International Civil Aviation Organization

MIDANPIRG/23 & RASG-MID/13 Meetings

(Cairo, Egypt, 14 – 18 June 2026)

Agenda Item 5.6: ATM-SAR

OPERATIONAL IMPACT OF THE CURRENT REGIONAL AIRSPACE CRISIS ON MUSCAT FIR ATM OPERATIONS

(Presented by Sultanate of Oman)

SUMMARY

This paper presents Oman's experience in managing the operational impact of the current Middle East airspace crisis on Muscat FIR. Although Muscat FIR remained operational, airspace closures, restrictions, and uncertainty in neighbouring FIRs significantly affected traffic flow patterns, routing structures, coordination requirements, diversion handling, airborne holding, tactical flow management, and ATS unit workload.

The paper also highlights the redistribution of traffic across key interface points, the contingency actions taken by Oman, lessons learned, and proposed measures to strengthen regional contingency coordination, and ATM system resilience.

Action by the meeting is at paragraph 3.

REFERENCE

- Annex 11- Air Traffic Services
- PPT04- Oman Contingency Arrangements during Airspace Closure, ICAO SCM and RACF Workshop, February 2026
- ICAO MID Region ATM Contingency Framework (RACF), Version 1.0
- ICAO MID Monthly Report, March 2026
- ICAO MID Monthly Report, April 2026
- Oman CAA traffic data, January–May 2026

1. INTRODUCTION

1.1 The Middle East region has experienced significant airspace disruptions due to the prevailing regional security situation, resulting in airspace closures, restrictions, and operational uncertainty across several FIRs. Although Muscat FIR remained available for civil aviation operations, the situation affected traffic flows, routing structures, coordination requirements, and tactical ATM within Oman airspace.

1.2 Muscat FIR became an important southern and eastern routing option for operators avoiding closed, restricted, or high-risk airspace. The impact on Oman therefore extended beyond traffic volume changes and included traffic redistribution through alternative interface points, increased coordination, diversions, airborne holding, route/level constraints, and higher ATS workload.

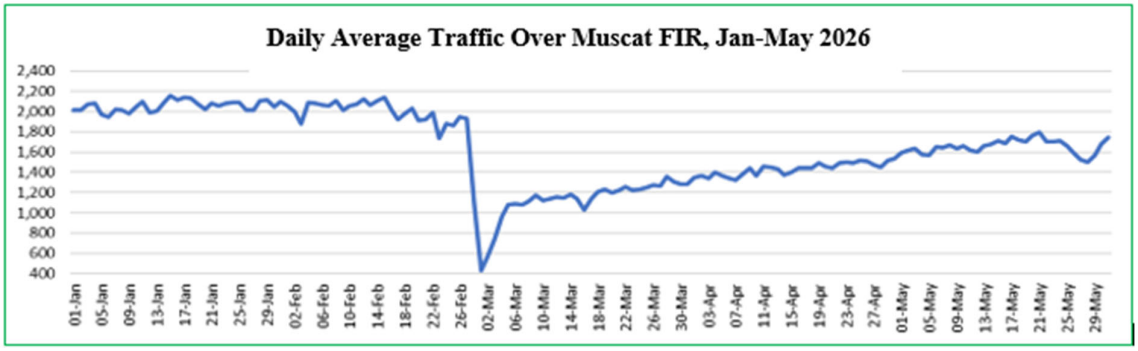
1.3 The operational experience gained from the regional airspace crisis in 2025, including the Pakistan and Iran airspace closures, provided an important foundation for Oman's response to the

current crisis. However, the February–May 2026 situation further highlighted the need to strengthen contingency arrangements, real-time regional coordination, ATM system resilience, and harmonized crisis response mechanisms within the MID Region.

2. DISCUSSION

2.1 Traffic impact in Muscat FIR

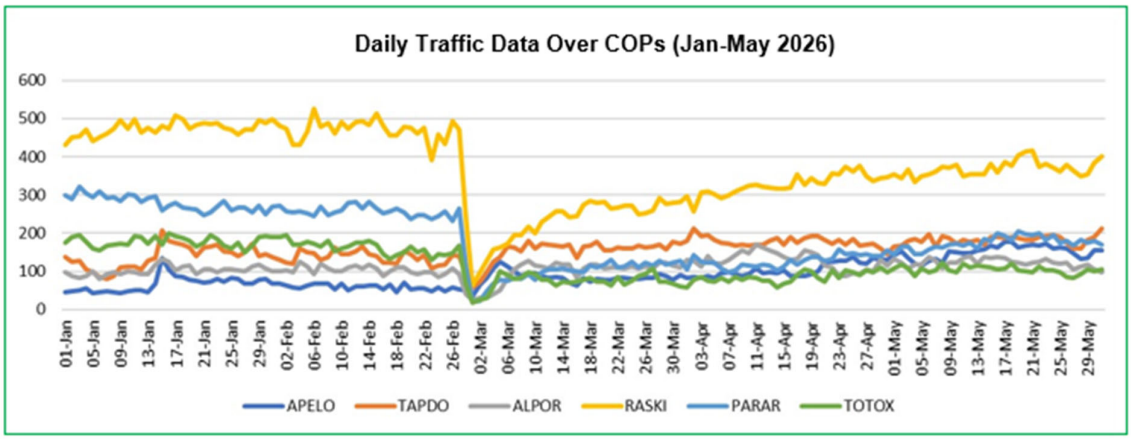
2.1.1 Compared with the January 2026 baseline, the average daily traffic in Muscat FIR decreased from 2,057 flights per day in January to 1,125 flights per day in March, representing an approximate 45.3 per cent decrease. Traffic subsequently recovered to 1,434 flights per day in April, but remained approximately 30.3 per cent below January, and further recovered to 1,655 flights per day in May, still approximately 19.5 per cent below the January baseline.



2.1.2 The data indicates that the initial phase of the crisis generated a major reduction in traffic volume, followed by gradual recovery as operators adjusted routings and regional traffic flows stabilized. However, Muscat FIR traffic had not returned to normal pre-crisis levels by the end of May 2026.

2.2 Traffic redistribution at Mumbai and Karachi interface COPs

2.2.1 The crisis produced a clear redistribution of traffic across the Mumbai and Karachi interface COPs. RASKI, PARAR and TOTOX, which were important normal traffic flows in January 2026, reduced significantly during March. RASKI decreased by approximately 51%, PARAR by 65%, and TOTOX by 58% compared with January. Although all three COPs gradually recovered in April and May, they remained below the January baseline by May, with RASKI approximately 22% lower, PARAR 37% lower, and TOTOX 41% lower.



2.2.2 In contrast, traffic progressively shifted towards TAPDO, ALPOR and APELO.

TAPDO increased continuously, reaching approximately 33% above the January baseline by May. ALPOR increased by approximately 25% in April and 21% in May, while APELO became the most significantly increased COP in May, rising by approximately 56% compared with January.

2.2.3 Overall, the crisis resulted in a major redistribution of traffic across the interface COPs, requiring enhanced monitoring of alternative flows, close coordination with adjacent FIRs, and flexible tactical flow management.

2.3 Operational impact on Muscat FIR Enroute Operations

2.3.1 Traffic normally using central Middle East corridors was dynamically redistributed through available southern routing structures. Certain entry/exit points and ATS routes became unavailable, restricted or operationally constrained due to airspace closures, military activities and contingency measures implemented by affected States. In response to operational demand and requests from adjacent FIR authorities, selected routes within Muscat FIR were temporarily converted to bidirectional operations.

2.3.2 During sudden airport closures and temporary operational suspensions in neighbouring airspace, airborne aircraft required tactical holding, rerouting, diversion support or return-to-departure coordination. Oman supported regional contingency operations by establishing temporary enroute holding patterns along the UAE-Oman FIR boundary and, when the initial holding arrangements were assessed as insufficient, by establishing additional four enroute holding patterns within Muscat FIR to improve traffic management flexibility.

2.3.3 The closure, restriction or avoidance of several regional airspaces compressed traffic into fewer usable corridors, increasing traffic-flow complexity within Muscat FIR and at adjacent FIR interfaces. Muscat ACC experienced increased coordination workload, rerouting requests, flight level negotiations, and monitoring requirements, particularly in sectors handling redistributed and contingency traffic flows.

2.3.4 Short-notice rerouting and temporary airspace changes required close tactical coordination with adjacent FIRs. Boundary constraints reduced the availability of preferred flight levels and required level capping, speed control, longitudinal spacing and tactical routing measures. Increased coordination and tactical traffic management also resulted in higher frequency occupancy, readback delays and increased communication workload.

2.4 Operational Impact on Muscat Terminal Operations

2.4.1 During the crisis period, particularly during the peak diversion events on 28 February and 04 May 2026, Muscat terminal operations faced sustained non-routine pressure affecting both approach and aerodrome control operations. Muscat APP absorbed diverted and rerouted traffic from ACC, often arriving through non-standard routes, non-optimum levels, and unpredictable flow patterns, increasing sequencing complexity within Muscat TMA.

2.4.2 APP was also required to manage airborne holding within the TMA due to closures or restrictions in adjacent airspaces and airports, which significantly increased workload and sequencing complexity while maintaining separation, arrival/departure flows, fuel-related priorities, and coordination with ACC and TWR. APP also handled multiple fuel emergency declarations, requiring priority handling, traffic resequencing, and close coordination with TWR, Oman Airports, and emergency services.

2.4.3 Muscat TWR was directly affected by large-scale diversion traffic caused by the closure of adjacent FIRs and airports due to security concerns. During the first peak diversion event, Muscat Airport received 28 diverted aircraft, all of which were accommodated on available stands through continuous coordination between ATC, Oman Airports AOCC, Oman Airports Operations, and handling agents.

2.4.4 During the second peak diversion event, Muscat Airport received 21 diverted aircraft; only 12 were accommodated on stands, while 9 were temporarily held on Taxiway H due to parking limitations. This increased TWR workload through stand monitoring, taxiway movement management, stand reallocations, and close stakeholder coordination; however, safety was maintained and no operational incidents were reported.

2.5 Actions and contingency arrangements applied by Oman

2.5.1 To manage the regional airspace disruption and maintain the safe and orderly flow of traffic within Muscat FIR, Oman activated a structured ATM crisis management arrangement as follows:

- The ATM Operational Contingency Group (AOCG) was activated in the ACC premises.
- Tactical flow management measures were applied as required, including longitudinal spacing, speed control, level capping, departure restrictions, airborne holding and tactical rerouting.
- Coordination was carried out with AIM for the publication or amendment of NOTAMs, operator briefings, and HDIs, where required.

2.5.2 The contingency arrangements were considered or applied based on traffic demand, airspace availability, route saturation, and coordination requirements with adjacent FIR; as below:

- Spacing restrictions were applied at agreed interface points to regulate traffic flow.
- Tactical level capping was used to separate major traffic streams and reduce operational complexity.
- Rerouting was applied away from saturated routes or constrained boundary points.
- Temporary bidirectional use of selected routes was considered where operationally necessary.
- En-route holding arrangements along the UAE–Oman FIR boundary were supported.
- Additional holding arrangements within Muscat FIR were implemented when needed.

2.6 Lessons learned and areas for improvement

- Regional airspace crises can rapidly shift from local events to multi-FIR contingency scenarios affecting Oman even when Muscat FIR remains open.
- Pre-defined crisis structures, clear leadership and timely safety initiatives are essential to avoid ad hoc decision-making.
- Real-time FIR coordination, flexible use of airspace, and adaptive flow control measures are essential for managing operational unpredictability and maintaining traffic continuity;
- Flexible airspace management, including temporary bidirectional routes, tactical rerouting and additional enroute holding patterns, is essential during regional contingency operations.
- Controller workload and fatigue management must be treated as core safety controls during prolonged crisis operations.
- Predictive ATFM or demand-capacity balancing tools and crisis dashboards showing sector load, route availability, active restrictions and diversion status should be explored to support future crisis management.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) recognize the operational impact of the current Middle East crisis on Muscat FIR, including traffic redistribution, tactical coordination workload, diversion handling and human factors considerations;

c) encourage MID States and ANSPs to share operational experience, lessons learned and best practices from airspace disruption and contingency events, to support harmonized regional contingency planning and continuous improvement; and

d) agree to develop, under ICAO MID coordination and as part of the MID Regional ATM Contingency Framework (RACF), a regional airspace contingency coordination protocol supported by a real-time coordination mechanism or dashboard for sharing FIR status, route/COP availability, capacity constraints, diversion/holding requirements, and agreed tactical flow measures during regional airspace disruption events.

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