

EUR Region Frequency Coordination Procedures and Tools

Current procedures and proposed improvements

Bertrand Desperier and Jose Roca
Radio Frequency Function
Dec 2018

Classification DCC : Green



Agenda

- Why Europe is different?
- Frequency Coordination process in the ICAO EUR Region
 - Principles and Methods
 - What is SAFIRE?
 - What is MANIF AFM?
 - Frequency Coordination Process
- Interregional Frequency Coordination
 - Current procedures
 - Proposed improvements
- Conclusions



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Why Europe is different?

Frequency Congestion Situation

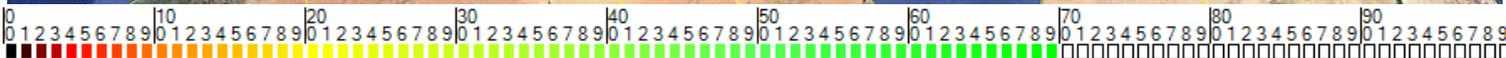
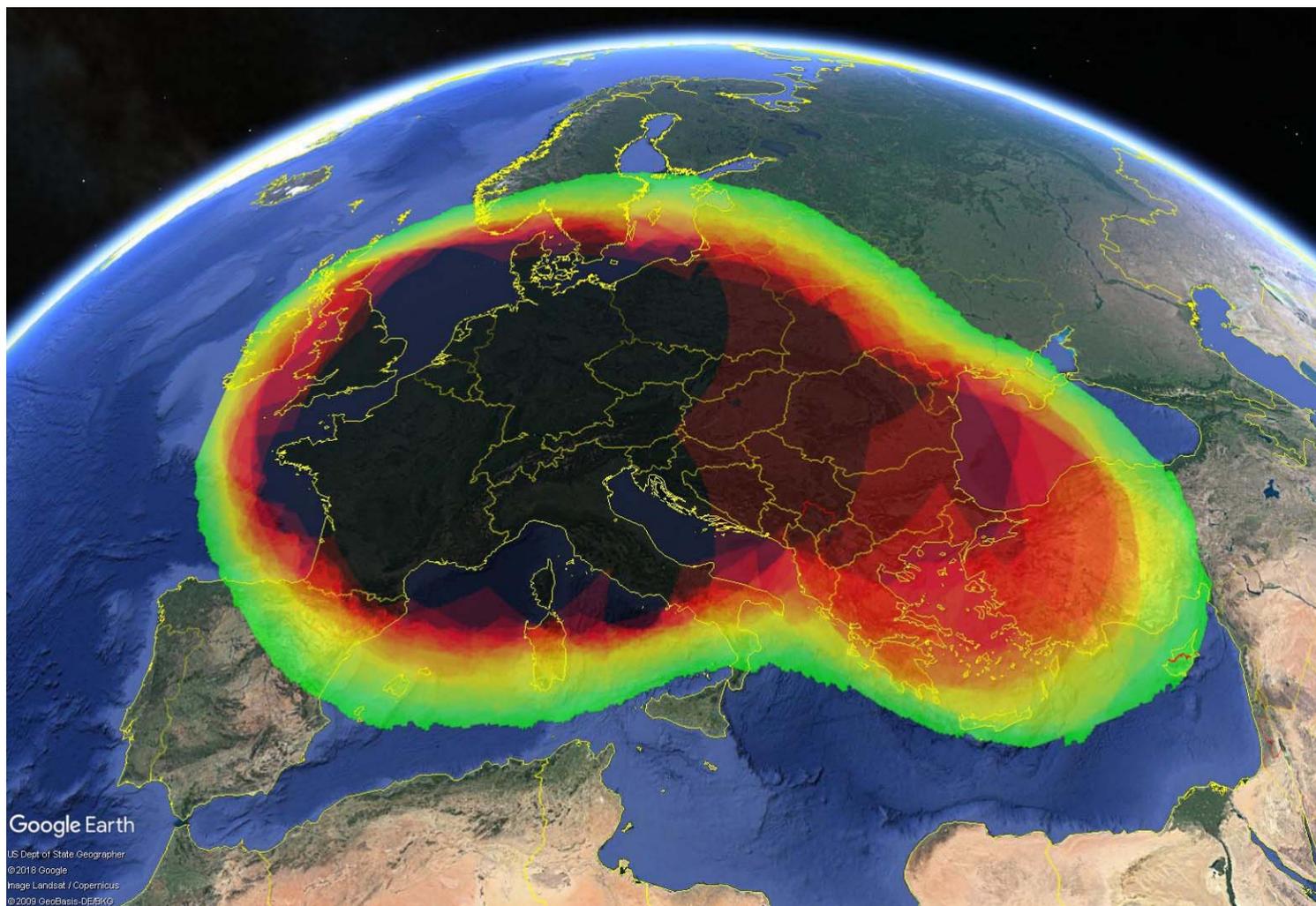
Classification DCC : Green





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ACC 25 kHz (50NM/FL450) 2018



Classification: DCC : Green

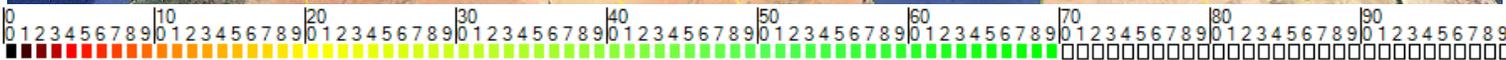
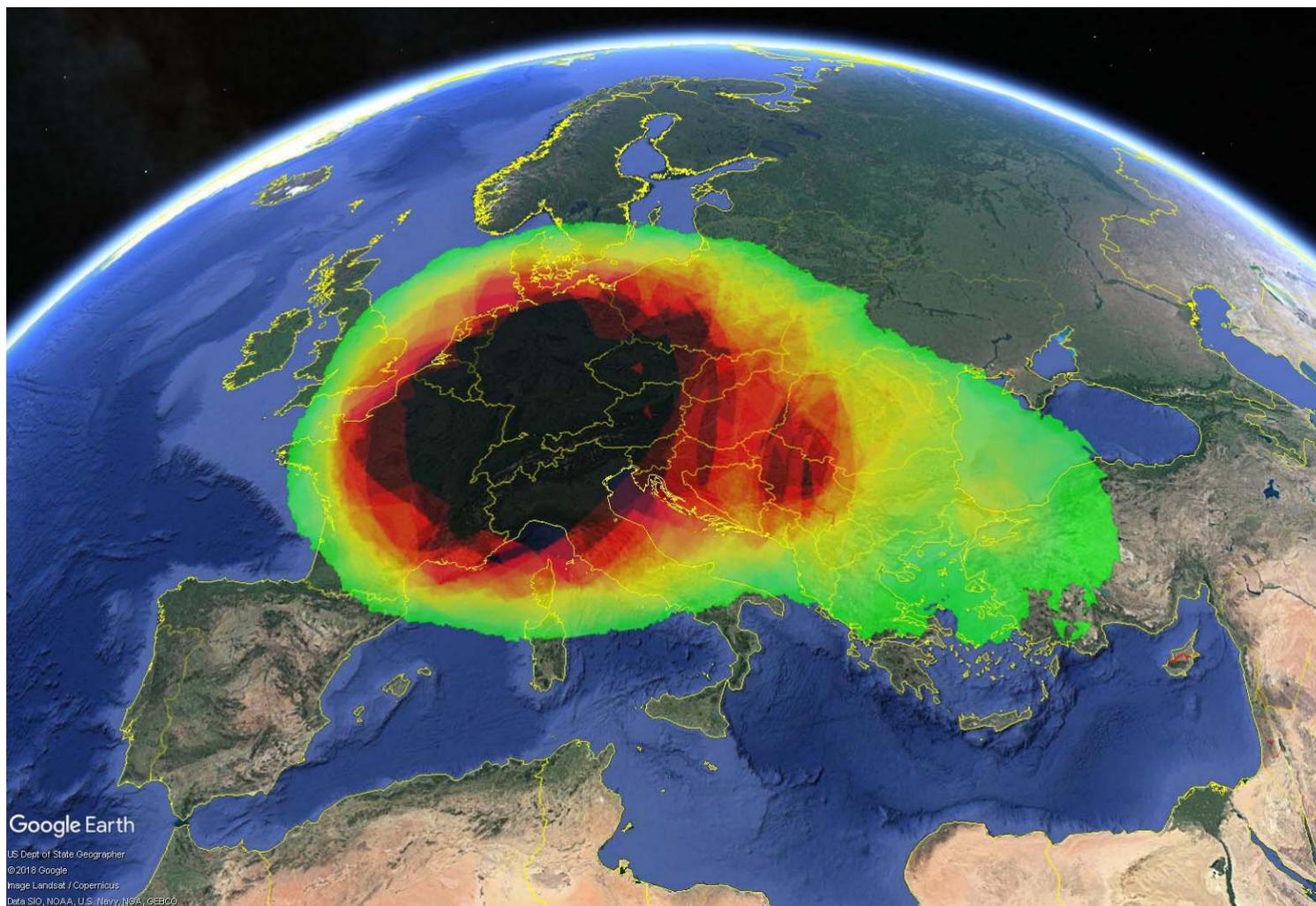


EUROCENTRAL



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ACC 8,33 kHz (50NM/FL450) 2018



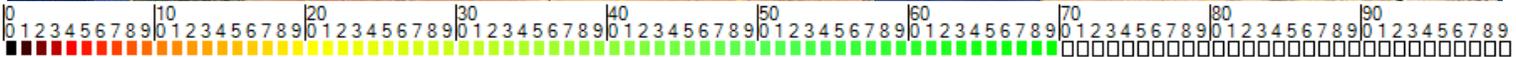
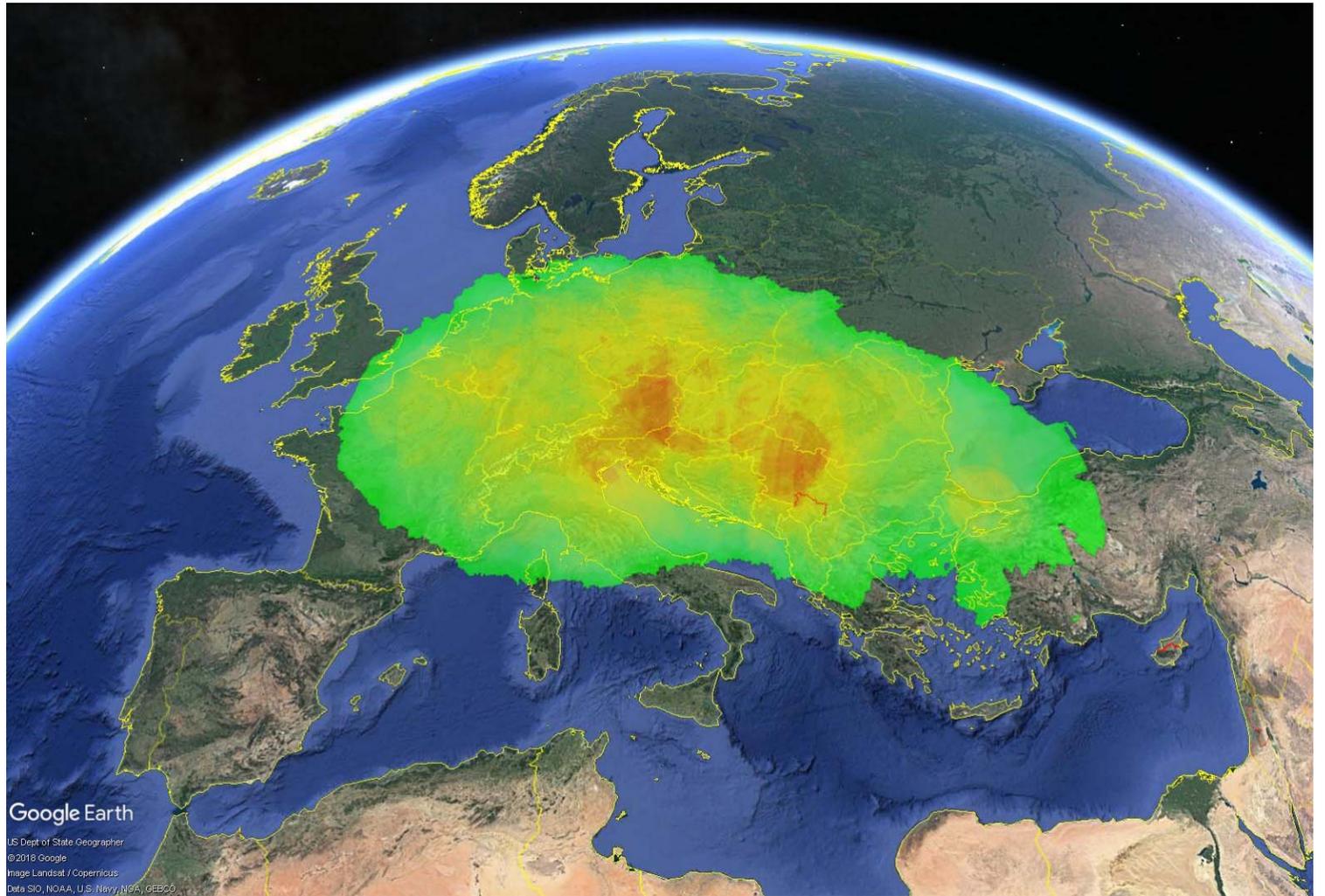
Classification: DCC : Green





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ACC 8,33 kHz (50NM/FL450) Forecast - January 2019?



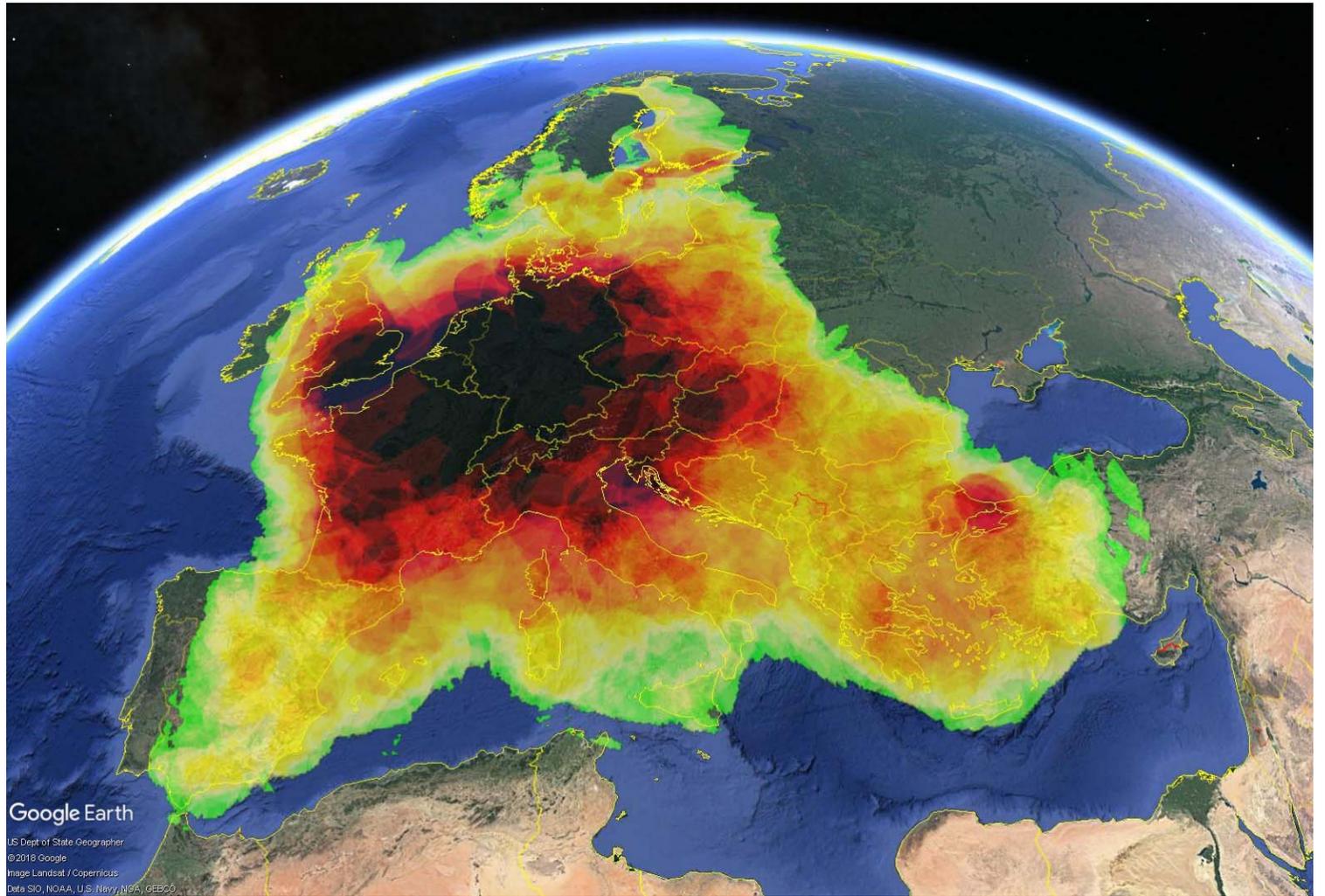
Classification: DCC : Green





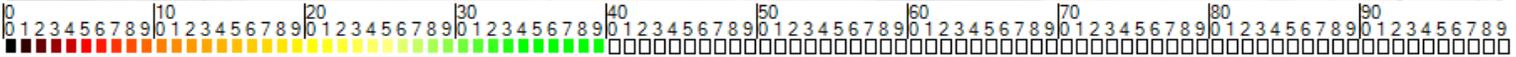
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VOR/DME 2018



Google Earth

US Dept of State Geographer
© 2018 Google
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO



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EUR Region Frequency Coordination Procedures and Tools

Principles, methods and SW tools

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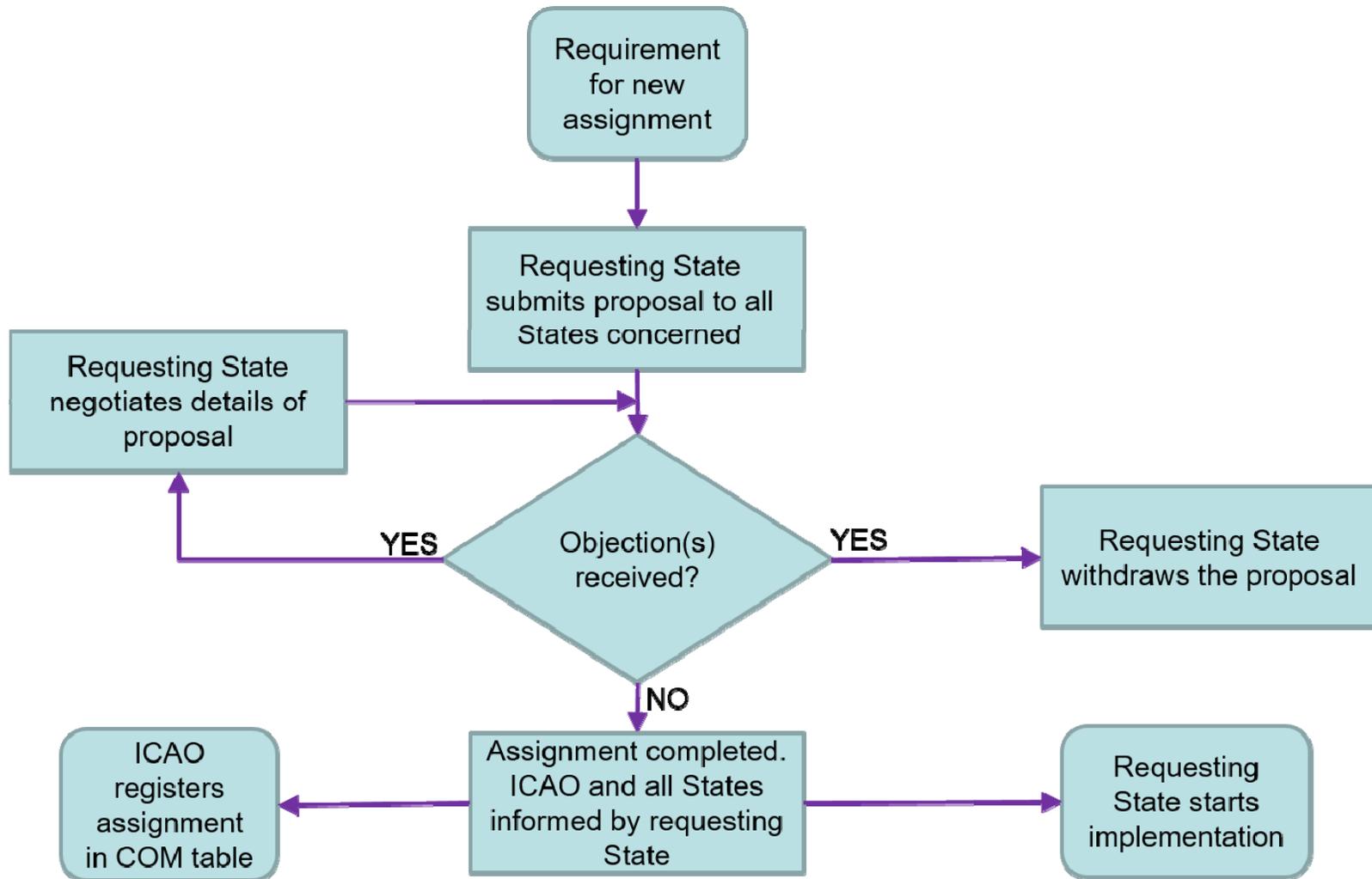
EUR Frequency Coordination – Principles and Methods

- The process to obtain the agreement of concerned States for any new assignment or any change of frequency or other basic characteristic of an existing assignment:
 - States can **object** to a proposed new assignment or a modification if they consider it can cause harmful interference to one of their assignments registered in SAFIRE and compliant with the ICAO EUR Doc011 provisions.
 - States can **accept** new assignments that do not respect the ICAO EUR Doc011 compatibility criteria with respect to one or more of the existing assignments.

This acceptance can include specific bilateral **coordination agreements** that impose conditions on the use of the assignment.



EUR Frequency Coordination – Principles and Methods





What is SAFIRE?

- **S**pectrum **A**nd **F**requencies **I**nformation **R**esource
- **C**entralised database with appropriate **security** and **confidentiality** access levels
- Contains all the EUR region frequency assignments (**ICAO COM tables**)
- The EUR frequency assignment coordination system operated by EUROCONTROL **on behalf of the ICAO EUR/NAT office.**
- **Characteristics:**
 - Web-based
 - International coordination according to ICAO EUR Doc 011 for all COM Tables
 - Always up-to-date
 - Available to users
 - Possibility to export data's to **MANIF AFM**
 - Records Coordination and Assignment history



What is MANIF AFM?

- MANIF AFM: **MAN**agement **I**nteractif des **F**requencies - **A**dvanced **F**requency **M**anagement
- **Characteristics:**
 - Windows PC software tool
 - Available to users
 - Automates **compatibility assessment** in compliance with ICAO EUR Doc 011 and Annex 10 / ICAO Doc 9718 planning rules
 - Planning criteria available for all COM Tables
 - Many graphical advanced functions integrated
 - MANIF AFM can import data from and export data to **SAFIRE**



Frequency Coordination Process

SAFIRE Work Area

Requesting State

Other States

MANIF-AFM Work Area

Requesting State

Other States

1. Frequency search





Frequency Search: MANIF AFM

AFM-MANIF V2.6.0 - COM2Standard

Project **Facilities** | Polygons | Ground sites | Compatibility | Search | Maps | Google map | Safire upload | FM | Free Pad

Com2 Com3 Com4 Com5 Country = F Region = EUR Use Ground Data

554 of 1273

EUR
France
TWR

Facility

COM: 2 Country: F Reference: TEST AFM status: LA ICAO status:

Location: LYON/ST EXUPERY Objected Ref.

Service: TWR

Nat ref.:

Remark: \$em

ICAO dates:

Areas: 454200N 050500E

Element Type VHF.25.C Channel: 119.150 Operational: Yes Unprotected:

Remark:

R/T Function: Air RcvTr. Max dist. to Tr. (NM): <None>

Remark:

Volume Type: Coordinates Radius (NM): 25 FL min.: 0 FL max.: 40 FL base: <Undefined> Altitude (m):

Coordinates: 454200N 050500E

R/T Function: Ground RcvTr. Height (m): 0 Power (EIRP in dBW): <None>

Remark:

Volume Type: Coordinates Altitude (m):

Coordinates: 454200N 050500E



Frequency Search: Proposal Submission

SAFIRE Work Area

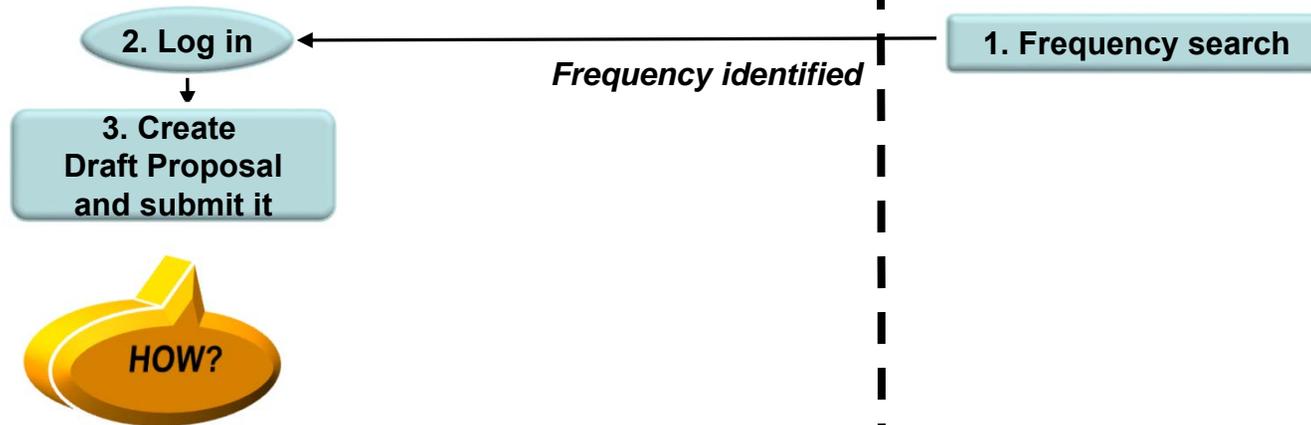
MANIF-AFM Work Area

Requesting State

Other States

Requesting State

Other States





Frequency Search: Proposal Submission

Project | Facilities | Polygons | Ground sites | Compatibility | Search | Maps | Google map | Safire upload | FM | Free Pad |

Upload/Download | **Web browser**

Configuration : SAFIREPILOT

SAFIRE | Home | Bookmark

EUROCONTROL

SAFIRE HOME | **FREQUENCY** | ADMINISTRATION | REGISTER

Return to My Proposals List

FREQUENCY

Facility | VHF Comms

Reference

Reference	2F60045
Status	Draft

Facility

Country*: France ITU: F ICAO: LF

Location*: LYON/ST EXUPERY

ICAO COM Table *: COM2

Facility Type*: VHF Comms

Service*: TWR

Forward to EuroControl for Channel allocation:

Optional Field

Remark: \$em

Email Remark:

Operating Agency:

Planning Agency:

National Coordination Reference:

* indicates mandatory field.

SAVE AS DRAFT | **SUBMIT**

Facility

Country: France
Location: LYON/ST EXUPERY
ICAO COM Table: COM2
Facility Type: VHF Comms
Service: TWR

VHF Comms

Channel: 119.150

Coverage

Coverage Type	Coverage Name
-	-
Circular :	C-25 / (0 -40)





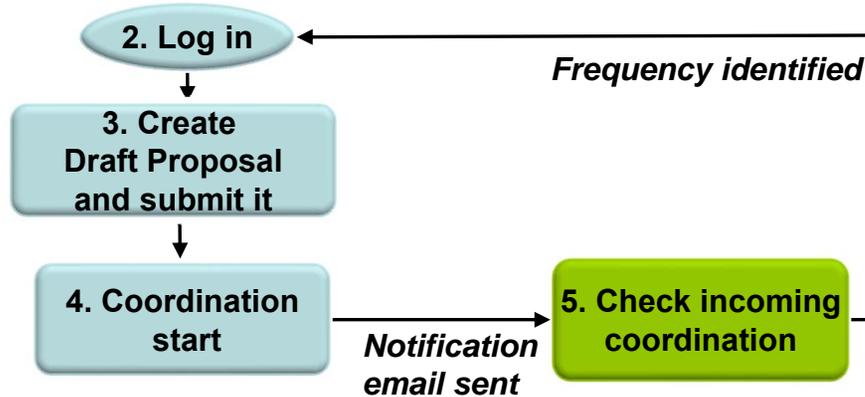
Frequency Coordination - Compatibility Check

SAFIRE Work Area

MANIF-AFM Work Area

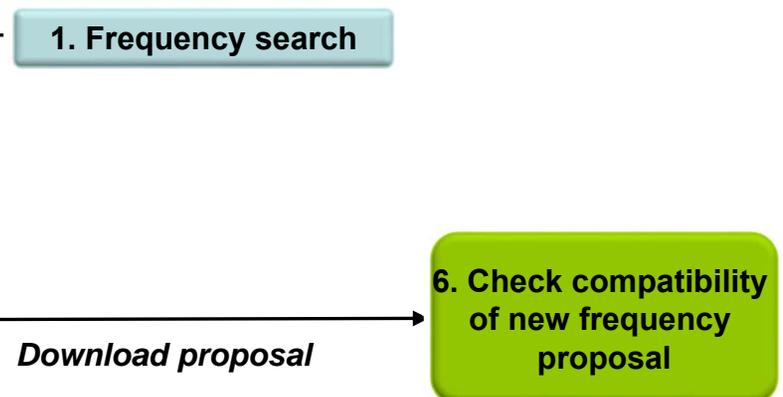
Requesting State

Other States



Requesting State

Other States





Frequency Coordination - Compatibility Check

Project | Facilities | Polygons | Ground sites | Compatibility | Search | **Maps** | Google map | Safire upload | FM | Free Pad

Select: Filter, Options, **Cubes**, Terrain

Levels

250.00	: 246.09
246.09	: 242.19
242.19	: 238.28
238.28	: 234.38
234.38	: 230.47
230.47	: 226.56
226.56	: 222.66
222.66	: 218.75

Details On mouse middle button click On mouse move No details Colors legend

Steps: 15/15
< < > >|

Iterations are completed

Mouse: 491735N 001329E Magnetic declination: Altitude(m): Dist&Az:

Pt A	490000N 010000W	Distance from Pt A and Azimuth
Pt B	464233N 030729E	215.5NM 128.1°

1.18NM/Pixel 0 50 100 150 200 NV

Classification: DCC : Green



Frequency Coordination - Acceptance/Objection

SAFIRE Work Area

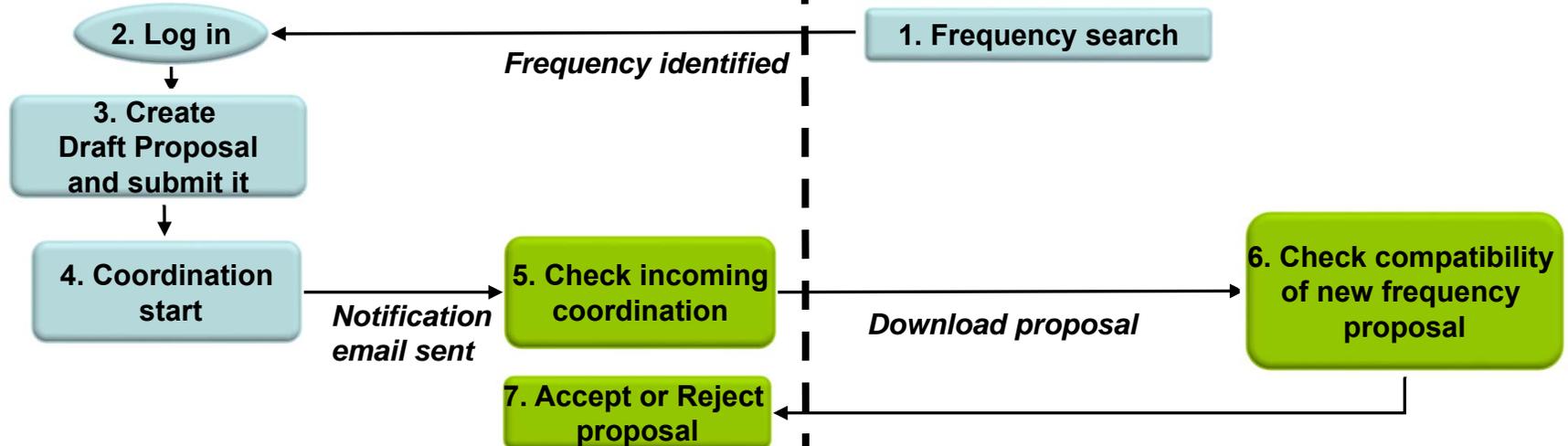
MANIF-AFM Work Area

Requesting State

Other States

Requesting State

Other States





Frequency Coordination - Objection

New Messages

Replies Within 7 days

All Proposals

My Proposals

Subscribed Proposals

Accepted Proposals

Pending Assignments

833 Convertible Proposals

Account Settings

FREQUENCY

Facility
VHF Comms

Facility

Country*:

Location*:

ICAO COM Table *:

Facility Type*:

ITU: G ICAO: EG

Select

- Export
- Edit
- Clone
- Withdraw Proposal
- Accept Proposal
- Object to Proposal
- View Acceptance
- View Audit Trail
- Make Assignment

Reference

Reference 2G2003

Status Submitted

Facility

Country: United Kingdom

Location: JERSEY/JERSEY

ICAO COM COM2

Table: COM2

Facility Type: VHF Comms

Service: ACC

VHF Comms

Channel: 125.205

Coverage

New Messages

Replies Within 7 days

All Proposals

My Proposals

Subscribed Proposals

Accepted Proposals

Pending Assignments

833 Convertible Proposals

Account Settings

Acceptance and Objection

View Details (2G2003)

Select

Acceptance		Objection	
Country	Comments	Country	Comments
		France	Incompatibility of 46.3 NM

Select



Frequency Coordination - Make Assignment

Reference	Location	Facility	Frequency	Status	Registered/Creation Date
2E30313	MADRID ACC	VHF Comms	134.575	Submitted	04/10/2014 12:00:00 AM CEST (Creation Date)

Summary

Reference: 2E30313

Status: Submitted

Country: Spain

Location: MADRID ACC

- Select
- Export
- View Details
- Edit
- Clone
- Withdraw Proposal
- View Audit Trail
- Make Assignment

Reference: 2E30313

Status: Assigned

Country: Spain

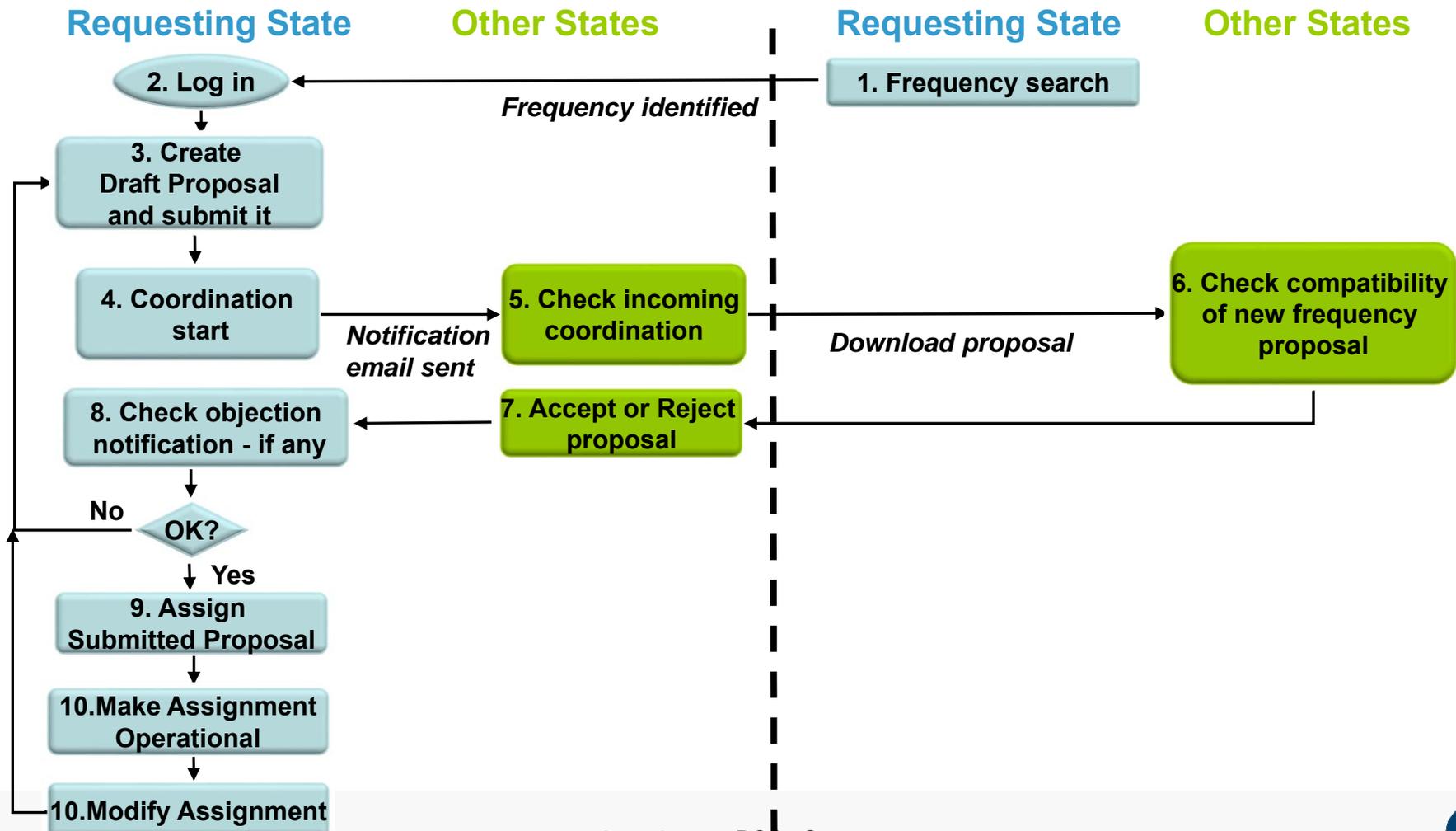
Location: MADRID ACC



Frequency Management Process / Modify Assignment

SAFIRE Work Area

MANIF-AFM Work Area

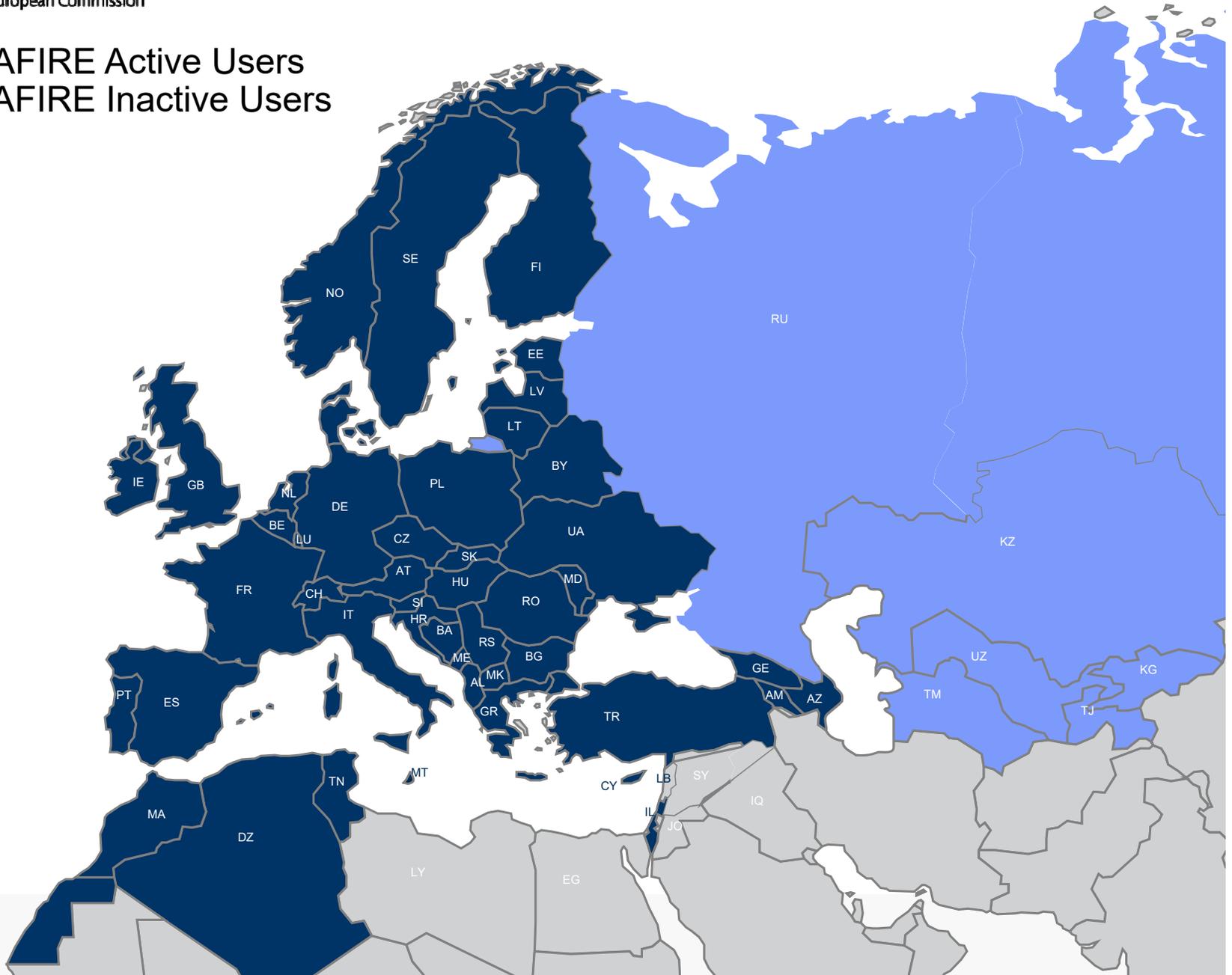


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- EUR SAFIRE Active Users
- EUR SAFIRE Inactive Users





SAFIRE Activity

- New/Modified Assignments in 2018: 2682
average of last 5 years: around 1700 assignments per year

- up to 150 user connections to SAFIRE per day in 2018



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Interregional Frequency Coordination

Current procedures and proposed improvements

Classification DCC : Green



Interregional Coordination - Current procedures (1/3)

- EUROCONTROL sends to the ICAO EUR/NAT Office the export file from SAFIRE including EUR assignments that have concluded their coordination period (Assigned or Operational status) and proposals that are still under coordination (Submitted or Objected status);

COM	Status	CTY	Ref	Location	Service	Is8	UnPro	Areas	VHFChannel	VHFDOC	Remarks	ISt
2	IR	G	59665	LEEDS&BRADFORD	OPC	Y		535159N 014004W	131.685	C-1/0	Multiflight Ops	Operational
2	IR	D	59685	NATIONAL RESEARCH	A/G	Y		NATIONAL RESEARCH(NRES)	132.230	A-400	TEST	Assigned
2	IA	POR	59705	EVORA	OPC	Y	U	383154N 075316W	131.435	C-1/0	Come Fly	Submitted
2	IR	D	59706	NATIONAL INSTRUCT...	A/G	Y	U	NATIONAL INSTRUCTIONS(LANDINST)	123.465	A-100	INST (initial operation d...	Assigned
2	IR	UKR	59725	KYIV/ANTONOV2	TWR	N		503527N 301239E	120.550	C-25/40		Assigned

- However, the ICAO EUR/NAT Office only uploads on the ICAO Global database (IGD) the SAFIRE EUR-Region assignments that have concluded their coordination period (Assigned or Operational status);



Interregional Coordination - Current procedures (2/3)

- Every six months, EUROCONTROL imports in SAFIRE the Non-EUR assignments registered in the IGD and checks their compatibility with the existing EUR-assignments in SAFIRE;

Region	COM	Status	CTY	Ref	Location	Service	Is8	UnPro	Areas	VHFChannel	VHFDOC	Remarks	ISt
AFI	2	IR	CPV	44199	SAL AMILCAR CABRAL	ACC	N		164500N 225700W	128.300	C-261/450	E/R N	Operational
AFI	2	IR	CPV	44200	SANTIAGO ISLAND	VOLMET	N		150200N 233600W	127.600	B-260/450		Operational
AFI	2	IR	CPV	44201	SANTIAGO ISLAND	ACC	N		150200N 233600W	128.800	C-261/450	E/R SW	Operational
MID	2	IR	EGY	48677	ASYUT	ACC	N		270332N 310108E	126.600	C-260/450		Operational
MID	2	IR	EGY	48678	ASYUT	ACC	N		270332N 310108E	129.400	C-260/450		Operational

<->	Region1	Cty1	Ref1	Location1	Service1	Doc1	Region2	Cty2	Ref2	Location2	Service2	Doc2	UD1	DType	DRcv	DFreq	UType	UTr	UFreq	Offset	RC	Sep	Missing	Unit
▶	MID	EGY	48695	BORG EL AR...	APP	150/450	EUR	GRC	4806	ATHINAI/ATHINAI	A/G	50/250	D	VHF.25.C	Air	122.800	VHF.25.C	Air	122.800	0	A10	RH	144.31	NM

.DESIRED FACILITY: [MID]COM2 IR EGY 48695 BORG EL ARAB APP 305556N 294058E

VHF.25.C 122.800 C-150/450

- Element:VHF.25.C 122.800 C-150/450. Op:Y
- Receiver : Air RcvTr 305556N 294058E NM:150 FLMax:450
- Transmitter: Ground RcvTr 305556N 294058E

.UNDESIRED FACILITY: [EUR]COM2 IR GRC 4806 ATHINAI/ATHINAI A/G 375400N 234400E

VHF.25.C 122.800 C-50/250

- Element: VHF.25.C 122.800 C-50/250. Op:Y
- Transmitter: Air RcvTr 375400N 234400E NM:50 FLMax:250

COMPUTATION METHOD :DRX=Air,VHF.25.C,|UTX=Air,VHF.25.C,|OFFSET=0.9,|SEP=,RH [A10]

COMPUTATION DETAILS:

ReqDist=455.4NM = 260.9[DRH]+194.5[URH]

Real Distance=311.1NM, Required Distance=455.4NM, Missing=144.3NM Incompatible

---> Incompatible.



Interregional Coordination - Current procedures (3/3)

- SAFIRE sends automated e-mail notifications to Regional Offices (EUR/NAT, AFI and MID) every time they may be impacted by a new submitted proposal in the EUR Region.



Wed 03-10-2018 10:09

safire_donotreply@eurocontrol.int

New Proposal 2I59026 (118.905 for SCALEA)

Proposal 2I59026 has been submitted.

Safire Reference: 2I59026

Status: Submitted

State: I (Italy)

Location: SCALEA

Channel: 118.905

Service Type: A/G

DOC:

Circular Zone (C)

- Min FL: 0
- Max FL: 150
- Radius: 25

Coordinates:

- Lat: N394650
- Lon: E0154900



Main Issues

- Updates to the ICAO Global Database and SAFIRE are done manually and every six months:
 - Only available for COM2 Table
 - Different data structure
- Only Registered assignments (Assigned or Operational status) are considered in the data exchange process.
- No option for EUR States to react to an incompatible proposal in other Regions.
- Different tools are used for compatibility assessment: Frequency Finder vs MANIF AFM



Proposed improvements

- Inclusion of proposals in coordination in the data exchange
 - EUR proposals (within the 28- days coordination period) are already included in the export file from SAFIRE that is used to update EUR assignments in the ICAO Global database.
 - Proposals from non-EUR States to be sent by e-mail to EUROCONTROL, who would include them in SAFIRE as new/modified submitted proposals subject to the 28-days coordination period.



Proposed improvements

- Accepting / objecting proposals
 - SAFIRE can send e-mail notifications to the corresponding ICAO Regional Offices in case of receiving objections from EUR-States to the non-EUR proposals.
 - Regional Offices can send an e-mail to Eurocontrol to object/accept EUR proposals. Eurocontrol will include in SAFIRE their acceptance/objection to the EUR proposal.



Fri 12-10-2018 15:41

safire_donotreply@eurocontrol.int

Objection received from France for 2BEL6889 (126.625 for BRUXELLES/NATIONAL)

An objection has been received from France for proposal reference 2BEL6889.
The reason given was: Incompatible with Aix-en-Provence 2F2523

Safire Reference: 2BEL6889
Status: Objected (Modification)
National Reference: 2.0191 2.0286
State: BEL (Belgium)
Location: BRUXELLES/NATIONAL

Channel: 126.625
Service Type: APP
Remarks: Sem
DOC:

Circular Zone (C)

- Min FL: 0
- Max FL: 195
- Radius: 60

Coordinates:

- Lat: N505400
- Lon: E0042900



Proposed improvements

- Weekly Incompatibilities e-mails (1/2)
 - Automated e-mails can be sent to the relevant ICAO Offices when a proposal in coordination in the EUR Region generates an incompatibility with an assignment from a State under their responsibility.
 - Calculations will be done with MANIF AFM in accordance with to ICAO Annex 10 / Doc 9718 planning rules.



Mon 03-12-2018 09:06

frequencies@eurocontrol.int

Incompatibilities found that affect your facilities, 03/12/2018

Report based on SAFIRE data dated: Mon Dec 03 08:00:52 UTC 2018

Incompatibilities on COM 2

Desired

2E1100	Operational	SEVILLA ACC	132.675 ACC	VHF.25.A
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Undesired

Reply By: 20-Dec-2018

2F10737	Submitted	PARIS ACC	132.675 ACC	VHF.25.A
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Classification: DCC : Green





Proposed improvements

- Weekly Incompatibilities e-mails (2/2)
 - No e-mails will be sent if EUR proposals that are in coordination do not generate incompatibilities with assignments from neighbouring regions.
 - Regional Offices will receive incompatibilities e-mails until:
 - they accept/object the incompatible proposal or
 - the 28-days coordination period of the incompatible proposal ends.



SAFIRE v6 – coming in 2020

3BEL4331
Operational Assignment
VOR/DME
115.450 MHz/101Y

RED FLAGS
0
1
3

LIEGE/LIEGE ITU: BEL ICAO: EB

503914 N
0052814 E

Facility Details		Elements		Map	AIP	Red Flags	Audit Trail
Operator:	NFM (Johan Van Der Heyden)	Submission Date:	18/09/2012				
Military:	No	Assignment Date:	15/11/2012				
Temporary:	No	Operational Date:	29/11/2012				
Assignment Type:	Standard	Originator:	Johan Van Der Heyden				
Navaid ID:	LGE	Reference Frequency Manager:	Johan Van Der Heyden				
Operational Purpose:	Aerodrome EBLG	Remarks:	-				

- Fully automates interregional coordination
 - Your ideas are very welcome



Conclusion

- Potential improvements:
 - Discuss and agree the proposed actions to improve the frequencies interregional coordination.
 - Assess other possible solutions to automate the data exchange and increase coordination between Regions.

frequencies@eurocontrol.int