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APWPT
ASSOCIATION OF PROFESSIONAL WIRELESS PRODUCTION TECHNOLOGY

Discussion on Advantages of new PMSE Technologies and their possible Limitations

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PMSE Technologies

- Frequency spectrum bands
- Modulation and / or protocol specifications
- Audio format requirements / Video
- Audio quality requirements / Video
- RF environment
- RF propagation models
- Spectrum Access Mitigation Technologies
- Cognitive Technologies

Are different for the many applications PMSE does serve.

PMSE Technologies

... And please note:

PMSE is different to well-known communication systems.

(A typical communication system cannot fulfil PSME requirements.)

PMSE Technologies

… are mainly driven by the factors:

- Regulatory
- User Requirements
- Manufacturer Innovations

PMSE Technologies

Regulatory driven

- New / modified assigned spectrum:
  - Model requests new spectrum access methods
  - New transmission protocols
  - New RF circuitry

PMSE Technologies

Regulatory driven

- Highly important:
  - Technical neutral regulations allow industry innovations.
  - **Return on investment for users and manufacturers!**
  - Availability of Spectrum – can we count on it…?

PMSE Technologies

User driven / Manufacturer Innovations

- Identify potential frequency bands – R&D
- Develop new technologies for improving user experience
  - Improve audio quality by e.g. going digital
  - Add ability to change transmission parameters
- Main focus on securing quality of service within changing RF environment
  - C-PMSE

PMSE Technologies

Manufacturer Innovations

The revision of EN 300 422 will add more parameters and specifications for wireless microphones.

- Improves spectrum efficiency
- Offers room for innovations
- PMSE industry is innovative, however needs support and long-term planning security by administrations (CEPT).

PMSE - Challenges

- PMSE systems have to serve very stringent latency requirements.
- A very high audio quality is expected.
  (In many cases source-coding could lead to artifact.)
- Requested availability of service is 100%.
- PMSE need to support mobility and long-time operation.
  (battery)
- Spectrum Efficiency vs. Efficient Spectrum Usage.

C - PMSE

C-PMSE --- adding cognitive functionality

C - PMSE

C-PMSE is able to acquire and use appropriate radio spectrum and autonomously avoid or minimize harmful interference while ensuring high/very high audio quality by:

- obtaining knowledge about regulatory requirements
- obtaining knowledge about other systems in use
- sensing the radio environment
- measuring the radio link quality
- switching to alternative frequencies and/or adapting their link parameters
- learning from past actions

C – PMSE - Challenges

- Every frequency band does show different interference scenarios.
- Real-time transmission requires extremely fast and secure reaction,
  e.g. changing of RF parameters.
- If the carrier frequency has to be changed –
  an interference free frequency needs to be available!
  - **C-PMSE needs a set of additional frequencies!**

C – PMSE - Advantages

- Adds ability to manage and coordinate.
- Provides a high quality user experience.
- Can guarantee continued operation.
- Builds a frequency management system for all PMSE devices in operation at the local event.

Summary

- New technologies can provide many advantages for
  - Efficient use of Spectrum
  - User Experience

  But cannot change the physics of RF!

- Many challenges lie ahead:
  - Regulatory frameset
  - Frequency Resource