International Civil Aviation Organization

Ninth Meeting of the Aerodromes Operations and Planning Sub-Group (AOP/SG/9)

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Agenda Item 8: Airport Innovation and Technology

UNIFIED TOTAL AIRSIDE MANAGEMENT (UTAM) AT IGI AIRPORT, DELHI

(Presented by India)

SUMMARY

Unified Total Airside Management (UTAM), developed by GMR-led Delhi International Airport Limited (DIAL), is a next-generation platform that integrates real-time data across airside operations to improve safety, efficiency and decision-making. UTAM tracks aircraft movements, ground vehicles and GSE activity from 70 miles inbound to departure. It enhances punctuality, reduces turnaround time, optimizes resource use and supports environmental goals by cutting emissions. The system benefits stakeholders including airlines, ground handlers, and air traffic controllers through predictive analytics, automation and compliance with international standards. UTAM sets a new benchmark in smart airport management and operational excellence.

1. INTRODUCTION

1.1 Delhi International Airport has consistently demonstrated operational excellence and culminating its recognition as 9th busiest airport in the world in the year 2024. To enhance operational efficiency, DIAL and its partners have adopted a strategic approach focusing on:

- Maximizing flight punctuality.
- Minimizing aircraft turnaround times.
- Enhancing utilization of airside resources and infrastructure.
- Enhancing airside operational efficiency.

1.2 UTAM directly supports these objectives by equipping stakeholders, airport operators, airlines, ground handlers and air traffic control with a robust platform to manage and analyse critical operational parameters in real time. This data-driven decision-making model enhances responsiveness and efficiency across all levels of airside operations.

Unified Total Airside Management Solution Overview

1.3 UTAM is an integrated digital platform that captures, consolidates, and analyses real-time data related to aircraft and ground operations. Key functionalities include:

- ❖ Continuous monitoring of assets and operational status across the airside environment.

- ❖ Supplementary data source for aircraft movement insights, complementing ATC systems.
- ❖ Utilization of advanced communication and technology systems to route data to backend dashboards.
- ❖ Improved safety oversight and operational optimization via integration with Airport Operations Control Centre (APOC) and Business Intelligence (BI) applications.

2. KEY OBJECTIVES:

2.1 Operational Benefits

- ❖ **Aircraft approach to airport captured in Miles View (10/40/70)** to enhance Airside preparedness and efficiencies.
- ❖ Flight **holding** duration monitoring, enabling ATC coordination and potential delay mitigation.
- ❖ Automated logging of IN/OUT times for all ground vehicles at the aircraft for performance tracking and alert-based delay notifications.
- ❖ Automated capture of **On-Block** and **Off-Block** timestamps, even at non-VDGS stands, improving billing accuracy.
- ❖ Real-time visualization of vehicle and flight movements using 2D monitoring tools.
- ❖ Parking Stand utilization **Idle Time Vs Used** analysis.
- ❖ **Baggage delivery efficiency** Enhanced baggage handling efficiency through trolley tracking and movement analysis to/from BBA/BMA.
- ❖ Optimization of **taxiway allocation**, Runway Occupancy Time (**ROT**), and stand utilization.
- ❖ Achieve Euro-control **16 A-CDM Milestones.**

2.2 Safety & Security

- ❖ Speed detection and alerting mechanisms for airside vehicle movement.
- ❖ Real-time deviation detection from designated paths for GSE, enhancing route compliance.
- ❖ Monitoring of movement of baggage trollies between BBA and BMA, reducing unwarranted delays.
- ❖ Playback and analysis capabilities in the event of operational incidents or accidents for post-incident review.
- ❖ Continuous surveillance and management of airside space utilization to identify and rectify deviations proactively.

2.3 Key Performance Indicators

- ❖ Reduce ROT, to increase airport capacity.
- ❖ Increased predictability of Aircraft Turnaround.
- ❖ Improved On Time Performance (OTP)

- ❖ Higher safety level by identifying potential hazard.
- ❖ Reduced carbon emissions through APU detection.
- ❖ Higher gate utilization (relevance of TSAT, increase stand utilization)
- ❖ Minimization of turnaround-related delays via real-time visibility and automated alerts.
- ❖ Reduced ground operation costs by improving performance accountability and identifying delay causes.
- ❖ Greater stakeholder collaboration through transparent and accurate data sharing.
- ❖ Boosted productivity of personnel and equipment.
- ❖ Integration with IT systems for seamless data exchange and automation.
- ❖ Compliance with ICAO, IATA, and DGCA regulatory frameworks.
- ❖ Deployment of AI and predictive analytics to continuously refine turnaround processes.

2.4 Airside Operations

- ❖ Measurement and continuous optimization of turnaround time.
- ❖ Accurate prediction of aircraft touchdown timing.
- ❖ Precise measurement of runway occupancy duration.
- ❖ Recording of taxi-in and taxi-out times.
- ❖ Tracking of first and last trolley movements.
- ❖ Real-time measurement of baggage loading and unloading duration.
- ❖ Maximization of stand occupancy through optimal allocation.

2.5 GHA Operations

- ❖ Efficient management of manpower and resources.
- ❖ Implementation of geo-tagging and telemetry for GSE.
- ❖ Comprehensive data on vehicle usage and availability.
- ❖ High-accuracy GSE tracking with real-time updates.
- ❖ Enforcement of speed limits to enhance safety compliance.

2.6 Airlines

- ❖ Improved coordination with GSE and other ground handlers.
- ❖ Streamlined aircraft turnaround processes.
- ❖ Real-time tracking of aircraft status and location.
- ❖ Instant access to delay reasons for better planning.
- ❖ Maintenance and improvement of scheduled departure punctuality.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information contained in this paper.

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