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## The 2nd UIC GSM-R World Conference was successfully held from 15 – 16 September in Paris

### GSM-R, the railway telecom system, still has a long future

(Paris, 21 September 2015) The 2nd UIC GSM-R World Conference was successfully held from 15 – 16 September 2015 at UIC Paris headquarters. The first edition was held in September 2013 and interest in the GSM-R system is always strong, as the figures of the conference clearly showed: around 200 participants, from 92 different companies/organisations, and 12 exhibitors present: Huawei, as a platinum sponsor, Funkwerk, Kapsch, Nokia, Triorail as other sponsors; Comtest Wireless, Expandium, Frequentis, Iskratel, Polomaroni.it, Siemens, Sierra Wireless and ZTE as exhibitors. This conference was endorsed by ETSI.

The “Opening” Session had four speakers from organisations involved in the GSM-R history. **Mr Marc Antoni**, Director of the UIC Rail System Department on behalf of **Mr Jean-Pierre Loubinoux**, UIC Director-General, said: *“GSM-R has quite a long past, and surely a long future. It was in the 1990s in the second half of the last century that the UIC radio frequency group negotiated with the European Frequency Committee (CEPT) for the allocation of a frequencies band specifically to railways. The final decision was to adopt GSM, as one of the main objectives was to use a system which was already proven and where off-the-shelf products were available, with the least modification.*

*After nearly 15 years of implementation of the first version of the EIRENE requirements, we can state that we have reached that target: GSM-R is **the** railway telecom system, mandated in Europe by the TSI but notably used worldwide with no EU legal obligations. It is a well-established worldwide railway standard ensuring interoperability between different countries with one system for all rail applications and one technology for all rail operation.*

*Since the beginning of the GSM-R story, UIC has collaborated with the European institutions and that collaboration continues nowadays, especially with the European Railway Agency (ERA), the European Telecommunications Standard Institute (ETSI) and the Electronic Communications Committee (ECC).*

*As any other telecom system GSM-R will have an end, sooner or later. We are still far from that time, nevertheless we know that a lot of time is necessary to define the successor of GSM-R and duly lead its future integration then migration towards a new system. This is a new exciting UIC project called FRMCS (Future Railways Mobile Communication System).”*

**Ms Isabelle Vandoorne**, representing the European Commission, highlighted the advantages of the GSM-R system. She indicated that in order to solve the interferences issues, DG Move together with the stakeholders created a group at the European level. There is a need for national support and international cooperation too. Coexistence is essential of course, but affordability is important too, with the best technical solutions. She paved the way towards the railway telecoms of the future in the European regulation system, highlighting that applications should be separated from technology.

**Ms Kerstin Schreiber**, CEO of Funkwerk representing GSMR-IG, then declared that GSM-R will be supported by the industry at least until 2030. The ongoing steps were to complete the essential migration of the current system towards the IP (Internet Protocol) technology. Industry

representatives must develop solutions and ensure maximum security of investment. The GSM-R group agreed to work on standards, and mentioned that there is a need to simplify the certification process in order to ensure stability of prices.

**Mr Jörgen Friis**, Chief Service Officer (CSO) at ETSI, said that ETSI is very active in the sector of transport and one of the clusters is addressing rail transport. ETSI conducts a wide range of activities and produces 2000 deliverables every year and has more than 80 partnership agreements. ETSI support policies of the EU but can also handle specifications Work with non-members (ISG). This year, the second edition of the UIC GSM-R World conference is endorsed by ETSI.

The second session chaired by **Mr Alex Raviart** from Infrabel addressed the success story of GSM-R within Rail in Europe showing detailed facts, organisation and applications using GSM-R as a bearer given by OEBB. This tremendous success worldwide was illustrated by the Overview and Outlook of GSM-R in China where the current situation and challenges were given by China Railways. The industry's contribution to GSM-R success without compromise on Capacity & Quality was highlighted by the GSM-R Industry Group speaker.

The Session 3 security and availability challenges chaired by **Mr Gottfried Winter** from Funkwerk included a presentation of the Security Identified Issues. In this context the Network Rail speaker emphasised the fact that "Security-is-Safety & Safety-is-Security" and that delivering a Cyber-Safe Service is essential in the railway environment. Kapsch Carrier Com speaker showed that GSM-R constant development was making no compromise to reliability and security for mission critical service. He showed how GSM-R Core network redundancy using "RAN Flex" for Group Calls was offering a highly resilient end to end solution to current Release 4 networks deployment. Then IFFSTAR speaker presented the results of the project SECRET collaborative R&D project co-funded by the European Commission within the FP7 with the objectives to assess the risks and consequences of EM attacks on the infrastructure, to identify preventive and recovery measures and to develop protection solutions to ensure the security of the rail network.

Session 4 on improving assessment of equipment chaired by **Ms Begoña Domingo** from ERA allowed GSM-R Industry representative to analyse the steps and cost drivers of assessment. He insisted in particular on the need to implement a "small change" procedure which could be agreed whereby changes which do not change Mandatory for Interoperability items are reported to the Notified Body but are not formally assessed. He concluded that it *"can save time and money"*. The Aeronautical Communications example given by EASA-The European Authority in aviation safety representative showed how the assessment was processed in this similar complex but different environment. The session was closed with the presentation of the Assessment of GSM-R Network in Hungary given by the Notified Bodies representatives from KTI and Rina Services.

Session 5 chaired by **Mr Dirk Schattschneider** from UIC gave a complete overview on the subject. The industry solutions were presented by the industry representative showing that the certified improved receivers compliant with the specifications exist and can be delivered now to Railway Operators. The Mobile Fixed Communications Networks (MFCN) viewpoint on this issue was presented by the Orange France representative insisting on common objectives with the railway community. Nevertheless he insisted on the fact that corrective action on the network part is less efficient than any action on the cab part and that a European deadline for transition period is necessary in which additional mitigation measures are required to avoid GSM-R interferences. These controversial statements on the need for rail's initial actions were rejected by the next speaker from UIC who insisted on the role of railways in taking coordinated and proactive actions taken within UIC and ETSI in solving the issue and adopting a more balanced attitude as the only way to achieve the goals of coordination. The European Communication Committee (ECC) representative described how coordination cooperation should work and described the essential role of all parties in finalising the ECC Report 229. This report shall be the basis of efficient coordination and cooperation between stakeholders where all parties are taking actions to achieve the common goal of spectrum efficiency. An example is the Netherlands in adopting an original scheme for handling GSM-R interferences financing of solutions. He described the stimulation process decided by the Dutch government for improving measures in both rolling stock and

infrastructure. These measures seem promising in accelerating the renewal of the radio equipment on board the trains and the enhancement of the GSM-R coverage in defined areas.

Session 6 chaired by **Mr Robert Sarfati** from Systra showed how the current and continuous evolution in GSM-R was preparing for the future while preserving railway assets. The industry representative gave an in-depth view of all the actions taken in standardisation to handle IP based applications and sub-systems, described the IP based systems benefits without omitting to stress the associated challenges. He indicated that *“Migration is already on the way and will progress continuously”*. The viewpoint on when and how packet switching will become the bearer for ETCS was given by the UNIFE representative. He insisted on the fact that in the future, ERTMS shall be based on IP communication principles, while offering “backwards” compatibility. He concluded that GPRS is the entry solution towards IP and is ready for project implementation. The Resource Optimisation in GSM-R was presented by the SBB representative since Spectrum Efficiency is necessary since radio frequencies are scarce resources. The compared the benefits of GPRS versus the EGPRS bearer service. Up to seven or more simultaneous sessions might be possible depending on radio conditions and modified resource allocation timer handling. Packet Switching (PS) could keep end-to-end performance under degraded radio condition and mixed operation shall be allowed. Improved Circuit Mode resource handling is under consideration for GSM-R which could improve multiplexing rate of Circuit Switched Channels up to a factor four.

Session 7 chaired by **Mr Jean Cellmer** as UIC FRMCS project Chairman was aimed at preparing the future. **Mr Dan Mandoc** from Network rail addressed the crucial question of Why Changing. He listed the drivers for change general, technical and business oriented. He concluded by saying that the new system must be as good as the existing one, cost effective and interference free. Migration must be smart and shall not jeopardise the interoperability. This must be an evolution, and not a revolution. The next speaker gave an overview on how Critical Communication standardisation was progressing. It showed that the issues faced by this sector were very close to the ones encountered for GSM-R and that LTE equipment availability without impacting standardisation would not be ready before 2020 and that release 15 and later releases implementation is planned after 2025. Cooperation with GSM-R is seen as a very positive trend. The following presentation from ERA was in line with this target and planning objectives. It was also clearly stated that GSM-R will still be operational when next generation systems will be rolled out by railways pathfinders. FRMCS working group leaders gave a valuable indication on the project progress in the functionality, Architecture and Technology as well as spectrum areas. The UIC driven Users Requirements Specifications are well advanced and should be available for dissemination around end of 2015.

The conference closed with a panel session led by **Messrs Marc Antoni** and **Robert Sarfati** who initiated the discussion with the panellists from Huawei, Kapsch, Nokia, ETSI, TCCA, UIC and ERA on future evolution.

## CONTACTS

UIC Rail System Department: Marc Antoni, [antoni@uic.org](mailto:antoni@uic.org); Piero Petruccioli, [petruccioli@uic.org](mailto:petruccioli@uic.org)

Media: UIC Communications Department, [com@uic.org](mailto:com@uic.org)