SAFE SKIES.
SUSTAINABLE FUTURE.

ESAF Regional Workshop on Amendment 82,PANS-MET-Doc 10157 and IWXXM Transition(Virtual)

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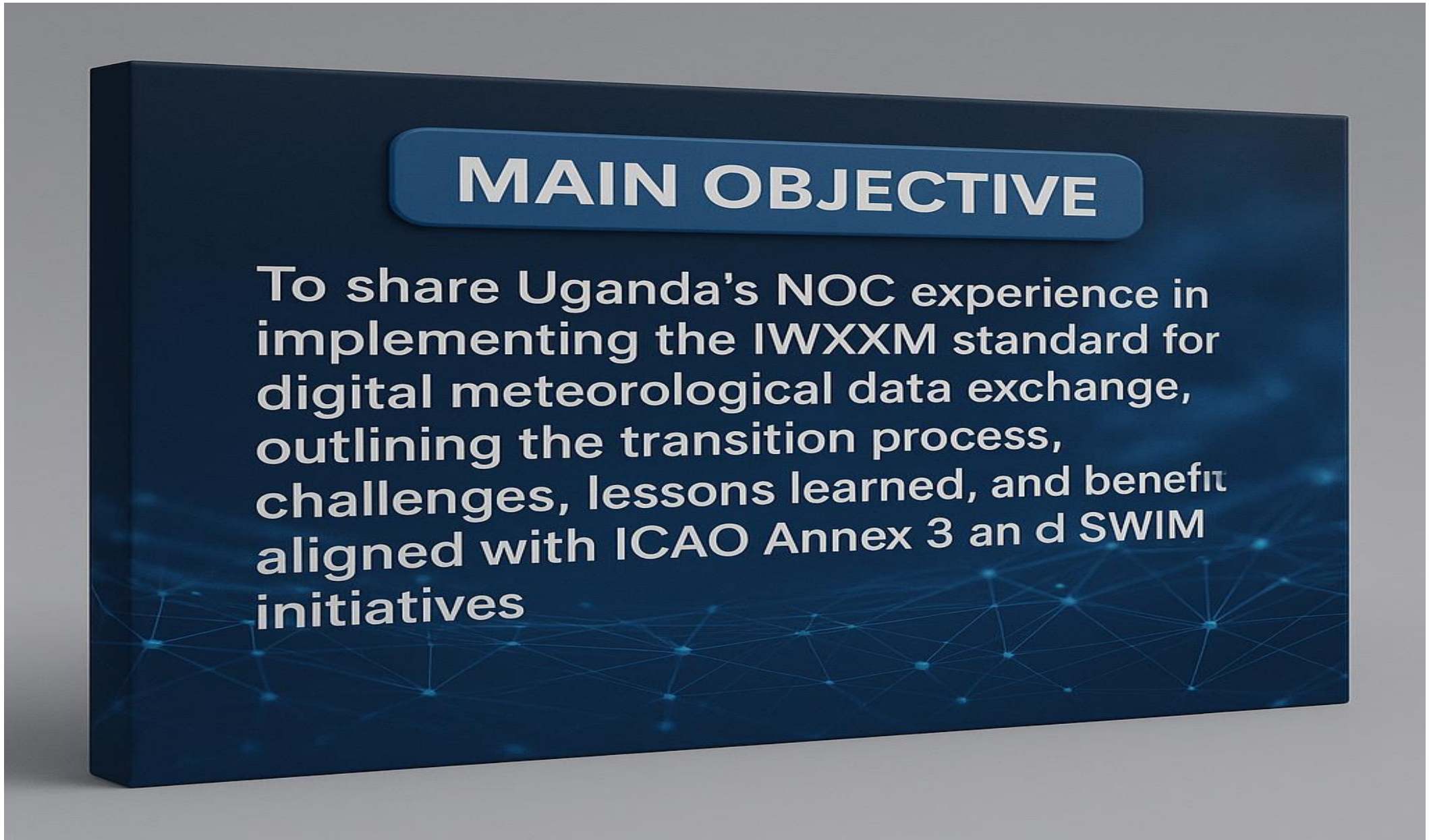
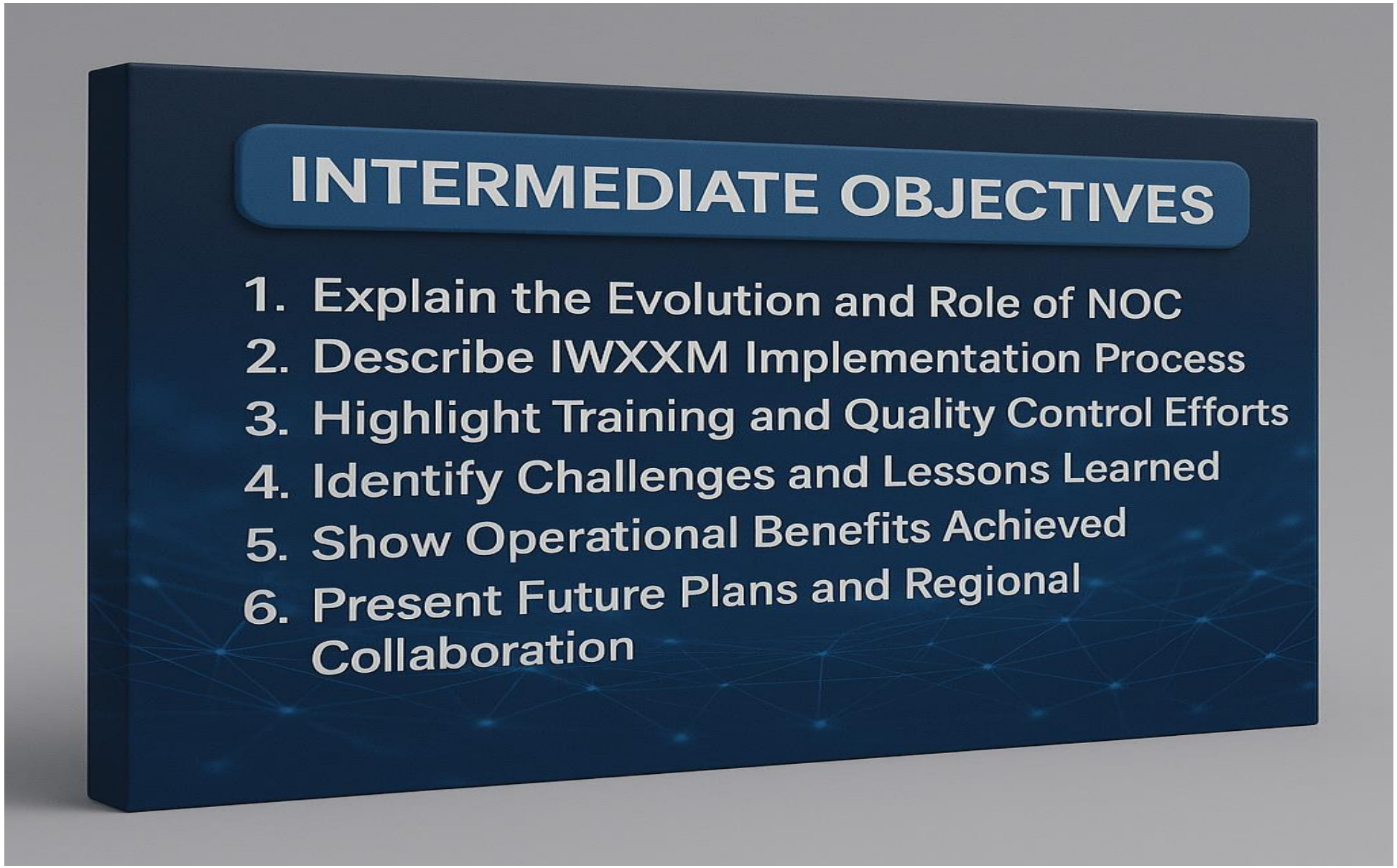
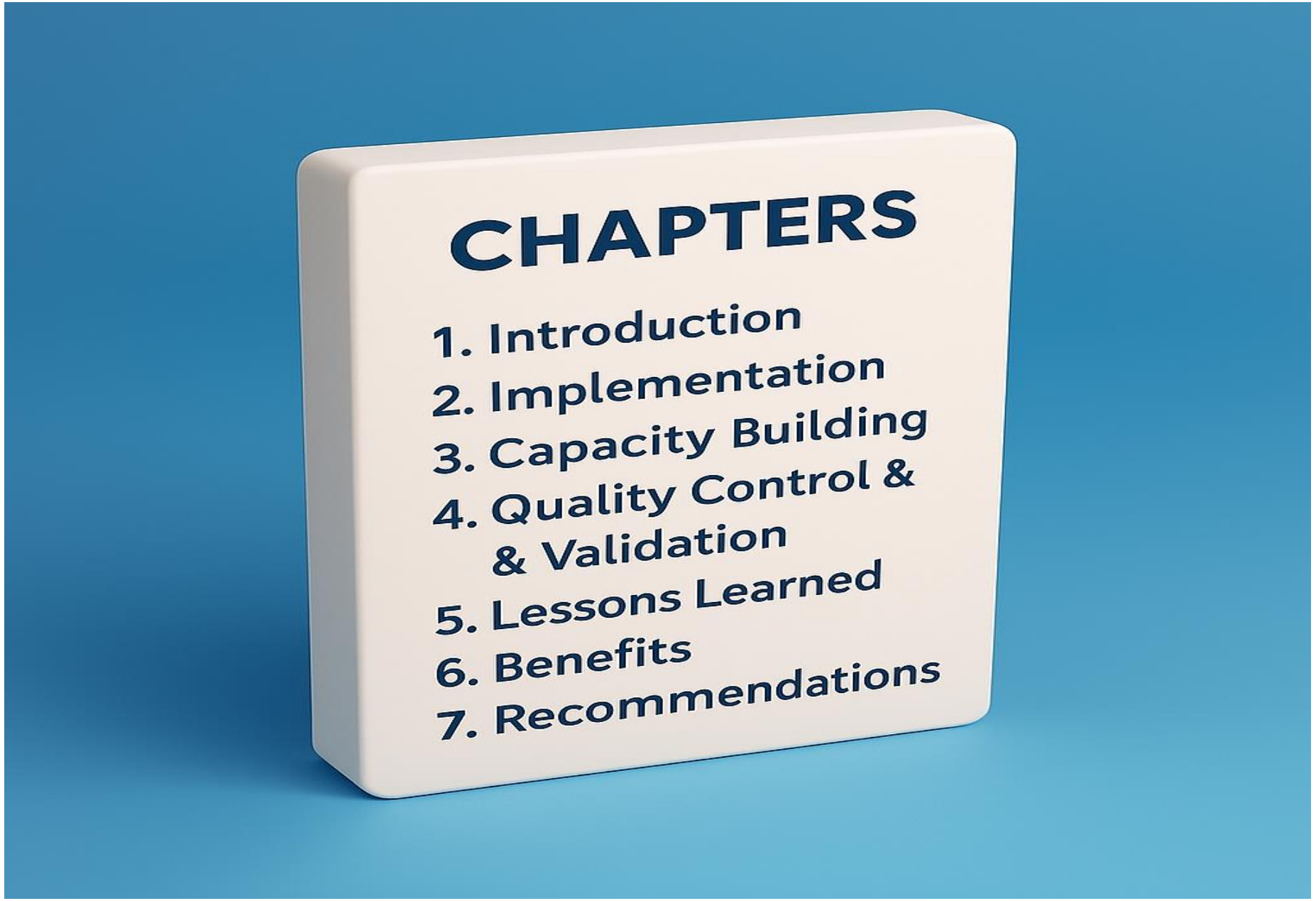
RONALD KIZZA
SAIMO – Supervisor In-Charge
Communication Centre
Aeronautical Information Management
(AIM) Department
Directorate of Air Navigation Services
Uganda Civil Aviation Authority (UCAA)


MAIN OBJECTIVE
To share Uganda's NOC experience in implementing the IWXXM standard for digital meteorological data exchange, outlining the transition process, challenges, lessons learned, and benefit aligned with ICAO Annex 3 an d SWIM initiatives


INTERMEDIATE OBJECTIVES
1. Explain the Evolution and Role of NOC
2. Describe IWXXM Implementation Process
3. Highlight Training and Quality Control Efforts
4. Identify Challenges and Lessons Learned
5. Show Operational Benefits Achieved
6. Present Future Plans and Regional Collaboration


CHAPTERS
1. Introduction
2. Implementation
3. Capacity Building
4. Quality Control & & Validation
5. Lessons Learned
6. Benefits
7. Recommendations

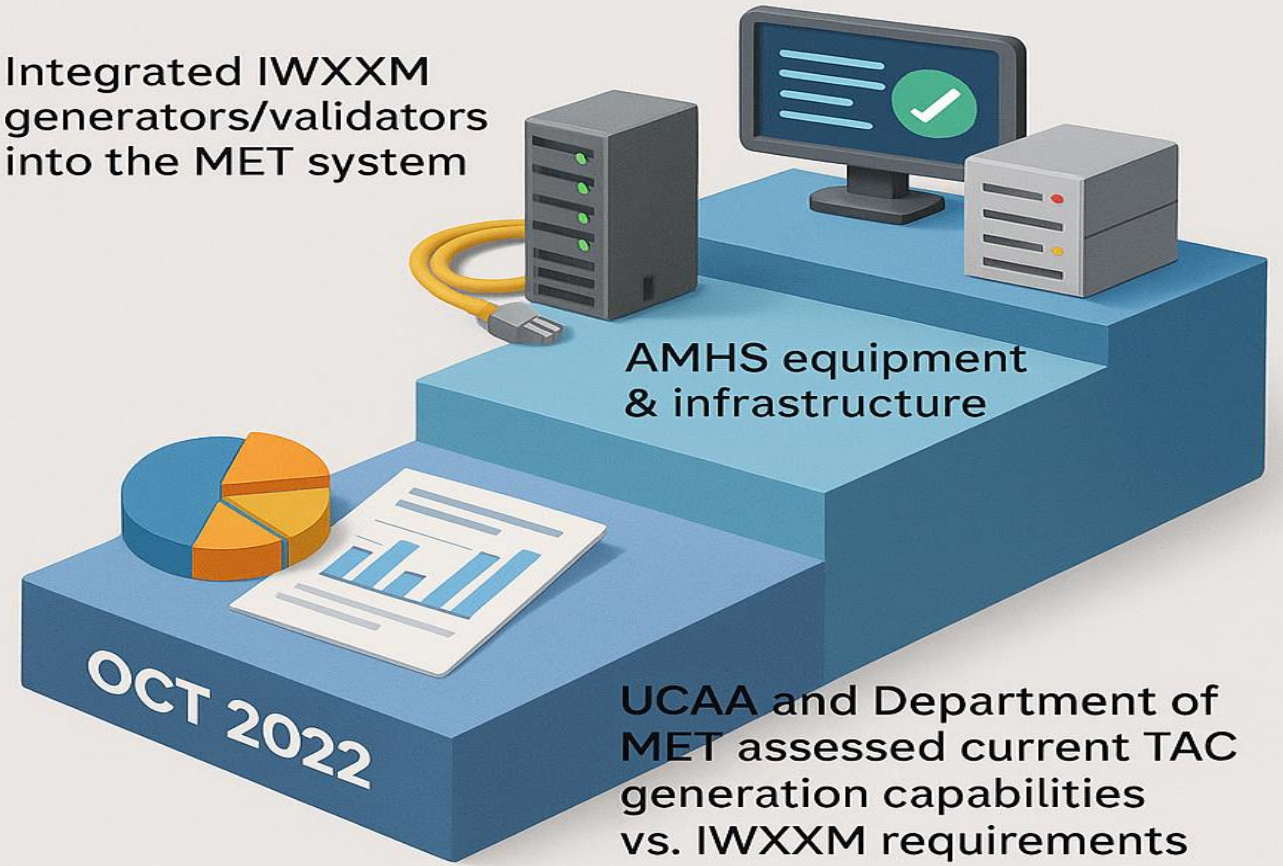
Introduction

INFRASTRUCTURE AFTN/AMHS,CIDIN

- Uganda's National OPMET Centre (NOC) is responsible for collecting, verifying, and distributing OPMET data from domestic aerodromes and transmitting it to the Regional OPMET Data Banks.
- In line with ICAO Annex 3 requirements, the NOC is transitioning to IWXXM to enable the production and exchange of machine-readable, interoperable XML-based weather products.
- The AFTN, established in the 1930s with landline teleprinter links, was upgraded to CIDIN in the 1980s using X.25 protocols and a store-and-forward mechanism.
- In 1996, AMHS was introduced as a modern solution, with the first operational connection between Germany and Spain in February 2005 using X.400 protocols over dedicated or IP-tunneled links.

IMPLEMENTATION JOURNEY

The NOC undertook a step-bv-step approach:



TAC & IWXXM

In TAC (Traditional Alphabet Code) format, messages are distributed using WMO abbreviated headings (TT AAii CCCC YYGGgg).

- The TT group indicates te data type.
- For METAR/SPECI reports, the TT used is SA (or SP for SPECIs).

When transitioning to IWXXM (XML/GML), ICAO/WMO defined new abbreviated headings to differentiate digital products from TAC.

- The TTAAii part had to change so bulletin switching centres (BCCs) and RODBs could handle both TAC and XML in parallel.

TTAAii CCCC YYGGgg	TTAAii CCCC YYGGgg
SA	LA

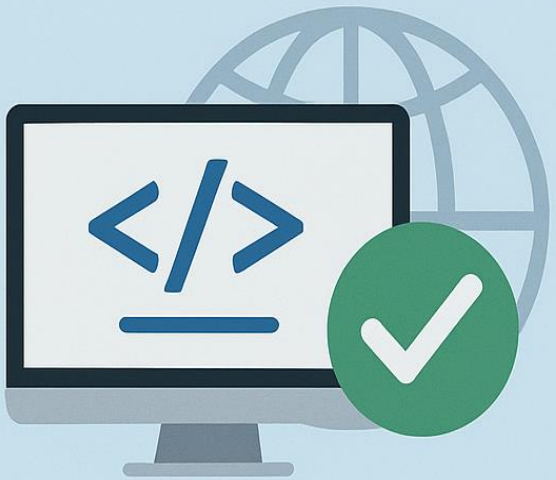
Key Reason

Using 'LA' avoids confusion and allows a smooth migration path: systems can subscribe specifically to IWXXM data streams without accidentally processing TAC messages or vice versa.

Capacity Building

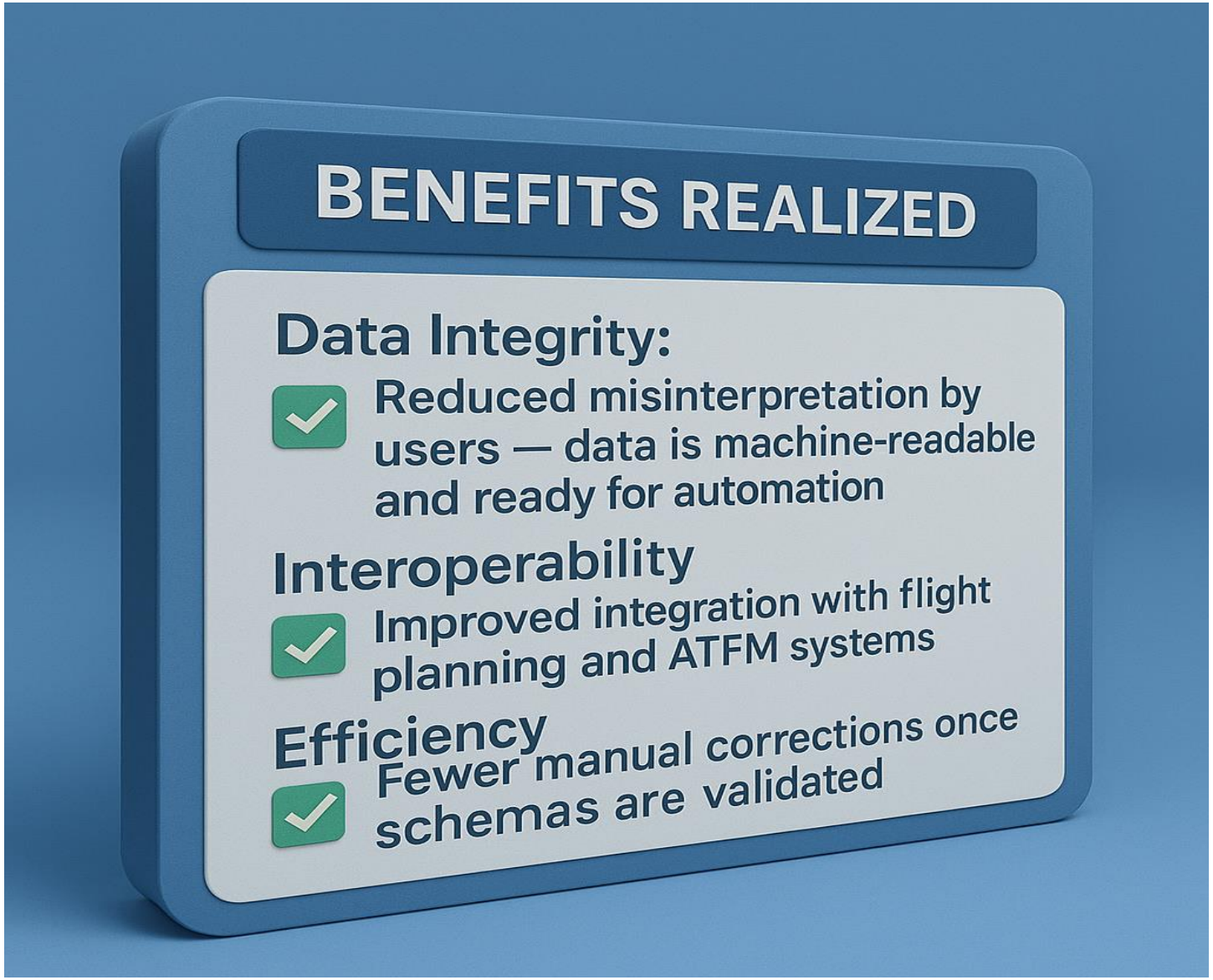
MET forecasters were trained on schema structure (METAR/TAF/SIGMET XML encoding) & COM operators trained on message handling

Quality Control & Validation

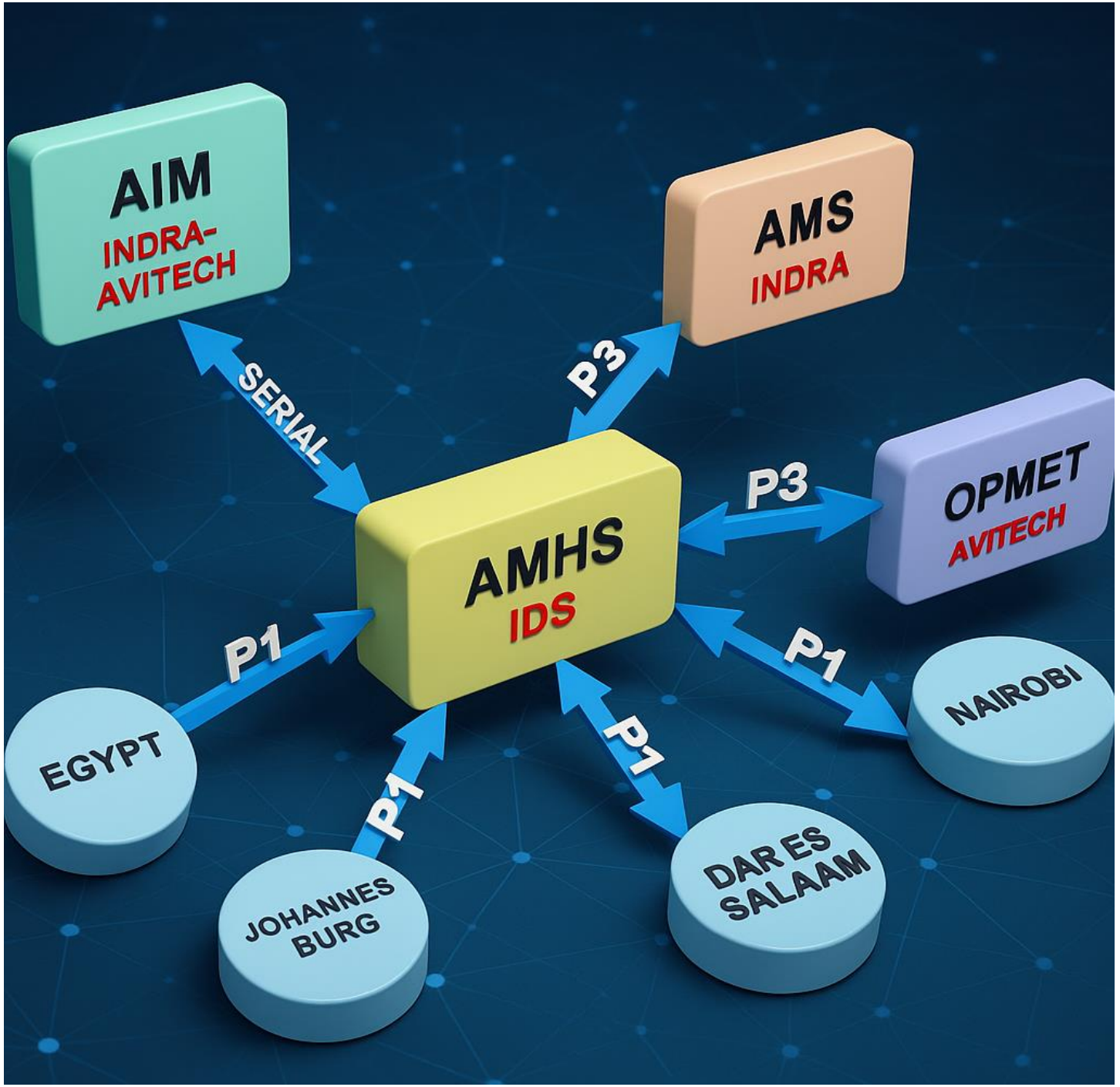


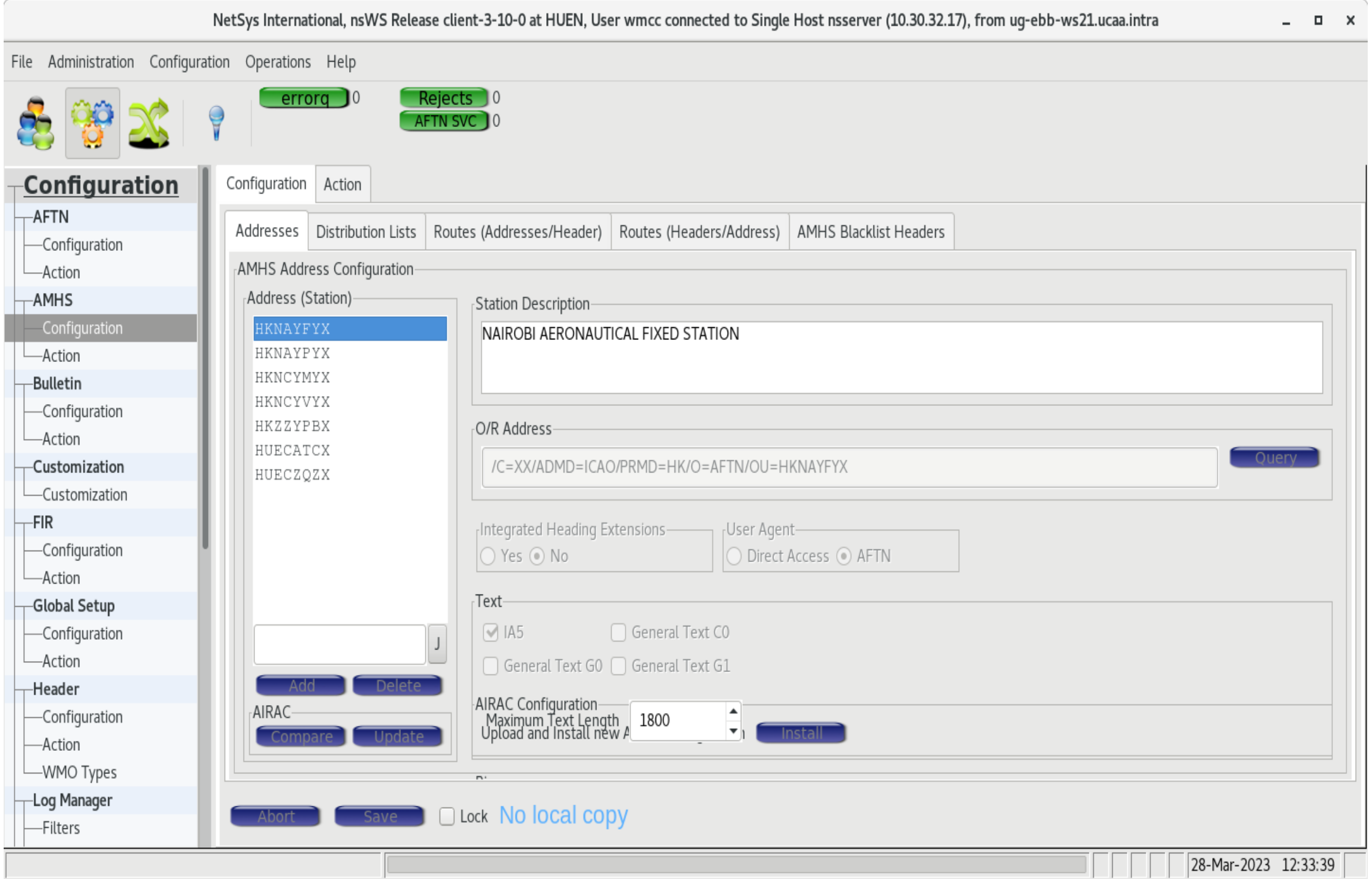
The WXXM message is validated against WMO schemas before release


CHALLENGES FACED AND LESSONS LEARNED
Uganda's NOC encountered:
Technical: AMHS configuration issues; some IWXXM messages too large for legacy AFTN fallback.
Operational: Running dual-format TAC
Lessons Learned
Early stakeholder engagement avoids resistance later.
Continuous monitoring of message ensures smooth global exchange


BENEFITS REALIZED
Data Integrity:
Reduced misinterpretation by users — data is machine-readable and ready for automation
Interoperability
Improved integration with flight planning and ATFM systems
Efficiency
Fewer manual corrections once schemas are validated


RECOMMENDATIONS
When ICAO provides timelines, TAC will be phased out systematically
Considering integration in IWXXM data feeds
Proposes regional collaboration for capacity building and common validation tools


AIM
INDRA-
AVITECH
AMS
INDRA
SERIAL
P3
P3
OPMET
AVITECH
AMHS
IDS
P1
P1
P1
P1
EGYPT
NAIROBI
JOHANNES
BURG
DAR ES
SALAAM


NetSys International, nsWS Release client-3-10-0 at HUEN, User wmcc connected to Single Host nsserver (10.30.32.17), from ug-ebb-ws21.ucaa.intra
File Administration Configuration Operations Help
errorq 0
Rejects 0
AFTN SVC 0
Configuration
AFTN
Configuration
Action
AMHS
Configuration
Action
Bulletin
Configuration
Action
Customization
Customization
FIR
Configuration
Action
Global Setup
Configuration
Action
Header
Configuration
Action
WMO Types
Log Manager
Filters
Configuration
Action
Addresses
Distribution Lists
Routes (Addresses/Header)
Routes (Headers/Address)
AMHS Blacklist Headers
AMHS Address Configuration
Address (Station)
HKNAYFYX
HKNAYPYX
HKNCYMYX
HKNCYVYX
HKZZYPBX
HUECATCX
HUECZQZX
J
Add
Delete
AIRAC
Compare
Update
Station Description
NAIROBI AERONAUTICAL FIXED STATION
O/R Address
/C=XX/ADMD=ICAO/PRMD=HK/O=AFTN/OU=HKNAYFYX
Query
Integrated Heading Extensions
Yes
No
User Agent
Direct Access
AFTN
Text
IA5
General Text C0
General Text G0
General Text G1
AIRAC Configuration
Maximum Text Length
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Upload and Install new A
Install
Abort
Save
Lock
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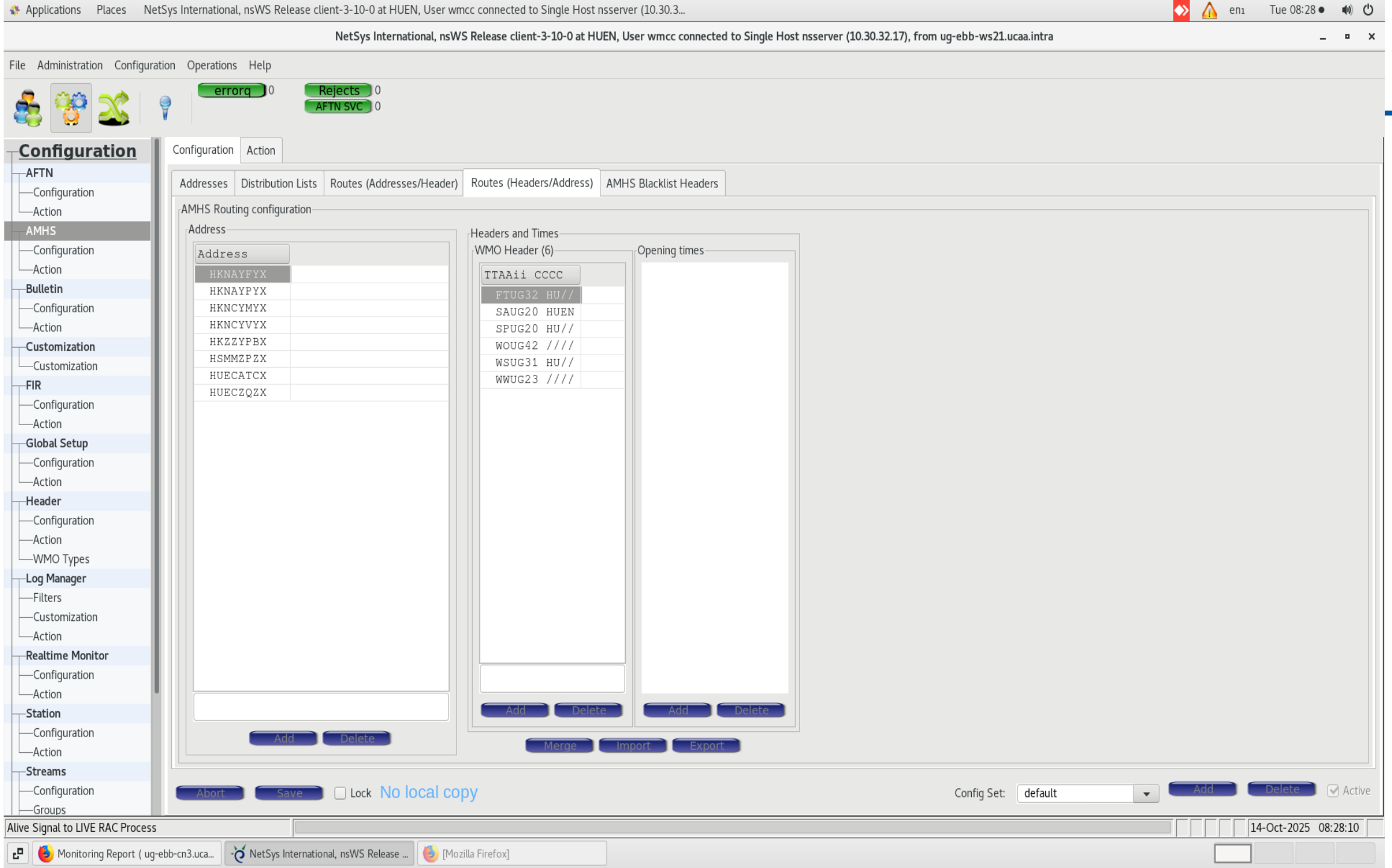
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en1 Tue 08:28
NetSys International, nsWS Release client-3-10-0 at HUEN, User wmcc connected to Single Host nsserver (10.30.32.17), from ug-ebb-ws21.ucaa.intra
File Administration Configuration Operations Help
errorq 0
Rejects 0
AFTN SVC 0
Configuration
AFTN
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AMHS
Configuration
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Bulletin
Configuration
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Customization
Customization
FIR
Configuration
Action
Global Setup
Configuration
Action
Header
Configuration
Action
WMO Types
Log Manager
Filters
Customization
Action
Realtime Monitor
Configuration
Action
Station
Configuration
Action
Streams
Configuration
Groups
Configuration
Action
Addresses
Distribution Lists
Routes (Addresses/Header)
Routes (Headers/Address)
AMHS Blacklist Headers
AMHS Routing configuration
Address
Address
HKNAYFYX
HKNAYPYX
HKNCYMYX
HKNCYVYX
HKZZYPBX
HSMMZPZX
HUECATCX
HUECZQZX
Add
Delete
Headers and Times
WMO Header (6)
TTAAii CCCC
FTUG32 HU//
SAUG20 HUEN
SPUG20 HU//
WOUG42 ////
WSUG31 HU//
WWUG23 ////
Add
Delete
Opening times
Add
Delete
Merge
Import
Export
Abort
Save
Lock
No local copy
Config Set:
default
Add
Delete
Active
Alive Signal to LIVE RAC Process
14-Oct-2025 08:28:10
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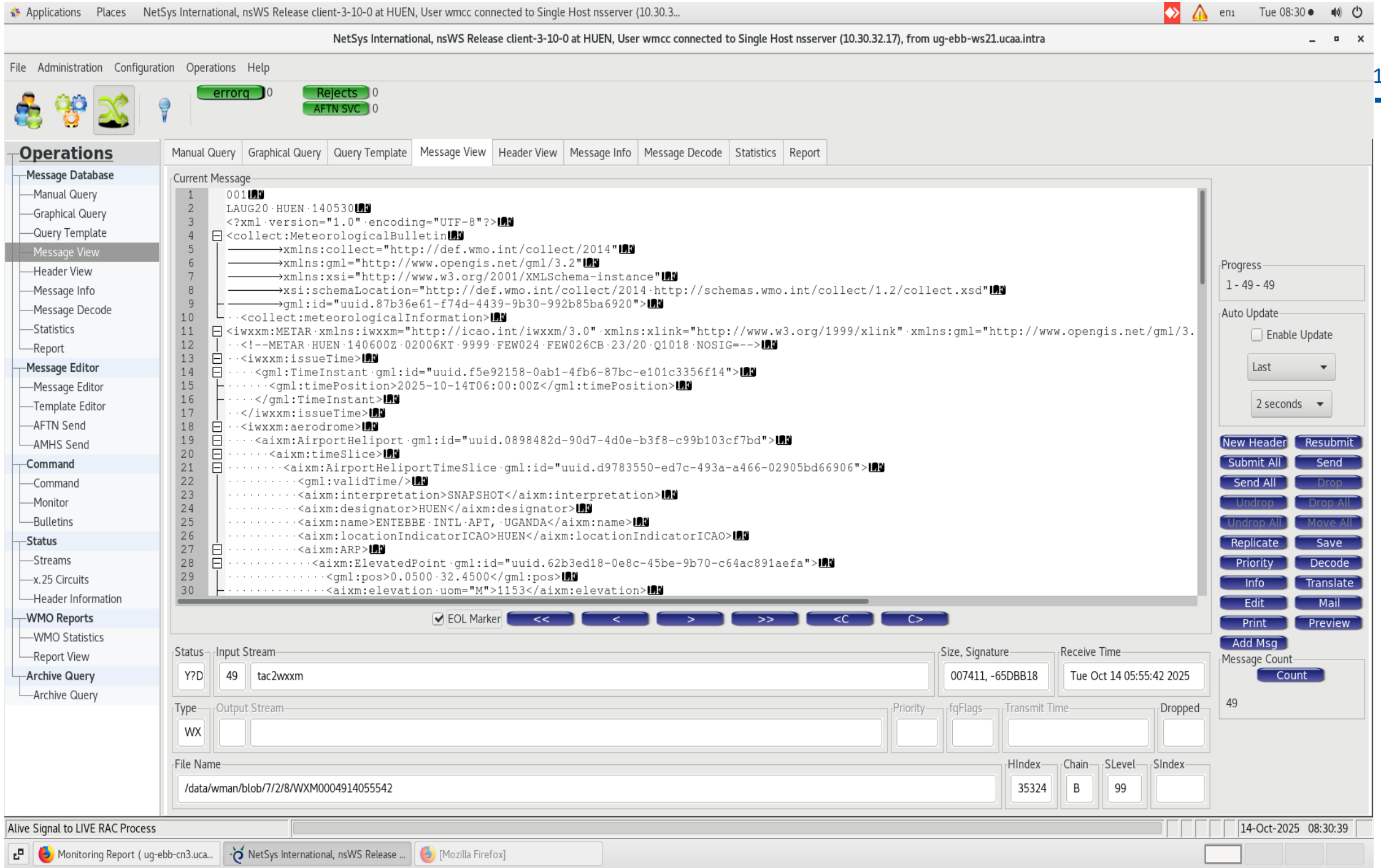
[Mozilla Firefox]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Tue 08:30
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File Administration Configuration Operations Help
errorq 0
Rejects 0
AFTN SVC 0
Operations
Message Database
Manual Query
Graphical Query
Query Template
Message View
Header View
Message Info
Message Decode
Statistics
Report
Message Editor
Message Editor
Template Editor
AFTN Send
AMHS Send
Command
Command
Monitor
Bulletins
Status
Streams
x.25 Circuits
Header Information
WMO Reports
WMO Statistics
Report View
Archive Query
Archive Query
Manual Query
Graphical Query
Query Template
Message View
Header View
Message Info
Message Decode
Statistics
Report
Current Message
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<< < > >> <C C>
Progress
1 - 49 - 49
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Enable Update
Last
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New Header
Resubmit
Submit All
Send
Send All
Drop
Undrop
Drop All
Undrop All
Move All
Replicate
Save
Priority
Decode
Info
Translate
Edit
Mail
Print
Preview
Add Msg
Message Count
Count
49
Status
Y?D
Input Stream
49
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Size, Signature
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Receive Time
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Output Stream
Priority
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Transmit Time
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File Name
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Chain
B
SLevel
99
SIndex
Alive Signal to LIVE RAC Process
14-Oct-2025 08:30:39
Monitoring Report (ug-ebb-cn3.uca...
NetSys International, nsWS Release ...
[Mozilla Firefox]

Thank You

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