



FINAL REPORT

Incident of Loss of Standard Minimum Separation between ALK122 and FDB1026 at Bandaranaike International Airport, Katunayake, Sri Lanka on the 9th of January 2024

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GLOSSARY OF ABBREVIATIONS USED IN THIS REPORT

AASL	Airport and Aviation Services (Sri Lanka) (Private) Limited
ATPL	Airline Transport Pilot License
ACC	Area Control Centre
ALK	Sri Lankan Airlines Limited
ATCO	Air Traffic Controller Officer
BEA	Bureau of Enquiry and Analysis for Civil Aviation Safety
CAASL	Civil Aviation Authority Sri Lanka
CPL	Commercial Pilot License
CRM	Crew Resource Management
DGCA	Director General Civil Aviation
ELPC Level	English Language Proficiency Course Level
FDB	Fly Dubai
FIR	Flight Information Region
FL	Flight Level
FZ	Fly Dubai
GCAA	General Civil Aviation Authority
Hrs	hours
IFR	Instrument Flight Rules
IR/MPA	Instrument Rating /Multi-pilot aeroplanes
IS	Implementing Standards
LT	Local Time
PIC	Pilot-in-Command
QAR	Quick Access Recorder
SID	Standard Instrument Departure
SLAF	Sri Lanka Air Force
TCAS	Traffic Alert and Collision Avoidance System
UAE	United Arab Emirates
UTC	Coordinated Universal Time
VCBI	Bandaranaike International Airport, Katunayake, Sri Lanka
VRMM	Male International Airport, Maldives
VOMM	Chennai International Airport, India
VHF	Very High Frequency



Incident of Loss of Standard Minimum Separation between ALK122 and FDB1026 at Bandaranaike International Airport, Katunayake, Sri Lanka on 9th of January 2024

SYNOPSIS

The incident involving the loss of standard minimum separation between aircraft ALK122 and FDB1026, which occurred on 9th January 2024, was reported to the Civil Aviation Authority of Sri Lanka (hereinafter referred to as the 'Authority') by the ATCO involved in the incident through a mandatory occurrence report on the same day.

The Authority appointed a team to investigate the incident with the objective of preventing the recurrence of similar events. The incident was also reported to the General Civil Aviation Authority (GCAA) of the United Arab Emirates, being the State of Registry and the State of the Operator for one of the aircraft. Additionally, the Bureau of Enquiry and Analysis for Civil Aviation Safety (BEA) of France was notified, as it is the State of Manufacture for the aircraft involved in SriLankan Airlines flight ALK122.

Accordingly, accredited representatives were appointed by both the GCAA of the UAE and BEA-France.

The investigation, led by an investigation team appointed by the Authority, has highlighted critical factors contributing to the breach of separation standards, particularly focusing on the actions of the Pilot-in-Command (PIC) of FDB1026 and the ATC involved with the incident.

The sequence of events leading to the loss of Standard Minimum separation began with explicit instructions issued to the PIC of FDB1026 by Colombo Approach Control. These instructions mandated adherence to the Standard Instrument Departure (SID) procedure. The initial clearance was provided before aircraft startup, followed by a reaffirmation at 05:54:22 UTC when FDB1026 was identified by Radar for the provision of Air Traffic Control Service and cleared to ascend to flight level 240 via the SID. The PIC confirmed understanding of this directive at 05:55:24 UTC.

1 FACTUAL INFORMATION

1.1 History of the flight

On 9th Jan 2024, FDB1026, which was a scheduled flight from Bandaranaike International Airport, Katunayake, Sri Lanka (VCBI) to Male International Airport, Maldives (VRMM) was issued clear instructions by Colombo Approach Control to follow the Standard Instrument Departure procedure, a routine directive designed to ensure the safe and orderly climb of aircraft. These instructions were communicated twice: first, during ATC clearance prior to engine start-up, and later when the aircraft was re-cleared to flight level 240. The PIC of FDB1026 confirmed receipt of these instructions by reading back the clearance to the controller.

However, the aircraft subsequently failed to comply with the vertical restrictions mandated by the SID, resulting in a critical situation of reduced separation from another aircraft, ALK122, which was



also operating under Instrument Flight Rules (IFR) originated from Chennai International Airport, India (VOMM) to Bandaranaike International Airport, Katunayake, Sri Lanka (VCBI).

As the loss of separation developed, the air traffic controller responded by providing traffic information to both aircraft. FDB1026 acknowledged the information; however, the aircraft had already climbed to an altitude of 4,300 feet, triggering the Short-Term Conflict Alert (STCA) in the Air Traffic Management (ATM) system. At the same time, ALK122 maintained an altitude of 5,000 feet, marking the point where the separation breach occurred.

1.2 Personnel information

1.2.1 Pilot-In-Command

- Validity of licences and ratings: A Valid ATPL Licence (ATPL-A- 71694) issued by the Director General of GCAA-UAE
- Ratings.Certificates and Privileges : IR/MPA ; B737 300-900
- Age: 42
- flying experience (total hours) 5810:09 (FZ) , 9,891 (Total)
- flying experience with types flown and hours on type / P1 4422:26 (FZ) , 6,603 (Total)
- hours flown;
 - in the last 24 hours : OFF (last 24hrs)
 - 7 days prior to the incident:32:00 (7 Days prior)
- duty time and rest periods in the 48 hours prior to the incident

Mon, 01 Jan	Tue, 02 Jan	Wed, 03 Jan	Thu, 04 Jan	Fri, 05 Jan	Sat, 06 Jan	Sun, 07 Jan	Mon, 08 Jan	Tue, 09 Jan
OFF R	OFF R	M 713 F	M 1937 T	M 183 T	OFF	1025L TP	==> TP	==> TP

- last medical checks: 19.04.2023

1.2.2 First Officer

- Validity of licences and ratings: A Valid CPL Licence (CPL-A- 115863) issued by the Director General of GCAA-UAE
- Ratings.Certificates and Privileges : IR/MPA ; B737 300-900
- Age: 32
- flying experience (total hours) : 332:54(FZ) , 564:34 (Total)
- flying experience with types flown and hours on type / P1 99:05 (previous flying)
- hours flown;
 - in the last 24 hours: OFF (24hrs)
 - 7 days prior to the incident: 22:40 (7Days prior)
- duty time and rest periods in the 48 hours prior to the incident

Mon, 01 Jan	Tue, 02 Jan	Wed, 03 Jan	Thu, 04 Jan	Fri, 05 Jan	Sat, 06 Jan	Sun, 07 Jan	Mon, 08 Jan	Tue, 09 Jan
OFF P	M 947 t	M 707 t	OFF P	OFF P	OFF P	1025L t P	==> t P	==> t P



- last medical done: 02.09.2023

1.2.3 Air Traffic Controller

ATC License Number: Valid ATC/132 issued by the DGCA Sri Lanka.

License Validity : 25.08.2023 to 24.08.2025

Ratings Validity :

1. Aerodrome Control Rating

- a. Katunayake 29.03.2024 to 12.03.2025
- b. Ratmalana 29.03.2024 to 12.03.2025
- c. Mattala 29.03.2024 to 12.03.2025

2. Approach Control Procedure Rating

- a. Katunayake 29.03.2024 to 12.03.2025
- b. Ratmalana 29.03.2024 to 12.03.2025

3. Area Control Procedural Rating: 29.03.2024 to 12.03.2025

4. Approach Control Surveillance Radar Rating: 29.03.2024 to 12.03.2025

5. Area Control Surveillance Radar Rating: 29.03.2024 to 12.03.2025

6. ELPC Level 05 Valid until 27-07-2026

1.3 Communications

The flight crew of both flights were established on two way communication with Colombo Approach Control Centre on frequency 132.4MHz.

1.4 Flight recorders

DFDR analysis report was sent by the GCAA-UAE to the investigation team for the investigation. Raw data of QAR of ALK 122 was shared with BEA and analysis report was obtained.

1.5 Organizational and management information

1.5.1 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 13th October 2011.

1.5.2 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 and continued post certification surveillance of air operators and Aeronautical Service providers. It is also responsible for the initiation of aircraft accident and incident investigations within the territory of Sri Lanka.

2 ANALYSIS

1. The analysis made on Surveillance data and VHF recordings pertaining to the occurrence, the investigation team found that the PIC of FDB1026 had not followed the instructions issued by the Air traffic controller at Colombo approach Control Centre and that is identified as the main causal factor for this occurrence.
2. The flight FDB1026 has been issued with clear instructions to follow the Standard Instrument Departure Procedure SID/LALUM2D for Runway 04 at two instances. Once at the time of issuing the ATC clearance prior to start up and secondly, at time 05:54.22(UTC), when the aircraft was identified by the Approach Surveillance Controller for the provision of ATC services. Instructions issued was to Climb to Flight Level 240 via the SID which the PIC of FDB1026 read back at time 05:55.24(UTC). The phrase “Climb via SID” as published, denotes that the Pilot shall comply with published level restrictions, speed restrictions applicable to SID while complying with lateral profile of the SID. Pilot had complied with the lateral profile of the SID but had failed to comply with the vertical restrictions associated with the SID. In the process FDB1026 has climbed above 4000ft prior to waypoint BI901 violating the restriction imposed to remain at or below 4000ft passing way point BI901.

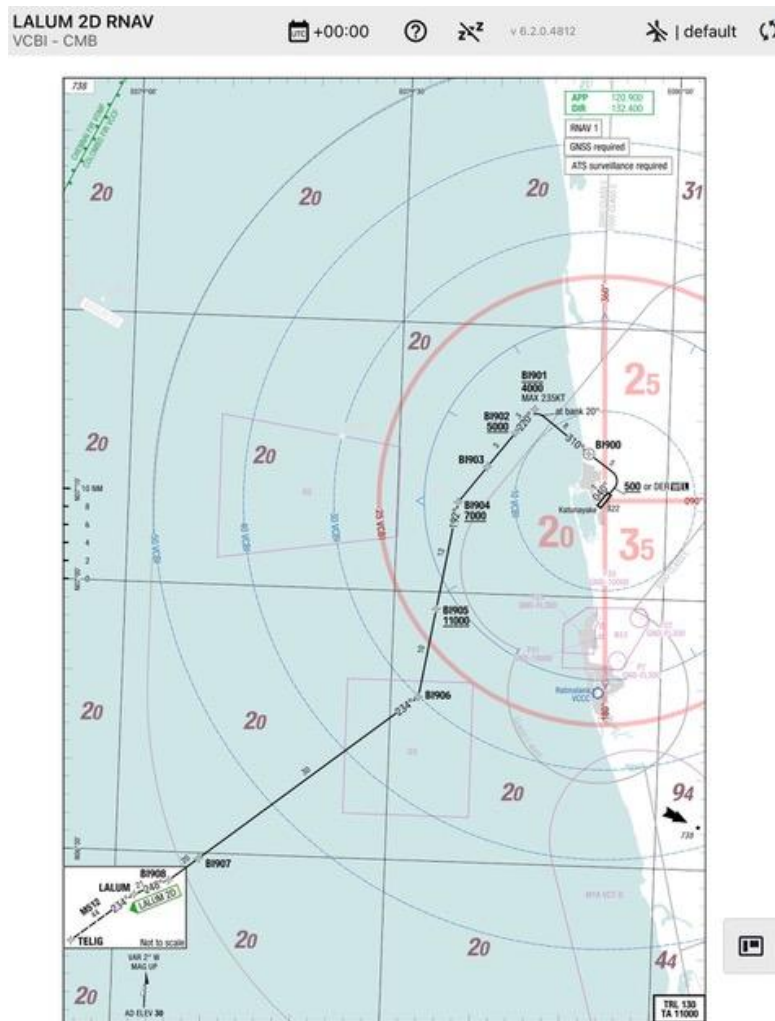


Figure 01 : Standard Instrument Departure Runway 04 of VCBI



3. According to the Air Safety Report submitted by the flight crew of FDB1026, it was indicated that the Approach Controller did not mention the phrase 'VIA SID' at the clearance to climb at first contact with the Approach Control Centre. However, audio recordings of the occurrence confirmed that the ATCO did, in fact, include the phrase 'VIA SID' when clearing FDB1026 to FL240 during the first contact.
During the Pilot in Command's (PIC) interview, he confirmed that the departure clearance received from ATC was clear and well understood, including the intermediate altitude constraints. Nevertheless, the flight crew mentioned that they had internally discussed these constraints (such as step climbs or altitude restrictions at specific waypoints), as such constraints were not commonly encountered in their regular operations.
4. It was further revealed that despite the ATC explicitly instructing "climb via SID" after departure, the flight crew had disregarded the constraints, resulting in a TCAS activation. This incident highlights a non-compliance by the flight crew to ensure clarity and safe execution of standard operating procedures. Adhering to standard operating procedures, maintaining unambiguous communication, and verifying ATC instructions are essential to prevent such occurrences. Furthermore, effective Crew Resource Management (CRM) plays a crucial role in fostering sound decision-making and enhancing situational awareness during operations. In which adhering to standard operating procedures, maintaining clear communication, and verifying ATC instructions are critical to avoiding such types of occurrences. Additionally, proper CRM plays a vital role in fostering effective decision-making and situational awareness during these operations.
5. The ATCO had cleared the incoming ALK122 on a Direct Track to BI172 to Join the Standard Arrival Route (STAR/ SAGOR2A for Runway 04) and a descend being provided to altitude 5000ft with the expectation that FDB1026 would comply with 4000ft and below, the restriction imposed in the SID so that she would achieve the standard vertical Separation of 1000ft between the aircraft when they are crossing each other and until the required surveillance separation of 5NM are achieved between the aircraft.
6. The investigation revealed that the Controlling strategy adopted by the ATC was not the correct strategy to be adopted for the separation of the two aircraft concerned given the positions of the two aircraft, when the clearance were issued. Considering lateral tracks followed by the aircraft, the investigation revealed that such controlling action would not have guaranteed 1000ft vertical separation between the two aircraft before the lateral separation minima of 5NM is established between them. The intended separation should have been achieved if and only if, FDB1026 aircraft is cleared to climb up to 4000ft. The Investigation team was conclusive of the involved ATCO causing judgmental error on the controlling strategy adopted.
7. The ATCO has provided the traffic information to both the aircraft when they are approximately 10NM apart. This action was considered as inappropriate to the context as both



the aircraft were flying on IFR flight plans. However, the apparent expectation of the ATC was that FDB1026 would comply with the climb restriction 4000ft or below at BI901 and the traffic information provided would have augmented the perceived expectation.

8. Flight FDB1026 was given traffic information of ALK122 at time 05:55.32(UTC) and the completion of the acknowledgement of the receipt of traffic information by the PIC of FDB1026 at time 0555.46(UTC). During that time the aircraft was observed to be climbing, indicating 4300ft Mode C reading at the surveillance display way before BI901. At 05:55.53(UTC) FDB1026 confirmed with the ATC the Altitude he had been cleared to. At this instance too Controllers expectation that FDB1026 would comply with the restriction was evident when she gives the same instruction for the 3rd time to Climb via the SID to Flight Level 240. However, considering the Mode C tolerance values on surveillance data, it verifies that the aircraft was passing 4000ft on Climb profile on that instance.
9. At 05:56.11(UTC) observing the vertical profile of the aircraft, the ATCO instructs the FDB1026 to maintain 4000ft and FDB1026 did not respond to the instruction and she continued to raise the aircraft for another two times and FDB1026 did not respond. She stopped raising the aircraft thereafter considering that the aircraft was following TCAS RA, given the depicted traffic scenario on the surveillance display.
10. At 05:56.28(UTC), FDB1026 confirmed carrying out TCAS RA procedure and that instance the aircraft are 1.2NM apart, ALK122 was crossing in front of FDB1026 with a vertical displacement of 200ft.
11. The flight FDB1026 has not adhered to vertical restrictions of the LAUM2D despite repeated instructions made by the ATCO and the ATCO has failed to issue timely instructions to prevent the occurrence. The ATCO's incorrect judgment on the traffic scenario and belated action in taking alternate evasive action of issuing instructions for FDB1026 to stop climb at 4000ft, and also not selecting the most appropriate phraseology to convey the instructions on to the merit of the intense scenario were revealed as contributory factors for not achieving desired results in the context.
12. It was revealed that the ATCO has been distracted by the continuous buzzer from SLAF Communication Link during exact moments she was required to have the highest concentration on the traffic scenario. It was noted that the Monitoring Controller at P1 was present at the time of the occurrence and has not responded to the situation in the manner expected by relieving the ATCO of responding to a Communication link during the delicate moment. Investigation team highlighted the need for the clear demarcation of responding responsibilities to the communication links when the Active Controller and the Monitoring Controller discharges the service in tandem.
13. It was observed that the duty Controllers at Approach Control Centre have exceeded the prescribed operational duty time limitation published in IS 096. The limitation is stated as, no period of operational duty of an ATCO shall exceed 2 hours with exceptions. The ATCO



concerned has commenced her duty at 0830hrs LCL at P1 position and has continued to work for 02hrs and 45mins at the position prior taking over Active Controller duties in sequence at R1 position at 1115hrs LCL. The occurrence has taken place at approximately 11minutes in to her duty time at R1, the Active Controller position. At the time of the occurrence she has recorded 02hours and 56 minutes of continuous work and was scheduled to work for 05hrs and 20minutes continuously before being relieved of the operational duty. IS 096 prescribes, a break of 30 minutes as minimum during or at the end of an operational duty. There were 03 ATCOs detailed to carryout operational duties during the period of 0830hrs to 1645hrs. The duty detailing at the Approach Control Centre has place taken place violating the duty lime limitations prescribed by IS 096.

14. As per the PIC of SriLankan Airlines flight ALK122 involved with this occurrence had not noticed a Traffic Advisory Alert on the TCAS during the scenario. However, further analysis based on QAR data conducted in collaboration with the aircraft manufacturer confirmed that a Traffic Advisory alert was indeed triggered during the incident and lasted for 46 seconds, contrary to the PIC's statement.

Additionally, a TCAS functional test, as per AMM 34-43-00-720-802-A and TCAS test report (Maintenance System Report) were performed by SriLankan Airlines. The test results confirmed that the TCAS system, including the antenna, was operating satisfactorily.

3 CONCLUSIONS

3.1 Findings

The investigation revealed the following:

1. The flight crew had valid licenses and medical certificates.
2. The PIC of FDB1026 had failed to follow the instructions issued by the Air Traffic Controller at Colombo Approach Control Centre and that is identified as the main causal factor for this occurrence.
3. PIC of FDB1026 while complying the lateral profile of the the SID/LALUM2D has failed to comply with published vertical profile, ie. level restrictions, speed restrictions applicable.
4. The aircraft were placed 1.2NM apart when ALK122 was crossing in front of FDB1026 with a vertical displacement of 200ft not meeting the standard minimum separation criteria either lateral or vertical dimension.
5. Controlling strategy adopted by the ATC was incorrect. The controlling action deployed would not have guaranteed 1000ft vertical separation between the two aircraft before the lateral separation minima of 5NM is established between them. Given the spacial lateral positioning of the two aircraft involved at that time, the intended separation should have been achieved if and only if, FDB1026 aircraft was cleared to climb up to 4000ft. Provison of traffic information to both the aircraft when they are approximately 10NM apart is found to be inappropriate to the context as both the aircraft were flying on IFR flight plans. These action provide clear evidences of a judgemental error on the involved ATC's perspective.



6. ATCO has failed to issue timely instructions to prevent the occurrence. Further, not selecting the most appropriate phraseology to convey the instructions considering the merit of the intense scenario is a contributory factor that has led to not achieving desired results.
7. ATCO was distracted by the continuous buzzer from SLAF Communication Link during exact moments she was required to have the highest concentration on the traffic scenario.
8. Monitoring Controller did not respond to the situation in the manner expected by relieving the ATCO of responding to a lesser priority Communication link.
9. There is no clear demarcation of responding responsibilities to the communication links when the Active Controller and the Monitoring Controller discharge the service in tandem.
10. At the time of this occurrence the ATCO has exceeded the prescribed operational duty time limitation published in IS 096.
11. The ATCO has been detailed to work continuously for 05hrs and 20minutes continuously before being relieved of the operational duty.
12. The duty detailing at the Approach Control Centre has taken place violating the duty time limitations prescribed by IS 096.
13. It was found that there was a lack of situational awareness on the part of the flight crew.

3.2 Causes

1. Pilot Non-Compliance: The failure of the PIC of FDB1026 to adhere to ATC instructions raises questions about decision-making authority and situational awareness in high-pressure environments. As outlined in aviation regulations, the PIC holds ultimate responsibility for flight safety and must comply with operational procedures unless safety dictates otherwise.
2. Judgmental Error- The perceived expectation of the ATC that FDB1026 would continue to adhere to the vertical profile of the SID, despite the data depicted on the actual vertical profile of the aircraft predicted otherwise. Further, expecting the required minimum separation would be achieved through the spatial profile displacement of the aircraft which would not warrant the ATC intervention to resolve.
3. ATC Communication Dynamics: The effectiveness of communication between ATC and pilots is crucial for maintaining safe separation. In this incident, distractions within the ATC environment have compromised the controller's ability to manage traffic effectively.

4 SAFETY ACTIONS

- I. Considering circumstance that ATCO has made incorrect judgment of the scenario and belated action in taking alternate evasive action of issuing most appropriate instructions avert the situation, a refresher training on surveillance services which shall include and but not limited to the following were recommended to the involved ATCO:
 - Use of ATS surveillance systems in ATC services
 - Short term conflict alert (STCA) procedures
 - PBN RNAV SID STAR operations



- Standard clearances for arrival and departing aircraft and associated phraseologies
- Practical assessments at the ATC simulator.

The concerned ATCO successfully completed the above training, and the evidence was evaluated by the Investigation Team, which found it to be satisfactory.

5 SAFETY RECOMMENDATIONS

- I. The Air Navigation Service Provider shall take immediate measures to implement the prescriptive Limitations on ATC duty shift Rostering at Approach Control Centre and also within shift ATC detailing as per prescribed limitations of IS 096.
- II. The Air Navigation Service Provider shall take immediate actions to demarcate the responding responsibilities to the communication links when the Active Controller and the Monitoring Controller discharges the service in tandem at the Approach Control Centre BIA. This recommendation is expected to facilitate Active Controller's highest concentration to the controlling traffic scenario, without the individual being distracted for responding to all the Communication links during the tenure of Active Controller duties.
- III. Review Current Training Programs that emphasize adherence to ATC instructions and situational awareness for both pilots and Air Traffic controllers.

- END -