



FINAL REPORT

ATC incident between Qatar Airways Flights QTR 34U, Boeing B777- 300ER, A7-BAH and QTR 54C, Boeing B777- 300, A7-BAC within Colombo Oceanic Control Area, passing position ELATI on route N640 (westbound) on 06th May 2022

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Office address: No 152/1, Minuwangoda Road, Katunayake, Sri Lanka.

Tel: +94 112 358 800

Fax: +94 112 257 154

Email: contactus@caa.lk

Website: www.caa.lk



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**List of Abbreviations**

ACC	-	Area Control Centre
ADS	-	Automatic Dependent Surveillance
ASD	-	Air Situation Display
ATC	-	Air Traffic Controller
ATM	-	Air Traffic Management
ATS	-	Air Traffic Services
BIA	-	Bandaranaike International Airport
CPDLC	-	Controller Pilot Data Link Communication
CAA	-	Civil Aviation Authority
CAASL	-	Civil Aviation Authority of Sri Lanka
CLAM	-	Cleared Level Adherence Monitoring
DGCA	-	Director General of Civil Aviation
FH	-	Flight Hours
FIR	-	Flight Information Region
FL	-	Flight Level
Ft	-	Feet
HF	-	High Frequency Communication
hrs	-	hours
ICAO	-	International Civil Aviation Organization
MET	-	Meteorological / meteorology
MSN	-	Manufacturer Serial Number
NM	-	Nautical Mile
OCP	-	Oceanic Control Position
P1	-	Captain or Commander
QTR	-	Qatar
SLMATS	-	Sri Lanka Manual of Air Traffic Services
SIGMET	-	Significant Meteorological Information
SMS	-	Safety Management System
UOIs	-	Unit Operations Instructions
UTC	-	Coordinated Universal Time
WILCO	-	Will comply



ATC incident between Qatar Airways Flights QTR 34U, Boeing B777- 300ER, A7-BAH and QTR 54C, Boeing B777- 300, A7-BAC within Colombo Oceanic Control Area, passing position ELATI on route N640 (westbound) on 06th May 2022

1 Introduction

The incident was notified to the Civil Aviation Authority of Sri Lanka by the Air Operator for the incident report filed by QTR34U of the level infringement on 09th May 2022 via email as required by Aircraft Accident and Incident Investigation Regulations.

Simultaneously, during a routine ATM inspection by CAASL of the ACC situated at Colombo International Airport Ratmalana, on the 20th May 2022, a log entry was observed stating the removal of ATC from duty due clearing QTR54C to incorrect flight level in the absence of standard separation with another aircraft.

The DGCA appointed a team to investigate this incident with a view to prevent the recurrence of similar events.

Pursuant to Regulation No. 4(1) of Aircraft Accident and Incident Investigation Regulations of Sri Lanka, the initial notification was sent to Qatar Air Accident Investigation Office being the State of Registry and State of Operator, and National Transport Safety Board of United State being the State of Manufacturer /the State of Design and the International Civil Aviation Organization.

Accordingly, Qatar Air Accident Investigation Office appointed an investigator as an accredited representative, to assist the investigation.

1.1 Synopsis

On 06th May 2022, Qatar Airways flight, QTR54C bearing registration A7-BAC at FL300 from Adelaide International Airport, Australia to Hamad International Airport, Qatar, reported ELATI at 2021 UTC.

Qatar Airways flight QTR34U bearing registration A7-BAH at FL320 from Perth International Airport, Australia to Hamad International Airport, Qatar reported ELATI at 2022UTC.

At 2022UTC, when passing position ELATI on route N640 (westbound) within Colombo Oceanic Control Sector, a request was made by QTR54C maintaining FL 300, to climb FL340. This level request was granted and the aircraft was cleared to climb FL340, through the level of the QTR34U at FL320. The clearance for level change for QTR54C was given when there was less than the required standard separation between both aircraft. (Required standard separation is 50NM longitudinal as per the instructions for trial operations carried out for 50NM longitudinal separation within Oceanic Control Airspace in Colombo FIR).

1.2 Objective

The objective of this investigation is to prevent the recurrence of similar incidents.



2 Factual Information

Operator of both aircraft	:	Qatar Airways Q.C.S.C PO Box 22550, Tower 1 Airport Road, Doha
Registered Owner	:	Qatar Airways Q.C.S.C
Aircraft Make and Model	:	Boeing B777-300 (MSN 36010) Boeing B777-300ER (MSN 37662)
Aircraft Nationality	:	Qatar (A7)
Aircraft Registrations	:	A7- BAC and A7-BAH
Place of Incident	:	Passing position ELATI on route N640 (westbound) in Colombo FIR
Date and Time	:	06 th May 2022 at 2022 (UTC); 01:52hrs (Local time)
Local time zone	:	+ 0530hrs

2.1 History of Flight

QTR34U had entered Colombo FIR at position ELATI at FL320 and communication established via CPDLC and HF contact. There were two ATCs working at the Colombo Oceanic Control Sector at the time of the incident. The Executive Controller assumed duties at Colombo Oceanic Control position at 2000 UTC whereas the ADS Controller handling ADS/CPDLC had been occupying the position since 1900UTC. At the time when the Executive Controller had assumed her position, there were 9 active aircraft in the Sector and all were connected to CPDLC.

The times aircraft reported ELATI, actions by ATC and the level requests are as follows;

- 20:21:52 UTC - QTR34U at FL320, had made a request for weather deviation 30NM right of track
- 20:22:22 UTC - QTR54C at FL 300, requested to climb to FL340. (Who was ahead of QTR 34U)
- 20:22:42 UTC - Weather deviation approved.
- 20:23:20 UTC - ADS Controller granted FL340 requested by QTR 54C via CPDLC and cleared to maintain FL340.

The level change to QTR54C was executed with QTR34U at FL320 and in the absence of standard separation between aircraft.



Soon after realizing the incorrect climb instructions, messages of “disregard”, “maintain FL300” and “confirm maintaining flight level 300” were sent to QTR34U and not to QTR 54C. By that time QTR 34U had also requested to climb FL340.

20:26:40 UTC, QTR34U had responded and confirmed that they were maintaining FL320.

2.2 Personnel Information

2.2.1 Executive Controller at Oceanic Control Position

Licence : Valid ATC (ATC/158) issued by the DGCA Sri Lanka;
Initial issue: 01st April 2012 and valid till 20th Jan 2023

Age and Gender : 40 years, Female

Last Medical Date : 04th Jan 2019, valid for 4 years

ATC Ratings : Aerodrome;

- i. Katunayake - Valid till 23rd May 2023
- ii. Ratmalana - Valid till 23rd May 2023
- iii. Mattala - Valid till 23rd May 2023

Approach;

- i. Katunayake - Valid till 23rd May 2023

Area Non Radar - Valid till 23rd May 2023

2.2.2 ADS Controller at Oceanic Control Position

Licence : Valid ATC (ATC/170) issued by the DGCA Sri Lanka;
Initial issue: 30th January 2014 and valid till 23rd Jan 2023

Age and Gender : 36 years, Female

Last Medical Date : 25th June 2020, valid for 04 years

Ratings : Aerodrome

- i. Katunayake: Valid till 29th Nov 2022
- ii. Ratmalana : Valid till 29th Nov 2022
- iii. Mattala : Valid till 29th Nov 2022

Approach

- i. Katunayake : Valid till 29th Nov 2022

Area Procedure: Valid till 29th Nov 2022



Note : for the initial issuance of the Rating, ATCs have to undergo the CAASL approved training programmes as relevant to the Rating to be obtained. Having successfully completed the approved training programme, the trainee has to undergo a further stipulated OJT period. Having successfully completed both training and OJT programmes, the ATCs are checked out by a Panel appointed by the DGCA.

The issuance of an ATC rating is valid for one year. If a rating is suspended, for the re-issuance of the same, the competency is rechecked by the Senior Manager of the relevant unit and the ATC has to satisfy the currency of having exercised the privileges of the rating by being deployed at the relevant ATC unit for 40 hours within the recent 6 months period.

In the context of two ATCs who were involved with the incident, their Area Control Rating was current and they had satisfied the recency requirements.

2.2.3 Pilot-In-Command of A7-BAC

Licence : Valid licence (QA2232TA) issued by Qatar CAA: Valid till 31st Dec 2069 (subject to the medical validity).

Age and Gender : 41 Years old, Male

Medical validity : 31st Oct 2022

Aircraft Ratings : B777, issued on Nov 2015

Flying experience :

Total hrs : 10476

On-type hrs : 9518

Total P1 hrs : 5317

Total P1 on B777-300ER: 5317

2.2.4 Pilot-In-Command of A7-BAH

License : Valid Licence (QA1970TA) issued by Qatar CAA, valid till 31st Dec 2069 (subject to the medical validity)

Age and Gender : 49 Years old, Male

Medical validity : 31st Jan 2023

Aircraft Ratings : P2 B777 issued on 04th Jan 2009

P1 B777 issued on 31st March 2015



Flying experience :

Total hrs : 12245

On-type hrs : 10200

Total P1 hrs : 5767

Total P1 on B777-300ER: 5767

2.3 Aircraft Information

1st Aircraft: A7-BAC: Flight no. QTR54C

Type and Model : Boeing B777-300 (B77W)

Manufacturer's Serial No. : 36010

Certificate of Registration : No. 185, Registered in Qatar Civil Aircraft Register

Certificate of Airworthiness : No. 185, Valid till 26th Aug 2022

Total Airframe Hours : 70394 FH/ 10588 FC (as at 06th May 2022)

Engines : 2 numbers, GE90-115B

Engine	Serial Number	Total Cycles (as at 6 th May)	Total Hours (as at 6 th May)
No. 1	907-794	4138	29122
No. 2	901-313	3107	20156

Weight and Balance : 171318,1 Kg

Type of fuel used : Jet A1

2nd Aircraft: A7-BAH: Flight No. QTR34U

Type and Model : Boeing B777-300ER

Manufacturer's Serial No. : 37662

Certificate of Registration : No 226, Registered in Qatar Civil Aircraft Register

Certificate of Airworthiness : No.226, Valid until revoked by Authority

Total Airframe Hours : 62022:19 FH/9452 FC (as at 06th May 2022)

Engines : 2 numbers, GE-90-115B

Engine	Serial Number	Total Cycles (as at 6 th May)	Total Hours (as at 6 th May)
No. 1	901-257	2988	20068:52
No. 2	907-084	7303	47041:19



Weight and Balance : 165641.093 Kg

Type of fuel used : JET A1

2.4 Meteorological Information:

- SIGMET issued for 06th May2022.

“TOP FL500 STNR NC = WSSB31 VCBI 061730Z

VCCF SIGMET C01 VALID 061730/062130 VCBI- VCCF COLOMBO FIR EMBD
TS OBS WI N0134 E09200 - S0045 E09200 - N0353 E08355 - N0538
E08548 - N0134 E09200”

- Decoded SIGMET

The provided MET Warning for Colombo Flight Information Region issued at 061730UTC for the period 061730-062130UTC, embedded Thunder storms observed within, coordinates; N0134 E09200 - S0045 E09200 - N0353 E08355 - N0538 E08548 - N0134 E09200. Tops up to Flight level 500

- Presence of Weather Obtained from aircraft

QTR34U maintaining FL320 requested weather deviation 30NM Right. Therefore it could be deduced that weather prevailed at the vicinity of ELATI at FL320.

2.5 Aids to Navigation:

Not applicable

2.6 Aids to Surveillance:

Automatic Dependent Surveillance – Contract (ADS-C) - Established as means of creating Air Situation Awareness in the provision of ATC Services in Oceanic Control Sector of the Colombo FIR.

2.7 Communication:

Flight crew communicated with Oceanic Control Centre via CPDLC and HF.

2.8 Digital Access Recorders:

The recordings of Digital Flight Data Recorder and Cockpit Voice Recorder were not required as the investigation to the incident required only data from the ATM systems, which was sufficient to conduct the investigation.

2.9 Organizational and Management Information:

2.9.1 Airport and Aviation Services (Sri Lanka) (Private) Limited

Airport and Aviation Services (Sri Lanka) Limited is the appointed Statutory Service Provider to provide Air Traffic Service, under the Civil Aviation Act No, 14 of 2010 as published in the Gazette No. 1727/12 dated 13 October 2011.

2.9.2 The Regulator, Civil Aviation Authority of Sri Lanka.

CAASL is responsible for the registration and issuance of certificate of airworthiness to aircraft, licensing of personnel, certification of air operators and continued post certification



surveillance. It is also responsible for the certification and surveillance of Aeronautical Service providers.

2.10 Additional Information:

Nil.

2.11 Useful or Effective Investigation Techniques:

Investigation conducted as per the procedures and techniques laid down in Accident Incident Investigation Manual

3 Analysis

3.1 Sequence of events from time Executive Controller Assumes duty

Time (UTC)	Observations
20:00	) Beginning of duty at OCP) Observed 9 active aircraft in the sector all connected to CPDLC
20:01	) QTR4J requested direct DUGOS due bad weather
20:03	) SIA469 Transferred from TMA to OCP) Total number of aircraft now increases to 10) UAE5CL request climb flight level 400(around position ELATI)
20:04	) UAE359 request climb flight level 360 (between position NISOK and SULEN)
20:05	) Accepts SIA469 transfer from TMA
20:06	) Unable for flight level 360 message sent to UAE359
20:07	) SIA535 passed position abeam TOPIN) UAE7DK within Colombo TMA, ADS coverage (aircraft transferred unable to verify)) 8 active aircraft in the sector all connected to CPDLC
20:08	) Unable for flight level 400 message sent to UAE5CL
20:09	) Unable higher level expect higher with Colombo Control, message sent to UAE5CL
20:12	) N360HP target accepted) Level not changed in target (strips indicate flight level 400 and flight level 430?)
20:13	) 10 active aircraft in the sector
20:14	) SVA823 requests 30 nautical miles right of track deviation
20:14:20	) N360HP target updates to flight level 430 and CLAM indication is displayed (this occurs without any intervention from the controller)
20:14:27	) SVA823 30 nautical miles right of track approved
20:16:42	) QTR4J requests deviation 10 nautical miles right of track
20:17:03	) QTR4J deviation approved
20:18	) Observed 12 active aircraft in sector 11 connected to CPDLC 1 on HF
20:18:13	) CLAM of N360HP corrected to FL430
20:18:39	) Accepts QTR54C descending flight level 300 and QTR34U at flight level 320



	)	14 active aircraft in the sector
20:19:32	)	UAE5CL given climb higher level flight level 400
20:19:52	)	QTR4J is clear of weather informed proceed direct DUGOS
20:21:52	)	QTR34U request weather deviation 30 nautical miles right of track
20:22:22	)	QTR54C request climb flight level 340
20:22:42	)	QTR34U deviation 30 nautical miles right of track approved
20:23:07	)	CLAM of QTR54C changed to flight level 340
20:23:11	)	Medium term conflict detection (MTCD) warning indicated on system message window, warning of proceeding QTR34U at flight level 320
20:23:23	)	QTR54C climb instructions given to flight level 340
20:23:30	)	QTR34U request to climb to flight level 340
20:23:33	)	Selects QTR34U from CPDLC menu and initiated “disregard” message
20:23:52	)	Observed ADS target update of QTR54C, still aircraft maintaining flight level 300
20:23:59	)	Sends maintain flight level 300 message to QTR34U
20:24:03	)	QTR54C sends WILCO message in acceptance of the Climb instructions given at time 20.23.23
20:24:46	)	Sends message “confirm maintaining flight level 300” to QTR34U
20:26:00	)	Realizes that the messages were sent to the wrong aircraft (QTR34U and not QTR54C)
20:26:33	)	Modifies the level displayed on the label, as FL300 of QTR54C
20:26:40	)	QTR34U responds via free text stating that they are maintaining FL320
20:27:40	)	Initiates an one-time position update for QTR54C
20:28:03	)	The update indicates that QTR54C has already climbed to FL340
20:28:26	)	Once again changes the aircraft label to indicate FL340
20:28:36	)	Measures the distance of the two aircraft (QTR54C and QTR34U) by the use of the RBL tool, the indicated distance was observed as 12.5 nautical miles.
20:28:38	)	QTR34U states once again that they are maintaining FL320 and if they can maintain the level.
20:29:21	)	Controller informs QTR34U to maintain FL320.

3.2 Description of incident

Clearance to Climb FL340, given to QTR54C, which resulted in a loss of separation. Both the Controllers failed to identify the required separation was not available for the climb to be initiated, the executive controller was unable to identify this by analyzing the strip board and had issued the approval to the CPDLC Controller to clear QTR54C for climb (as stated at the investigation interview). The ADS Controller had given the climb instructions to the aircraft without a proper analysis as a rated Controller herself, having access to the situational display where both traffic can be clearly observed as not having the required separation minima to execute such a level change.

The below Image (an excerpt of ASD recording), illustrates the breakdown of separation, where the required minima was 50Nm whereas in this instance it indicates the distance between aircraft positions was 8.9 Nm.



Figure 01: An excerpt of ASD recording which illustrates the breakdown of separation

On realizing the mistake, the ADS Controller had issued several corrective actions via CPDLC to make sure the aircraft did not climb. But the ADS Controller has sent all messages to the wrong aircraft (QTR34U). She did not realize this mistake until 3 to 4 minutes after sending the corrective messages, by which time QTR54C had already climbed and maintained level FL340.

ATM system supporting alert had not been used by the Executive Controller. ATM system decision making support tools had not been utilized at this time. ADS controller had done a probe but Executive Controller admitted that she didn't observe the resultant Medium Term Conflict Detection (MTCD) conflict alert.

ADS Controller in her actions initiated the probe for climb on MTCD but failed to monitor the system message which denoted a MTCD warning.



3.3 Analysis of the actions/ omissions /practices/ system discrepancies considered as contributory factors for the incident

3.3.1 Traffic handing over taking over Process at the Executive Controller Position at OCP Procedures in SLMATS require, the outgoing ATC brief the traffic Situation to the Incoming ATC and both the controllers are to be present for an initial overlapping period for a smooth transferring of controls.

Investigators could not collect enough evidence from the interviewees or other recording sources available at the ACC to confirm that there had been a comprehensive briefing session taken place between the two ATCs and if an overlapping period has taken place in this instance.

Only available information sources were the position detailing sheet which contains the signing of ATCs against the time slot they had been detailed. This signing does not indicate the actual physical presence as required prior to commence at the detailed time.

The need for such independent information source/s is highlighted especially in this scenario as the occurrence takes place at the 22nd minute from the recorded time of taking over of the OCP Controller involved.

3.3.2 Controller change over taking place amidst of the peak traffic Scenario or during the immediate preceding time period of the peak traffic scenario

The change over time as recorded at the position detailing sheets of the ATCs at ACC on 06th May 2022 was 0130hrs (LCL), i.e. Controller A, assume duties at 2200hrs(LCL) and hands over the position to Controller B at 0130 hrs.

The peak traffic occurrence at ACC under normal circumstance begins around 0100hrs and the introduction of an ATC during the period of the peak was a safety concern that had been pointed out by CAASL in previous occasions when investigating incidents that had occurred during the peak traffic. (Refer Letter dated 19/05/2016 AS/19/02/02). It is evident that the ATC Management has not implemented these recommendations, as a result of the changeover taking place during peak traffic the evidences available supports this to be a contributory factor to the incident.

3.3.3 Responsibilities of the OCP Controller and the ADS Controller.

Investigations clearly revealed that there was an uncertainty prevailing in the respective responsibilities of the OCP Controller and the ADS Controller.

More than the two individuals involved in the incident, the uncertainties of the exact span of responsibilities associated with the OCP Controller work position and the ADS Controller work position as clear instructions were not specified in the SLMATS.

CPDLC is the primary mode of communication between the OCP Controller and the Pilot in the oceanic sector and ADS-C is the information source that provide the information on the Air Situation to the OCP Controller.

ADS controller is entrusted to handle the ADS-C /CPDLC, acting as the human interface between the OCP Controller and Pilot similar to the arrangement taking place between the



OCP Controller and the HF operator who relays the instructions provided by the OCP controller to aircraft, and vice versa.

After assessment of the air situation from the flight progress strip board and augmenting the assessment from the ADS-C information available in the Air Situation display, it is the OCP controller who shall be carrying out the duties of deciding on the ATC clearances and instructing the ADS Controller for clearance delivery to Pilots using the CPDLC link. At the time of the incident, ADS Controller was delivering clearances to the aircraft which is supposed to be the clearances received from OCP Controller.

In this scenario, ADS Controller answers links from other controlling units and exchanges boundary information and boundary coordination which shall be the information used by the OCP Controller for decision making process. ADS Controller does the ATM system probes on the traffic scenario but does not observe the ATM system prompts providing information of the impending conflict and delivers clearances to aircraft.

OCP Controller also does not observe the ATM system prompts which is a decision support tool established at the ATM system.

It was a predominant observation that the bulk of the controlling tasks had been performed by the ADS controller who was not the executive Controller in this working arrangement.

During the interviews with the ATCs involved, it was noted by both the individuals that there was no clear cut task definition to the ADS Controller position. Further, both of them declared that, this kind of incident would not have happened if the OCP controller was handling the CPDLC link by herself, or the OCP controller was managing both the Executive controlling and the ADS/CPDLC component.

3.3.4 OCP Controller not making proper use of the flight progress strip board, information on ASD, and ATM system prompts for the decision making process.

At the Oceanic sector, decision making pertaining to the clearances to be issued to aircraft is made primarily through the assessment of the flight strip board which shall be updated by the OCP controller with the progress of flights through the airspace. Updating the flight progress strip is the main task of the OCP Controller. As published-in the SLMATS appendix 1 Part 5, 5.2 Strip Board Management, the executive controller has failed to analyze and manage the strip board prior to issuing the clearance to QTR54C to climb higher level.

The situational awareness acquired through the flight progress strip board is augmented through the information on the ASD and the prompts received through the ATM system decision support tools when manipulated.

In this instance, OCP Controller has failed to update flight progress strips in respect of the requests made by the aircraft for higher climb and failed to assess through the flight progress strip board the decision made, failed to acquire the information shown in the ASD to augment the decision made and disregarded the ATM system prompts or did not consider them for the decision made to climb the aircraft concerned.

The claim made by the OCP Controller which says, clearing QTR54C to effect a climb to F340 is a mistake, is not acceptable as a mistake. Because, if the prerequisites required at the



assessment of the level availability has been done, she shouldn't have missed the procedural constraint involved with the climb.

3.3.5 Failure to introduce North South sectorization when Sector Capacity is expected to be exceeded

As per the ATC instruction 1 of 2019, ATC Watch Manager is expected to make the decision on the introduction of the sectorization arrangement taking into consideration the expected traffic volume during the time period under consideration. The sector capacity calculated according to methods published in the SLMATS is a maximum of 14 aircraft per sector at any given time. The option of opening up a sector lies when the number of aircraft exceeds 12, but the ATCs on duty on this day had decided to keep operating in a combined sector. The present ATM system at ACC provides necessary decision support tools for ATC Watch Manager to make use of, in order to arrive at such a decision.

During the interview of the ATC Watch Manager, he stated that according to his observation at the time of allocating duty positions, he observed that the flight progress strips which were already available at that time was an indication to him that the Sectorization of North/South Sectors was not necessary and the indications were that most of the traffic was concentrated on the south sector. It is evident that the ATC Watch Manager had failed to properly analyze the traffic pattern in depth, to decide on the opening of the 2nd Sector in this instance as it was clearly evident during the investigation that there was an even distribution of traffic to both sectors.

3.3.6 Current duty Roster arrangements

The 24 hour shift arrangement came in to being at the ANSP during the COVID period when the Air traffic volumes continuously recorded very low counts. The basis for the introduction of 24hour shift was to maintain 3 separate ATC teams without any intermingling taking place among the teams to negate threats that may have posed for the continuity of ATC service due to mass COVID-19 infections.

The determinants based for the introduction of the 24hour shift is not present in the ATC environment. Traffic counts at the ACC has been steadily escalating to pre-COVID levels and so is the de-escalation of the COVID threat. Yet, 24hr shift continues with tired and fatigued human element being present at the ATM system delivering ATC service.

The incident referred has occurred at the beginning of the 18th hour after the ATCs involved had reported to work. This is despite both the ATCs claim that they have had adequate rest before assuming duties at their respective working positions and documentary evidence are available to support the claim.

Further, both ATCs involved in the incident admitted that during the 24hr shift, if heavy traffic situation is encountered during day time, they feel tired during night time.

3.3.7 Traffic Briefing for ADS Controller

The ADS Controller involved informed the investigators that there was no practice of traffic situation briefing taking place when assuming duties as the ADS controller position.

When the ADS controller is the person who handles CPDLC communication on behalf of the OCP controller, manipulates the ASD and carries out executive Controller's actions and



interactions with ATM system, a traffic situation briefing becomes an essential requirement. Any individual forming an integral element of the ATC service delivery and taking over from some individual who has been delivering integral element of the ATC service needed to be briefed of the status quo for the incoming individual to continue to discharge the service at the expected safety levels.

3.3.8 Insufficient training and currency in the ATM system.

Both ATCs involved in the incident admitted that exposure for the handling of the ADS/CPDLC communication took place only during on-the-Job Training phase of their Oceanic Control training. They were not provided with formal training on handling of the ADS/CPDLC communication.

However, considering the number of years both individuals have been exposed to the ADS/CPDLC system, it could be due to the ATCs not being current at working at high density traffic.

It was revealed that the handling of CPDLC messages by the ADS Controller involved was not at its acceptable form during the incident concern. Wrong call sign selection at the CPDLC link was the cause that the Controller could not take evasive action to the erroneous clearance.

CPDLC is the primary communication mode between the OCP Controller and the pilot. It replaced the previous arrangement of relaying instructions through the HF communicator beyond the VHF coverage. Majority of the present aircraft population traverses Colombo FIR are FANs 1/A equipped that has the capability of ADS/CPDLC communication. ICAO Doc.4444, Chapter 14: CPDLC communication Procedure and Appendix: 5 carries standard CPDLC Message templates and CPDLC system integrated to the ATM system with a unique interface facilitating Controller interaction and communication with pilots. Considering the importance of the CPDLC communication being the primary mode of delivery of clearance in the Oceanic Control sector it is important that the new entrants to the system are exposed to a formal Training on ADS/CPDLC Operation.

3.4 Rest Period /Fatigue

3.4.1 Executive Controller

The following table depicts how the Executive controller was assigned duty on 6th May 2022

Time period (Local)/ Working Position	Type of duty / Rest
08:45 to 10:45	2 Hrs as standby controller
10:45 to 12:45/ Tower	2 Hrs as active-duty controller
12:45 to 14:45 / FDP	2 Hrs as Active controller
14:45 to 16:45	2 Hrs Rest Period
The controller had a total of 2hrs rest period during the 8hr day time shift	
16:45 to 18:30 / OCP	1 Hr 45 mins active controller



18:30 to 01:30	7 Hrs of Rest allocated (Reported to have taken her feeding break, during this time period)
01:30 to 04:30 / OCP	3 Hrs active controller
04:30 to 08:45	4Hrs 15 mins of Rest
The controller had a total of 11hrs 45mins rest period during the 16 hr evening shift	

The Executive Controller in the interview stated that she was not detailed for duty for the preceding 7hrs and admits of having a sleep break between 2230-0130 LCL. She having woken 15 minutes prior to assuming duties claims of not being effected by sleep inertia.

When considering the statement made by the Executive Controller and her other environmental factors, it is unlikely for her to overcome sleep inertia within 15 minutes though the scientific evidence indicates normal sleep inertia can last 15 minutes to 4 hours.

The time period of overcoming sleep inertia varies from person to person according to their lifestyle, inappropriate rostering, and environmental factors including family commitments, stressors and staffing levels especially during night shifts. Instead of 15 minutes to 4 hours of sleep inertia, it may last more than up to 4 days if a person is having lack of proper restorative sleep which may affect the initiation of sleep and quality of sleep.

3.4.2 ADS/CPDLC Controller

The following table depicts how the ADS/CPDLC controller was assigned for duty on 6th May 2022

Time period (Local)/ Working Position	Type of duty / Rest
08:45 to 10:45 / Tower	2 Hrs as active-duty controller
10:45 to 12:45	2 Hrs Rest period
12:45 to 14:45 / Tower	2 Hrs as standby controller
14:45 to 16:45/ FDP	2 Hrs active controller
The controller had a total of 2hrs rest period during the 8 hr day time shift	
16:45 to 18:30	1 Hr 45 mins of Rest
18:30 to 20:15/ FDP	1 Hr 45mins active controller
20:15 to 0030	4Hrs 15 mins of Rest
00:30 to 02:30/ ADS	2Hrs active controller
02:30 to 08:15	5Hrs and 45 mins of Rest
08:15 to 08:45/ OCP	30 Mins active controller
The controller had a total of 11hrs 45mins rest period during the 16hr evening shift	



The ADS Controller on being questioned on tiredness when on continuous duty for 24 hrs commented that if the positions are changed, they do not get bored, but if the traffic is high at Tower Control there is a tendency to feel tired.

The position logs of the ADS Controller indicates that during her 8hr day duty turn she had a 2 hr rest, and immediately preceding her duty take over at 0030LCL , she has 4hrs and 15min rest out of which a sleep break of around 3hrs.

Considering the enclosed environment and the long period of work. When the incident occurred which was at the 18th hour since reporting for duty, the fatigue felt by the ADS Controller, could have been more excessive. The reason for her to miss the prompts provided by the ADS system tools on the safety risk of climbing the aircraft and the call sign confusion in sending the avoidance messages to the wrong aircraft may be attributed to fatigue.

3.4.3 Expert comments on the fatigue of the ATCs.

In conclusion the following could be mentioned; It was revealed that the ATC uses 24-hour rostering system presently which is not justifiable and causes more damage to the health of ATCs such as reduction of mental capabilities and impaired physical abilities including strength, speed, reaction time, coordination and decision making. This impairment has a direct impact on the air traffic control duties of the individual.

An optimal roster shall be promulgated, based on ICAO and CAASL requirements as per the IS 096.

3.5 Non-reportage of the Mandatory Occurrence.

Both ATCs involved had failed to report the occurrence to CAASL. It is a violation of the provisions stipulated in Section 3.3 of Implementing Standard 006. The ATCs have not reported the incident to ATC Watch Manager or Senior Manager In-charge of ACC (SMATC/ACC) as revealed during the interviews. Subsequently, the incident had been reported to BIA Tower by the Qatari Airlines and SMATC/ACC has taken the OCP Controller away from ATC operations, pending local investigation within.

Failure to report such incidents indicates the lack of knowledge of the controllers regarding the regulations in place. SMS audit conducted in 2021, SMS manual acceptance and continuous SMS inspections have repeatedly informed the ATCs to conduct internal awareness programs to staff to educate the importance of SMS and especially the requirement and importance of maintaining a reporting culture.

ACC is a unit that is under the purview of the ATS Safety Management System approved by DGCA. ATS Safety Management system is implemented through the Safety Management Manual approved by DGCA.

Creating awareness among the ATCs on the Safety Management Manual for effective functioning of the safety management system was a recommendation that had been made by CAASL at the acceptance of the Manual.

The ATCs involved have failed to report a reportable occurrence as per the SMS manual of ATS. It was revealed that the non-reportage was a coordinated attempt by the two ATCs



involved to suppress the information on the incident being known to the ATS Occurrence reporting system as well as to the Mandatory Occurrence Reporting System at CAASL.

4 Conclusion

4.1 Findings

- I. Failure to report the incident by duty controllers who were responsible of the incident to the AASL senior management, which is a non-compliance to provisions stipulated in ATC Safety Management System approved by CAASL.
- II. Failure to report the incident by duty controllers/ Senior Management to CAASL which is a mandatory requirement as stipulated in Implementing Standard 006.
- III. Non-Availability of evidence of exact time of reporting for taking over duty on console, and lack of evidence of overlapping times for briefing prior to taking over duty on console.
- IV. Non availability of a mechanism to monitor/observe whether the said procedures have correctly taken place to ensure and maintain the required standard of safety in an Air traffic Control Centre were found to be lacking, to the extent where the investigation could not verify the coordination between the Executive Controller and the ADS Controller.
- V. Duty Change over time.
The incident had occurred at a time where peak traffic exists.
- VI. Lack of usage of safety features provided in the ATM system for decision support.
- VII. Failure to update, manage and utilize the Flight progress Strip board for decision making.
- VIII. Failure to implement sectorization in the OCP when sector capacity had reached the sectorization requirement.
- IX. Fatigue due to excessive duty hours.

Though the ATM management justifies the rostering pattern claiming inbuilt rest period, which is expected to eliminate fatigue of ATCs working on shift duties, the latest research findings which are elaborated in the ICAO DOC9966, clearly states the night shift exceeding 10hrs will cause fatigue in ATCs.

- X. Lack of definition in the responsibilities and duties of the ADS position and OCP position.



4.2 Probable cause(s)

- I. Failure to observe fundamental procedures in ATC which is to scrutinize prevailing traffic conditions prior to authorizing level changes.
- II. The two ATC controllers on duty at the oceanic control sector not having clearly defined responsibilities.
- III. Fatigue causation due to long duty period.

5 Safety Recommendations

- I. Two ATCs involved in this incident shall undergo;
 - a) 3 day training program at the SLAAA covering all theoretical and practical aspects required to work as an ADS/CPDLC and an oceanic controller at the OCP of Colombo ACC.
 - b) OJT, targeting the peak traffic times at the ACC (Including both night and day turns) under Watch Managers or suitable senior controller for a total of 30 OJT hours each,
 - c) on completion of above(a & b)Final Performance Check/Observation conducted by a suitable Panel appointed by the Head of ANS and shall submit the results for the approval of CAASL prior to re-detailing both controllers for independent duties at OCP and/or ACP Controller Working Positions (CWPs) at ACC.
- II. AASL shall do away with the existing practice of 24hour shift immediately to redefine and implement shift lengths in compliance with implementing Standards 96 (ISO96 - Fatigue Risk Management in ATC) issued by CAASL.
- III. AASL shall re-designate the change over time of ATCs at OCP at the night shift such that an adequate lead time of handling traffic is made available for the incumbent Controller who would be encountering traffic peak to experience the developing traffic scenarios leading to the peak. Appropriately, the change over time should not be less than 45 minutes prior to the time the peak traffic is anticipated.
- IV. Sectorization of the ATC units - with the increase in the number of aircraft following the pandemic period, the ATC centers shall follow the sectorization procedures as stipulated in the respective UOIs and ATC instructions, when it is considered that the sector capacity is expected to exceed the defined number of aircraft.
- V. It is recommended to ensure that the ATCs who are expected to take on the Controlling duties after a nap/sleep break, shall be awake at least 15 minutes prior to reporting at the controller work position for briefing by the outgoing controller. This recommendation is made to mitigate the safety hazard that may be caused due to sleep inertia being prevalent at the time of taking over.
- VI. It is recommended to introduce specified overlapping time (appropriate time period not less than 15 minutes) between the handing over ATC and taking over ATC



- VII. The responsibilities and duties of the ADS position (ADS/CPDLC Controller) and OCP position shall be redefined and updated, The ADS position, when operating in tandem with OCP controller, shall be categorized only as an 'Assistant' position. The Assistant shall purely be involved ONLY in coordination duties. All Air Traffic controlling activities including the CPDLC manipulation shall be vested with the OCP Controller.
- VIII. It is recommended to develop methods of identifying fatigue of ATCs by having fatigue safety action group or merging the fatigue related indicators to the existing ATC safety team.
- IX. SLMATS shall be updated to include the above specified overlapping time of duties when the working position is handed over to the incoming Controller. Further institutionalize the requirement of signing of the duty log position to indicate the exact time of handing over of duty by the outgoing controller.
- X. It is recommended to establish background recording devices to cover each and every duty position at the ACC. Priority shall be accorded to fixing background recording devices to the Oceanic Sector of the ACC.

The recommendation is made in view of non-availability of vital conversations and coordination between the duty ATCs which is a prerequisite to re-construct the incident occurrence scenario. Implementing such will facilitate the availability of independent evidences required for ATM investigations.

- XI. It is recommended to introduce a separate training module on ADS/CPDLC communication for the training curriculum ICAO 053- Area Control (Procedural) competency training. This module shall incorporate at minimum, creating awareness of the standard message template in the CPDLC communication, awareness on the handling of ADS/CPDLC component of INTELSCAN ATM System at ACC and the standard /best practices in CPDLC communication (e.g. Select C/S , enter message, recheck C/S, send message).
- XII. During the OJT period of trainees at the Oceanic Control, sessions involving the usage of correct procedures while working with ADS, use of 'PROBE' function to obtain ATM system support for the decision making and the reading and responding ATM system generated safety Alerts/messages are mandatory at minimum to be imparted to the trainee.
- These sessions shall be separately documented and the records of such shall be incorporated in the OJT files which would be a mandatory pre-requisite to be considered for the competency assessment.
- XIII. It is recommended to conduct awareness program to all ATC staff of reporting of incidents and how reporting will improve the safety of the ATS system. The records of participation to the awareness program shall be forwarded to CAASL.



- XIV. It is recommended to display all mandatory reportable occurrences as per IS006 & ATS SMS Manual in a suitable format at each ATC Center facilitating as a reminder for ATCs to do the necessary reporting in case of occurrence of such events.