Global Services

AIS Data Process after its Origination – a Data-House View

ICAO MID AIM/QMS Webinar

Volker Meyer – Manager International Relations

29 April 2021

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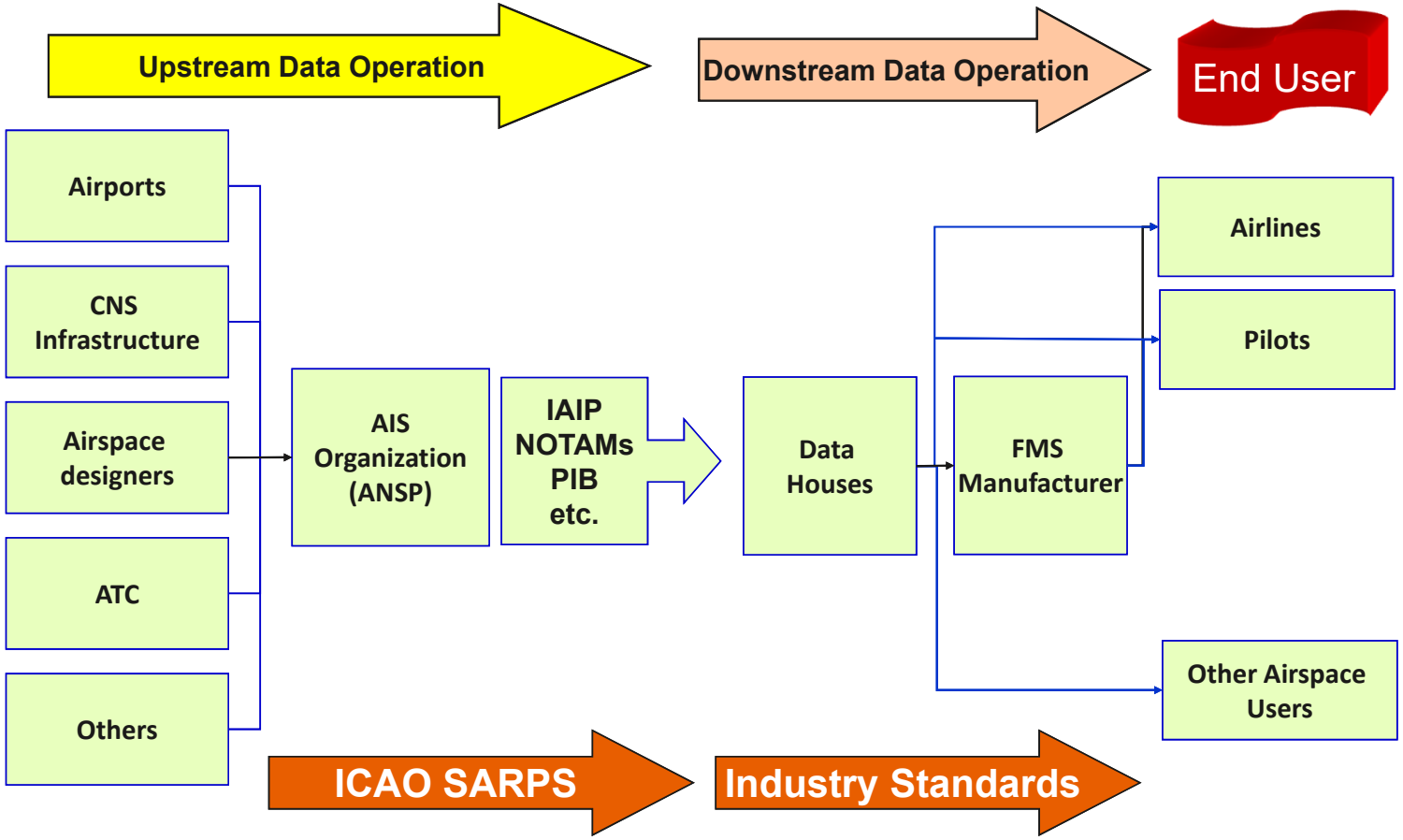
Upstream and Downstream Actors in the Aeronautical Data Supply Chain

Global Services



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Standardizing Aeronautical Information

Global Services

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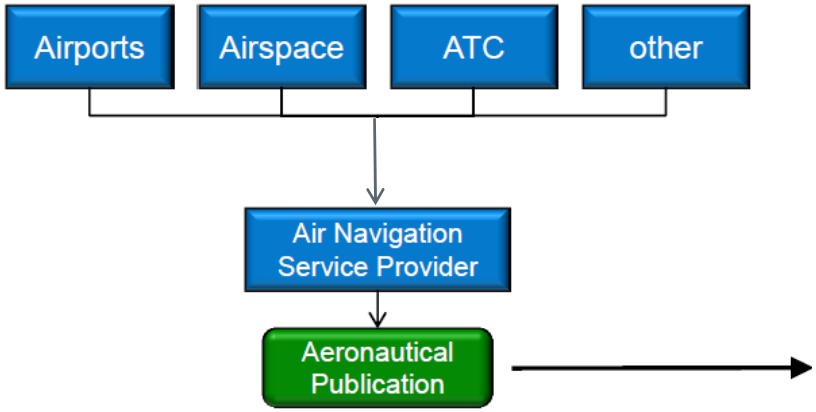

New ICAO Annex 15

2.1 State responsibilities

2.1.1 Each Contracting State shall:

provide an aeronautical information service (AIS) …

2.1.2 Each Contracting State shall ensure that the provision of aeronautical data and aeronautical information covers its own territory and those areas over the high seas for which it is responsible for the provision of air traffic services …

2.1.4 Each Contracting State shall ensure that the aeronautical data and aeronautical information provided are complete, timely and of required quality …

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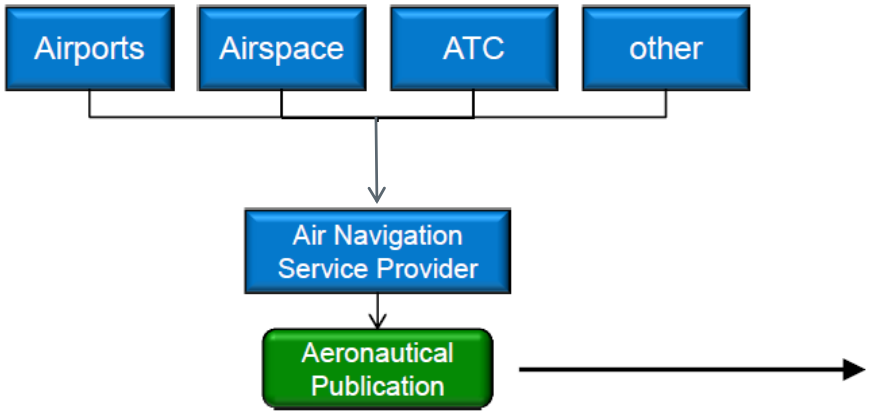

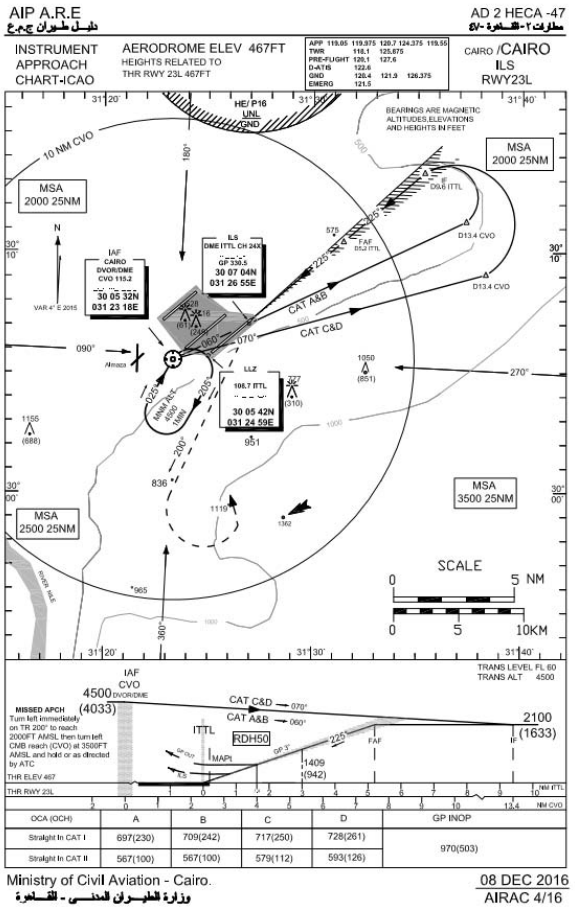

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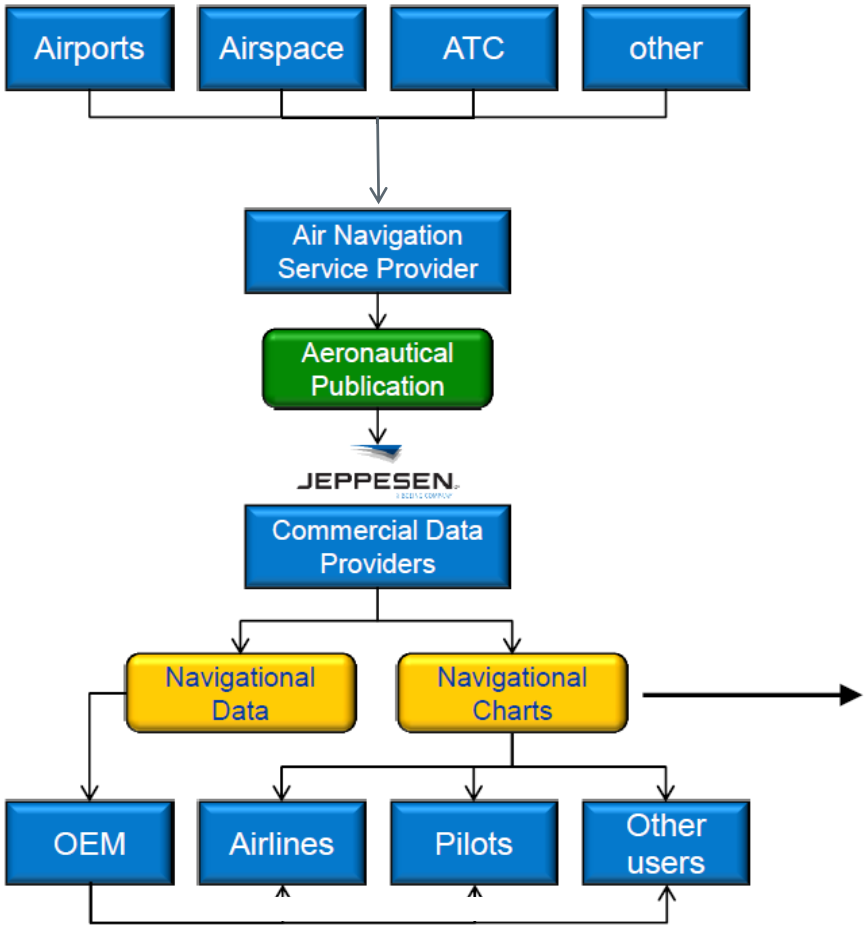

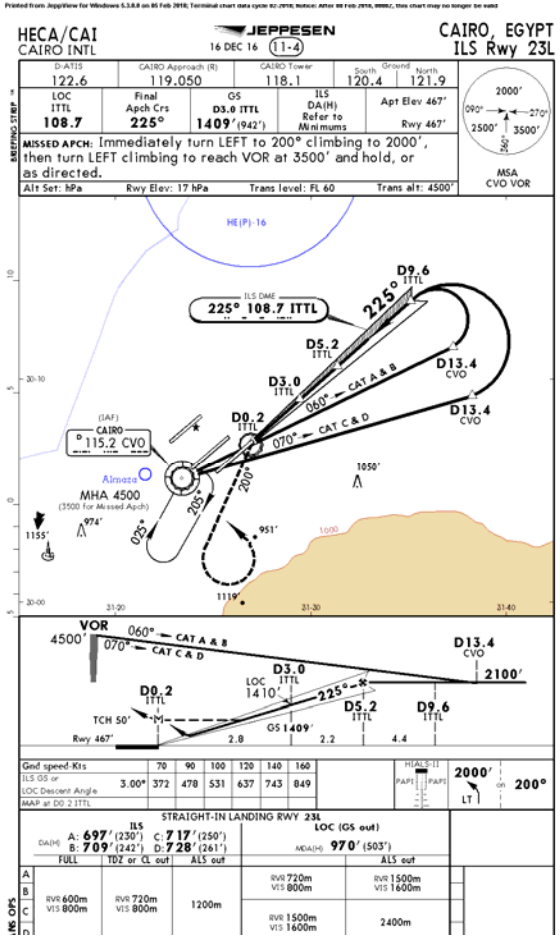

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Jeppesen NavData

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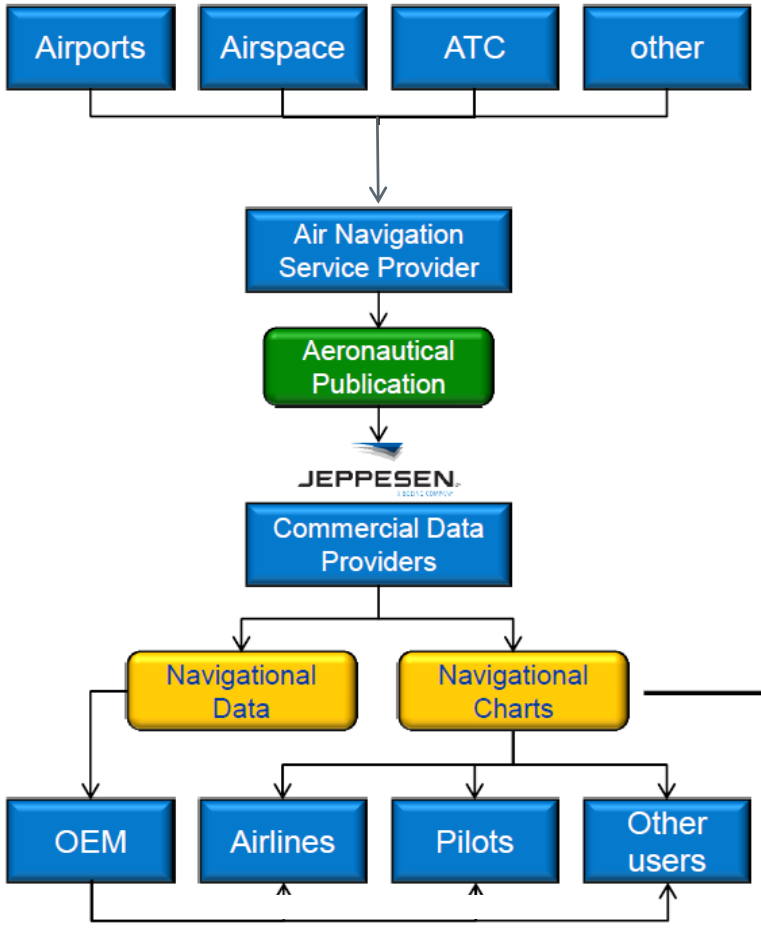

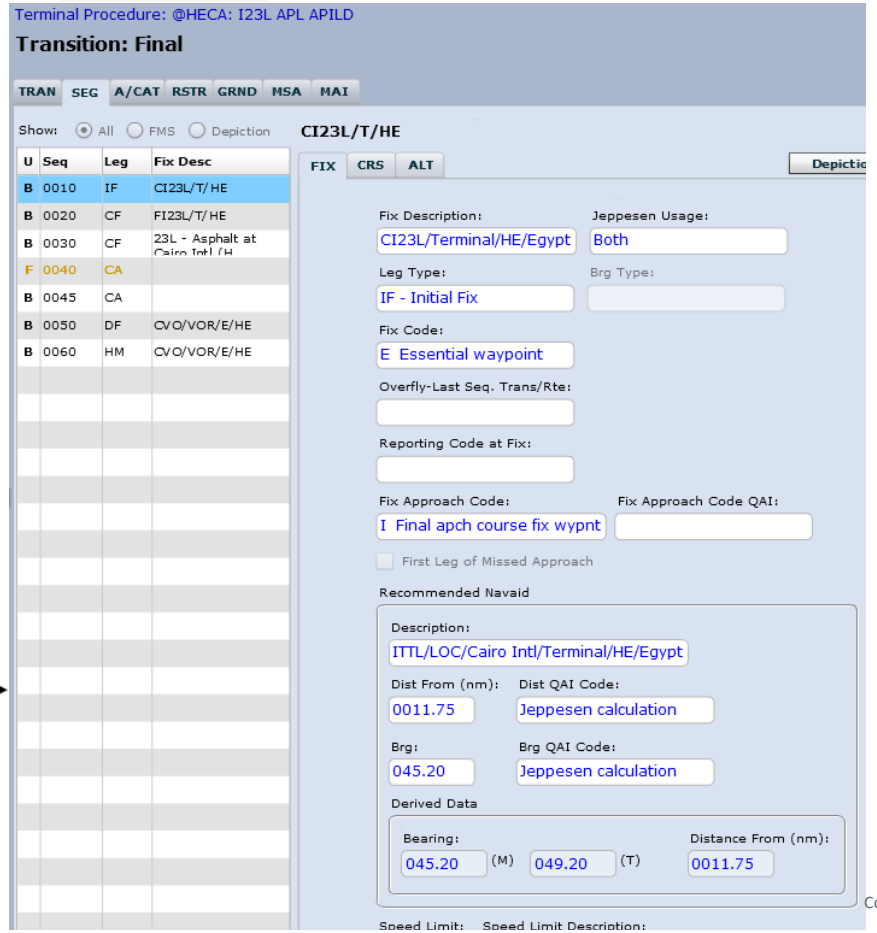

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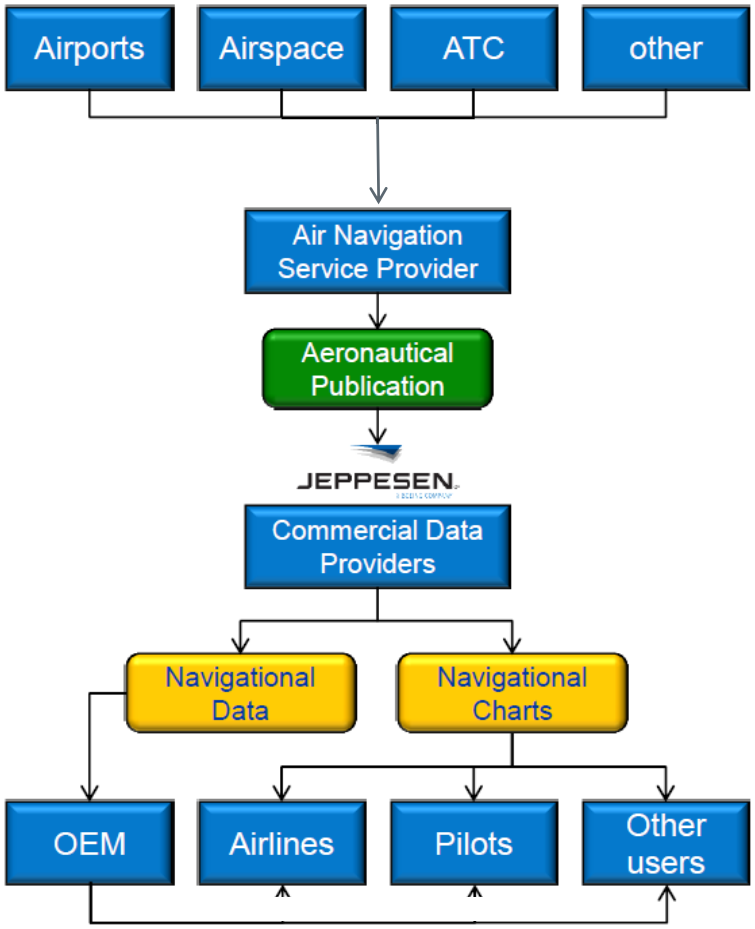

▲	**UPTAR** **213042N 0774055E**					
		109/289 62.2 NM	FL 250 FL 75 Class D 5400 FT (N895)	20 NM	↓	↑
△	**ATMUV** **211059N 0784408E**					

AMDT 01/2019 Airports Authority of India

A

AIP India ENR 3.1 G472-3 11 OCT 2018

Route Designator (RNP Type) Name of Significant Points Coordinates	Track-Magnetic/Geo VOR Radial Distance COP	Upper Limit Lower Limit MFA Airspace Classification	Lateral Limits	Direction of Cruising Levels		Remarks Controlling Unit Frequency
G472 cont'd				Odd	Even	
	109/289 19.0 NM	FL 250 FL 75 Class D 5400 FT (N895)	20 NM	↓	↑	
▲ **NAGPUR VOR DVOR/DME (NNP)** **210453N 0790322E**						
	098/278 90.2 NM	FL 250 FL 75 Class D 5300 FT	20 NM	↓	↑	
△ **RUXAL** **205314N 0803857E**						
	098/278 40.9 NM	FL 250 FL 75 Class D 5300 FT	20 NM	↓	↑	

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Navigational Data

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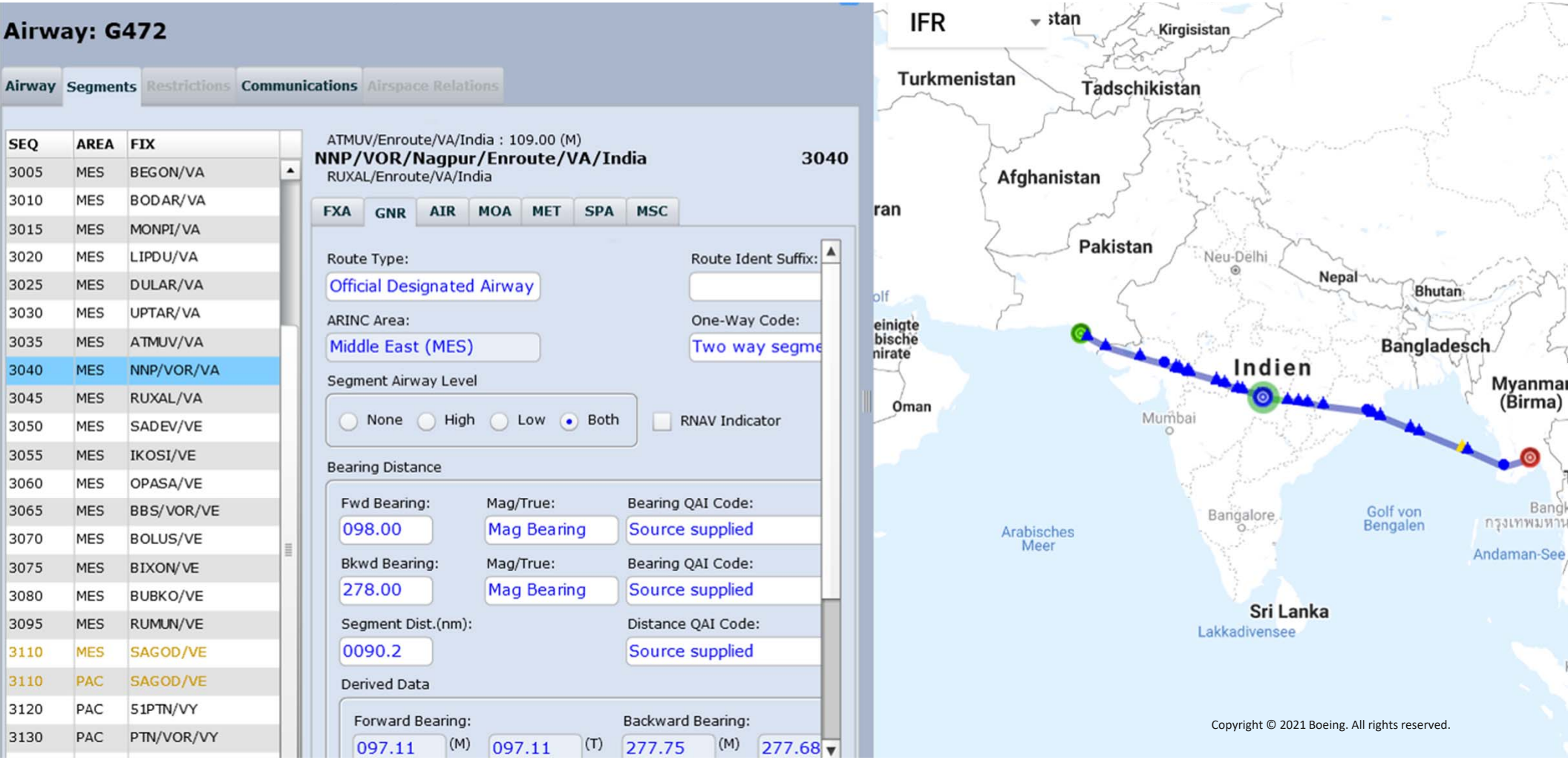

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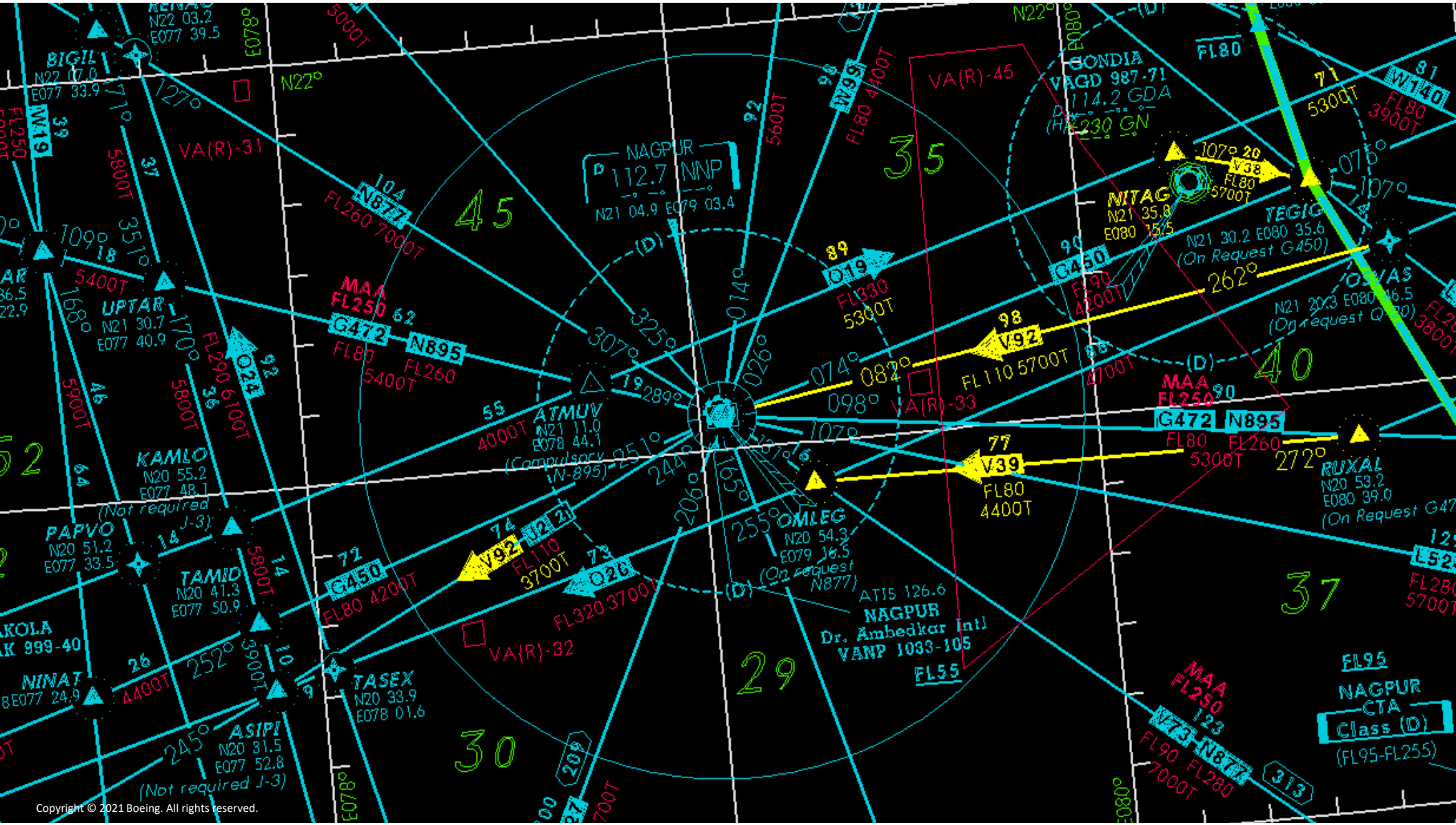

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Aviation Data Management

Main steps of the production process

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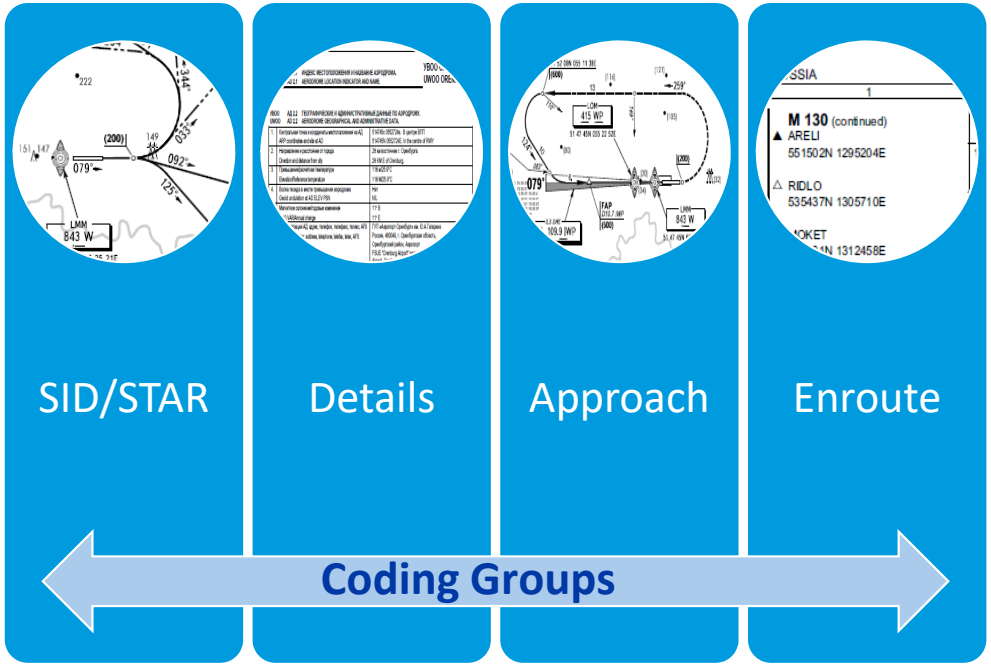
Obtain Source → Analyze Source → Code in Production Tool → Verify in Production Tool → FIQR → Deliver to Customer



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Maintenance

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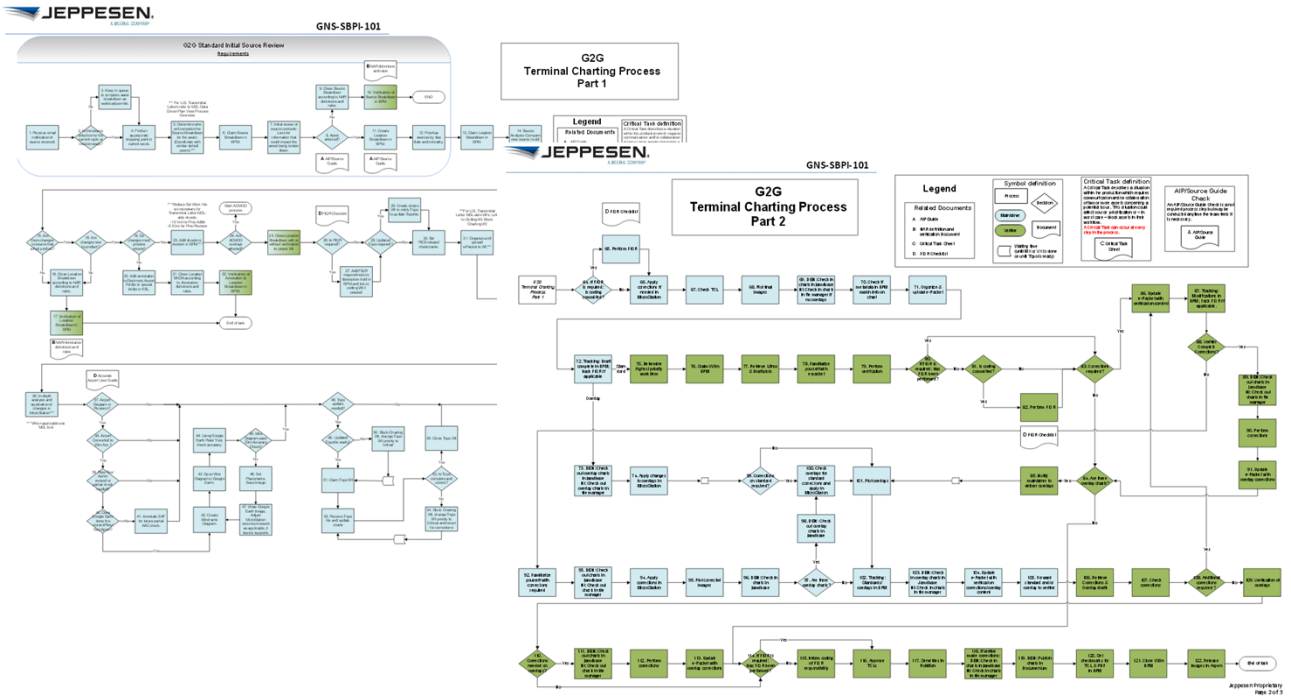
Maintenance:

… following proven and documented processes, product specifications….



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Standard & Regulation Compliance
External Audit Evidence & Certificates

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Maintain compliance with standards:
- ISO 9001:2015
- DO-200A/B ED-76/A

Maintain compliance with regulations:
- FAA AC 20-153A
- EASA LOA Conditions*
- CASA Part 175

Global ISO compliance – certified with a third party registrar, SGS
- First certification in 1997
- Annual audit in DEN, NI, GDN & UK

Type 1 Letter of Acceptance (LOA) for NavData 424 Data
- FAA & EASA 2005

Type 2 Letter of Acceptance (LOA) for Airport Moving Map Data
- FAA 2009

*Transition from LoA to Certificate based upon EU 2017/373 Regulation (LoA Condition Replacement)

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Maintenance

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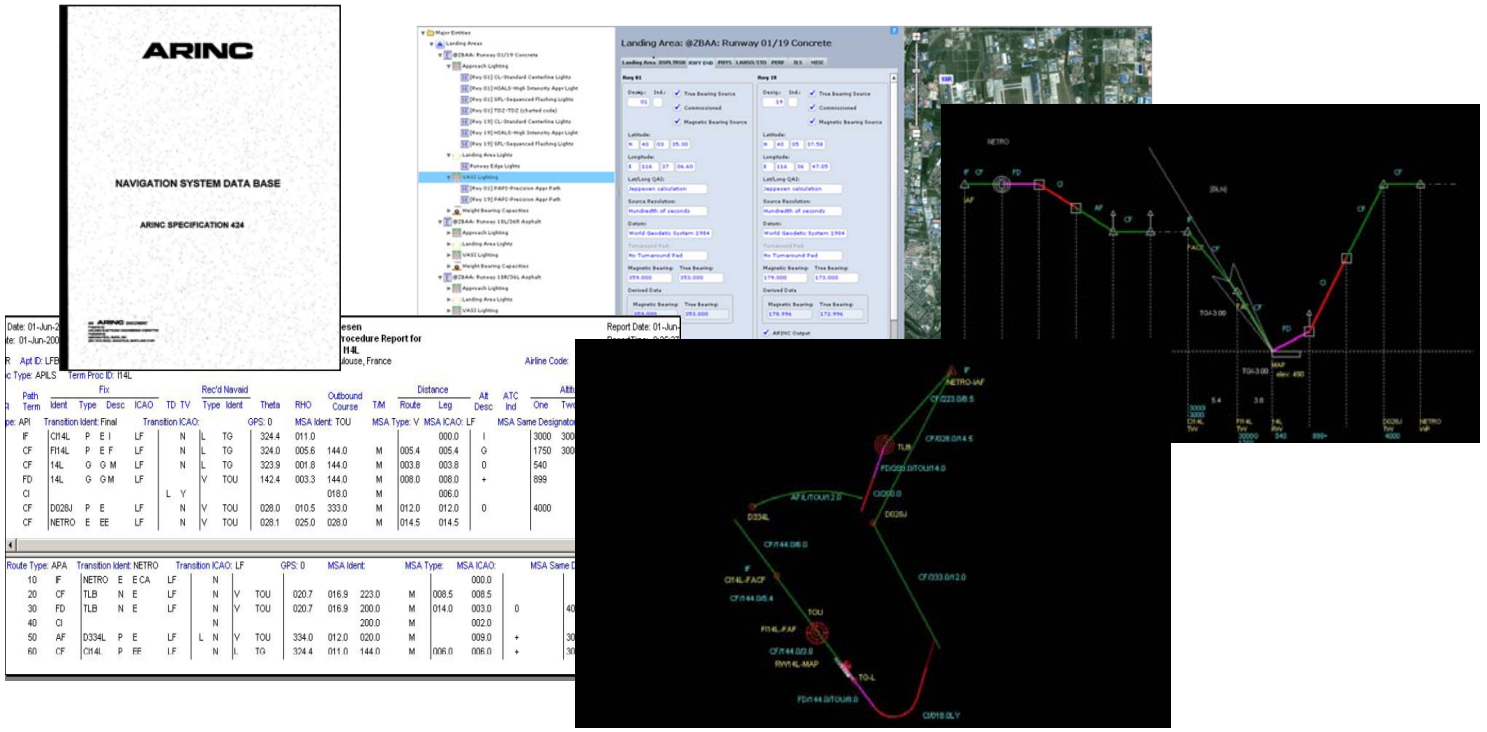
Maintenance:

… and requirements like ARINC 424.



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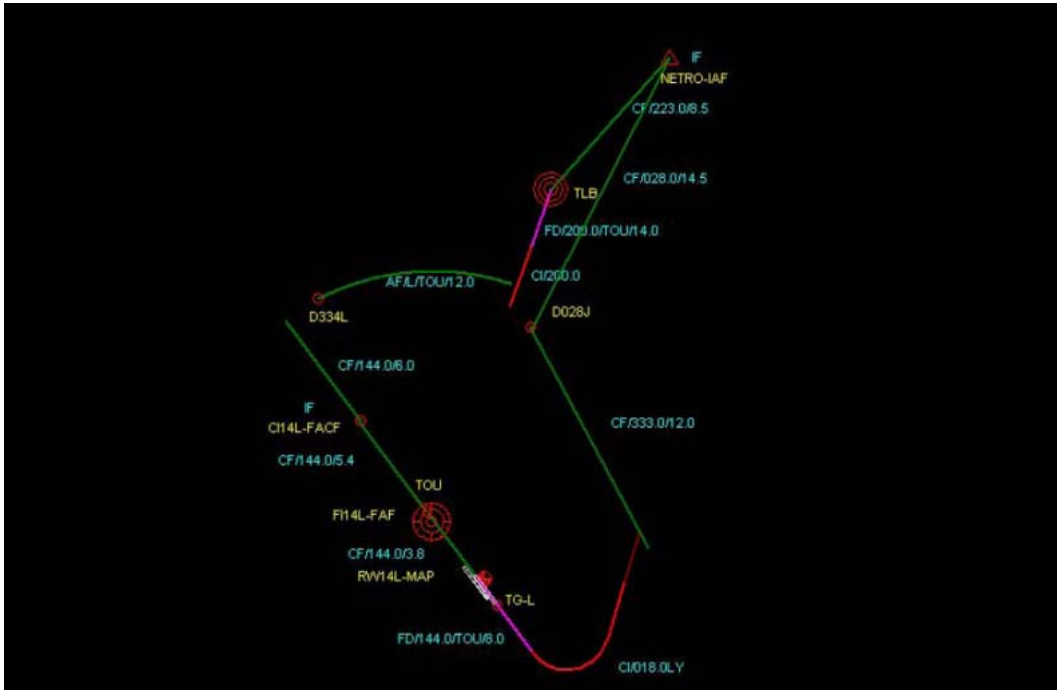
Verification

Verification:

JAD Verification considers critical, essential and routine elements

- **Re-Key**
  - Non-Critical data
- **Blind Re-Key**
  - Flight Critical data

Supported by Graphical Editing Tool



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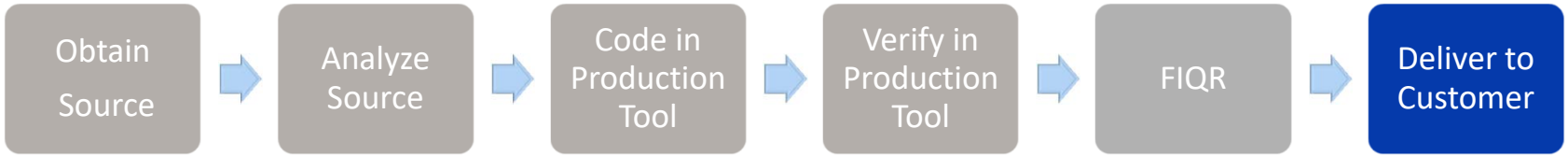
Aviation Data Management

Global Services



ARINC 424 file maintenance and creation

- ARINC 424 parameters maintained in Production Tool
- Extracts ARINC 424 data from Production Tool based on requested

```
SEEUP URSSURFJ02   AKOGU2 010KOGULUREA0E CC    IF                              B FL200FL11005000                  0 LS   134281905
SEEUP URSSURFJ02   AKOGU2 020SS024URPC0E       TF                                                                 0 LS   134291905
SEEUP URSSURFJ02   AKOGU2 030SS023URPC0E       TF                                                                 0 LS   134301905
SEEUP URSSURFJ02   AKOGU2 040SS022URPC0EE B    TF G02AUR                    PT   + 02020                          0 LS   134311905
SEEUP URSSURFJ02   AKOGU3 010KOGULUREA0E CC    IF                              B FL200FL11005000                  0 LS   134321905
SEEUP URSSURFJ02   AKOGU3 020SS026URPC0E       TF                              + FL110                            0 LS   134331905
SEEUP URSSURFJ02   AKOGU3 030GOKINURPC0E       TF                              B FL100FL060                       0 LS   134341905
SEEUP URSSURFJ02   AKOGU3 040SS024URPC0E       TF                                                                 0 LS   134351905
SEEUP URSSURFJ02   AKOGU3 050SS023URPC0E       TF                                                                 0 LS   134361905
SEEUP URSSURFJ02   AKOGU3 060SS022URPC0EE B    TF G02AUR                    PT   + 02020                          0 LS   134371905
SEEUP URSSURFJ02   APITOP 010PITOPURPC0E CC    IF                              B FL080FL06005000                  0 LS   134381905
SEEUP URSSURFJ02   APITOP 020SS022URPC0EE B    TF G02AUR                    PT   + 02020                          0 LS   134391905
SEEUP URSSURFJ02   J      010SS022URPC0E  I    IF G02AUR                    PT   J 0202002020005000                0 LS   134401905
SEEUP URSSURFJ02   J      020SS028URPC0E  F    TF G02AUR          02200050PT   G 0202002020        -280ADL   URD 0 LS   134411905
SEEUP URSSURFJ02   J      030MJ02 URPC0EY M    TF G02AUR          02200035PT     00960             -280           0 LS   134421905
SEEUP URSSURFJ02   J      040SS029URPC0E M R   DF                                                 210            0-LS   134431905
SEEUP URSSURFJ02   J      050PITOPURPC0EE H    TF                              + FL060                            0 LS   134441905
```

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NavData History & Uses

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How it began:

- NavData department established 1970
- First Commercial Flight 1973
- ARINC Specification 424 1975
- First Direct Update Service 1983 for the B737-300 FMS

How is NavData being used:

- Flight Planning Engines
- Flight Management Systems (FMS)
- Simulation
- Paper / Electronic Charting
- Airport Analysis
- Terrain Awareness Warning Systems (TAWS)
- Synthetic Vision Systems

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AIRAC Adherence in New Annex 15

Global Services

6.2 Aeronautical Information Regulation and Control (AIRAC)

6.2.3 ~~6.2.1~~ Information provided under the AIRAC system ~~in paper copy form~~ shall be ~~distributed~~ made available by the AIS unit ~~at least 42 days in advance of the effective date with the objective of reaching~~ so as to reach recipients at least 28 days in advance of the AIRAC effective date.

Note. — AIRAC information is distributed by the AIS at least 42 days in advance of the AIRAC effective dates with the objective of reaching recipients at least 28 days in advance of the effective date.

6.2.7 ~~6.2.2~~ Recommendation. — *Whenever major changes are planned and where advance notice is desirable and practicable, information ~~provided in paper copy form~~ should be ~~distributed~~ made available by the AIS ~~unit~~ so as to reach recipients at least 56 days in advance of the effective date. This should be applied to the establishment of, and premeditated major changes in, the circumstances listed ~~in Appendix 4, Part 3,~~ below, and other major changes if deemed necessary.*

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New Annex 15 – AIRAC Changes

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6.2 Aeronautical Information Regulation and Control (AIRAC)

6.2.1 Information concerning the following circumstances shall be distributed under the regulated system (AIRAC) …:

a) Limits (horizontal and vertical), regulations and procedures applicable to:

1) FIRs; 2) CTAs; 3) CTRs; 4) ADZs; 5) ATS Routes; 6) restrictive airspace …

c) Holding and approach procedures, arrival and departure procedures, noise abatement procedures and any other pertinent ATS procedures.

d) Transition levels, transition altitudes and minimum sector altitudes.

6.2.3 Information provided under the AIRAC system shall be made available by the AIS so as to reach recipients at least 28 days in advance of the AIRAC effective date.

Note. — AIRAC information is distributed by the AIS at least 42 days in advance of the AIRAC effective dates with the objective of reaching recipients at least 28 days in advance of the effective date.

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New Annex 15 – Major AIRAC Changes

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6.2.7 **Recommendation.**— *Whenever **major changes** are planned and where advance notice is desirable and practicable, information should be made available by the AIS so as to **reach recipients at least 56 days in advance** of the effective date. This should be applied to the establishment of, and premeditated major changes in, the circumstances listed below, and other major changes if deemed necessary.*

*a) **New aerodromes** for international IFR operations.*

*b) **New runways** for IFR operations at international aerodromes.*

*c) Design and structure of the **air traffic services route network**.*

*d) Design and structure of a **set of terminal procedures** (including change of procedure bearings due to magnetic variation change).*

*e) Circumstances listed in 6.2.1 if the **entire** **State** or any significant portion thereof is affected or if **cross-border coordination** is required.*

Note. — Guidance material on what constitutes a major change is included in Doc 8126.

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Jeppesen Production Process in sync with ICAO Publication Dates according to Annex 15

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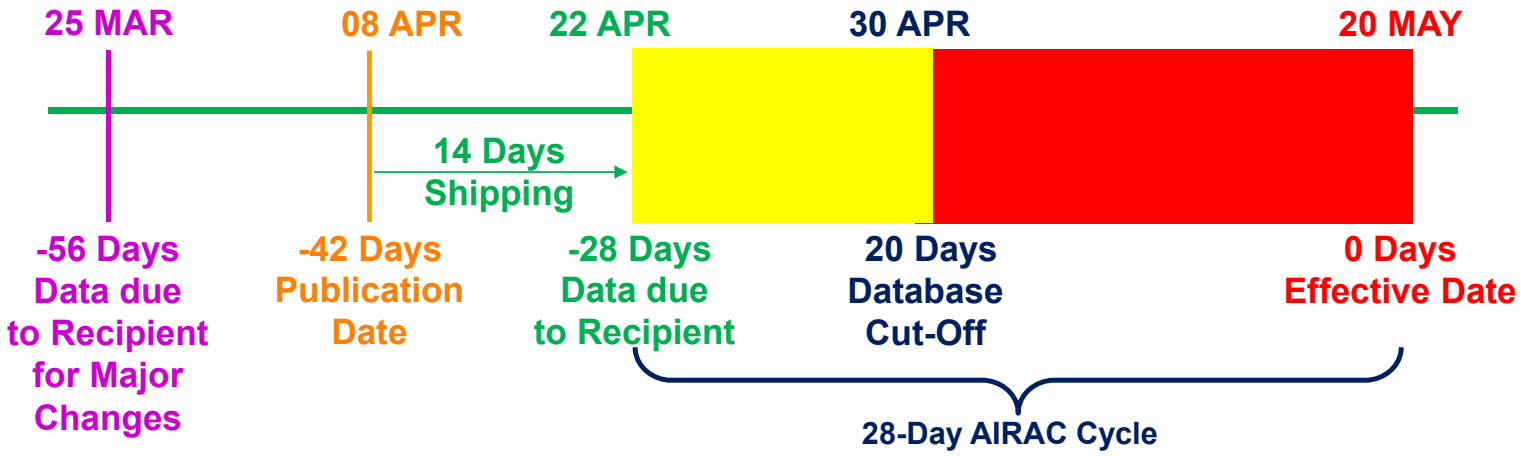
Jeppesen Navigation Database

- Updated every 28 days (AIRAC system)
- No updates outside AIRAC system
- A change may not be in the database at the effective date if
  - the effective date is outside the AIRAC system
  - source was received late
  - the ANSP is not responding to clarifications
- Cancellation of changes has to follow the AIRAC system as well
- Adherence to the AIRAC system should ensure that the change is in the database



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Jeppesen Production Process in sync with ICAO Publication Dates according to Annex 15

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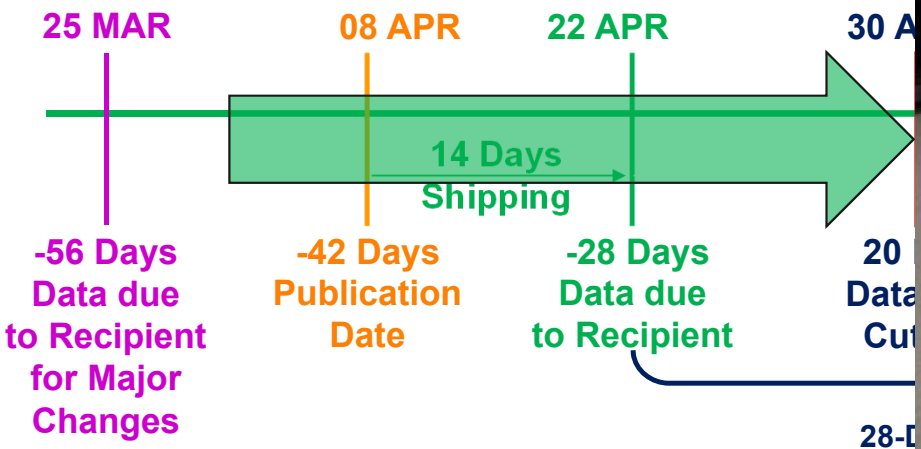
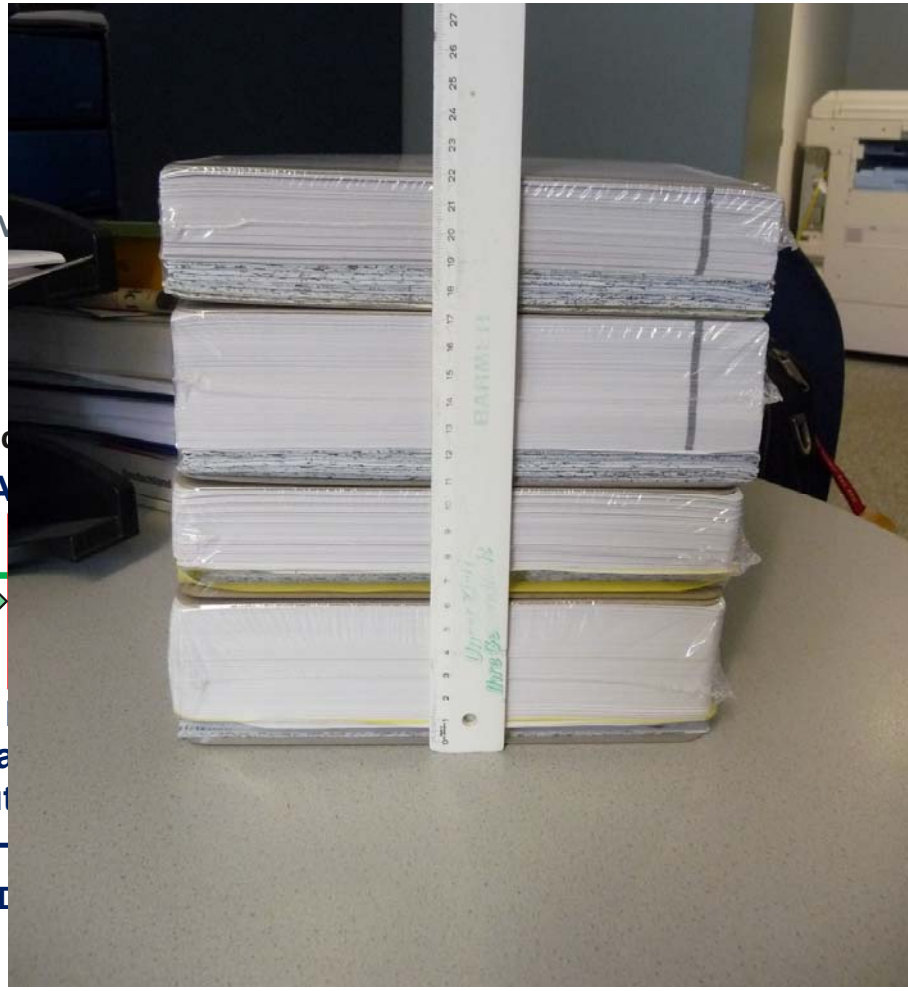
Issues

- Late source, no source
- **Incomplete and erroneous** source
- AIRAC changes published in a non-AIRAC Amendment
- Permanent AIRAC changes published by SUP or NOTAM
- Late postponement
- **Effective date outside AIRAC system**
- **Missing harmonisation between states**
- **No response**
- **Restrictive disclaimers on Websites, Manipulation of so**





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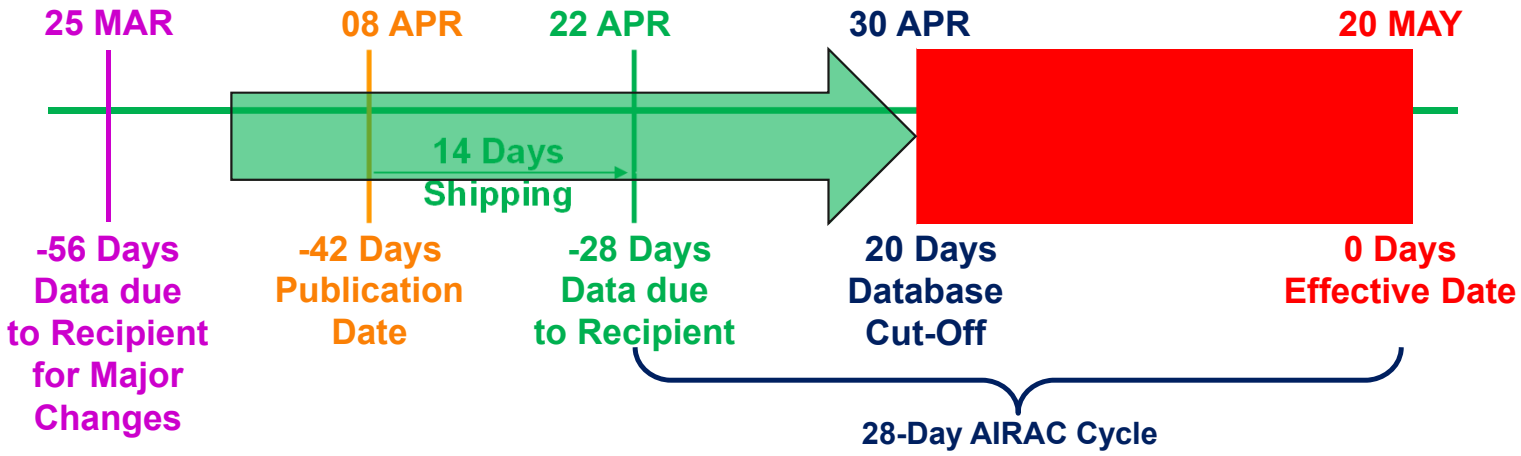

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Downstream Data Process

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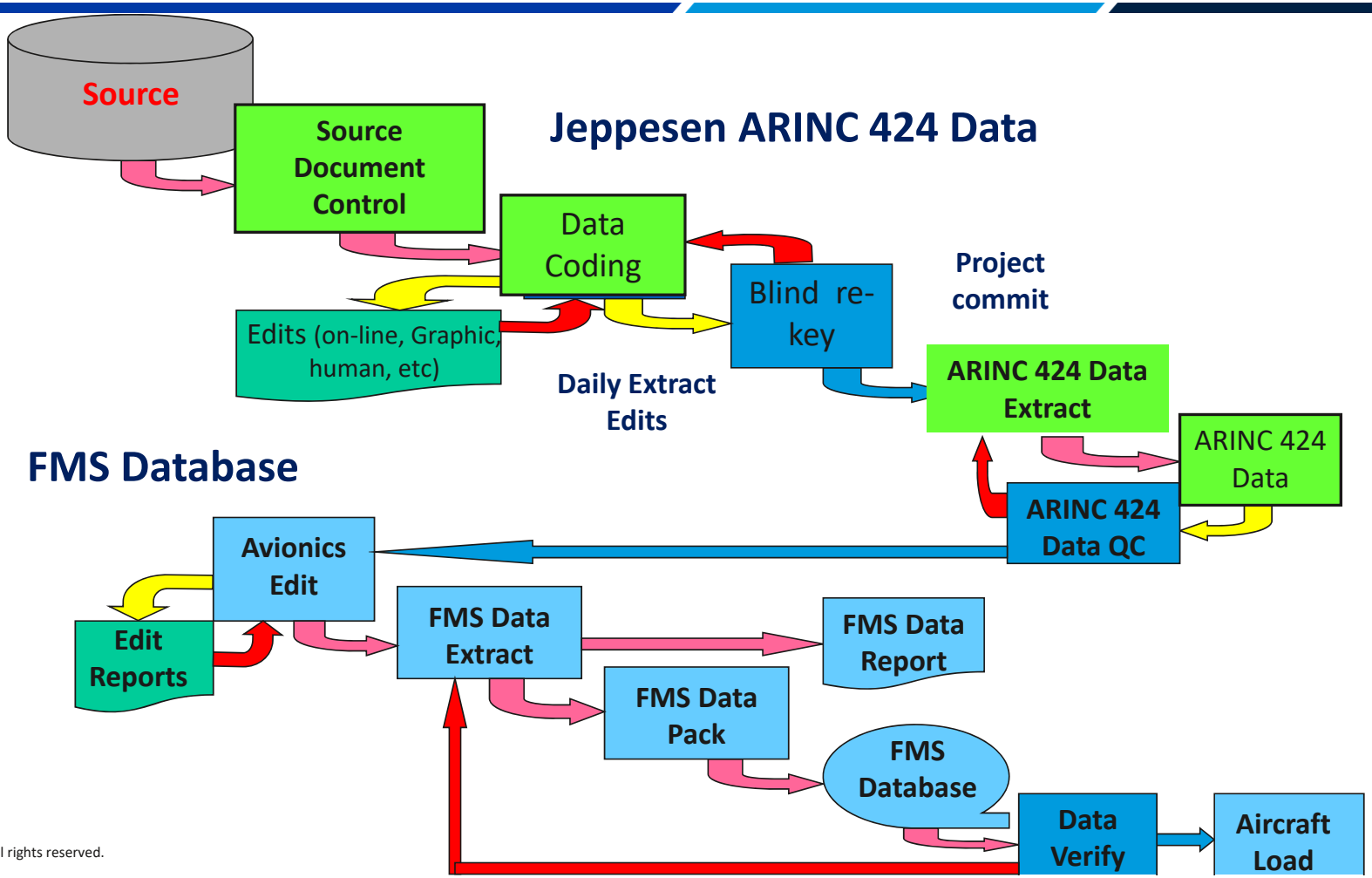

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Two types of DAT providers are identified:

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Authoritative Source -> Type 1 DAT Provider -> Type 2 DAT Provider -> End User

Process/Data Obstacles

Late source
No source
Incomplete source
Erroneous source
No communication
Manipulating source

Process/Data Obstacles

OEM restrictions
Database size restrictions
FMS capabilities

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Process/Data Obstacles between AIS and OEMs/Users
Memory Size and other Restrictions by OEMs (DQRs)

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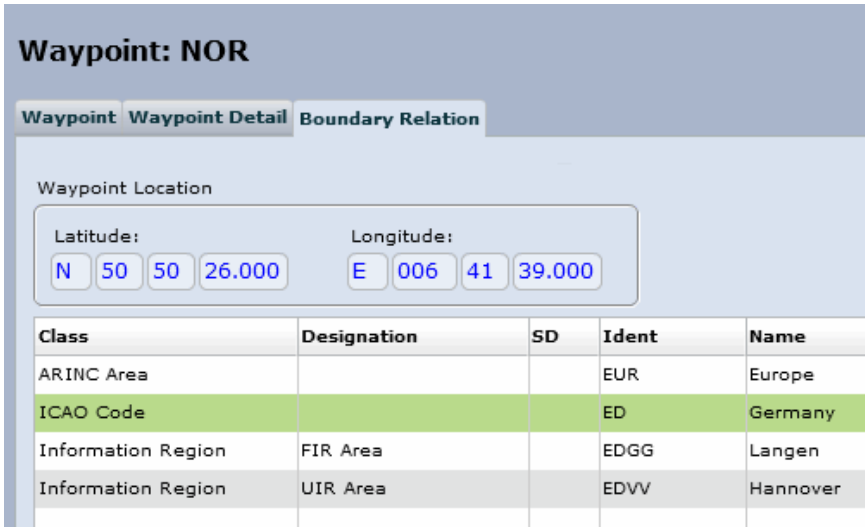
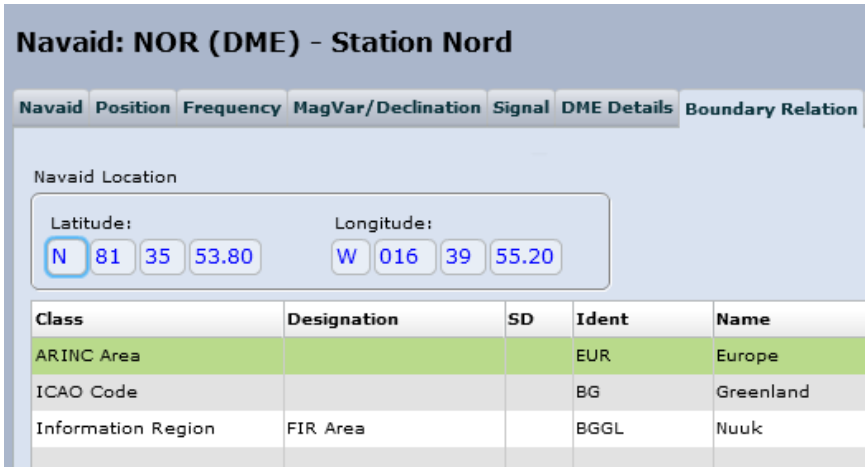
- We deliver ARINC-424 from -8 to -20
- Older FMSs cannot handle all procedure types
- Older FMSs may have a very small memory size (dabase overflow – customers have to select)
- Max. memory size in modern aircraft is 30 MB
- OEM (database manufacturer) excludes certain data elements to save memory
- OEM (database manufacturer) cannot handle certain procedure types
- OEM (aircraft manufacturer) does not allow certain procedure types
- Data may lose attributes and differenciators in FMS





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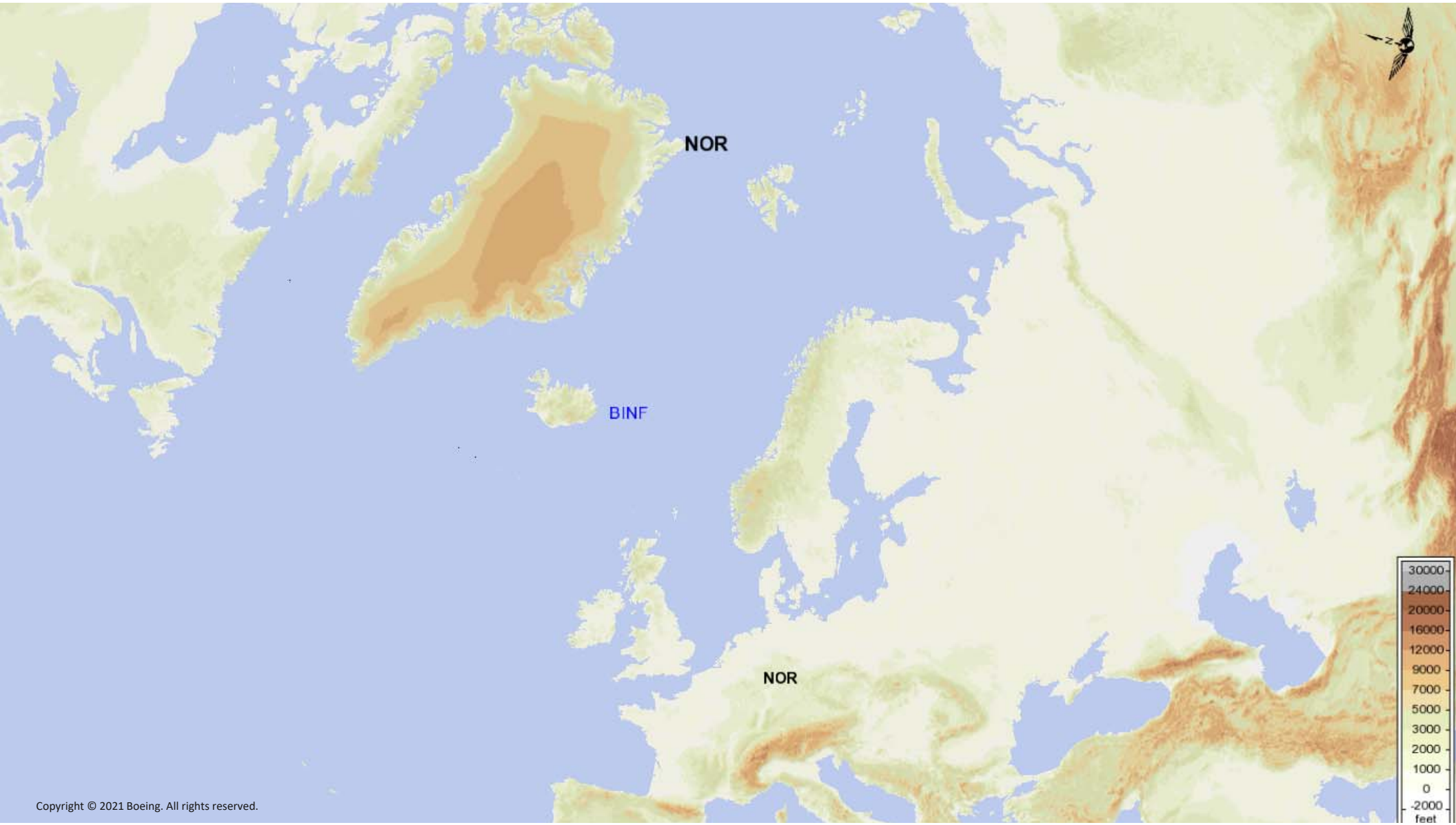

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Questions?

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