International Civil Aviation Organization

MIDANPIRG/22 & RASG-MID/12 Meetings

(Doha, Qatar, 4 – 8 May 2025)

Agenda Item 5.3: ANS (AIM, PBN, AGA-AOP, ATM-SAR, CNS and MET)

ELECTRONIC FLIGHT STRIP SYSTEM (EFSS)

(Presented by Islamic Republic of Iran)

SUMMARY

This paper describes the design and implementation of a new system called the Electronic Flight Strip System (EFSS) in the airports of the Islamic Republic of Iran. The system aims to enhance speed, accuracy, and ease of operation for air traffic control personnel at airports.

REFERENCE

- ICAO ANNEX 2
- ICAO ANNEX 3
- ICAO ANNEX 10
- ICAO ANNEX 11
- DOC 4444, PANS-ATM
- DOC 7910
- DOC 8400, PANS-ABC
- DOC 8585

1. INTRODUCTION

1.1 The need to eliminate the paper-based flight strip writing process, standardize strip marking by air traffic control personnel, and provide services to facilitate this process, along with collecting flight strip data in digital format on databases and utilizing this data for statistical reporting and secondary processing, led us to initiate the design and implementation of the Electronic Flight Strip System.

1.2 The design and implementation of the Electronic Flight Strip System have been carried out internally by experts from the General Directorate of Aeronautical Telecommunications and Information Technology at the Iran Airports and Air Navigation Company.

1.3 The Electronic Flight Strip System utilizes the AFTN service for sending and receiving aeronautical messages. It processes and categorizes all incoming aeronautical messages based on the standards outlined in Document 4444 and Annex 10, Volume II and other ICAO annexes and documents. Additionally, all messages generated and transmitted by the Electronic Flight Strip System comply with these referenced documents.

1.4 The Electronic Flight Strip System also integrates with other locally developed systems at the Iran Airports and Air Navigation Company, such as the Zagros System (ASUR) and Iran's e-FPL System via the

AFTN service or through API connections. This integration facilitates the workflow of air traffic controllers by enabling seamless data exchange.

1.5 The Electronic Flight Strip System also provides features and solutions such as Mirroring Mode and Assist Mode to reduce verbal coordination between different air traffic control units such as Approach, Tower, Ground, and Clearance Delivery. These capabilities enhance the pre-planning process for flights that need to be hand over to the relevant unit and are particularly beneficial in high-traffic conditions.

1.6 The Electronic Flight Strip System is designed to eliminate verbal coordination between airport air traffic control units and ACC at airports equipped with RADAR automation system such as FDP and RDP. It functions as an interface between airport RADAR automation system and incoming aeronautical messages via the AFTN service, facilitating the exchange of EST and CPL messages between units for more coordination.

2. DISCUSSION

2.1 The development of the Electronic Strip System began approximately three years ago. Since this system was the first of its kind to be designed and deployed in Iran, and due to the lack of access to existing global implementations for benchmarking or gathering initial design ideas, we faced unique challenges. Additionally, the system needed to:

- Meet domestic and localized requirements of Iran’s air traffic control (ATC) units.
- Integrate with legacy systems in Iran’s aviation infrastructure.

To address these challenges, we adopted a phased approach:

- Pilot Implementation: The system was initially deployed at Abadan Airport (with moderate traffic volume) to collect user feedback and refine functionalities.
- Iterative Improvements: Over two years, we resolved bugs, added features, and expanded the system to multiple airports across Iran, each with varying traffic loads.
- Stakeholder Collaboration: Continuous feedback from ATC personnel and aviation experts helped shape a comprehensive, stable system that enhances speed, accuracy, and workload reduction for users.

2.2 Key Features of the Electronic Strip

System The system now offers a wide range of

capabilities, including:

- Graphical Strip Interface: Replicates all paper-based strip processes while introducing tools for faster, more efficient operations.
- Automated Message Processing: Handles aeronautical messages (e.g., FPL, DLA, CHG, CNL, DEP, ARR, EST and CPL) and processes them in real time.
- Dynamic Message Routing: Automatically sends DEP/ARR/EST/CPL messages to relevant destinations based on flight plans, including alternate airports.
- Airport-Specific Configuration: Fully customizable to each airport’s requirements.

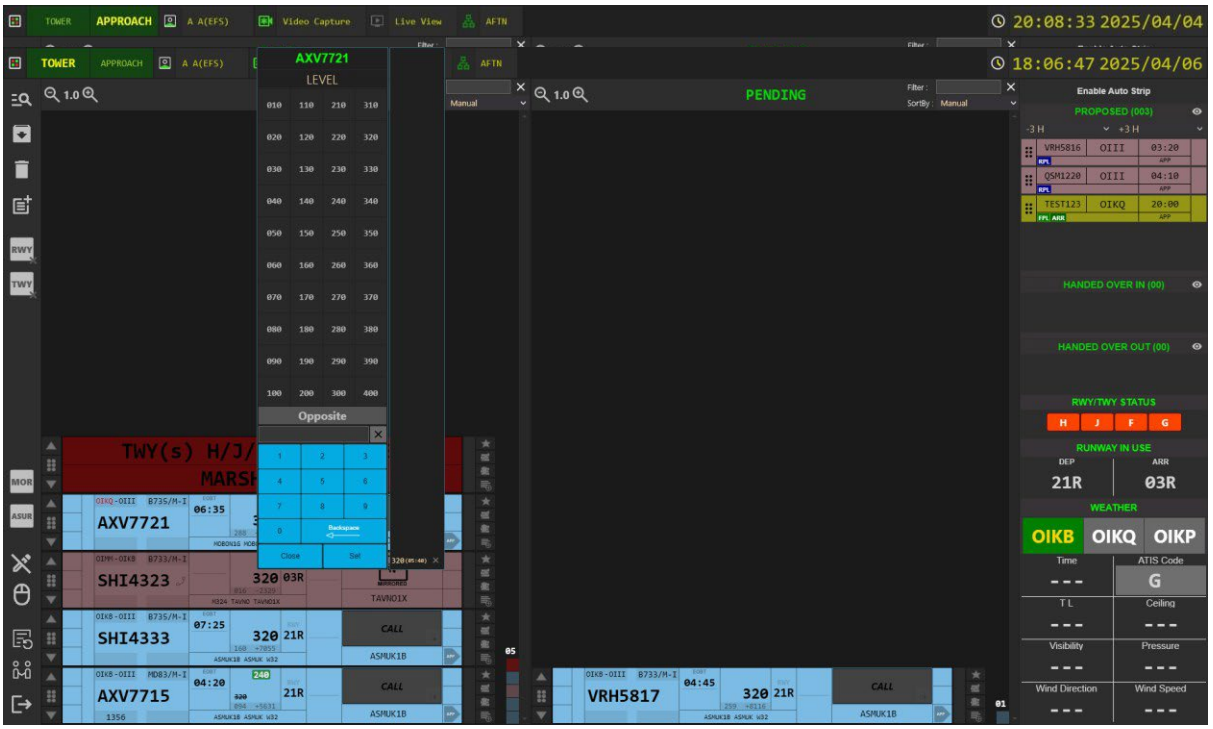
- Workspace Segmentation: Organizes flights by phase (e.g., departure, en-route) for streamlined control.
- Assist Mode: Allows two users to collaborate on a single strip with real-time synchronization.
- Mirror Mode: Facilitates pre-coordination between ATC units (Approach, Tower, Ground, Clearance Delivery) before handover.
- Procedure Filtering: Filters Approach Types, SIDs/STARs by runway, entry/exit points, or flight path.
- Vehicle/Obstacle Strips: Manages airspace restrictions for ground vehicles or obstacles.
- Statistical Reporting: Generates traffic statistics for any custom time period.
- Change Logs: Tracks all strip modifications for audit and review.
- Screen Capture: Records all client screens for supervisory needs.

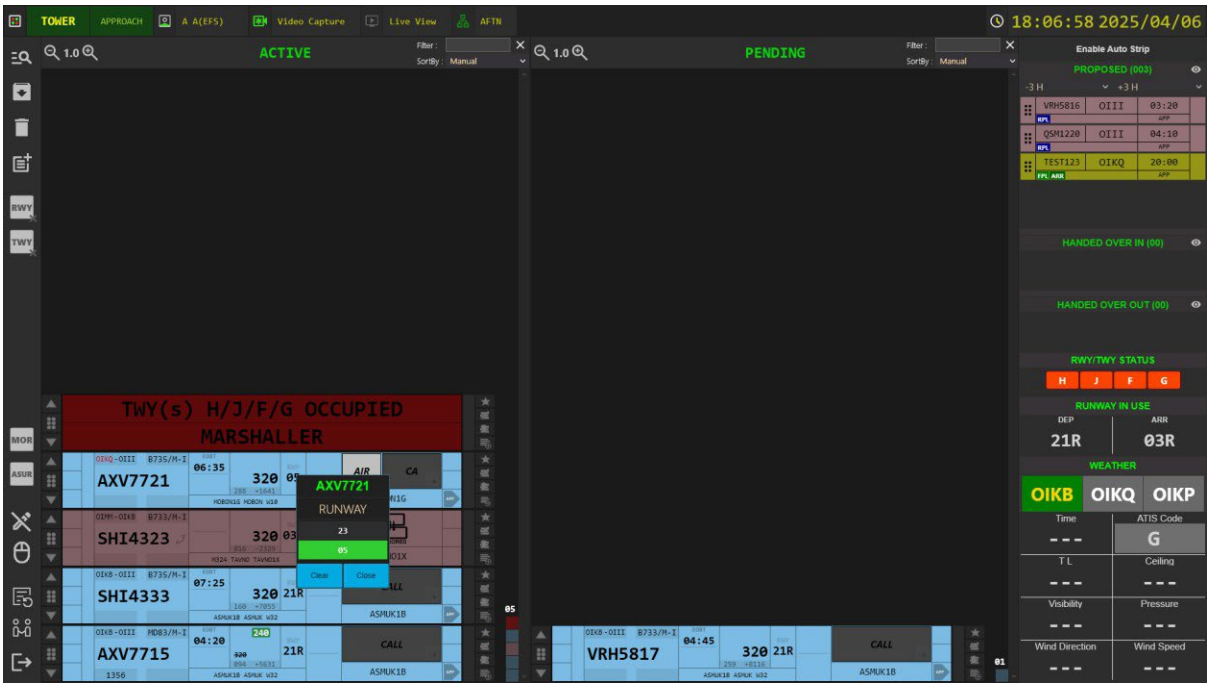
- Live Mode: Supports training and real-time monitoring by supervisors

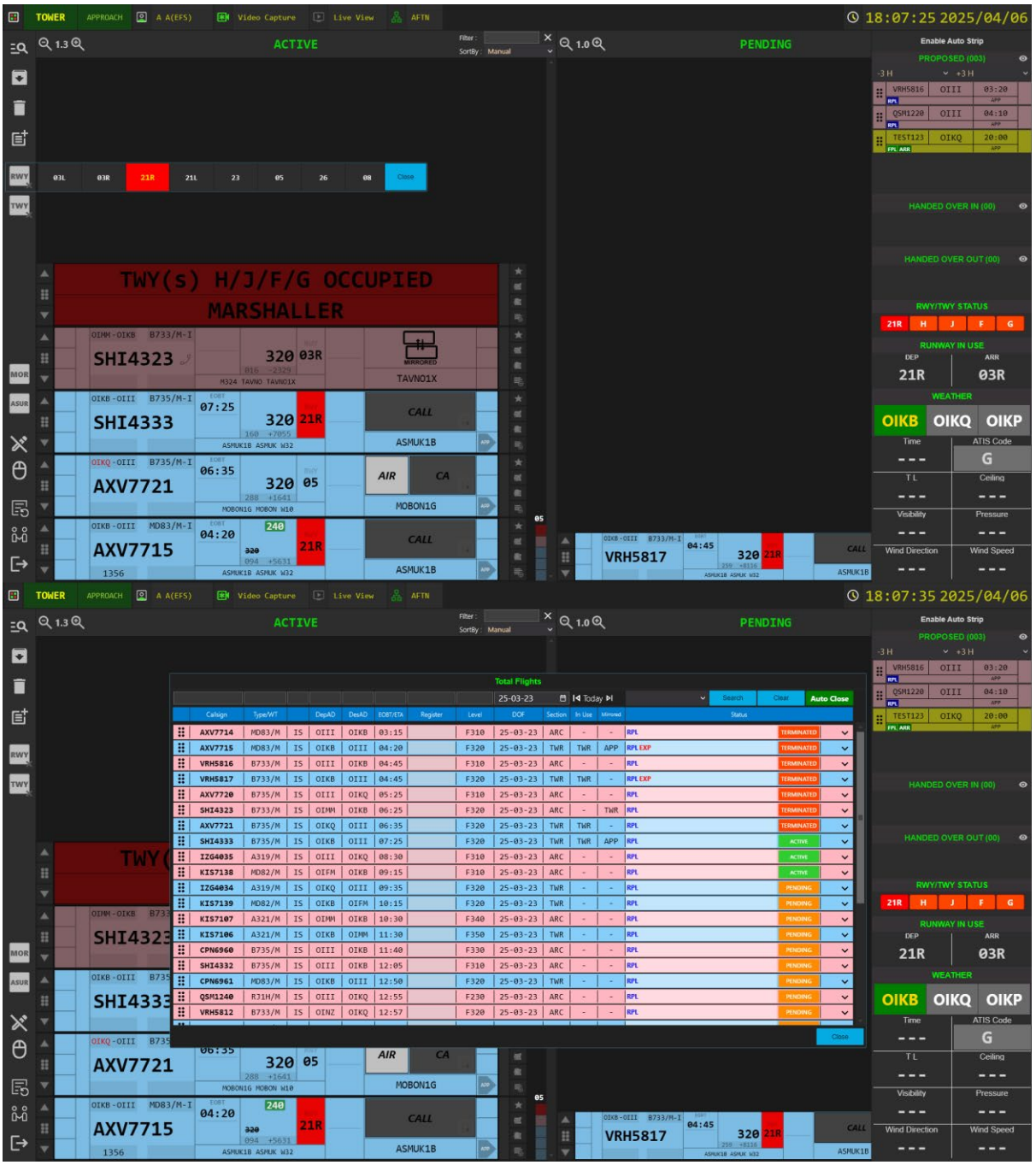
3. ACTION BY THE MEETING

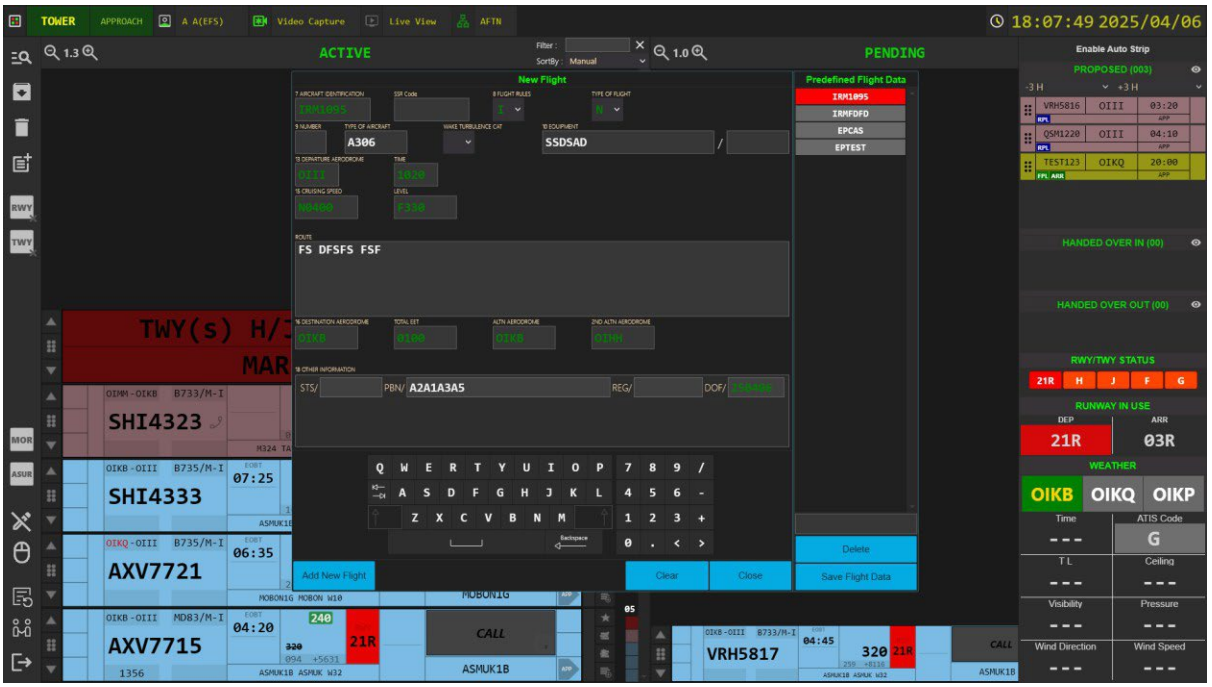
3.1 The meeting is invited to take note of I.R. of Iran experience.

Attachment A – EFSS Sample Snapshots






TOWER
APPROACH
A A(EFS)
Video Capture
Live View
AFTN
18:07:25 2025/04/06
ACTIVE
PENDING
TWY(s) H/J/F/G OCCUPIED
MARSHALLER
SHI4323
SHI4333
AXV7721
AXV7715
VRH5817
CALL
AIR
CA
ASMUK1B
MOBON1G
TAVNO1X
Enable Auto Strip
PROPOSED (003)
HANDED OVER IN (00)
HANDED OVER OUT (00)
RWY/TWY STATUS
RUNWAY IN USE
DEP
ARR
21R
03R
WEATHER
OIKB
OIKQ
OIKP
Time
ATIS Code
Ceiling
Visibility
Pressure
Wind Direction
Wind Speed
18:07:35 2025/04/06
Total Flights
Auto Close


TOWER
APPROACH
A A(EFS)
Video Capture
Live View
AFTN
18:07:49 2025/04/06
ACTIVE
PENDING
New Flight
Predefined Flight Data
IRM1095
IRMFDFD
EPCAS
EPTEST
A306
SSDSAD
FS DFSFS FSF
A2A1A3A5
Add New Flight
Clear
Close
Delete
Save Flight Data
Enable Auto Strip
PROPOSED (003)
HANDED OVER IN (00)
HANDED OVER OUT (00)
RWY/TWY STATUS
RUNWAY IN USE
DEP
ARR
21R
03R
WEATHER
OIKB
OIKQ
OIKP
Time
ATIS Code
G
Ceiling
Visibility
Pressure
Wind Direction
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SHI4323
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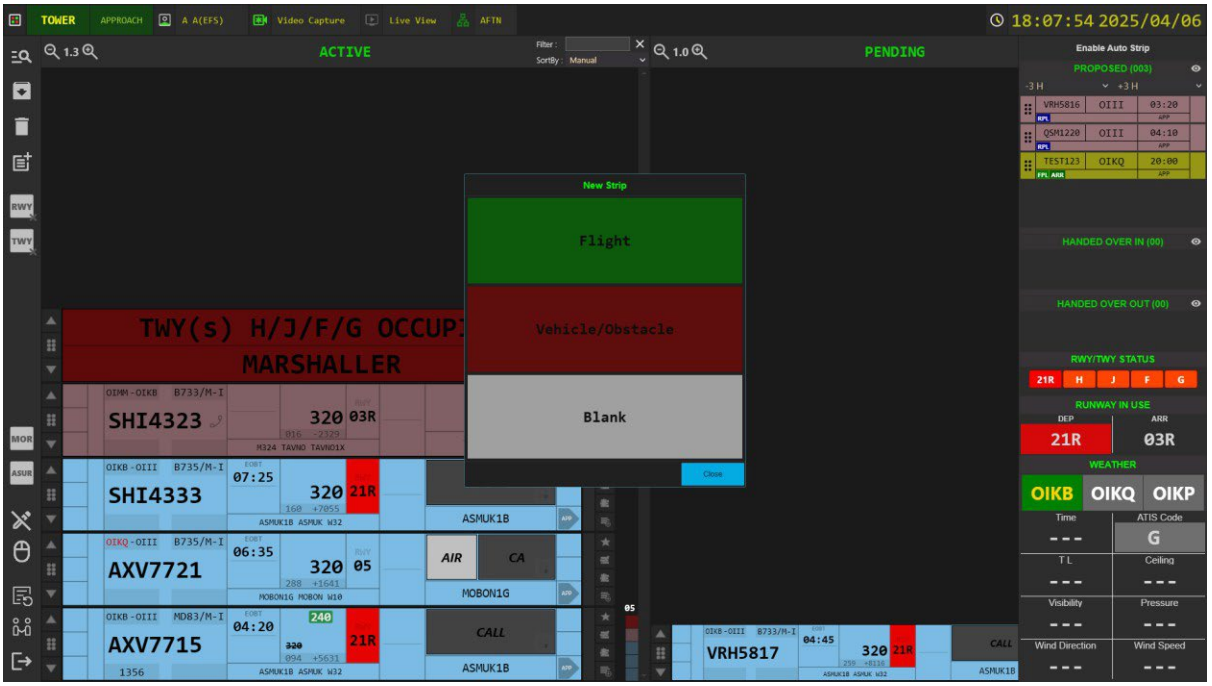
TOWER
APPROACH
A A(EFS)
Video Capture
Live View
AFTN
18:07:54 2025/04/06
ACTIVE
PENDING
New Strip
Flight
Vehicle/Obstacle
Blank
Close
TWY(s) H/J/F/G OCCUP
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