Electronic Communications Office of Latvia

# Training Course
# Radio Spectrum Management, Monitoring and Interference Analysis

This two-day training program is designed to strengthen the skills and practical capabilities of spectrum management officers, monitoring engineers, and mid-level managers working within national frequency administrations and regulatory authorities.

Delivered in English, the course combines lectures, demonstrations, case studies, and hands-on activities to provide a comprehensive understanding of radio spectrum management principles, international coordination, monitoring practices, interference detection, and equipment compliance evaluation, following ITU, CEPT, and ETSI recommendations.

The training course will be held in person at Eksporta street 5, Riga, Latvia. It will take place in spring 2026, with participants able to select their preferred dates in the application form.

## After this training program, you will be able to:

- Explain the principles of international spectrum management and coordination.
- Operate basic spectrum monitoring and measurement equipment.
- Identify and analyze interference sources using practical methods.
- Evaluate radio equipment compliance and assess GNSS signal integrity.
- Apply preventive spectrum protection strategies in national contexts.

# Training Course Program

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## Day 1 Fundamentals of Spectrum Management and Monitoring

### Spectrum Regulation, Allocation and International Coordination

- Role of the ITU, CEPT, ECC and other regional organisations;
- Frequency allocation, refarming and planning principles (e.g. digital dividend);
- Cross-border coordination and harmonized spectrum use;
- Case study: Example of a national spectrum management structure.

Participants will learn how international and regional frameworks ensure harmonised use of frequencies and how administrations coordinate spectrum at borders. Real examples of frequency reallocation and refarming illustrate the practical implications of international decisions.

### National Spectrum Management and Licensing

- Structure and responsibilities of national spectrum management authorities;
- Spectrum planning for critical communications (aviation, defence, mobile networks);
- Licensing, authorization and spectrum monitoring as part of enforcement;
- Overview of automated spectrum management systems.

This module focuses on national-level spectrum governance, including strategic planning and regulatory enforcement mechanisms. It explains how licensing and monitoring processes are integrated and how digital tools support spectrum efficiency assessment.

### Measurement Principles and Instrumentation

- Spectrum analysers, antennas, filters, measurement receivers;
- Equipment preparation, configuration and calibration;
- Electric field strength (E-field) and Equivalent Isotropically Radiated Power (EIRP);
- Reference to ITU-R SM.1708 and SM.2257.

Participants are introduced to the technical foundations of electromagnetic field (EMF) measurements and the correct configuration of monitoring equipment. This module links theory to practice through real instrument setups, illustrating relationships between EIRP, field strength and measured signal levels.

## Spectrum Monitoring and Data Analysis

- Fixed, transportable and mobile monitoring stations;
- Monitoring software capabilities and remote control;
- Data post-processing and analysis (FM, DVB-T, LTE/5G, etc.);
- Emerging technologies: IoT, 5G NTN, Wi-Fi 6E.

This module explores monitoring system architectures and software tools used in modern spectrum control. Participants will learn methods for data visualisation, occupancy analysis and interference pattern recognition. Examples include real spectrum traces from various services and technologies.

# Day 2 Interference, Compliance and Practical Exercises

## Radio Equipment Compliance and Market Surveillance

- Key requirements of the Radio Equipment Directive (RED) 2014/53/EU;
- Safety, EMC and efficient use of spectrum;
- Equipment classification, marking, and harmonised standards;
- Examples of non-compliant devices in market surveillance activities.

This module covers equipment conformity and the regulatory framework ensuring electromagnetic compatibility and efficient spectrum use. Participants will review practical examples of equipment testing and non-compliance cases, gaining insight into coordination between market surveillance and spectrum monitoring teams.

## Interference Mechanisms and Mitigation

- Natural and man-made interference sources
- Impact on communications and critical infrastructure (mobile, aviation, GNSS)
- Good engineering practices, shielding and filtering
- Spectrum protection strategies and preventive monitoring algorithms
- Case studies of real interference incidents

This module explains how various interference mechanisms arise and how they affect system performance and safety. Through real case studies, participants learn methods of identifying, preventing, and mitigating interference using best engineering practices and proactive monitoring techniques.

Electronic Communications Office of Latvia

## Interference Detection and Direction Finding

- Principles of direction finding (DF) and location techniques;
- DF antennas, mobile monitoring vehicles, and transportable systems;
- Use of triangulation and geolocation methods;
- Practical "Interference Hunting" exercise ("Fox Hunting");
- Integration with monitoring networks and cross-border cooperation.

Participants gain hands-on experience with interference detection and localisation techniques. The block includes demonstrations using mobile and stationary DF systems and practical exercises in identifying unknown interference sources. This module consolidates knowledge through teamwork and field-based problem solving.

## GNSS Interference, Evaluation and Final Exercise

- GNSS signal parameters and quality indicators;
- Impact of interference on timing and network synchronisation;
- Jamming", "spoofing" and "meaconing" phenomena;
- Practical measurement of GNSS signal quality and interference detection;
- Final team exercise – interference localisation scenario and result evaluation.

The final module focuses on GNSS signal vulnerability and detection of deliberate interference. Participants will use monitoring tools to identify and evaluate GNSS jamming scenarios. The training concludes with a team-based "fox hunting" exercise and expert feedback discussion, followed by certificate presentation.

## Closing Session

Summary, Feedback and Certificates.
A wrap-up discussion highlights the key learning outcomes and invites feedback on the training content and potential follow-up modules (e.g. advanced spectrum monitoring or automation workshops).

Reserve Your Spot

## Fee: 2190 EUR (including VAT).

## It includes:

- **A comprehensive 2-day in person training program;**
- **Expert lectures, demonstrations, case studies;**
- **On-site practical experience;**
- **Access to necessary professional equipment;**
- **Digital training materials;**
- **Coffee breaks.**

# About Electronic Communications Office of Latvia.

(in Latvian - SIA ''Elektroniskie sakari'').

Electronic Communications Office of Latvia is a state-owned capital company that manages a strategically important national resource – the radio frequency spectrum and numbering. The company ensures a reliable and secure radio communications environment, which is essential for national security, defense, and critical infrastructure.

It maintains and develops modern technical infrastructure, carries out radio frequency spectrum planning and monitoring, and provides electromagnetic compatibility and other professional services. Electronic Communications Office of Latvia cooperates with state institutions, industry organizations, and international bodies (ITU, CEPT, EC RSC, RSPG, ETSI), providing innovative solutions for both civil and defense needs.

## Competencies & Advantages

### Engineering capacity

Highly qualified and experienced radio communications engineers with specialized knowledge in radio frequency management (planning and monitoring) and in the development and maintenance of specialized information systems.

### International representation

Regular participation in the work of international radiocommunications institutions (ITU, CEPT, RSPG, ETSI, etc.) and in the development of regulations, recommendations and technical documents, ensuring access to spectrum resources and defending the interests of Latvian frequency users.

### Modern infrastructure

A technological base that meets modern requirements, which is essential for effective radio frequency spectrum management and includes appropriate solutions that allow for accurate radio frequency spectrum planning, monitoring and providing quality services to customers.

### Techritory Partnership Network

A broad and trusted network of contacts within the Techritory platform, connecting policymakers, industry, academia and security structures, facilitating information exchange and partnership building, including in the field of defense communications

Reserve Your Spot

**For additional information, please contact the service manager:**

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