

«Spectrum management and monitoring»

►► Bucharest, 21-23 March, 2016

- ❑ Law No. 9918, amended, on “Electronic Communications”
- ❑ NRF Plan Approved by Government on May 2013
 - ✓ Update foreseen after WRC-15
- ❑ Usage Plan approved by the Authority
 - ✓ Update foreseen after update of NRF

- Issuing Authorizations on first come first serve bases after administration of application
 - ✓ Regulatory act of the Authority when the frequencies are not limited subject), else

- Based on a procedure defined by the law for Electronic Communications and a government decision.

❑ Public consultation

- After administration of an application
- When Authority decides
- Minister responsible for Electronic Communication

❑ Based on a Government decision for this procedure approving:

- Type of the procedure (beauty contest or open tender)
- Minimum price for usage right,
- Criteria of evaluation procedure, number of rights to use, expired date of Authorisation etc...

- ❖ Asking interest parts during public consultation
- ❖ Experience of passed tenders and price applied
- ❖ Applying price/ratio between different bands (2600-2100-1800-900-800-700)
- ❖ Other countries experience
- ❖ Studies done on evaluating of certain spectrum.

❖ By points accumulated

- price (about 90 % of points)
- coverage criteria – geographic (about 10 % of points)
- sometimes points are evaluated only on the price offered per usage rights, Criteria defined

❖ Beauty contest is not applied until now.

EVALUATION BY ROUNDS



- ❖ Number of rounds is defined based on the maximum spectrum to be issued by this procedure and the maximum spectrum to be issued for each bidder.
- ❖ Bidders could bid for each round or for any other
- ❖ For each round is set a maximum usage rights that bidders could bid.
- ❖ Each bid should be evaluated only if fulfill the requirements for minimum price for usage rights and if any other requirement is applied.
- ❖ For each round bidders are ranked by points accumulated.

- ❖ Authorizations Granted in 2100 MHz (until 2013 for UMTS systems, after the new NRF – approved on May 2013 for IMT systems)
- ❖ Authorizations Granted in 1800 MHz for free spectrum remained (6x6 MHz) on technology neutrality bases, GSM/LTE/UMTS/WiMAX.
 - Reshuffled spectrum in 1800 MHz band and
 - Removed restriction on technology in 900/1800 and 2100 MHz band
- ❖ Authorizations Granted in 2600 MHz on technology neutrality bases (3 Authorization 3x20 MHz)
- ❖ 4G services in 1800/2600 MHz band, from 1 September 2015, by 3 operators

ONGOING PROCCESS



A K E P
AUTORITETI I KOMUNIKIMEVE
ELEKTRONIKE DHE POSTARE

- ❖ Procedure for granting usage rights in 2100 MHz
- ❖ Finishing study for Spectrum management/
assigning and granting usage rights in 800 MHz
band

□ Technical Agreement

- Agreement with Montenegro (GSM bands)
- Agreement with Macedonia (GSM/UMTS bands)
- Agreement with Kosovo (GSM bands)

□ Working to establish technical requirements of agreements in other bands (2100/2600 MHz)

❑ **790-862 MHz**

- ❖ Until finalization of ASO administrators of this band are:
 - Audiovisual Media Authority – AMA and
 - Electronic and Postal Communications Authority - AKEPthen
- ❖ Will be under the administration of AKEP available for mobile broadband services
- ❖ Date to be decided by the progress of ASO.
- ❖ Public Consultation for allocation of 790-862 MHz frequency band for mobile services immediately after freed up band

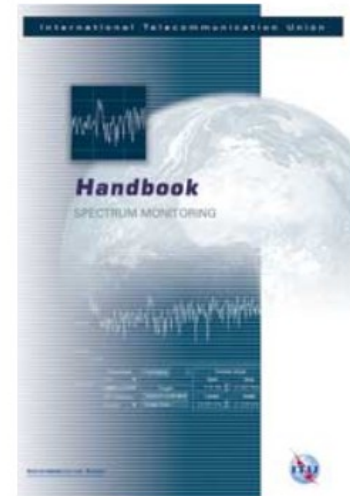
❑ **694-790 MHz**

- ❖ Broadcast - GE06.....
- ❖ Coordination, SEDDIF...

Radio Frequency Spectrum

This means following topics:

- **Authorizing:**
 - Frequency assignment
 - National cooperation and consultation
 - Issuance authorizations documents
- **Frequency planning and managing**
 - Allocation
 - Spectrum engineering practices
 - Regulation and planning
 - Frequency table
- **Spectrum control**
 - Verification of compliance with authorizations
 - Harmful Interference hunting
 - Spectrum surveillance and reconnaissance

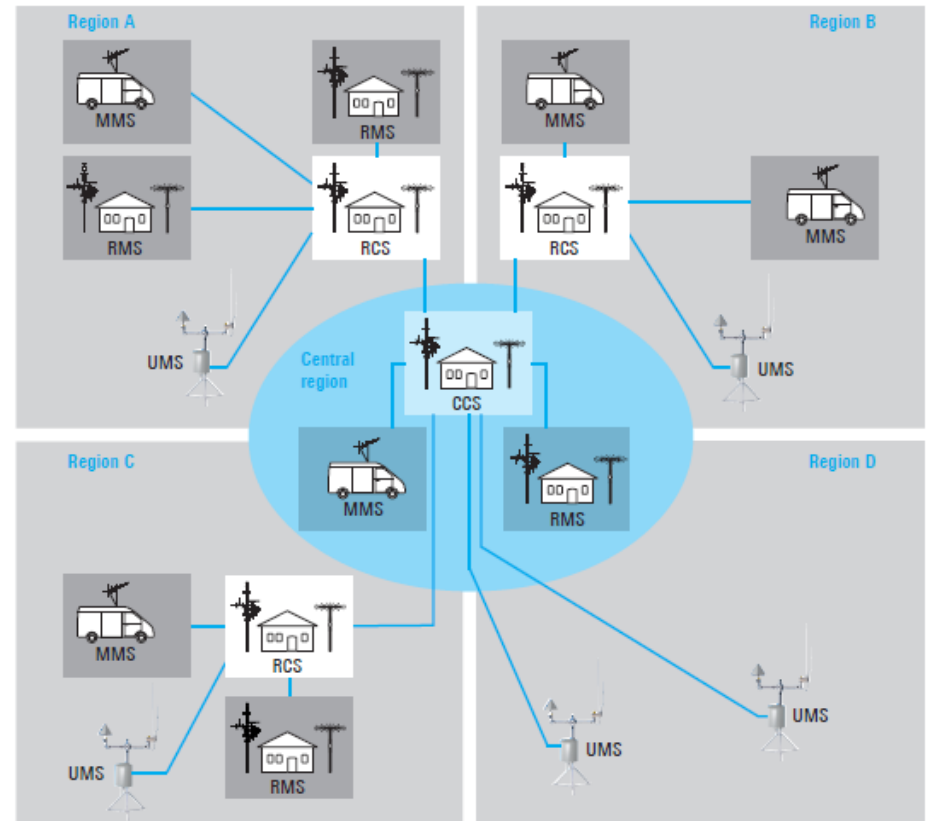


**SPECTRUM
MONITORING**







AKEP – ITU assistance

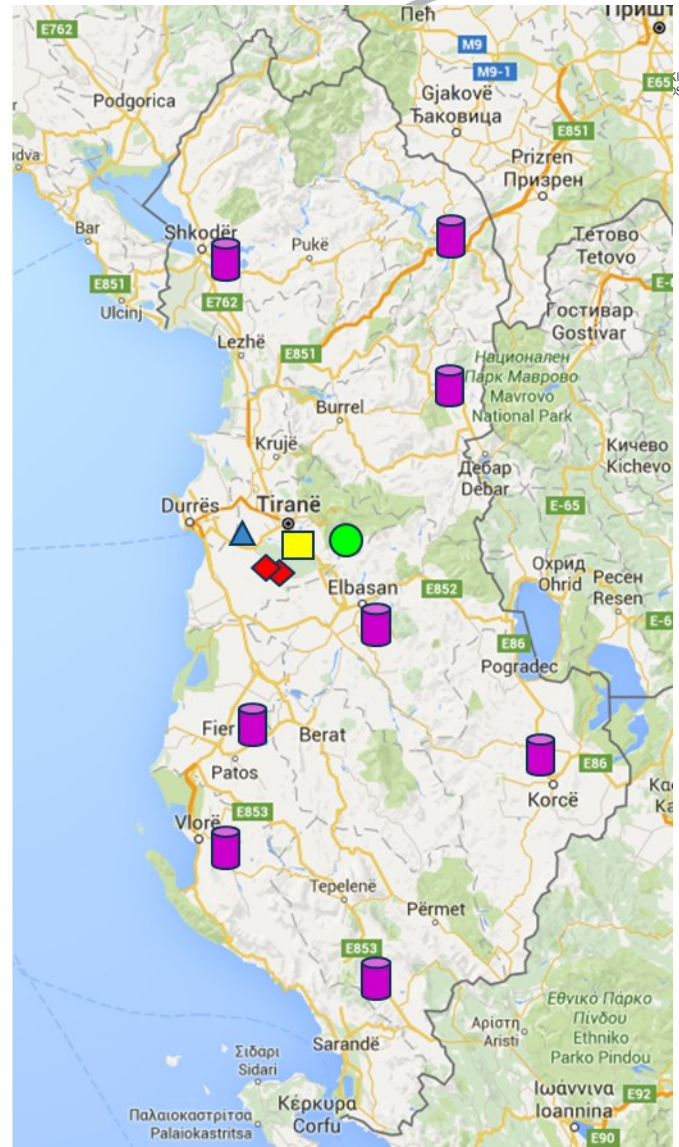
- Main Control Centre (MCC)
- Remote Fixed Monitoring Station (RFMS)
- Simplified Remote Fixed Monitoring Station (SRFMS)
- Mobile Monitoring Station (MMS)
- Portable Equipment (PME)

Spectrum monitoring network



Typical structure of a nationwide radiomonitoring network with a central control station (CCS), regional control stations (RCS), fixed monitoring stations (RMS), mobile monitoring stations (MMS) and universal compact systems (UMS).

	Main Control Centre (MCC)
	Remote Fixed Monitoring Station (RFMS)
	Simplified Remote Fixed Monitoring Station (SRFMS)
	Transportable Monitoring Station (TMS)
	Mobile Monitoring Station (MMS)
	Portable Equipment (PME)



CURRENT SITUATION

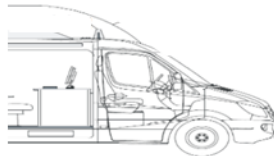


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Existing Monitoring Vehicle

Hardware

- ESMB/DDF195
- Antennas (HE010, HE500, **HL033**, **HL040**, ADD195, **ADD074**, AC008/HL050)



Software (ARGUS V5.4)

- ARGUS-Basic
- ARGUS-AMM
- ARGUS-IMM
- ARGUS-BMM
- ARGUS-EVAL
- ARGUS-ORM
- ARGUS-SMDI
- ARGUS-DEI
- Drivers
 - ARGUS-RX
 - ARGUS-DF
 - ARGUS-Analyzer
 - ARGUS-SYSDEV



- **ARGUS-RCI**

NEW

MCC Tirana

Software (ARGUS V5.4) from existing Monitoring Vehicle used in MCC

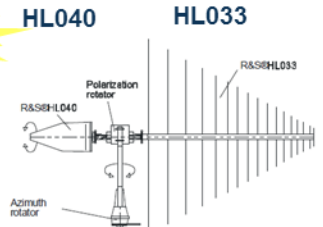


RFMS Kruje



NEW
ADD197

ADD071



Software (ARGUS)

- ARGUS-Basic
- Drivers
- ARGUS-RX, DF, SYSDEV



NEW

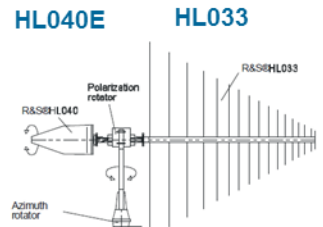
RFMS Pinet

NEW



ADD197

ADD071



Software (ARGUS)

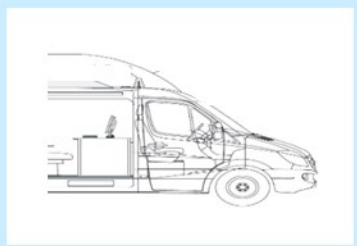
- ARGUS-Basic
- Drivers
- ARGUS-RX, DF, SYSDEV



IMPLEMENT 2 NEW SRMFS

NEXT STEP

Existing Monitoring Vehicle



MCC Tirana

Software (ARGUS V5.4) from existing Monitoring Vehicle used in MCC



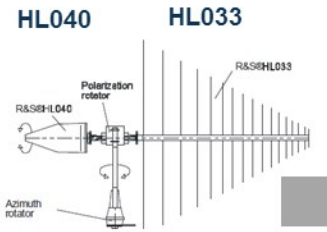
SRFMS 1
 SRFMS 2



ON GOING PROCEDURE



RFMS Kruje



Software (ARGUS)

- ARGUS-Basic
- Drivers
- ARGUS-RX, DF, SYSDEV

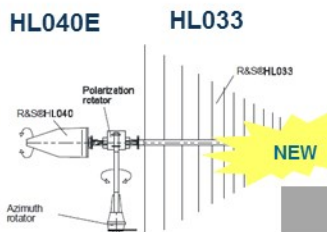


ESMD Monitoring Receiver

- ESMD-DF
- ESMD-PS
- ESMD-IM



RFMS Pinet



Software (ARGUS)

- ARGUS-Basic
- Drivers
- ARGUS-RX, DF, SYSDEV



ESMD Monitoring Receiver

- ESMD-DF
- ESMD-PS
- ESMD-IM



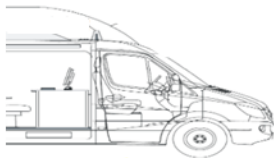
ARGUS HARMONIZATION



Existing Monitoring Vehicle

Hardware

- ESMB/DDF195
- Antennas (HE010, HE500, ADD195, AC008/HL050)



Software (ARGUS V6)

- ARGUS-Basic
- ARGUS-AMM
- ARGUS-IMM
- ARGUS-BMM
- Drivers
 - ARGUS-RX
 - ARGUS-DF
 - ARGUS-Analyzer
 - ARGUS-SYSDEV

Upgrade



MCC Tirana

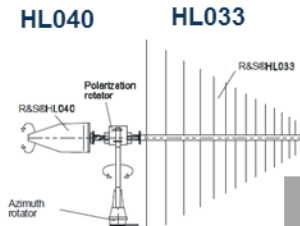
NEW/Upgrade

Software (ARGUS V6)

- ARGUS-Basic
- ARGUS-AMM
- ARGUS-IMM
- ARGUS-BMM
- ARGUS-EVAL
- ARGUS-ORM
- ARGUS-SMDI
- ARGUS-DEI
- ARGUS-RCI



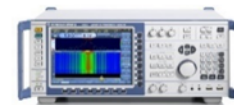
RFMS Kruje



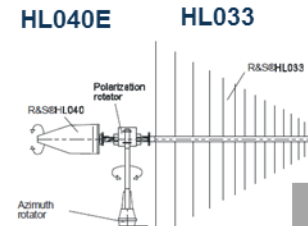
FU129

Software (ARGUS V6)

- ARGUS-Basic
- Drivers
- ARGUS-RX, DF, SYSDEV



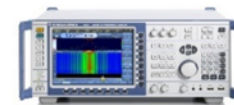
RFMS Pinet



FU129

Software (ARGUS V6)

- ARGUS-Basic
- Drivers
- ARGUS-RX, DF, SYSDEV



SRFMS 1
SRFMS 2



The background features a blue grid with a vertical axis on the right side, marked with numbers from 0 to 19. A large, 3D arrow rises from the bottom left, with a wavy, ribbon-like base that transitions into a straight shaft ending in a triangular arrowhead. The arrow is filled with a pattern of small, colorful characters, giving it a digital or data-like appearance. The overall scene is illuminated with a bright light source from the right, creating a glow and casting shadows.

Thank you!