
ICAO
AIXM/XML/GML
Seminar – Workshop
Lufthansa Systems


ICAO
iWXXM - Chance for Improvements?
Lufthansa Systems

Agenda

01 About Lufthansa Systems

02 Weather Data Application

03 Current System - Deficiencies

04 iWXXM – Chance for Improvement

05 iWXXM - Summary


Lufthansa Systems
About Lufthansa Systems
01

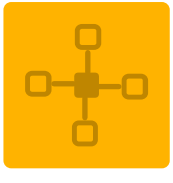
Lufthansa Systems

Originally founded in **1995** and reorganized in **2015**

Holds a **leading position** in the **global aviation industry**

Around **1,900 employees** worldwide

Provides **consulting and IT services** for selected airlines and their customers

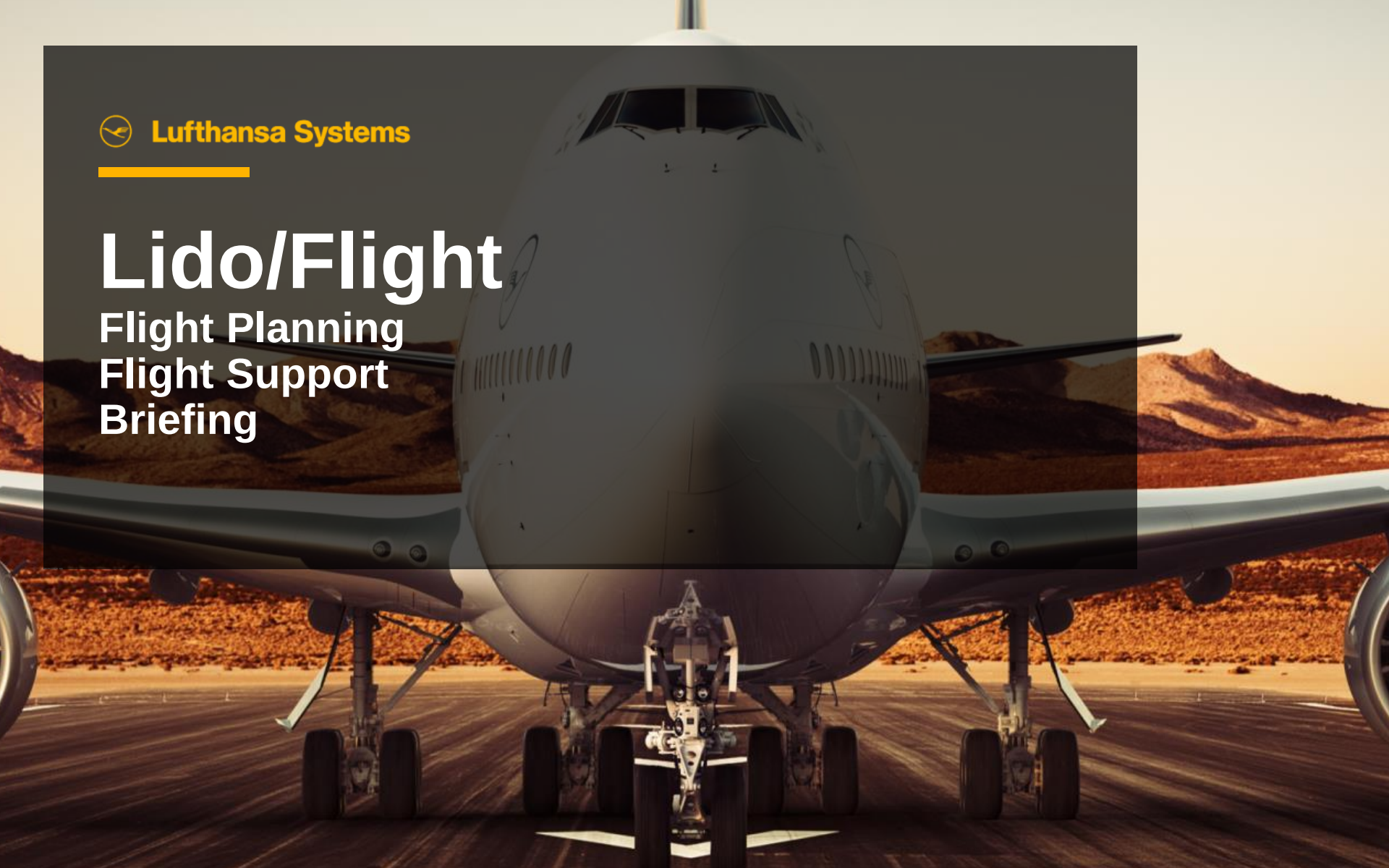


Head office in Raunheim near Frankfurt/Main, with **branches in 16 other countries**

Revenue in 2014: **EUR 640 million**

OUR VISION

Be the No.1 choice in the airline industry for reliable and innovative IT solutions and services.

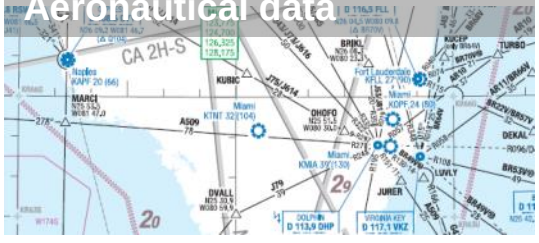

Lufthansa Systems
Lido/Flight
Flight Planning
Flight Support
Briefing

Lido/Flight Customer Selection

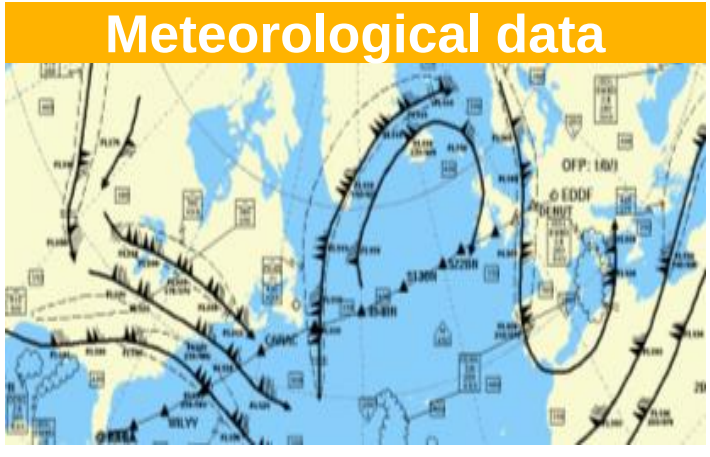

Lufthansa Systems
Weather Data Application
02

Weather Data – Basic Core Data

Aeronautical data



Meteorological data

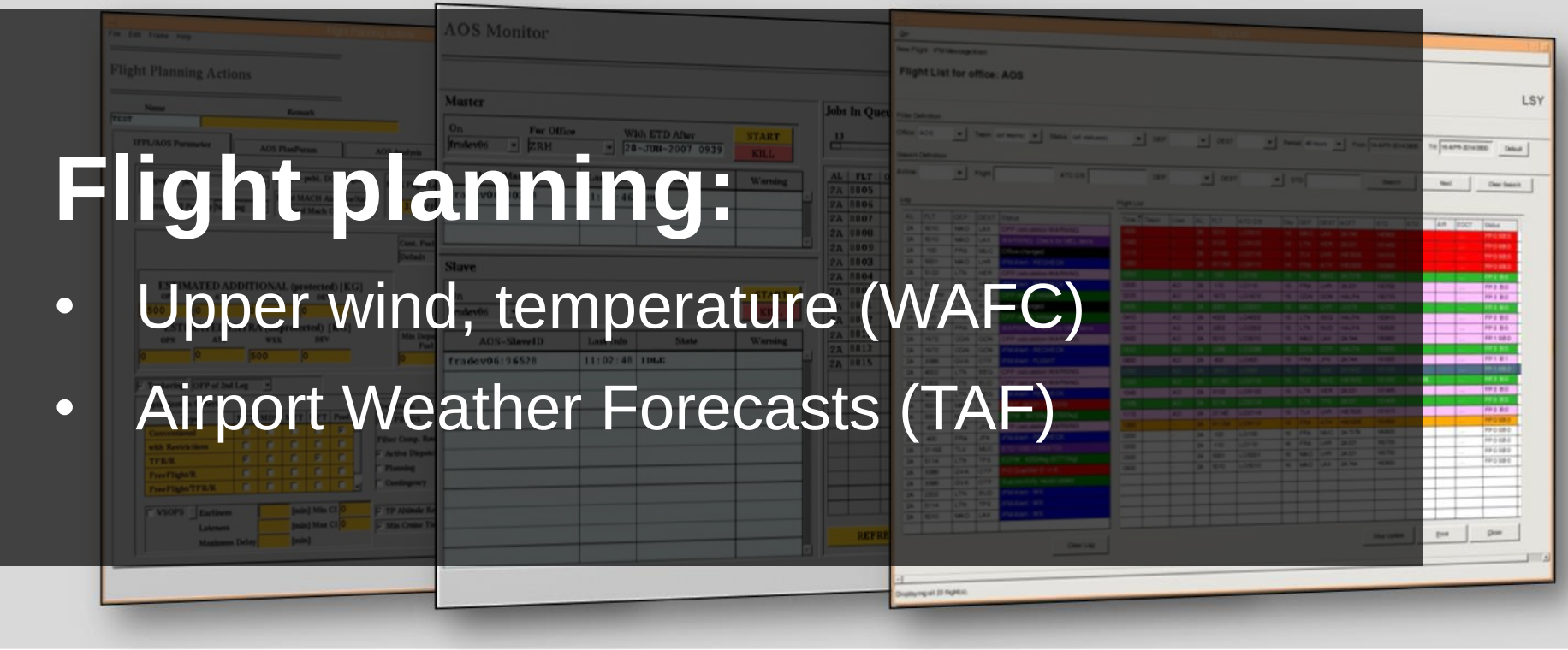


NOTAMs

ICAO	Quality	Status
EDDF	TKOF	Suitable 07C(TKOF) Unspecifi
EDDF	TKOF_DEST	Suitable 25C(CAT3B) Unspecif
KMIA	DEST	Suitable 30(RNAV (GPS)) (101

Terrain data

Aircraft performance data



Flight planning:

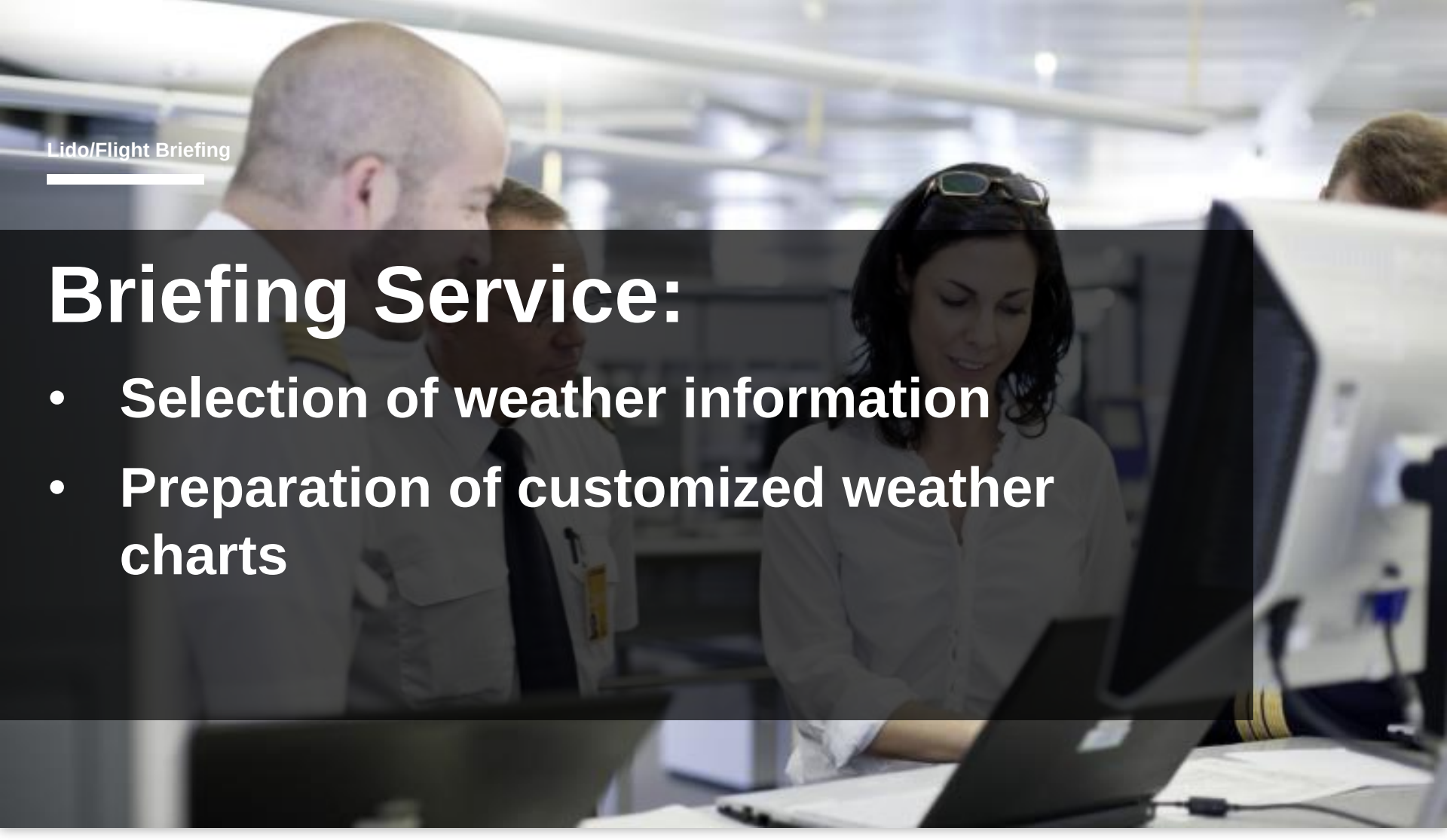
- Upper wind, temperature (WAFC)
- Airport Weather Forecasts (TAF)

Track and avoid:

- Volcanic ash clouds (VAA)
- Tropical cyclones (TCA)
- Atmospheric hazards (CAT, Cb etc.)

Continuous en-route and airport suitability check:

- Automated analysis of weather information (METAR, TAF, SIGMET)
- Automated alerting



Briefing Service:

- Selection of weather information
- Preparation of customized weather charts

Takeoff and Landing performance:

- Airport Weather Forecasts (TAF, FCST)

Data exchange:

- Weather information via datalink
- Send messages from Lido/Flight

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Current System - Deficiencies

03

OPMET (METAR, TAF, SIGMET, AIRMET, GAMET)

METAR: appr. **3200** airports
more than **100.000** messages daily

TAF: appr. **2850** airports daily
more than **15.000** messages daily

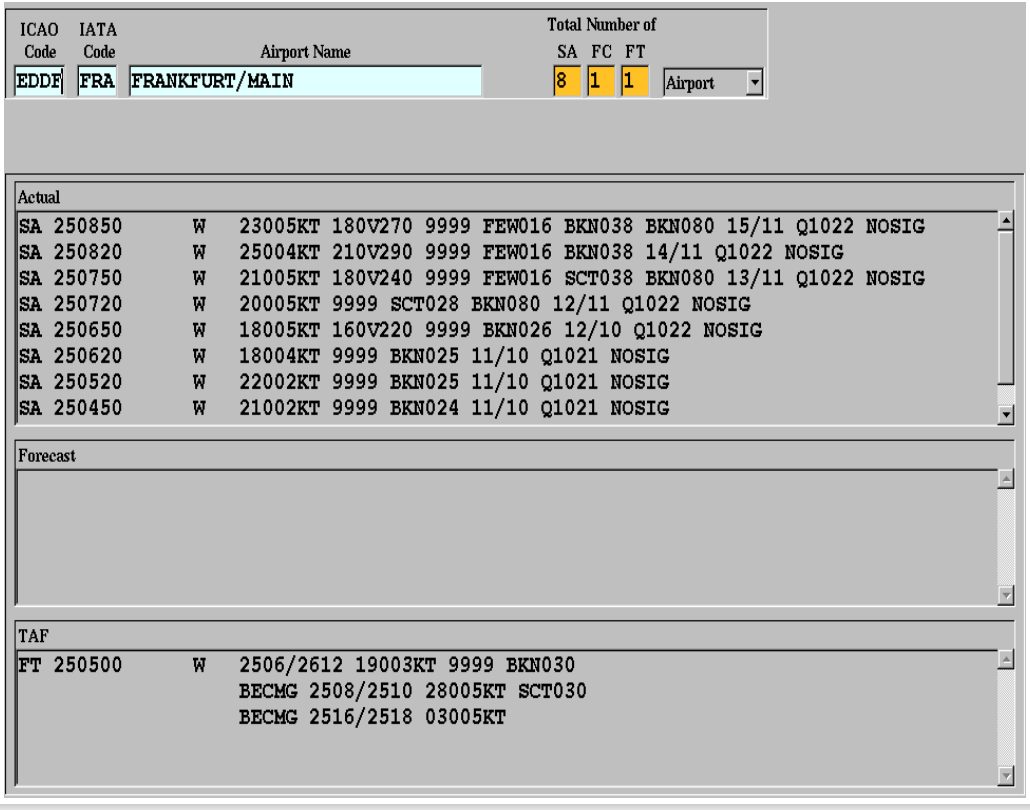
Other: appr. **1500** messages daily

Distributed via AFTN, SADIS and WIFS

All OPMET are issued as alphanumeric messages according ICAO/WMO regulations

OPMET – a challenge for automation

- Templates for all OPMET messages prescribed in ICAO ANNEX 3
- Several differences are filed by states
- Deficiencies in correct issuance of OPMET data regarding format
- MET Services are responsible for correct application
- Auto- versus manual-correction



OPMET – Format errors

METAR:

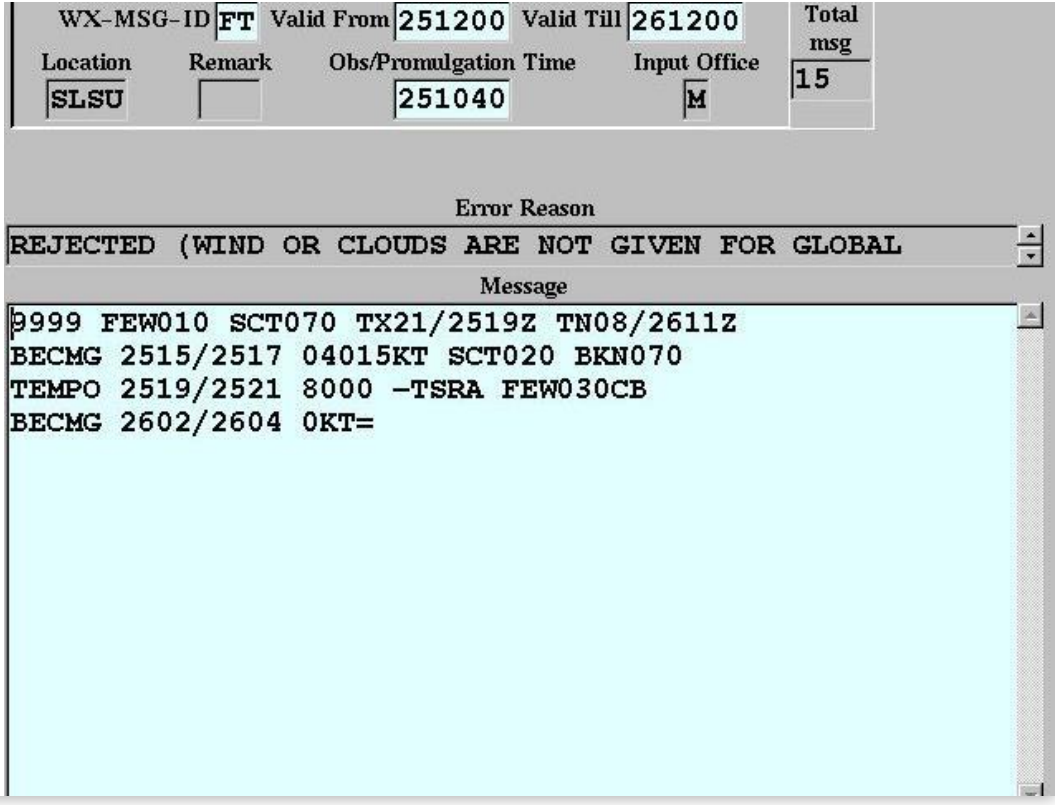
only **less than 20** METARs are rejected daily after autocorrection, manual correction if possible

TAF:

between 200 and 300 TAF are rejected daily after autocorrection, manual correction if possible

Other:

autocorrection only applied for times, FIR/UIR and clearly identfied format errors



OPMET – Format errors (Examples)

- BECMG/TEMPO/INTER/FM missing
- Period outside global validity dates
- BECMG begin time after end
- BECMG longer than 4 hours
- Message validity period longer than 30 hours
- Wind or clouds are not given for global period
- MAIN, BECMG or FM period without valid time token given
- Temperature lower than dew point (METAR)
- 270G05KT
- Invalid end date (SIGMET)

OPMET – Error Correction

Automated Correction (advantages)

- Useful for persistent errors
- Senseful for format errors in comparison to templates in ICAO Annex 3
- Quick availability of corrected messages
- High number of corrections (90% of rejects)

Manual Correction (advantages)

- Correction of random errors
- Complex errors can be handled

Automated Correction (disadvantages)

- Software change required
- Risk of wrong correction
- Difficult to identify general correction rules

Manual Correction (disadvantages)

- Timeliness of correction
- Correction not possible in all cases especially if the meteorological content is affected
- Non correctable messages skipped

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iWXXM – Chance for Improvement

04

ICAO – iWXXM

ICAO Annex 3 Amendment 76 contains following for OPMET data (example: TAF):

1.1.2 **Recommendation.—** TAF should be disseminated, under bilateral agreements between States in a position to do so, in digital form, in addition to the dissemination of the TAF in accordance with 1.1.1.

1.1.3 TAF if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).

1.1.4 TAF if disseminated in digital form shall be accompanied by the appropriate metadata.

Note.— Guidance on the information exchange model, XML/GML and the metadata profile is provided in the Manual on the Digital Exchange of Aeronautical Meteorological Information (Doc 10003).

In ICAO Annex 3 Amendment 78 (applicable November 2018) the OPMET Data Exchange in XML/GML will become standard between states

OPMET – iWXXM

-
- iWXXM is developed by ICAO AND WMO as a special XML format for OPMET Data Exchange
- XML/GML is an industry standard
- XML/GML files are machine generated
- XML/GML requires a strict application of ICAO standards
- No difference and variations to ICAO standard accepted

iWXXM – Benefits for users

- XML/GML translation automatically improves quality of OPMET messages
- No corrections of messages at end users site necessary (quality)
- XML/GML files are machine readable and supports any automated processing
- Strict application of ICAO standards
- No difference and variations to ICAO standard
- Information can be used directly in many applications for graphical display

iWXXM – Challenges

- XML/GML retranslation to traditional alphanumeric code (TAC)
- XML/GML creates huge overflow of administration and big files
- Improvement of data exchange networks
- Strong discipline at origin
- iWXXM **does not inhibit** the issuance of wrong information

Summary

05

iWXXM – Summary

OPMET Data Exchange in XML/GML format offers a great opportunity for all data issuing centers to improve the quality of the data messages

OPMET Data Exchange in XML/GML format enables users to receive OPMET data without format errors and to allows a direct use of data in applications

OPMET Data Exchange in XML/GML format is a challenge for the message distribution networks

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