Future Railway Mobile Communication Solutions

Summary of the UIC GSM-R Conference Sept 2013
EIRENE: what’s in the box

WHAT IS USED NOW? WHAT IS NEEDED LONG TERM?

WHAT WILL CHANGE?

SPECTRUM?

Railway Voice Applications

Railway Emergency Call

ETCS

Other voice and data applications

Specific Voice Services VGCS, VBS

Addressing features LDA, FA

Priority features eMLPP

Standard Voice Services

Standard Data services

GSM-based Radio Access Network

Fixed Access Network

ONE SYSTEM FITS ALL?
The world around us is changing

Future Railway Communication Solutions

- Telecom Market Evolution
- Technology Evolution (IP, LTE, SDR, etc.)
- Spectrum Shortage -> Efficiency
- GSM-R adoption at Global level
- Cost Reduction
- Broadband for Critical Communications
- End of Life GSM technology
- EU Spectrum policy
- Expansion of ETCS
- Increase of the demand for mobile applications

Cost Reduction
Main Questions

- What do Railways use today
  - Dedicated: GSM-R, analog radio, Tetra
  - Commercial/shared: public networks
  - What kind of applications (voice/data)

- What is needed in the future
  - Railway operation at least of same level and supportive applications
    ➔ Voice data, messaging, video?

- What technologies are candidate
  - One technology, multi-technology, or technology free approach
  - Co-existence with GSM-R is essential (long migration period)

- What architecture?
  - Separation of Application Layer and Network/bearer layer wished
  - Migration of existing applications towards IP (like ETCS)

- Radiosystem needs spectrum:
  - own / shared / public?
Railways Context

- **Europe: relation with Commission/ERA**
  - Commission: strategy regarding spectrum, asset sharing, etc.
  - ERA: concentrate on Interoperability: functions and air-interface
  - Introduction of new System, Migration strategy

- **UIC: Europe or Worldwide?**
  - One standard suitable for all railways
  - How to organise?

- **Standardisation bodies 3GPP/ETSI**
  - Developments for « LTE PPDR » are ongoing; monitor/influence?
  - Railways standardisation needs assessed for proposal

- **Critical Communication Broadband Group**
  - Cooperation on standards and spectrum
  - Technical and functional connection with GSM-R during migration
  - One solution for both?
Overview:

- ERA
- UIC
- 3GPP
- ETSI
- CEPT
- UIC
- Industry
- UIC
- ERA/EC
- Railway Undertakings, Inframangers


UIC and ERA: specs
ERA: baseline, legislation

UIC + 3GPP/ETSI: standardisation
CEPT: spectrum

UIC + Industry: development and pilots

UIC: guidelines, coordination
Users: contract and operate
**UIC and ERA**

- Scope of ERA and UIC are complementary and convergent to the same target
- The activities and interfaces between UIC and ERA are defined.
- Deadlines for the new system choice and availability for deployment are defined.
The UIC FRMCS Project

- UIC has defined a Project to provide all needed information for decisions on the succession of GSM-R. The Project will cover the period 2013/14 – 2016

- The Project contains the following main work packages:
  - Functionality
  - Spectrum
  - Technology and architecture

- Project preparation in 2013:
  - Define scope and deliverables
  - Define study-items to be included in the deliverables
  - Define supporting actions
  - Organisation
  - Synchronisation with non-EU (e.g. Australasia)
  - Synchronisation with ERA
Functionality

Main goal is to describe the railway needs on the long term, taking into account the continuation of the actual applications and interoperability requirements.

- Evaluate usage of GSM-R
- Investigate future trends and applications

Deliverables:
- Reports
- Use Cases for Train related communication
- User Requirement Specification 2.0
Main goal is to define the needed spectrum and conditions.

- **Subjects to be studied:**
  - Spectrum opportunities
  - Availability for the ER-band
  - Co-existence of new technology and GSM-R in these bands
  - Radio planning aspects
  - Spectrum size calculation (actual, mid term, long term)
  - Coordinated actions with PPDR?
  - Possibilities for « networks with governmental tasks »

- **Deliverables:**
  - Reports
  - Spectrum Requirement Specification
Main goal is to prepare the decision on the future technology(ies) and the conditions.

- **Candidate subjects to be studied:**
  - Network Architecture evolution
  - On-board Architecture
  - Railway specific architecture items
  - IP based railway specific voice applications
  - ETCS Bearer Free – telecom part
  - Radio aspects
  - Evolution/migration scenarios

- **Deliverables:**
  - Reports
  - System Requirement Specification
Conclusion

- Work on succession of GSM-R has started
- All needed parties are involved
- Milestones are defined
- Cooperation is essential

Note:

- GSM-R will be the only solution for many years
- It will not be easy to beat the success of GSM-R!
Thank You!

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