

# Spectrum Monitoring

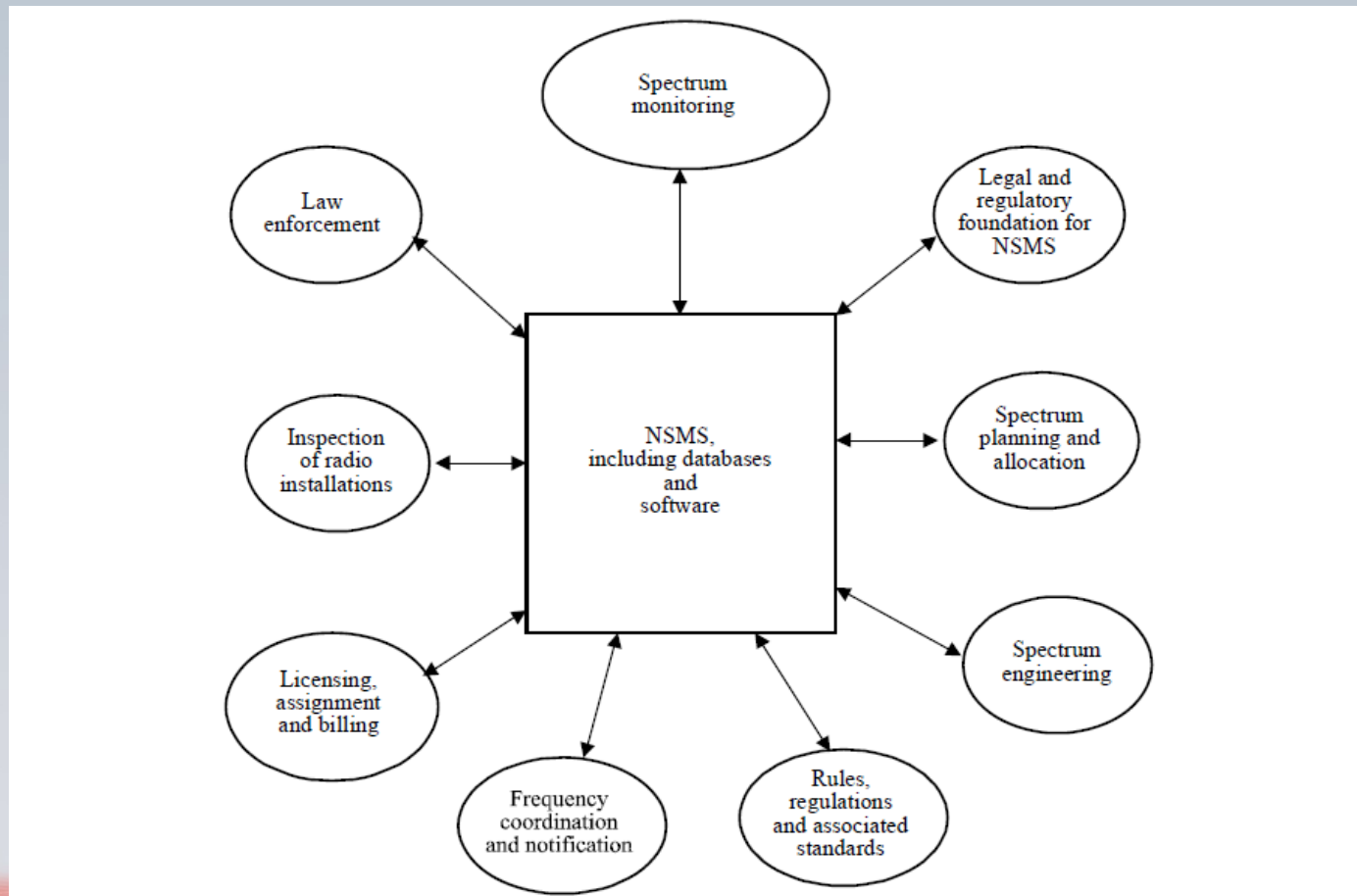
Spectrum Management Training Program

**Elective Module EM1-Option 1 : Spectrum Monitoring**

# Outline

- National Spectrum Management Systems
- Definitions
- Importance of Spectrum Monitoring
- The purpose of Spectrum Monitoring
- Relationship Between Spectrum Monitoring and Spectrum Management
- International Monitoring Program

# National Spectrum Management Systems (NSMS)



# Definition

- Spectrum monitoring serve as the eyes and ears of the spectrum management process.
- Spectrum monitoring should be on a continuous basis to appropriately fulfill the purposes and goals of monitoring.
- Provide valuable monitoring information for programs organized by the ITU Radiocommunication Bureau (Bureau)

# Importance of Spectrum Monitoring

- Monitoring shows the actual use of the spectrum.
- Protect licensed users.
- Protect free bands from illegal users.
- Ensuring efficient use of the spectrum.
- Ensure Compliance with national and international rules

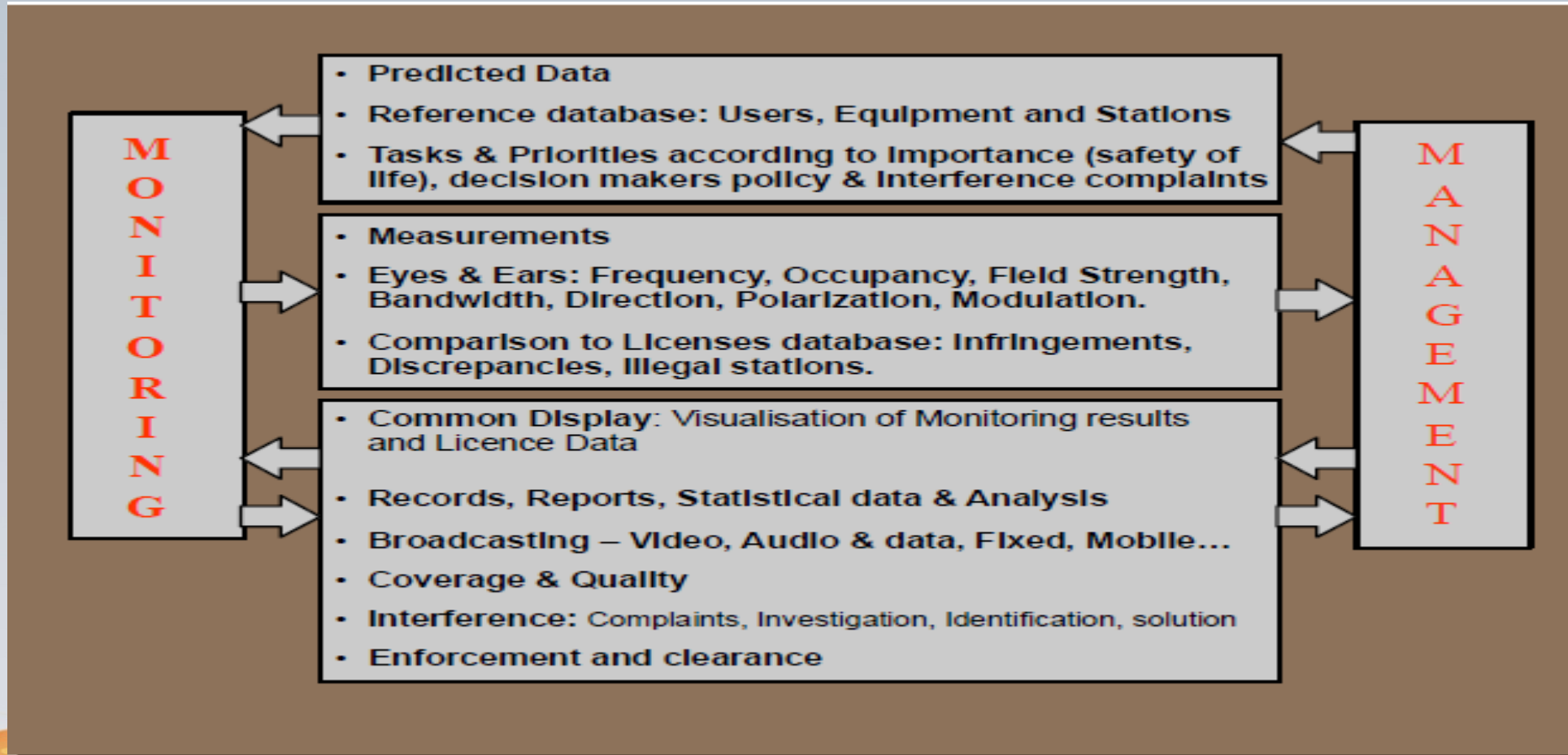
# Importance of Spectrum Monitoring

- Why is Spectrum Monitoring Needed If You Have Good Spectrum Management?
  - Propagation, prediction, modeling software is not perfect:
    - Need to verify with RF monitoring hardware
  - Interference arises daily (model cannot predict):
    - Illegal (unlicensed) signals
    - Co-channel interference
    - Harmonics of legal transmissions
    - Equipment fails
  - Occupancy monitoring required to predict problems

# The Purpose of Spectrum Monitoring

- Assist in resolution of interference to other radio services:
- Assist in ensuring acceptable reception of public broadcasting.
- Assist in the spectrum management process:
  - Provide monitoring data for spectrum planning purposes
  - Provide monitoring data to support regulatory compliance efforts
  - Provide monitoring data to support the ITU in resolving international issues

# Relationship between spectrum monitoring and spectrum management





# Relationship between spectrum monitoring and spectrum management

- In general, monitoring gives feedback to spectrum management on whether the practical use of the spectrum matches the national policy.
- Measured information not otherwise available.
- Spectrum Monitoring supports spectrum management.

# Monitoring supports Management

- Monitoring enforces frequency management policies
  - Identifies unlicensed users
  - Ensures that technical standards are met
- Monitoring provides the actual use of the spectrum.
  - Identifies the spectrum Occupancy to insure the efficient use of the spectrum.
- Monitoring provides a "reality check" for management
  - How well are management policies being followed?
- Monitoring solves interference policies for management
  - Are new policies needed to prevent interference?

# Monitoring supports Management

- Monitoring aid to new assignments.
  - Identifies the actual free bands that could be used.
- Monitoring aid to spectrum sharing.
  - Identifies channels occupancy.
- Monitoring aid to database verification and correction.

# International monitoring Program

- RR Article 16 contains the provisions governing the establishment and operation of the international monitoring system.



Article 16

# International monitoring Program

- Use of international monitoring information by the Bureau:
  - assisting in clearance of unauthorized or out-of-band operations;
  - assistance to administrations in cases of harmful interference;
  - guidance to administrations in selecting frequencies;
  - preparation for Radiocommunication Conferences, in particular those responsible for allocating frequency bands, by providing reports on spectrum occupancy.

# International monitoring Program

- Regular Monitoring Program is in the frequency Bands between 2850 KHz and 28000 KHz
  - The different propagation characteristics in different parts of the frequency spectrum.
- Monitoring stations participating in the International Monitoring System (IMS) send their reports to the Bureau via their designated centralizing office and in accordance with Article 16 of the RR, the Bureau records and publish periodically the summaries of monitoring information.

# International monitoring Program

- The objective of the regular monitoring program is to:
  - identify whose emissions are not in compliance with the Radio Regulations (RR);
  - provide administrations that do not have monitoring facilities with information for frequency management purposes and to comply with No.3.14 of the RR;
  - assemble information on spectrum utilization at the location of the monitoring stations and to derive thereafter how the spectrum is used;
  - collect information, when required by Radiocommunication conference, on the use of the bands exclusively allocated to specific services (i.e. broadcasting, maritime, aeronautical) for consideration by the appropriate Radiocommunication Conferences

# International monitoring Program

- List VIII, includes information about the different functions that each monitoring station is able to perform.
- Sample of Summary Report



Last Summary  
Report