Wing swept back at 25 degrees, optimized for maximum operating Mach number 0.82. The A320 features a single-aisle cabin of 155.5 inches (3.95 m) outside diameter. In addition, the aircraft has a cargo hold equipped with large doors to assist in expedient loading and unloading of goods.

Aircraft Type:	A320-214
Aircraft Manufacturer:	AIRBUS INDUSTRIE
Aircraft MSN:	4061
Max TO/Ldg Mass:	77000 / 66000
Date of the last C of A:	8 th October 2012
Last C of A expiry date:	7 th October 2012
C of A category:	Passenger
Aircraft Station License:	TBA
Insurance Validity Period:	16 th November 2012
Last CMR date:	TBA
Next Due CMR	TBA
TCAS System Details	TCAS II Software Version 7 Mode S: 896298
Manufacturer	ROCKWELL INTL CORP COLLINS AVIONICS AND COMMUNICATIONS DIV
P/N	822-1293-322
S/N	168700

1.6.2 Aircraft General Information- 2nd Aircraft B738

The Boeing 737 Next Generation, commonly abbreviated as Boeing 737NG, of which over 4000 aircraft has been built, is the name given to the -600/-700/-800/-900 series of the Boeing 737 and was first produced in 1996. They are two man cockpit crew, short- to medium-range narrow-body jet airliners with a retractable tricycle landing gear and a single aisle cabin with a seating capacity on the -800 aircraft from 162 typical two class to 189 dense single class configuration.

The B738 has a fuselage length of 129 ft 6 in (39.5 m), wing span 117 ft 5 in (35.7 m) with a 25.02° (437 mrad) sweepback angle, cruising speed of 0.785 MACH, maximum speed of 0.82 MACH and powered by two wing mounted CFM 56-7B27 producing max thrust of 27,300 lbf (121.4 kN).

Aircraft Type:	B737-8KN
Aircraft Manufacturer:	BOEING COMPANY, SEATTLE, USA
Aircraft MSN:	40238
Max TO/Ldg Mass:	79,015 kg/ 66,361 kg
Date of the last C of A:	5 TH November 2011
Last C of A expiry date:	4 th November 2012
C of A category:	Passenger
Aircraft Station License:	00569/11
Insurance Validity Period:	16 th November 2012
TSN:	6093.06
Last CMR date:	6 th February 2012
Next Due CMR	5 th June 2012
TCAS System Details	TCAS II Software Version 7 Mode S: 8962B6
Manufacturer	Honeywell TCAS
P/N	940-0300-001
S/N	TBA

1.6.3 Aircraft ACAS II Installed

The ACAS II version 7.0 fitted to both aircraft had the required TCAS II computer, antenna, Mode S Transponder which gives both Traffic avoidance, TA, as well as Resolution Advisory, RA, alerts. Both aircraft systems were functional and serviceable and operated as per design. The TCAS RA alert required the A320 aircraft to descend and the B738 aircraft to climb, and the pilots of both aircraft responded correctly to the TCAS RA commands till they were both clear of conflict.

1.7 Meteorological Information

1.7.1 The weather report at Sharjah International Airport before and after the departure of the A320 from OSMJ was as follows:

OMSJ, Sharjah International Airport (United Arab Emirates).
WMO index: 41196. Latitude 25-20N. Longitude 055-31E. Altitude 35 m.

METAR/SPECI from OMSJ, Sharjah International Airport (United Arab Emirates).

SA 22/04/2012 18:00-> METAR OMSJ 221800Z 19005KT 160V240 7000 NSC 26/18 Q1007=

SA 22/04/2012 17:00-> METAR OMSJ 221700Z 26005KT 220V280 5000 DU NSC 26/17 Q1007=

SA 22/04/2012 16:00-> METAR OMSJ 221600Z 25008KT 5000 DU NSC 26/18 Q1007=

SA 22/04/2012 15:00-> METAR OMSJ 221500Z 26010KT 4000 DU NSC 27/18 Q1007=

TAF from OMSJ, Sharjah International Airport (United Arab Emirates).

FT	22/04/2012 15:57->	TAF OMSJ 221557Z 2218/2324 22005KT 6000 NSC PROB30 2218/2305 4000 DU BECMG 2306/2308 27014KT BECMG 2316/2318 18005KT=
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1.7.2 The weather report at Dubai International Airport before and after the departure of the B738 from OMDB was as follows:

OMDB, Dubai International Airport (United Arab Emirates).
WMO index: 41194. Latitude 25-15N. Longitude 055-20E. Altitude 8 m.

METAR/SPECI from OMDB, Dubai International Airport (United Arab Emirates).

SA 22/04/2012 18:00->	METAR OMDB 221800Z 23006KT 190V270 8000 NSC 26/18 Q1008 NOSIG=
SA 22/04/2012 17:00->	METAR OMDB 221700Z 22004KT 170V250 8000 NSC 26/18 Q1007 NOSIG=
SA 22/04/2012 16:00->	METAR OMDB 221600Z 26006KT 200V280 8000 NSC 26/18 Q1007 NOSIG=
SA 22/04/2012 15:00->	METAR OMDB 221500Z 27010KT 5000 DU NSC 26/18 Q1007 NOSIG=

TAF from OMDB, Dubai International Airport (United Arab Emirates).

FT 22/04/2012 19:57->	TAF OMDB 221557Z 2218/2324 27010KT 7000 NSC BECMG 2218/2220 21005KT PROB30 2218/2305 4000 DU BECMG 2306/2308 27014KT BECMG 2316/2318 18005KT=
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1.8 Aids to Navigation

Both aircraft were under the control of Dubai Departure Air Traffic Control.

1.9 Communications

The ATC recordings and radar files were made available to the Team. In addition, throughout the following communications between Dubai ATC Departure, DXB DEP, and both aircraft, there was clear instructions from ATC and read back by both flight crews was always clear and correct.

1.10 Aerodrome Information

Sharjah International Airport has a single runway 12/30 and the departure of the A320 was on runway 30.

Dubai International Airport has two parallel runways 12L/30R and 12R/30L and the departure of the B738 was on runway 30R.

1.11 Flight Recorders

The Flight Data Recorders (FDR) of both airlines were removed at the request of the GCAA and sent to the General Civil Aviation Authority Air Accident Investigation Laboratory, Abu Dhabi, in order to download the data for the investigation purpose.

Data from both SSFDRs were successfully downloaded and will be reviewed for the purpose of this serious incident.

Below are the details of the FDRs from each Aircraft:

1st Aircraft – A320:

DFDR PN: 980-4700-042, S/N: SSFDR - 17419, Manufacture: Honeywell

CVR PN: 980-6022-001, S/N: CVR 120-13136, , Manufacture: Honeywell (Data not downloaded as it was not required for the investigation)

2nd Aircraft – B738:

DFDR PN: 980-4700-042, S/N: SSFDR - 18331, Manufacture: Honeywell

All units were returned to the Airlines after downloading.

1.12 Wreckage and Impact Information

Not applicable to this investigation.

1.13 Medical and Pathological Information

Not Applicable to this investigation.

1.14 Fire

No fire involved in this occurrence.

1.15 Survival Aspects

There was no requirement as no injuries were reported.

1.16 Tests and Research

Not applicable at this stage of the investigation

1.17 Organizational and Management Information

1.17.1 Airline 1 information

The Sharjah based Airline, with headquarters at Sharjah International Airport, UAE, operates a fleet of all A320s and all powered by CFM-56 turbofan engines. The airline was established on 03rd February 2003 by the Ruler of Sharjah, becoming the first low-fare airline in the region. Operations started later in the same year and on 28th October 2003, the airline made its first flight from Sharjah to Bahrain International Airport.

There are currently scheduled services to 46 destinations in the Middle East, North Africa, the Indian subcontinent, Central Asia and Europe to 22 countries from Sharjah, and through a joint venture also operates to 11 destinations in 10 countries from Casablanca and 5 destinations in 5 countries from Alexandria.

1.17.2 Airline 2 Information

The Dubai based low cost Airline, with headquarters at Terminal 2, Dubai International Airport, UAE, operates a fleet of all B737NGs and are powered by CFM56-7 engines. The airline was established in July 2008 by the Government of Dubai and the first flight was on 01st June 2009 with flights from Dubai Airport to Beirut, Lebanon and Amman, Jordan. Since then, the route network has been significantly expanded.

1.17.3 Dubai Air Navigation Service – Air Traffic Control Approach Unit

Dubai ATC is responsible for Dubai International Airport as well as Al Maktoum International Airport, Jebel Ali, OMDW. In addition, Dubai Approach also provides services to aircraft approaching Dubai until handed over to Tower as well as taking over from Sharjah Tower for aircraft departing from Sharjah Airport.

Controllers are rostered based on a shift system and a seating plan is done which requires the controllers to occupy different positions during their shift duty.

DXB ATC utilizes Flight Refueling Radar system to track aircraft position but this system does not provide Short Term Conflict alert, STCA, to the ATC controller. The STCA alert was highlighted to the DXB DEP ATC from UAE ACC controller which does employ the use of STCA.

It was found during various audits (from 2005 to 2011) that the Flight Refueling Radar display did not provide Short Term Conflict Alert (STCA) and Minimum Safe Altitude Warnings (MSAW) as required in ICAO DOC 4444 PANS-ATM 8.14 and GCAA CAR Part VIII Subpart 4, paragraph 4.34.(c) .4. On original purchase of the equipment, it was expected that the system would provide the warning requirements. Since the original dates of the findings, the simulation testing of the STCA (trials done in the ATC Simulator in 2008) showed there was an unacceptable level of nuisance and false alerts. The STCA parameters could not be configured with the Flight Refueling Radar (FRL) current software to reduce this to a level that would be acceptable for the operational environment. FRL did not progress the algorithms they use for this and so it was therefore not possible to implement the warnings on to the FRL system in a safe manner. The GCAA Authority were requested and agreed to several extensions to the audit finding completion dates.

Introduction of the Raytheon Auto Track 3 system and a more advanced STCA capability was and is the proposed solution and as per Dubai ANS is planned to be operational by October 2012 (TBA).

1.18 Additional Information¹

1.18.1 AIRPROX

Description

An AIRPROX is a situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. (ICAO Doc 4444: PANS-ATM).

ICAO defines a series of classifications for AIRPROX events which have been reported and subsequently investigated by an appropriate body. It is required that this classification should be assigned on the basis only of actual risk, not potential risk. This means that only the residual risk after any avoiding action is considered.

The available classification categories are:

A - Risk of collision. The risk classification of an aircraft proximity in which serious risk of collision has existed. An AIRPROX Classification A may or may not be deemed to be a Serious Incident as defined by ICAO Annex 13.

B - Safety not assured. The risk classification of an aircraft proximity in which the safety of the aircraft may have been compromised.

C - No risk of collision. The risk classification of an aircraft proximity in which no risk of collision has existed.

D - Risk not determined. The risk classification of an aircraft proximity in which insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination.

The definition and classification of an AIRPROX given above was agreed prior to the introduction of ground radar and airborne systems (ACAS) capable of measuring accurately the actual separation of the aircraft involved.

An AIRPROX may occur as a result of a Level Bust or Airspace Infringement. Safety nets such as ACAS and STCA mitigate the resultant risk of collision.

An AIRPROX is commonly referred to as a Near Midair Collision (NMAC) in the USA; however, they are not precisely the same as a comparison of their definitions demonstrates. Whereas an NMAC is always an AIRPROX, an AIRPROX is not necessarily an NMAC.

¹ Information taken from EUROCONTROL website on Airborne collision avoidance system.
http://www.eurocontrol.int/msa/public/standard_page/ACAS_Overview_Principles.html#international

Reporting and Investigation of an AIRPROX

ICAO requires the establishment of AIRPROX reporting and investigation procedures and these are specified in national procedures.

Typically, national authorities establish a special committee to investigate an AIRPROX report which allocates the actual risk classification and to recommend further action. Some States use their Annex 13 Accident Investigation Agency to also investigate all AIRPROX, not just those which are considered to be a Serious Incident.

An AIRPROX should be reported as soon as possible to facilitate investigation of the incident. If circumstances allow, the pilot should report the incident immediately to ATC using RTF, the details will then be reported by ATC to the appropriate body. If it is not possible to report an AIRPROX in flight (e.g. because the frequency in use is too busy) the pilot should report the incident as soon as possible after landing. ATS units to whom AIRPROX incidents are reported should also report the circumstances of which they are aware to the appropriate body. In all cases, initial verbal reports should be followed up by full written reports using any prescribed form which may be in use for that purpose.

Depending on circumstances, an AIRPROX may qualify as a Serious Incident which will then require that it be reported to and investigated by the National Accident Investigation Agency, GCAA, under the terms of ICAO Annex 13, Chapters 4 and 5. Non-Annex 13 AIRPROX investigations are essentially a special case of State Mandatory Occurrence Reporting and follow up by or in association with the applicable Regulatory Authority under the terms of ICAO Annex 13 Chapter 8, whereas an Annex 13 Investigation is independent of Regulatory influence.

1.18.2 Airborne Collision Avoidance System (ACAS)

1.18.2.1 General Description

The Airborne Collision Avoidance System II (ACAS II) was introduced in order to reduce the risk of mid-air collisions or near mid-air collisions between aircraft. It serves as a last-resort safety net irrespective of any separation standards.

ACAS II is an aircraft system based on Secondary Surveillance Radar (SSR) transponder signals. ACAS II interrogates the Mode C and Mode S transponders of nearby aircraft ('intruders') and from the replies tracks their altitude and range and issues alerts to the pilots, as appropriate. Non-transponding aircraft are not detected.

ACAS II works independently of the aircraft navigation, flight management systems, and Air Traffic Control (ATC) ground systems. While assessing threats it does not take into account the ATC clearance, pilot's intentions or autopilot inputs.

Currently, the only commercially available implementations of ICAO standard for ACAS II (Airborne Collision Avoidance System) are TCAS II versions 7.0 and version 7.1 (Traffic alert and Collision Avoidance System). ICAO Annex 10 states that ACAS installation for new aircraft after 1 January 2014 must be version 7.1 compliant and existing aircraft must be upgraded to version 7.1 before 1 January 2017.

A typical schematic diagram of ACAS II aircraft equipment is shown in FIG 5.

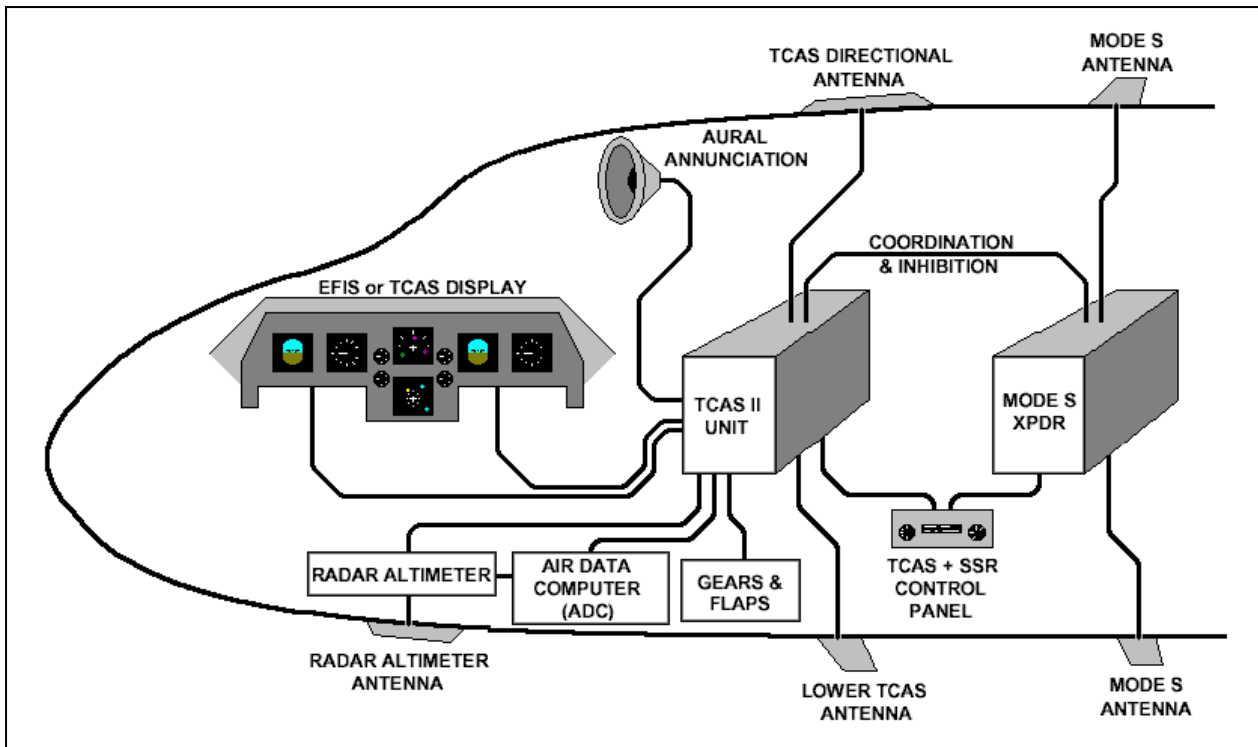


FIG 5

Typical Equipment Schematic Diagram for ACAS II

1.18.2.2 Information Provided by ACAS

Two types of alerts can be issued by ACAS II - TA (Traffic Advisory) and RA (Resolution Advisory). The former is intended to assist the pilot in the visual acquisition of the conflicting aircraft and prepare the pilot for a potential RA.

If a risk of collision is established by ACAS II, an RA will be generated. Broadly speaking, RAs tell the pilot the range of vertical speed at which the aircraft should be flown to avoid the threat aircraft. The visual indication of these rates is shown on the flight instruments. It is accompanied by an audible message indicating the intention of the RA. A "Clear of Conflict" message will be generated when the aircraft diverge horizontally.

The vertical sense (direction) of the RA is coordinated with other ACAS II equipped aircraft via a mode S link, so that two aircraft choose complementary manoeuvres. RAs aim for collision avoidance by establishing a safe vertical separation (300 - 700 feet), rather than restoring a prescribed ATC separation.

ACAS II operates on relatively short time scales. The maximum generation time for a TA is 48 seconds before the Closest Point of Approach (CPA). For an RA the time is 35 seconds. The time scales are shorter at lower altitudes (where aircraft typically fly slower). Unexpected or rapid aircraft manoeuvre may cause an RA to be generated with much less lead time. It is possible that an RA will not be preceded by a TA if a threat is imminent. The effectiveness of an RA is evaluated by the ACAS equipment every second and, if necessary, the RA may be strengthened, weakened, reversed, or terminated.

RAs can be generated before ATC separation minima are violated and even when ATC separation minima will not be violated.

A protected volume of airspace surrounds each ACAS II equipped aircraft. The size of the protected volume depends on the altitude, speed, and heading of the aircraft involved in the encounter. See illustration below.

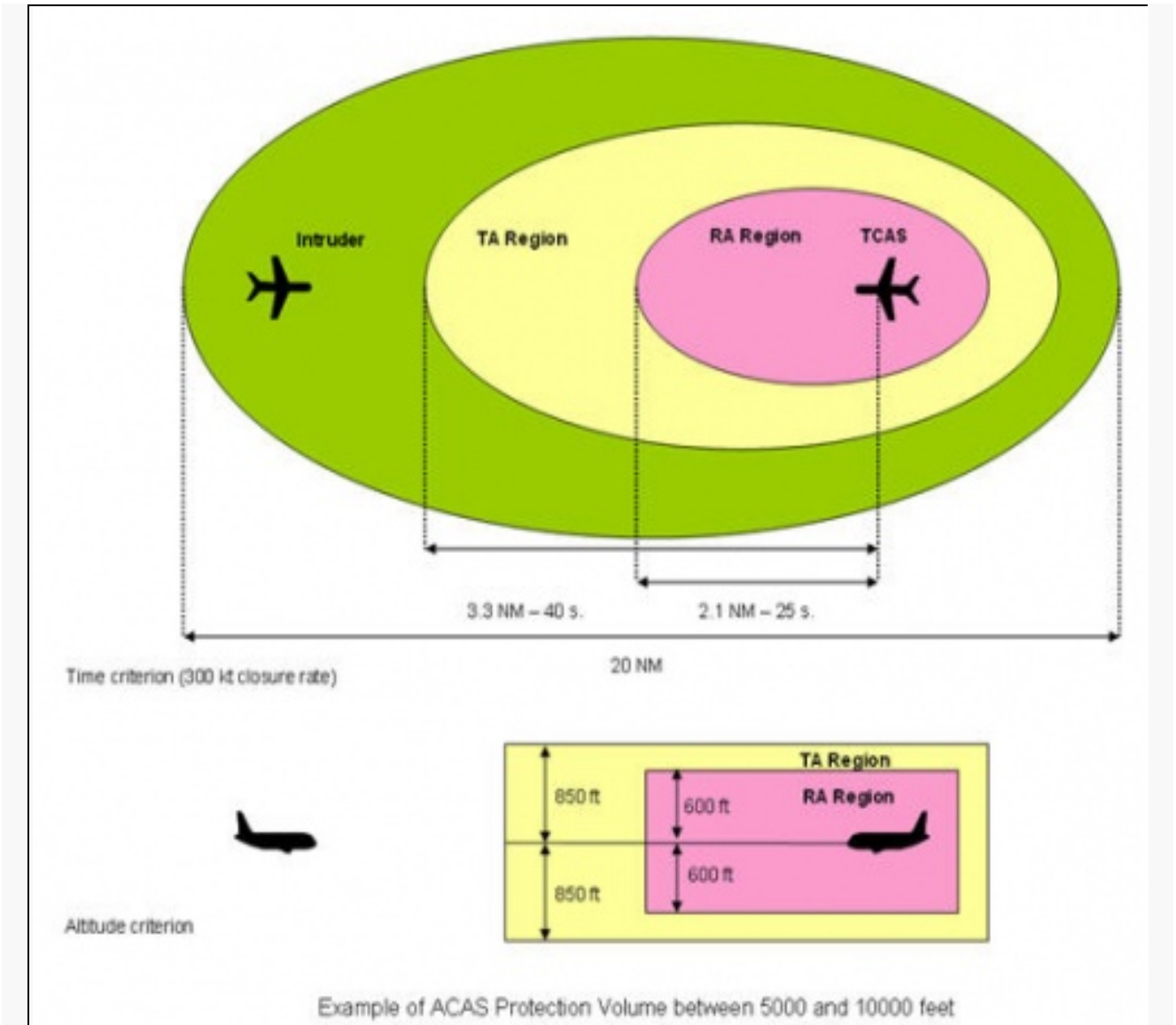


FIG 6

A protected volume of airspace surrounds each ACAS II equipped aircraft

ACAS II version 7.0 Commands

Upward sense			Downward sense		
RA	Required vertical rate (ft/min)	Aural	RA	Required vertical rate (ft/min)	Aural
Climb	1500	Climb, climb	Descend	- 1500	Descend, descend
Crossing Climb	1500	Climb, crossing climb; Climb, crossing climb	Crossing Descend	- 1500	Descend, crossing descend; Descend, crossing descend
Maintain Climb	1500 to 4400	Maintain vertical speed, maintain	Maintain Descend	- 1500 to - 4400	Maintain vertical speed, maintain
Maintain Crossing Climb	1500 to 4400	Maintain vertical speed, crossing maintain	Maintain Crossing Descend	- 1500 to - 4400	Maintain vertical speed, crossing maintain
Reduce Descent ¹	0 - 500 - 1000 - 2000	Adjust vertical speed, adjust	Reduce Climb ¹	0 500 1000 2000	Adjust vertical speed, adjust
Reversal Climb ²	1500	Climb, climb NOW; Climb, climb NOW	Reversal Descend ²	- 1500	Descend, descend NOW; Descend, descend NOW
Increase Climb ²	2500	Increase climb, increase climb	Increase Descend ²	- 2500	Increase descent, increase descent
Preventive RA	No change	Monitor vertical speed	Preventive RA	No change	Monitor vertical speed
RA Removed	—	Clear of conflict	RA Removed	—	Clear of conflict

1 Replaced by "Level off, level off" in version 7.1
 2 Not possible as an initial RA

FIG 7

Table showing typical commands for TCAS II Version 7.0 to the Crew whenever an RA alert is generated.

Complying with TCAS RAs

Pilots are required to immediately comply with all RAs, even if the RAs are contrary to ATC clearances or instructions.

If a pilot receives an RA, he/she is obliged to follow it, unless doing so would endanger the aircraft. Complying with the RA, however, will in many instances cause an aircraft to deviate from its ATC clearance. In this case, the controller is no longer responsible for separation of the aircraft involved in the RA.

On the other hand, ATC can potentially interfere with the pilot's response to RAs. If a conflicting ATC instruction coincides with an RA, the pilot may assume that ATC is fully aware of the situation and is providing the better resolution. But in reality ATC is not aware of the RA until the RA is reported by the pilot. Once the

RA is reported by the pilot, ATC is required not to attempt to modify the flight path of the aircraft involved in the encounter. Hence, the pilot is expected to “follow the RA” but in practice this does not yet always happen. Some States have implemented “RA downlink” which provides air traffic controllers with information about RAs posted in the cockpit obtained via Mode S radars. Currently, there are no ICAO provisions concerning the use of RA downlink by air traffic controllers.

International Standards for ACAS

The International Civil Aviation Organization (ICAO) is responsible for the global standardisation of ACAS.

ACAS equipment is available from three vendors. While each vendor’s implementation is slightly different, they provide the same core functions and the collision avoidance and coordination logic contained in each implementation is the same. In order to be certified, ACAS equipment must meet the Minimum Operational Performance Standards (MOPS) laid down set in RTCA and forthcoming EUROCAE documents. The equipment which meets the ACAS II Standards and Recommended Practices (SARPs) is known as TCAS II, version 7. A joint RTCA/EUROCAE working group has finalized amendments to the MOPS, addressing three specific safety improvement changes related to the collision avoidance logic; these new MOPS will form TCAS II version 7.1 and are published as RTCA DO-185B and EUROCAE ED-143.

UAE GCAA Standard for ACAS

The requirements for a specific version are normally mandated by the National Aviation Authority and in this case, the GCAA reference documents of Civil Aviation Regulations, Part IV, CAR OPS 1, Section 1.668 and Civil Aviation Advisory Publication 29, CAAP 29, mandates ACAS II without version standardization.

GCAA CAR PART IV CAR-OPS 1.668 states:

Airborne Collision Avoidance System:

(a) An operator shall not operate a turbine powered aeroplane:

- (1) Having a maximum certificated take-off mass in excess of 15000 kg or a maximum approved passenger seating configuration of more than 30 after 1 January 2000; or
- (2) Having a maximum certificated take-off mass in excess of 5700 kg, but not more than 15000 kg, or a maximum approved passenger seating configuration of more than 19, but not more than 30, after 1 January 2005, unless it is equipped with an airborne collision avoidance system with a minimum performance level of at least ACAS II.

Types of ACAS

ACAS I - Gives Traffic Advisories (TAs) but does not recommend any maneuvers. The only implementation of ACAS I concept is TCAS I. ICAO Standards and Recommended Practices (SARPs) for ACAS I are published in ICAO Annex 10, volume IV but are limited to interoperability and interference issues with ACAS II. ACAS I is mandated in the United States for certain smaller aircraft.

ACAS II - Gives Traffic Advisories (TAs) and Resolution Advisories (RAs) in the vertical sense (direction). ACAS II SARPs are published in ICAO Annex 10. The only implementation of ACAS II concept is TCAS II Version 7.0.

The types of TCAS II are:

TCAS II version 6.04a – old version of TCAS II never mandated in Europe still used by some military aircraft or foreign aircraft (which do not fall within the current European mandate)

TCAS II version 7.0 - currently mandated in Europe but to be gradually phased out and replaced by version 7.1

TCAS II version 7.1 - mandated in Europe as per EU regulations 1332/2011:

- for all new aircraft as of 01st March 2012
- and for all aircraft currently with version 7.0, before 01st December 2015

TCAS II version 7.1 - mandated by ICAO Annex 10:

- for all new aircraft as of 1 January 2014
- and for all aircraft currently with version 7.0, before 01st January 2017

ACAS III - Gives TAs and RAs in vertical and/or horizontal directions. Also referred to as TCAS III and TCAS IV. Not currently implemented and unlikely to be in the near future. ICAO SARPs for ACAS III have not been developed. Currently, there are no plans to proceed with such a development.

1.18.3 Safety Benefits of ACAS II Version 7.1

1.18.3.1 Version 7.0 – Two Safety Issues identified

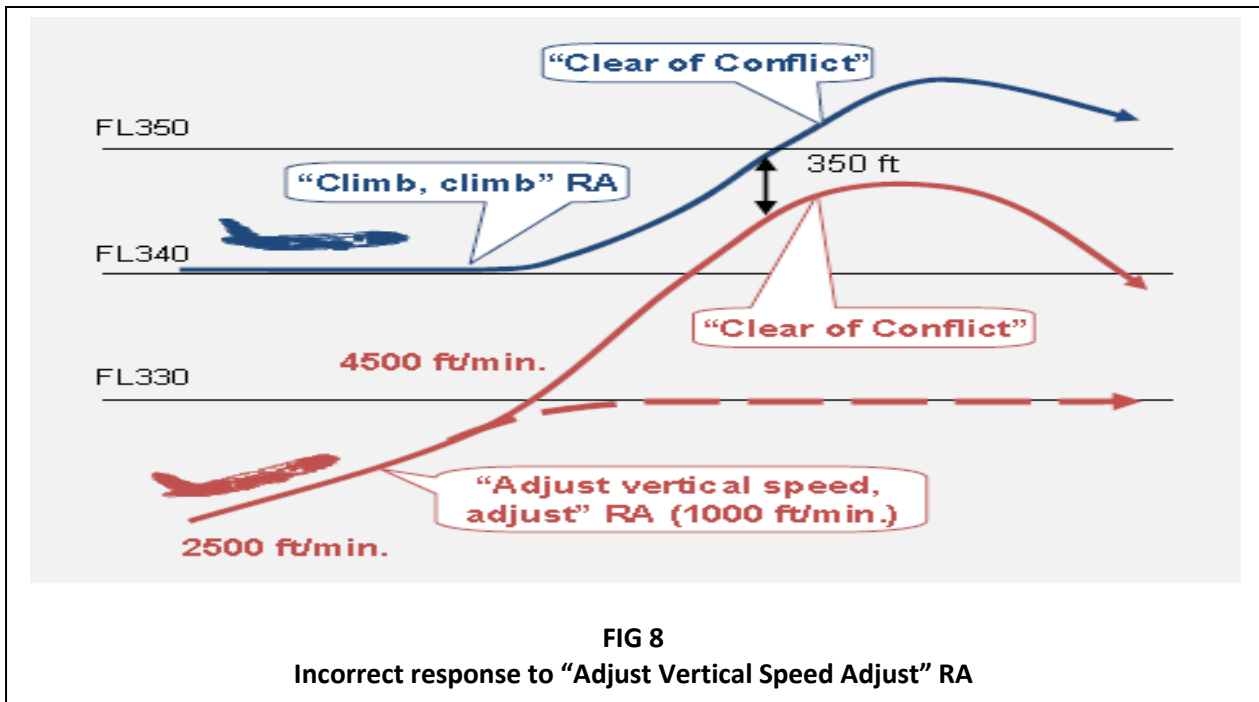
Following a series of mid-air encounters in which safety margins have been lost, including accidents in Yaizu (Japan) in 2001 and in Überlingen (Germany) in 2002, the current airborne collision avoidance system software should be upgraded. The studies concluded that with the current airborne collision avoidance system software there is a probability of a mid-air collision risk of 2.7×10^{-8} per flight hour. Therefore the current ACAS II version 7.0 is considered to be of an unacceptable safety risk².

The two main safety issues identified with version 7.0 were Adjust Vertical Speed, Adjust”(AVSA) and Late TCAS Reversals.

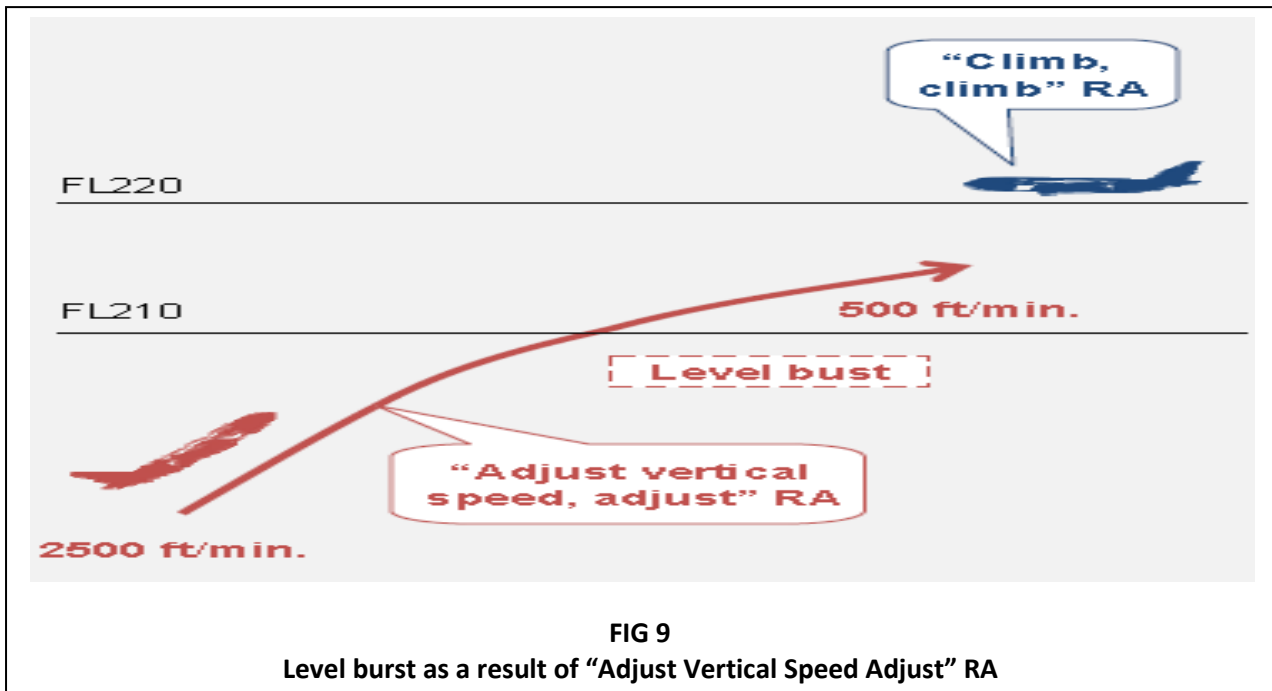
1.18.3.2 Version 7.0 – Safety issue 1 with” Adjust Vertical Speed, Adjust”(AVSA)

Since its introduction in Europe in 2000, TCAS II version 7.0 has been the subject of monitoring. In the course of analyzing recorded and reported events, many cases – as many as 23 per year – were found in which pilots did not respond correctly to the “Adjust vertical speed, adjust” Resolution Advisories (RAs). The “Adjust vertical speed, adjust” RA requires the reduction of vertical speed to 2000, 1000, 500, or 0 ft/min., as indicated on the flight instruments. In those cases involving an incorrect response, the pilots increased their vertical speed instead of reducing it, consequently causing a deterioration of the situation. The “Adjust vertical speed, adjust” RA is the only RA whose aural annunciation does not clearly communicate what exact maneuver is required. It is also the most common RA, representing up to two-thirds of total RAs, all of which increases the potential for incorrect pilot response (see figure 8).

² Reference Commission Regulation (EU) No 1332/2011

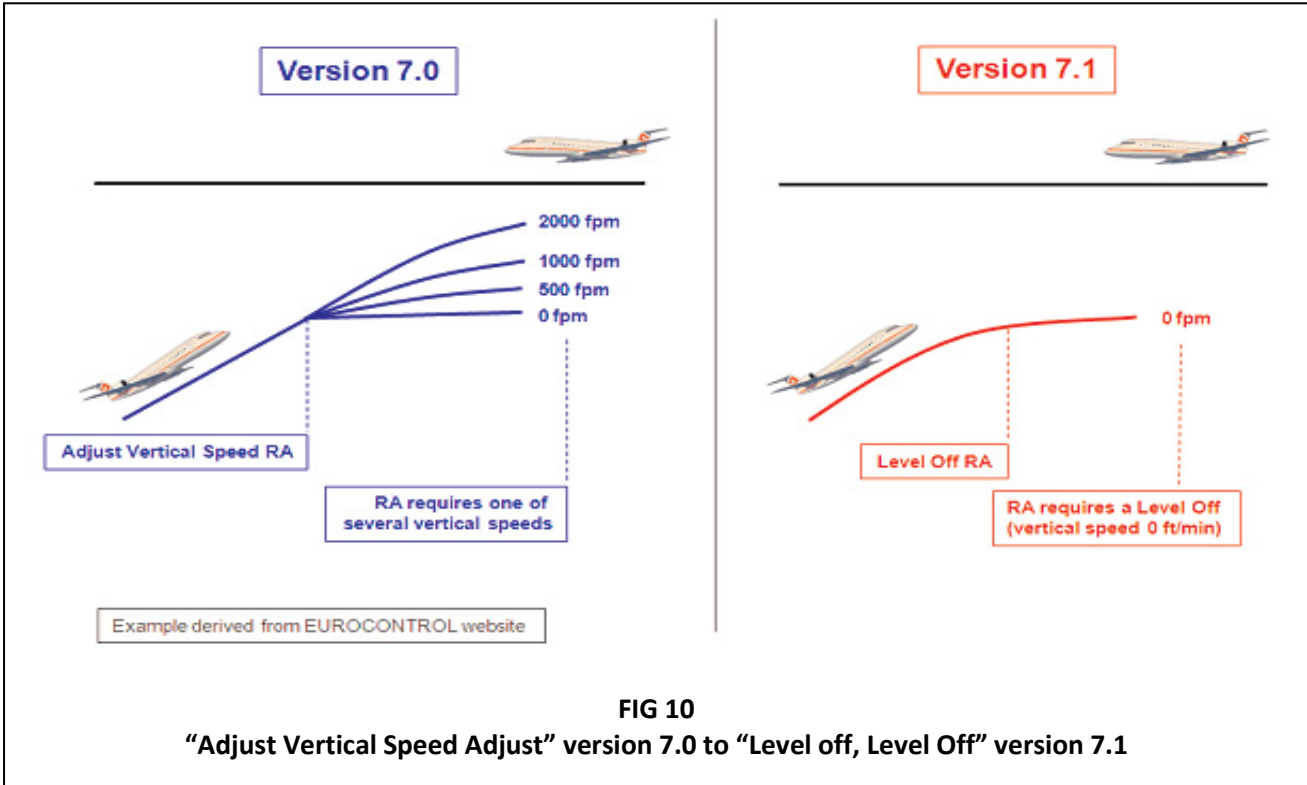


Additionally, there have been numerous cases of level bust when pilots following the "Adjust vertical speed, adjust" RA went through their cleared level, often causing a follow up RA for the other aircraft above or below, and disrupting ATC operations (see Figure 9).



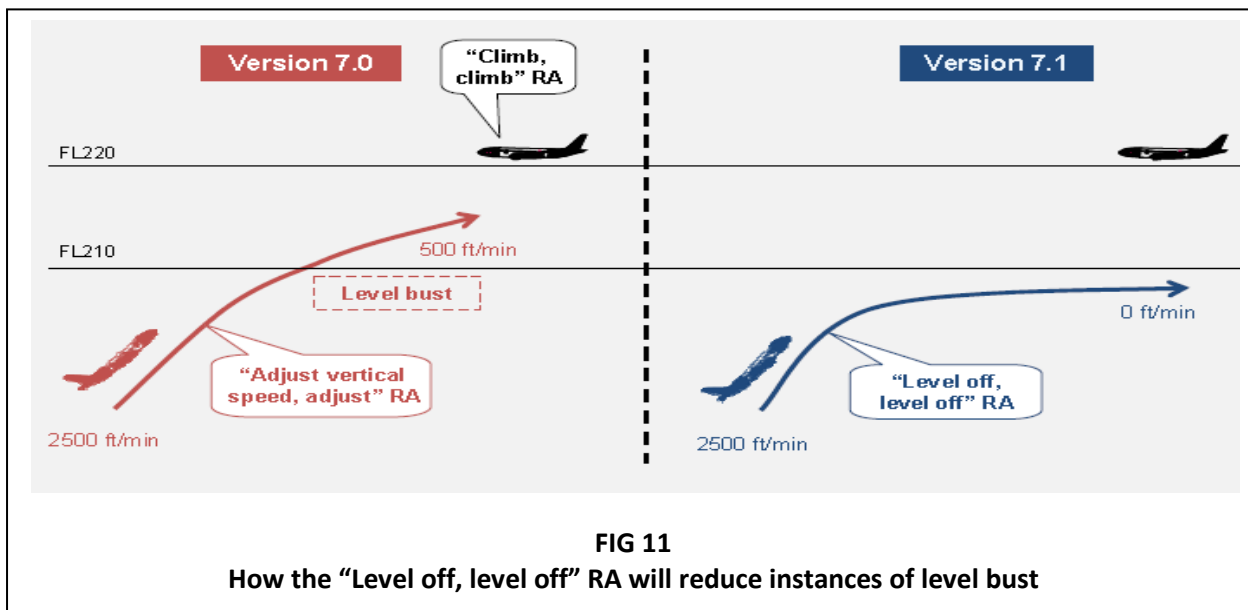
1.18.3.3 Solution for Safety issue 1 - Version 7.1 - AVSA changed to “Level off, Level off”

The AVSA Resolution Advisory (RA) has been determined to be confusing, and there is a history of some pilots not responding to the AVSA RA as intended. The solution in Version 7.1 replaces 4 AVSA RAs with a single “Level Off, Level Off” RA. See Figure 10.



The aural message “Level off, level off” also has the benefit of being intuitive and the associated maneuver corresponds to the standard leveling off maneuver.

Additionally, replacing the multiple climb/descent rates of the “Adjust vertical speed, adjust” RA, the “Level off, level off” RA will minimize the altitude deviations induced by TCAS (level busts while “flying the green arc”), thus reducing the impact on ATC operations. It will contribute to the overall reduction of RA occurrences because follow up RAs resulting from the “green arc level bust” should not occur any more (see Figure 11).



1.18.3.4 Safety issue 2 - Version 7.0 – TCAS RA Reversal Logic

The design of the current TCAS II version 7.0 allows for reversal RAs (i.e. “Climb, climb NOW” and “Descend, descend NOW”) to be issued when the current RA is no longer predicted to provide sufficient vertical spacing. However, there have also been a number of cases in which TCAS II version 7.0 failed to reverse an RA when two converging aircraft remained within 100 feet.

This type scenario can occur when one aircraft is not following the RA or is not TCAS II equipped and follows an ATC instruction or performs an avoidance maneuver based on visual acquisition.

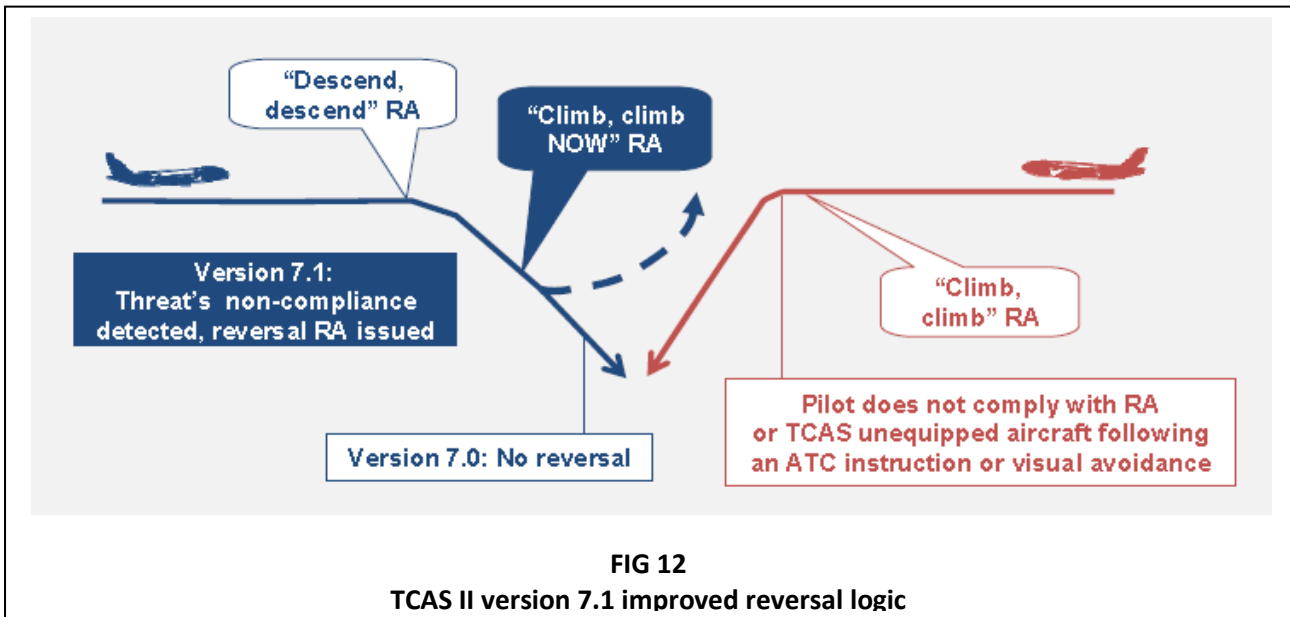
A number of these types of cases have been discovered each year – as many as 7 per year – the most notable events being the Yaizu (Japan) midair accident (2001) and the Überlingen (Germany) midair collision (2002).

1.18.3.5 Solution for Safety Issue 2 - Version 7.1 – TCAS RA Improved Reversal Logic

Version 7.1 will bring improvements to the reversal logic by detecting situations in which, despite the RA, the aircraft continue to converge vertically.

A feature has been added to the TCAS logic which monitors RA compliance in coordinated encounters (i.e. when both aircraft are TCAS II equipped). When version 7.1 detects that an aircraft is not responding correctly to an RA, it will issue a reversal RA to the aircraft which maneuvers in accordance with the RA.

In single equipage encounters (i.e. when only one aircraft is TCAS II equipped), version 7.1 will recognize the situation and will issue a reversal if the unequipped threat aircraft moves in the same vertical direction as the TCAS II equipped aircraft. Although the reversal logic change is transparent to flight crews, it will, nevertheless, bring significant safety improvements. Ref figure 12.



1.18.4 Air Traffic Control Alerting System

1.18.4.1 Safety Nets for ATC

Listed are some of the ground safety nets that are utilized across ATC centers in order to aid air traffic controllers in performing their jobs safely especially with the demands of air traffic. These safety aids are currently being introduced throughout Europe and with a current implementation target period of the end of 2013 across European ATC units:

- Short Term Conflict Alert (STCA), which assists the controller in preventing collision between aircraft by generating, in a timely manner, an alert of a potential or actual infringement of separation minima.
- Minimum Safe Altitude Warning (MSAW), which warns the controller about increased risk of controlled flight into terrain accidents by generating, in a timely manner, an alert of aircraft proximity to terrain or obstacles.
- Area Proximity Warning (APW), which warns the controller about unauthorised penetration of an airspace volume by generating, in a timely manner, an alert of a potential or actual infringement of the required spacing to that airspace volume.
- Approach Path Monitor (APM), which warns the controller about increased risk of controlled flight into terrain accidents by generating, in a timely manner, an alert of aircraft proximity to terrain or obstacles during final approach.

1.18.4.2 STCA – Short Term Conflict Alert

STCA is a function integrated into an ATC Radar system. It assists the controller in preventing collision between aircraft by generating, in a timely manner, an alert of a potential or actual infringement of separation minima.

In the STCA function the current and predicted positions of aircraft with pressure altitude reporting capability are monitored for proximity. If the distance between the positions of two aircraft is predicted to be reduced to less than the applicable separation minima within a specified time period, a warning will be generated to the controller. The parameters for determining when STCAs are generated are left for the local ANS unit to define based on fine tuning out nuisance alerts.

There is no direct connection that exists between STCA and ACAS II although the aircraft transponder provides data for both TCAS II computer and ATC radar system. Although normally very effective in alerting controllers about actual or potential separation losses, STCA is not as efficient as ACAS II in providing collision avoidance.

1.18.4.3 ATS Surveillance Services – GCAA CAR Part VIII 4.34 (c) & ICAO DOC 4444

As stated in the GCAA CAR Part VIII, subpart 4.34:

(c) The applicant for an air traffic service certificate shall establish procedures to ensure that, where radar or automatic dependent surveillance is used to support the provision of an air traffic service:

1. All surveillance separations are in accordance with the requirements of Appendix A.1 and PANS -ATM;
2. Mode A SSR code allocation shall be made by the ATC units in accordance with the ORCAM allocation procedures.
3. Full information is made available to pilots and aircraft operators on:
 - i. the nature and extent of the surveillance services provided;
 - ii. any significant limitations regarding such surveillance services;
4. The information displayed at individual surveillance operating positions is that required for the air traffic services to be provided, including the display of safety related alerts and warnings, where the Authority has determined that the facility is required; and
5. The surveillance system used shall be provided and maintained in accordance with the provisions of Subpart 5 of the Civil Aviation Rules.

The requirement for the display of safety related alerts and warnings is mentioned in paragraph 4 of the GCAA regulations as quoted above.

Reference for ATS surveillance systems capabilities with safety related alerts and warnings is also highlighted in ICAO DOC 4444 PANS-ATM 8.1.4, 8.4.1, 15.7.2

1.19 Effective Investigation Techniques

- Will be determined during the course of the investigation, if required.

2 ANALYSIS

As per GCAA CAR OPS Part IV and in accordance with ICAO PAN Doc.4444, Procedures for Air Traffic Management, once the crew receives alert from the aircraft TCAS of a RA, ATC ceases to have control over the affected aircraft till such time that the crew reports that they are clear of conflict as advised by the aircraft TCAS system. However, the crew should inform ATC that they are responding to a TCAS RA climb or descend, which was promptly performed by both airline crew members involved with this AIRPROX incident.

Both aircraft involved in this AIRPROX were equipped with the mandatory standard of ACAS II version 7.0 and both systems were serviceable. The commands generated by TCAS II for any RA event are mentioned in para 1.18.2.3 and the crews are trained to respond to this command which was evident for our occurrence under investigation. We have evidence to believe that both crews followed exactly what was required from the call out of the RA and regained safe separation. However, there was no report from either crew that there was any prior TCAS TA (Traffic Avoidance) and this may be due to the fact of immediate need for avoidance action.

In mitigation of the risk involved with all TCAS RA events since 2002 when the crew fails to follow the TCAS RA commands, or follows ATC instructions instead of TCAS RA commands or one of the aircraft is not TCAS equipped, studies initiated by EUROCONTROL discovered two safety issues with the current TCAS II version 7.0, which led to the development of version 7.1.

This Development was undertaken jointly by the RTCA in the United States and by EUROCAE in Europe with support and contributions from several other organizations, including airlines and ANSPs.

2.1 Recommended Training Requirements for ACAS II with Version 7.1³

The mandate of EU regulations 1332/2011 requires aircraft flying within European airspace to be equipped with ACAS II Version 7.1 for all new aircraft above 5,700 kg Maximum Take-off Mass or authorized to carry more than 19 passengers as of 01st March 2012. An extended deadline, i.e. 1 December 2015, is granted to aircraft with an individual certificate of airworthiness issued before 1 March 2012 and equipped with version 7.0.

The EU Implementing Rule sets an earlier equipment requirements than those published in ICAO Annex 10 (1 January 2014 new installations, 1 January 2017 existing units).

As the regulations also affects UAE operators as well as ANSP units, the requirement for Pilots and ATC Controllers training has been recommended as mentioned hereunder.

³ Reference Eurocontrol ACAS II Bulletin # 14

2.1.1 Recommended Training for Pilots

Before the new version of TCAS is deployed to its fleet aircraft operators should ensure that crews are:

- aware of the TCAS version upgrade
- trained on the new “Level off, level off” RA and understand how to respond to this RA correctly.

2.2.1 Recommended Training For Air Traffic Controllers

Before the new version of TCAS mandate takes effect (i.e. before 1 March 2012) ANSPs should ensure that air traffic controllers are:

- aware of the TCAS version upgrade
- understand the effect that the new “Level off, level off” RA will have on ATC operations (i.e. some aircraft may level off hundreds of feet before the cleared level as a result of the “Level off, level off” RA.

Besides that there are no differences (visible to controllers) between version 7.0 and version 7.1.

2.2 UAE Operators - GCAA CAR OPS 1.668 and CAAP 29

The current revision of the GCAA CAR OPS Part IV section 1.668 together with CAAP 29, requires to have clear guidance with the version of ACAS II to be fitted on UAE operators aircraft. This will avoid any misunderstanding of requirements especially as the new mandate by the European Union, Regulation No 1332/2011, will impact UAE based operators.

The GCAA as the regulator should identify the safe requirements of ACAS for its own airspace and ensure that airlines are in compliance so as to minimize the risk associated with intruder airborne traffic.

During the course of this investigation, preliminary indications reveal that the UAE Operators are not fully aware of the recent changes and development with ACAS II, especially version 7.1. It was also revealed that a UAE Operator has had Version 7.1 already installed on some of its aircraft since October 2011.

With the current deliveries of new aircraft after 01st March 2012 to UAE based Operators, airlines, the GCAA and ANSP units will be affected and all concerned will be required to make the necessary manual changes and training, both theory and simulator, in order to avoid any safety related misinterpretations.

That is why the GCAA should provide, as soon as possible, clear guidance in regards to the version that should be used, with preference to 7.1 Version, without excluding the earlier version that is acceptable in accordance with industry standards for all aircraft flying in, out and over the UAE airspace. As explained earlier, it is already known that the 7.1 version has more advanced provisions thus enhanced safety. However, a risk assessment could provide a better amalgamation of all related issues that have to be taken into account. This will assist the decision makers to verify the most suitable version for the current and current UAE airspace conditions. Especially as it is commonly understood that overflying or aircraft coming from other countries may utilize other versions, which might reduce the safety margins that the UAE has established. That is why the UAE should provide these guidelines, for all aircraft users.

2.3 UAE ANSPs awareness of ACAS Version 7.1

ATC Units depend on feedback from the flight crew with regards to TCAS RA events and are instructed not to give any deviations during such events. With ACAS II Version 7.1, controllers need to be aware that there are changes in commands for the pilots to follow during a TCAS RA.

As aircraft has already started flying within the UAE airspace with ACAS version 7.1, ATC units should be made aware that the effect of the new “Level off, level off” RA will have on ATC operations (i.e. some aircraft may level off hundreds of feet before the cleared level as a result of the “Level off, level off” RA.

2.4 Dubai STCA

It was found during GCAA audits that the Flight Refueling Radar system Short Term Conflict Alert (STCA) warnings were not being utilized by Dubai ANS. Since the original dates of the findings, the simulation testing of the STCA conducted by Dubai ANS (trials done in the ATC Simulator in 2008) revealed there was a level of annoyance and false alerts which Dubai ANS determined was unacceptable. Dubai ANS Management stated the STCA parameters could not be configured with the Flight Refueling Radar (FRL) current software to reduce the false alerts to a level that would be deemed acceptable for the operational environment. The proposed introduction of the new Raytheon Auto Track 3 system which should include software to provide a more advanced STCA capability is seen as a solution to this non-compliance.

However in the meanwhile there are no radar alerts provided to the ATCOs. A significant concern is raised regarding the GCAA Finding Notice action required from the Dubai ANS Department to provide a risk assessment to the GCAA by the 30 May 2012, which has not yet been completed to an acceptable level by Dubai ANS. The required risk assessment is required to satisfactorily demonstrate that the FRL Radar continues to be fit for operational use, based on appropriate mitigations being implemented to negate the risk of the continued non-compliance of not having appropriate alerts and warnings on the radar system (STCA/MSAW), until the successful integration of Auto Track 3 is completed with appropriate alerts and warnings utilised.

3 CONCLUSIONS

3.1 Findings

- 3.1 Both airline flight crews held valid license and medicals to operate their aircraft.
- 3.2 Both aircraft were maintained IAW the operators maintenance program
- 3.3 The affected airlines are in compliance of GCAA CAR OPS 1.668 and CAAP 29.
- 3.4 The airlines had the required ACAS II version 7.0 equipment fitted to the aircraft.
- 3.5 Both aircraft TCAS systems were serviceable.
- 3.6 There is no ACAS II version mentioned in the documents of the GCAA CAR OPS 1.668 and CAAP 29.
- 3.7 The two airlines currently have ACAS II version 7.0 fitted which meets the minimum international standard.
- 3.8 Some UAE based operators already have ACAS II version 7.1 fitted to their aircraft.
- 3.9 One of the airline involved in this AIRPROX did not have ACAS II version 7.1 FCOM updates.
- 3.10 ACAS II version 7.1 training requirements for both pilots and ATC controllers yet to be provided by the operators and ANS units.
- 3.11 STCA/MSAW unit at Dubai ATC is currently not operational with the Flight Refuelling Radar system at Dubai ANS.
- 3.12 GCAA has not published clear guidelines to the UAE AOC holders regarding the ACAS II version to be utilised.

3.2 Probable Cause

To be determined

4 SAFETY RECOMMENDATIONS

SR 17/2012

GCAA to provide clear guidelines with minimum ACAS II version for aircraft flying within UAE FIR.

SR 18/2012

The GCAA to immediately ensure that all UAE Civil ATC units equipped with radar and ADS-B displays shall provide and utilise safety related alerts and warnings, appropriate to the service provided, and units which have not yet complied shall provide alternative measures, acceptable to GCAA, which achieve an equivalent level of safety in the interim.

SR 19/2012

The GCAA to provide Air Navigation Service Information Notice (ANSIN) to all UAE Civil ATC Units, requiring ANS Management to include awareness of the new ACAS11 version 7.1 capabilities and limitations, in their initial and continuation Air Traffic Controller training syllabus.