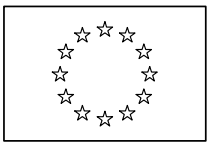

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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

Progress report on the implementation of the Railway Safety Directive (Directive 2004/49/EC)and of the Railway Interoperability Directives (Directives 96/48/EC and 2001/16/EC)

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Both the high speed network and the corridors of the TEN freight network are being developed gradually.

A number of technical parameters, such as track and loading gauge, were largely harmonised from the 'start'. Other technical parameters, such as power systems, signalling systems or characteristics of the infrastructure were not harmonised, as the first generation of High-Speed TSIs was not available until 2002, causing significant difficulties, for example between France and Germany.

The freight corridors are based on existing lines. The main idea is to identify the obstacles that hamper the competitiveness of freight transport along the corridors, and to agree on a coordinated strategy to remove them.

Three important objectives dominate the activities on freight corridors, and they are pursued simultaneously:

– The implementation of ERTMS/ETCS;

– Applying cross-acceptance of rolling stock and operational procedures associated with the use of rolling stock within the 'limiting conditions' of minimal technical compatibility: safety systems, supply voltage, loading gauge, axle loads, train length etc. must be minimally compatible and therefore acceptable.

– Upgrading the infrastructure, where necessary, to ensure that the 'limiting conditions' are progressively removed and that the track capacity is increased stepwise, so as to meet the growing demand for path.

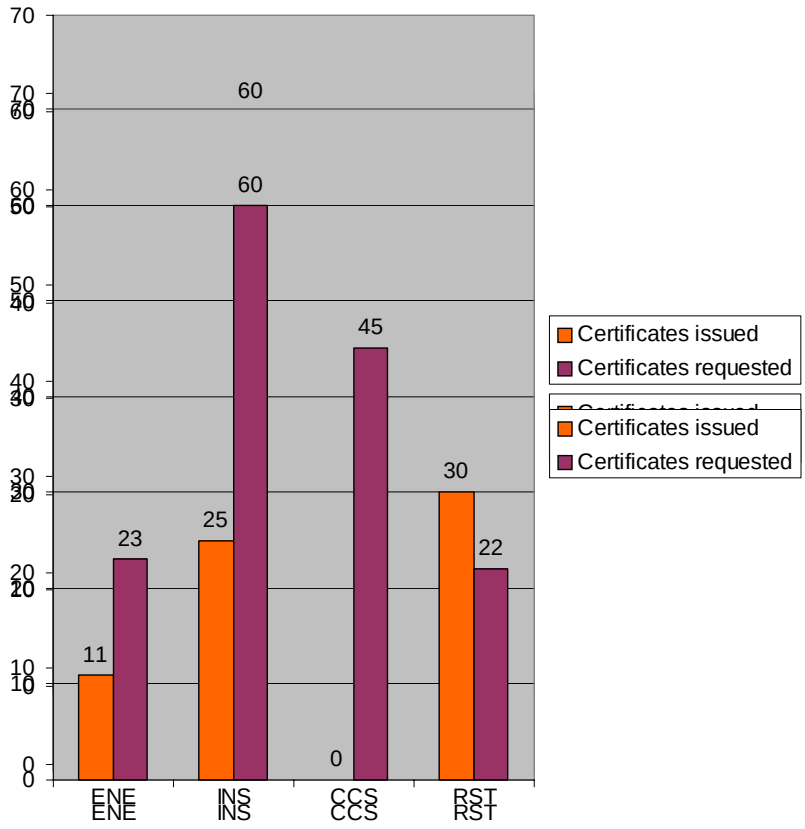
There are many studies and statistics on the state of development of the TEN high speed network and the freight corridors. Because ERTMS is so important for the development and progress of interoperability, the introduction of ERTMS on the European interoperable network is an important indicator.

Within the TEN network, several ERTMS projects are being carried out.

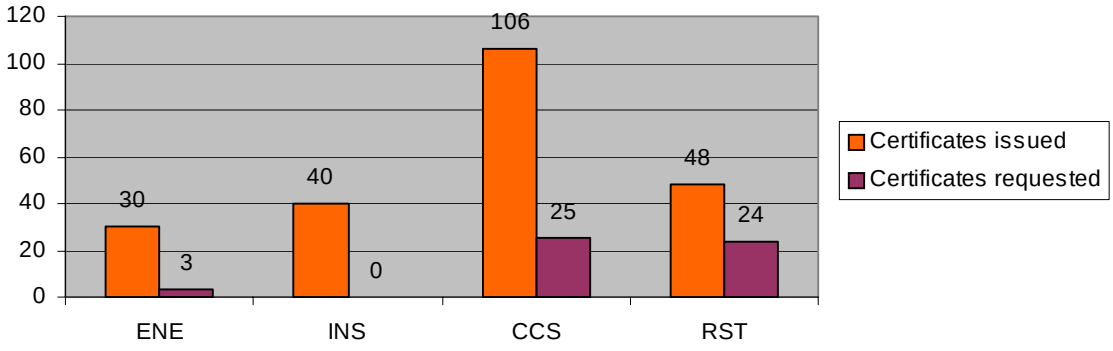
The table in Annex 2 gives an overview of European ERTMS projects.

Another possible indicator of progress in the field is the number of conformity certificates issued by the Notified Bodies. The charts below show the number of certificates issued and requested (number of ICs in Annex 2).

Requests and certificates for Subsystems (July 2007). Source NBRail



Requests and Certificates for Interoperability Constituents (July 2007) — source: NBRail

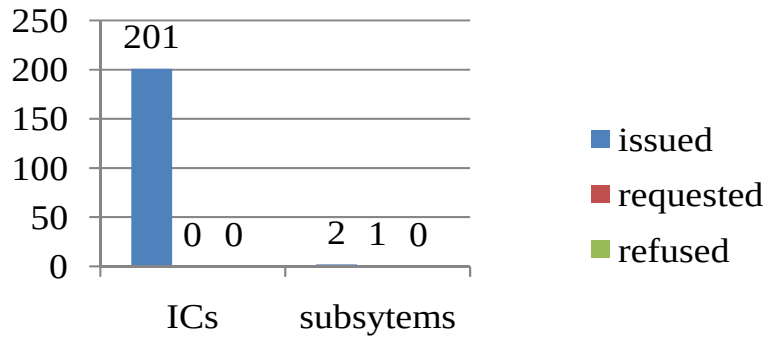


1.1. Vehicles

At present, the vehicle-related TSIs in force are CR TSI Freight Wagons from 2006 and HS TSI Rolling Stock from 2002. The latter has recently been revised. The revised HS TSI Rolling Stock entered into force in September 2008. However the framework is still incomplete, as the Conventional Rail TSIs for traction units and passenger carriages are not yet finalised.

The tables below indicate the progress in the certification of interoperability constituents (ICs) and subsystems of the HS TSI Rolling Stock and CR TSI Freight Wagons for the period of entry in force of the relevant TSI to 20 June 2008. Interestingly, a relatively large number of ICs (201), are certified under the CR TSI Freight Wagons, which has been in force for only a year and a half. Almost all of these certificates have been issued by the German Notified Body. The number of ICs certified according to HS TSI RST is 126, plus 19 requests, and again most of them have been certified in Germany.

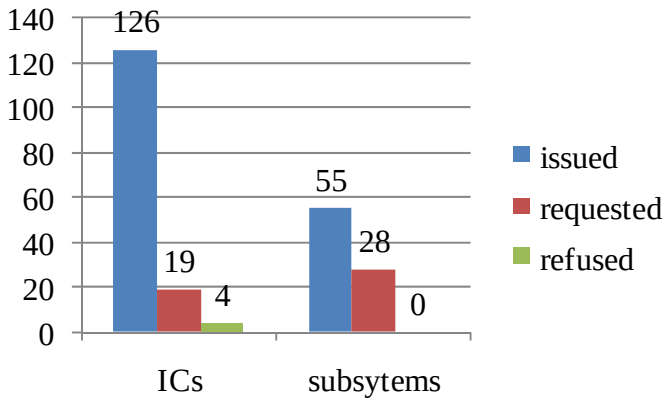
CR TSI Freight Wagons, certificates issued and requested for ICs and subsystems:



Source: NB Rail database

However, the number of certificates issued for ICs does not always give an accurate picture of the certified ICs used in TSI-compliant subsystems. A discrepancy might arise when certified ICs are used in non-TSI-compliant systems.

HS TSI Rolling Stock, certificates issued and requested for ICs and subsystems:



Source: NB Rail database

The number of certified subsystems is 2, plus 1 request for freight wagons, and 55,

plus 28 requests, for HS trains. The latter is much higher because the HS TSI Rolling Stock came into force in 2002. The subsystem certificates for HS rolling stock almost doubled in the last year of the period analysed.

1.2. ERTMS

1.2.1. What is ERTMS ?

Today, ERTMS encompasses two main components:

– GSM-R, the radio system used for exchanging voice and data information between the track and the train. It is based on standard GSM but using frequencies specific to rail as well as certain advanced functions.

– ETCS, the European Train Control System, which is made up of an on-board and a trackside module. The trackside sends (via balises or via GSM-R) information on the movement authority to an on-board computer. In this way, ETCS makes it possible not only to transmit permitted speed information to the train driver, but also to constantly monitor the driver's compliance with these instructions.

Signalling systems bring about considerable economic advantages because they allow more trains to operate safely on a given section of track than would otherwise be possible with other methods of safe working. ETCS will replace the many incompatible systems that exist on our European network by single system which is more modern, more sophisticated, safer and compatible at EU level.

1.2.2. What have we done so far on ERTMS ?

There are three main phases:

1) A first phase, corresponding roughly to the period 1990-2000 and to the Research and Development phase. The main objective was to pool various ongoing projects on rail signalling at EU level.

2) A second phase, corresponding roughly to the period 2000 to 2004. In this period, various trial sites were developed in Europe and the first 'commercial' projects entered an implementation phase.

3) A third phase from 2005 to 2009, during which a number of lines opened in different countries, allowing ERTMS to be validated in different situations (High Speed, conventional, freight, passenger etc.).

1.2.3. What is the situation today ?

Approximately 3 000 kilometres of lines are in service today in different countries. These different projects have proved the capacity of ETCS to deal with very different situations: freight lines, passenger lines, mixed traffic, high speed, conventional, etc.

The users of ETCS are completely satisfied with the performance of the system. The opening of the Spanish High Speed lines Madrid–Málaga, Madrid–Segovia–Valladolid and the extension of Madrid–Zaragoza to Barcelona are good examples. In the first few weeks of commercial service these new lines achieved punctuality records that have never been reached before.

1.2.4. Funding ERTMS projects

The EU has provided substantial financial support for the development and deployment of ERTMS since 1995.

Building on the recommendation made by the European Parliament in 2006 (Cramer report), EU resources have been concentrated on the 'first movers' and on selected corridors. With a view to encouraging these 'first movers' for on-board and trackside deployment, 17 ERTMS projects were awarded 50 % co-financing, for a total of €259.96 million, through the TEN-T multi-annual programme (2007-2013) under a first call for proposals in 2007. A second call for proposals has been launched in 2009 for additional co-financing.

The fact that the first ERTMS call was over-subscribed (requests for funding totalled €1.5 billion) is further proof that things are moving forward.

In the new Member States, the deployment of ERTMS is very much linked to infrastructure upgrades, and here the contribution of the regional funds is instrumental.

1.2.5. Deployment of ERTMS

In July 2008, the European Commission and the rail industry (manufacturers, infrastructure managers and undertakings) signed a memorandum of understanding aimed at accelerating deployment of ERTMS throughout Europe and clarifying the steps towards the development of a new version of the specification called baseline 3.0. It is important to note that with the signing of this MoU, the Member States that were still reluctant to equip their lines with the system have entered into a genuine deployment strategy.

ERTMS can succeed only if, on the one hand, there is full technical compatibility between the tens of thousands of kilometres of track and the trains to be equipped and, on the other, deployment is carried out swiftly and in a coordinated manner. Failing to equip just one kilometre of a route can seriously jeopardise the competitiveness of rail transport on the entire route. The memorandum of understanding addresses these two fundamental issues by:

- using a single technical baseline for all railway lines equipped with ERTMS in the European Union up to the end of 2012;
- getting manufacturers to agree to include software updates in new contracts at a client's request. Clients (rail companies and infrastructure managers) currently complain about the excessive costs imposed by manufacturers;
- agreeing on a programme enabling a new version of the specifications to be drawn up by the end of 2012 in such a manner that trains equipped with this new version can run on lines equipped with the old version;
- improving and harmonising test procedures for checking the compatibility and compliance of equipment; accelerating deployment of ERTMS, particularly by adopting a binding European plan and equipping new models of engine.

Several ERTMS projects in the world such as India, China, South Korea, Taiwan, and more recently Argentina, to name just a few, demonstrate the very high potential of this European technology which is becoming the world standard more quickly outside Europe than in Europe!

Now, in early 2009, almost 3000 kilometres of ETCS equipped lines are in commercial service. Signed contracts and the deployment plans submitted by the Member States already show that we will face an exponential increase over the next few years: 11 500 kilometres will be in service by the end of 2012, and 23 000 by the end of 2015.

1.2.6. Deployment in Europe

Member States were due to submit national deployment plans by 28 September 2007. They have now all fulfilled this obligation. However, the pace at which ERTMS is being deployed varies widely from one EU Member State to another.

In certain Member States, all main lines are due to be equipped with ERTMS by 2015. In others, ERTMS deployment will scarcely have started by then.

There are various reasons why the pace of ERTMS deployment is uneven. For one thing, Member States have different starting points. In some, the existing speed control systems are obsolete and need to be replaced swiftly. In others, the existing systems will be viable for several years, and ERTMS installation is slower.

Member States also tend to conduct their own 'national' cost-benefit analysis of ERTMS deployment. For some countries, particularly smaller ones, the costs of maintaining a national system will mean that swift ERTMS deployment is justified on economic grounds alone. Other countries may be motivated by safety and performance improvements.

Also the pace of ERTMS deployment may vary from Member State to Member State: efforts to achieve the interoperability of the network should be more fairly shared.

Therefore the Commission decided to consult EU Member States and the rail sector on how best to coordinate ERTMS deployment and the national deployment plans.

The corridor organisations set up under the aegis of the European Coordinator for ERTMS, Mr Karel Vinck, are a pragmatic tool to coordinate deployment.

Six important corridors have been set up in agreement with the sector in order to further study costs, benefits and measures required to support ERTMS deployment.

These six corridors represent 6% of the Trans-European Network track length but more than 20% of European freight traffic. For each of the corridors, precise objectives have been defined in terms of regularity, reliability, quality of service and corridor capacity.

The studies show that the deployment of ERTMS/ETCS must very often be accompanied by the modernisation of existing infrastructure and the harmonisation of operating rules.

By putting all of the parties involved in each corridor around a table, the difficulties can be tackled at an early stage. Improving the competitiveness of a corridor and more particularly ensuring its interoperability requires cooperation by many different parties and full implementation of the interoperability and safety directives in a consistent manner.

Coordination of investment is also an obvious issue: there is no point in undertaking huge investments to relieve a bottleneck on a corridor if upstream and downstream other bottlenecks remain.

Building on the corridor plans and national plans, the Commission has drafted an EU ERTMS Deployment Plan which was adopted on 22 July 2009.

1.2.7. Next steps

Firstly, ensuring full compatibility between existing ERTMS projects is a key priority. In other words, a locomotive equipped with ERTMS should be able to run on all ERTMS lines without any software adaptation. This will be the reality as soon as all existing lines are upgraded to become compatible with the version of the specification adopted in April 2008. This will be a difficult exercise as it entails upgrading software on lines which are in operation today or in the final testing phase before entering in operation.

Secondly, with a view to monitoring existing projects more closely, the Commission has decided to strengthen its capacity to follow up ERTMS projects in the field. The aim is to ensure that any technical difficulty that might arise is properly addressed at EU level and registered as an 'open point' to be covered by the TSI before any 'local' solution is adopted. The cross-acceptance initiative will ensure that all vehicle-related parameters that are specified at national and project level are recorded in the 'check list' and evaluated for equivalence prior to the single solution being adopted in the TSI.

Thirdly, speeding up deployment is a necessity. A longer 'migration' period would mean that all parties would bear the costs of dual equipment (ERTMS & national systems) for a longer time period. The Commission will closely monitor the progress on corridors and the implementation of the EU ERTMS deployment plan.

1.3. Telematics applications for freight

The efficient interchange of information between infrastructure managers, railway undertakings and other service providers in support of the commercial operation of trains and wagons and the continuity of information services across borders is a prerequisite for the quality of international rail freight services. The development of harmonised telematics applications throughout Europe is expected to boost the competitiveness of the freight railway sector, as has happened in other geographical regions (for example USA) and transport sectors.

For this reason, the Commission adopted on 23 December 2005 a TSI on Telematics Applications for Freight (TAF-TSI). The TAF-TSI identifies the type of messages to be exchanged and the databases required and provides quality criteria for the data exchanged. It also sets guidelines for the migration strategy, but without a precise calendar for its implementation.

Unlike other TSIs, the TAF-TSI has been adopted not through a Decision but by a Commission Regulation in response to the Member States' demand to make it directly applicable to industry. The TAF-TSI required the railway sector to present by January 2007 a Strategic European deployment plan (SEDP) and the rail industry has full responsibility for the implementation of this plan in accordance with the legal requirements in force.

The SEDP describes the development of the overall TAF-TSI architecture from concept to final delivery. It refers to technical and economical feasibility studies, taking into account the relevant legacy IT applications, and establishes the interface requirements for the TAF-TSI architecture and its potential client systems. It identifies the optimum deployment strategy and determines total life cycle costs.

This plan, which was developed with the support of TEN-T funds, was submitted to the Commission in 2007. In 2008 industry started to develop the IT systems under the governance structure described in the SEDP. The aim is to deliver it by 2013.

A steering board assisted by a deployment team hosted by UIC is managing the different tasks of the SEDP. A cluster has been created for each stakeholder group, which should deliver the work under the control of the steering board.

The implementation of the SEDP has led recently to some issues.

Firstly concerning the governance structure: the roles and responsibilities of all interested parties was reviewed and, as a result, the Commission suggested that a memorandum of understanding (MoU), which outlines the tasks and commitments of each stakeholder, should be signed by the chairpersons of the various representatives' associations involved as well as by the Commission. The MoU would promote mutual trust between the various rail actors, increase transparency on the decision making process and reassure all parties on the role of the Commission as guardian of the correct implementation of the TAF-TSI and objective arbitrator between the parties. Further steps to be taken would entail closer involvement of the European Railway Agency in the implementation process and the promotion of a legally independent structure (European economic interest group) to manage the implementation. In addition to this, Member States will continue to be involved in monitoring implementation (and possible modifications of the legislation) through the Committee on rail interoperability and safety.

Secondly on the choice of the IT architecture for the Wagon and Intermodal Operating databases (WIMO): divergent opinions on the architecture of the WIMO threatened the future developments and the Commission decided to carry out an independent review. The review concluded that a central platform approach was the most effective means of providing in the necessary timely manner the vehicle data required for meeting all legal obligations (safety and interoperability directives, TSIs, dangerous goods, etc.). A new Task Force has recently been created under the RISC Committee to deal with this new challenge.

Another problem appeared in relation to change management of the TAF-TSI Annexes, including a number of technical documents to which the TSI refers. As part of the implementation of the SEDP, UIC merged and amended some of the Annexes in one XML data catalogue in order to facilitate the development of the IT applications. This data catalogue will require permanent adaptation during the software development phase and the normal process for revising TSIs through Commission legislation is not suitable for such frequent updates. In accordance with the principles of better legislation it is highly recommended to change the status of such documents from mandatory to voluntary. In addition there is a need to reinstate the normal revision procedure in which the European Railway Agency is charged with preparing the revision of TSIs, including the TAF-TSI.

Finally, the Agency is currently developing a TSI on telematics applications for passenger transport by rail (TAP). Given the obvious synergy between the two TSIs it will be necessary to agree on a common structure and on common reference files, as well as to adopt the same process for adjusting the specifications to technical progress.

1.4. Registers of Infrastructure and Rolling Stock

1.4.1. Registers of infrastructure

Article 24 of the Interoperability Directives 2001/16/EC and 96/48/EC as well as HS TSI Infrastructure require a register of infrastructure to be drawn up in each Member State. The register of infrastructure will be a tool for collecting general data on railway infrastructure as specified in the TSIs.

It may be used:

– By the National Safety Authority and Notified Bodies, to check the compatibility of the subsystems they are placing in service with the system into which they are being integrated;

– By the Infrastructure Manager, to provide a documentary record summarising the lines concerned, to allow tracking of future developments in implementing the TSI;

– by Railway Undertakings providing or looking to provide services on the line, to be informed of its particular features and of parameters of interoperability specifications which depend on a specific choice of the Infrastructure Manager;

– by Railway Undertakings, to prepare their applications for safety certification;

– by Contracting Entities tasked with preparing the EC declarations of verification, to verify and consolidate the technical files prepared by the Notified Bodies;

– by the Commission and the Agency, for assessing the progress of TSI implementation and evaluating new projects and funding requests.

The information to be included in the register of infrastructure will be based on:

– list of parameters defined in TSI INF (Annex D of the revised HS TSI Infrastructure);

– parameters specified in other TSIs where the subsystem concerned has interfaces with an infrastructure subsystem: in particular TSI Energy, TSI CCS, TSI Rolling Stock, TSI Operation as well as TSI People with Reduced Mobility and TSI Safety in Railway Tunnels.

The register of infrastructure will cover TSI-compliant lines. It must also ensure consistency with the Register of Rolling Stock (RRS) mentioned in 4.4.4. Work on the register of infrastructure is in an initial phase of preparation.

1.4.2. National Vehicle Register (NVR)

The requirements related to development and functioning of the NVR are stipulated in Article 14 of Directives 96/48/EC and 2001/16/EC.

The main uses of the NVR are:

- to keep record of authorisation and the identification number allocated to vehicles,
- to search for information related to a particular vehicle,

- to find the entities involved: vehicle keeper, entity in charge of maintenance, entity in charge of the register of rolling stock, vehicle owner, etc.,

Acting on an ERA recommendation, the Commission adopted Decision 2007/756/EC, which details the common specifications to be used for vehicle registration. The implementation of this Decision creates obligations for both the Member States and the ERA.

The Member States are required to use the common specifications of the Decision. They also need to designate a national body responsible for keeping and updating the NVR and notify it to the Commission and the other MSs. Most importantly, each MS is required to establish a computer-based NVR. All NVRs should be linked to a central Virtual Vehicle Register (VVR) managed by the Agency. The VVR should allow users to search all NVRs through a single portal and enable exchange of data between national NVRs. However, for technical reasons, the link to the VVR cannot be set up immediately. Therefore, MS should only be required to connect their NVRs to the central VVR once the effective functioning of the VVR has been demonstrated.

The ERA tasks involve:

- carrying out a pilot project for the European Centralised Virtual Vehicle Register (ECVVR) described in section 2.2 of the Annex to the Commission's Decision
- ensuring at least three MS NVRs are connected to the VVR, including a successful connection of an existing NVR using a translation engine,
- publishing the specification to be used by Member States to connect their NVRs with the VVR,

The Commission, by a separate decision and following an evaluation of the pilot project, will require the connection of all national NVRs to the central VVR.

In the period between January 2007 and January 2008 ERA carried out the ECVVR pilot project with the following three pilot MSs: France with a standard NVR (sNVR), Italy with a translation engine and the Netherlands with a sNVR hosted by ERA during the pilot project.

After satisfactory results of the evaluation by the three pilot MS and ERA in January 2008, the evaluation phase was extended to the other MS until April 2008. The MS are now in the process of either finalising their technical choice of sNVR or translation engine or installing their NVR and connecting it when ready to the ERA VVR.

1.4.3. Register of Rolling Stock (RRS)

Among the thirteen items of the NVR, there is a reference to the RRS. In July 2007, ERA submitted to the Commission a recommendation on the RRS which covered its content, format and management, shortly summarised below.

The scope of the RRS should be limited to the vehicles authorised to be placed in service after the entry into force of the Interoperability Directives, for which TSIs are implemented. Extension of the scope to existing vehicles may be done on a voluntary basis by the MS.

The RRS should contain fixed technical data relating to the basic parameters of the published TSIs which have been checked by a Notified Body. It will not contain variable

nor operational data, for example elements related to maintenance. The data format is expected to be developed in the future new and revised TSI.

The NSA is responsible for establishing a link between the NVR and the RRS. This should allow the interested parties including the other NSAs and the ERA to have access to the RRS data.

Since ERA has access to the data of the RRS for each MS, it will take responsibility for the annual publishing of the EU RRS on its website. The update will be limited to introduction of new vehicle types in the RRS.

The New Interoperability Directive (2008/57/EC) has simplified the requirements linked to the RRS: an European Register of authorised types of vehicles is to be set up and maintained by the ERA. This is a new task for ERA starting in 2009.

1.5. Follow-up of TSI implementation (derogations, errors, etc.)

Further to the adoption of TSIs, a number of monitoring activities has been set up through cooperation between the Commission and ERA. The framework mandate of 13 July 2007 asked ERA to prepare the revision of all adopted TSIs. It also set out a procedure for the correction of minor and critical errors, including the development of Technical Opinions by ERA that, once approved by the Member States in the context of the Committee, can be used by the industry pending the formal revision of the TSIs. This process has recently been confirmed by Article 7 of Directive 2008/57/EC.

Further to that mandate ERA and the Commission have prepared a table of errors that is being regularly updated and that provides a tool for the change management process. It is important to have transparency and traceability of all measures taken following the notification of an error to ERA or to the Commission. That table is regularly presented to the RISC Committee for information, but also to discuss the importance and hence the priority to be given to the correction of errors.

A similar process is used to handle derogations and notification of national rules related to TSIs.

Derogations allow exceptions from the application of TSIs under certain conditions laid down by the Interoperability Directives. Since the adoption of the first TSIs in 2002 until the entry into force of Directive 2008/57/EC on 19 July 2008 the Commission received 43 derogations from 9 Member States. The full list of derogations is provided in the annex.

These derogations concern almost all TSIs in force. The highest numbers of derogations have been received for the TSIs noise (18 derogations), freight wagons (11), energy (high-speed, 6), CCS (high-speed, 5) and infrastructure (high-speed, 5).

The majority of the derogations (34) have been based on Article 7(a) of both Directives granting exemptions from the application of TSIs for new, renewed or upgraded sub-systems at an advanced stage of development at the time of publication of a TSI. Due to the specific nature of this type of derogation they can only be granted a short time after the publication of the TSI and the number of new derogations can therefore be expected to fall significantly in the coming years once all TSIs are adopted.

Overall, the low number and the types of derogations indicate that the application of TSIs can be regarded as successful.

1.6. Certification process (authorisations of placing in service and conformity assessment)

1.6.1. Conformity Survey Group

To support the revision and drafting of the TSI chapters related to conformity assessment, a Conformity Survey Group was set up in ERA in September 2007. It validated the choices regarding the assessment procedures made by the working parties on CR TSI Energy and CR TSI Infrastructure. A further task will be to harmonise the process of conformity assessment described in each TSI by drafting a common document, taking into consideration the new internal market package for goods (Decision No 768/2008/EC on a common framework for the marketing of products; Regulation (EC) No 765/2008 on the requirements for accreditation and market surveillance; Regulation (EC) No 764/2008 on mutual recognition) .

1.6.2. Data related to conformity assessment and certification

ERA is preparing a public database which will include declarations of conformity of ICs, declarations of verifications of subsystems, authorisations of placing in service, national technical rules, as well as a link to Rolling Stock and Infrastructure Registers published by MS.

1.6.3. Survey of safety approvals for the first ERTMS implementations

Some ERTMS projects are now at a very advanced stage of deployment, while others are already in operational service.

In every project, the approval of ERTMS implementation has been managed by the relevant national safety authority, ensuring compliance with the safety objective for the service. This has mainly been done by reference to the level of safety of existing (non ERTMS) signalling and train protection systems.

The process of safety approval has been supported by the ERTMS specifications, establishing a harmonised safety target for a ‘top hazard’ associated to the supervision functions of ERTMS/ETCS and defining tolerable hazard rates (THR) for ETCS equipment, with the aim of achieving cross-acceptance until the full European specifications for ERTMS are complete.

The results obtained so far are positive and encouraging; nevertheless, some issues still exist that could create obstacles for future international connections of the national ERTMS networks.

In particular, it cannot be excluded that some national solutions adopted to achieve safety have the undesirable effect of jeopardising interoperability: this has been recognised as an open point by the experts from the railway sector This underlines the need for the TSIs to exhaustively cover the essential requirement of safety

The European Railway Agency therefore decided to perform a survey of the ERTMS implementations already in service or at an advanced stage of development, to gauge the severity of this open point and to provide the information necessary for finding a solution.

The call for tender was published in 2006 and the study was carried out in the first half of 2007. The contract was awarded to a consortium of CETREN, KEMA RTC, RINA SpA, with Arsenal Research, Attica Advies and EBC as subcontractors.

The consortium analysed a number of the ERTMS implementations in the following countries: Italy, Austria, Spain, The Netherlands, Belgium, France, Germany, including cross-border projects such as Basis Brenner Tunnel, Vienna–Budapest and Figueras–Perpignan.

The results of the survey consist of three reports that can be found in the European Railway Agency website (http://www.era.europa.eu):

– Report on safety approval process followed in the different ERTMS projects

– Analysis of integration of ERTMS system

– Analysis of potential interoperability problems

The study showed how bilateral solutions are sometimes negotiated to compensate for poor harmonisation of operational aspects and how this may jeopardise interoperability.

The reports are currently being analysed by the Agency and the relevant working groups, in particular the NSAs Focus Group on ERTMS. The following items are considered important to improve the process of putting ERTMS applications into service:

– Tests should be explicitly categorised according to the following scheme:

  - Integration of the Control Command and Signalling (CCS) assembly (either track-side or on-board, including tests in full operational conditions — in the scope of the TSI);
  - Integration of the whole CCS subsystem (track-side + on-board) and integration of the CCS subsystem into the overall railway system (responsibility of the Member State).

– Adequate test reporting should allow for re-use of the test results

– There is a need to harmonise the terminology of the CCS TSI (Interoperability Constituents, assemblies, subsystems) with the terminology of EN 50126 and EN 50129 (examples: *product, generic application, specific application, railway authority*)

– comparable procedures for system development and approval should be applied in all projects

– ‘national requirements’ should be properly notified

– Error correction and system improvement should strictly follow the Change Control Management procedures defined by the Agency

– the importance of using the Operations TSI as a part of implementing ERTMS must be recognised.

Many of these issues will be addressed by the cross-acceptance initiative, which will define the on-board ERTMS parameters to be checked and determine which national requirements are equivalent and which are contradictory

1.7. Market aspects

Interoperability can only be reached in the long term by small steps, consistently following a clear migration path taking account of asset lifecycle replacement, whereby life-expired non-TSI-compliant assets are replaced with new assets conforming to TSIs. Otherwise, achieving instant interoperability would call for vast sums of money to modify existing assets before they are life-expired. The short-term economic incentives for creating 'instant' interoperability for existing subsystems are insufficient to motivate the parties involved to take action. There is also an imbalance between vehicles and infrastructure.

For infrastructure (a monopoly supply) there is no 'market pull' apart from new lines (requiring new interoperable equipment). The most viable approach taken by an IM in isolation is to continue with the existing system architecture and expect railway operators to configure their trains to be compatible.

In contrast, for vehicle suppliers and operators there is a strong market pull for a single set of vehicle specifications rather than a different set for each country. A single specification reduces costs, increases reliability and allows international operation and a European market for vehicles and their components. The objective must therefore be to define the 'single vehicle specification' and then modify infrastructure over time to support it. However the 'single vehicle specification' must take as its starting point the characteristics of existing infrastructure. The corridor approach is a promising way to move in this direction. To migrate by first making trains interoperable alongside the existing system is far less expensive than double-equipping the infrastructure (e.g. dual signalling, dual catenary voltages, dual track gauges).

Looking at the issues that drive the investment decisions of Railway Undertakings, which often do not have a long-term financial horizon, they are not the best placed parties to initiate a successful migration to interoperability. For the existing infrastructure and rolling stock the only economically viable time for refurbishment/renewal seems to be the time when it has to be replaced for other reasons such as end of technical/economical life. That point in time can be chosen to adapt to interoperability requirements. This is a regulatory obligation in cases of major infrastructure upgrading projects.

Considering the huge investments necessary, it is obvious that full interoperability can only be reached by implementing long-term, well coordinated migration strategies of all parties involved, at the same time improving the necessary systems. This can only be done if European policy makers stay fully committed, with active intervention aimed at optimising the long-term costs for Railway Undertakings and Infrastructure Managers and thus improving the competitiveness of the sector. They can expect the RUs' and IMs' cooperation only if they can convince them that the overall effect is ultimately positive and that those who have to invest disproportionately are compensated somehow, and in time. The corridor approach is a promising way to move in this direction.

In addition RUs, manufacturers and leasing companies are all pushing for European specifications because they all want to operate in a single market: it makes them more competitive with other sectors. Managed sensibly, interoperability is far cheaper than non-interoperability.

There are only two constraints holding interoperability back and these apply to the ERTMS system as much as any other part:

– the timescales of infrastructure upgrading and renewal and the tendency of IMs to want to stay the same (which is natural for a monopoly overseen by a national government)

– the need for mechanisms to pass overall railway system savings on to the customer. By removing line-side signalling, a study in one country showed the overall costs of signalling could be reduced by 50 %; but for the sector to realise the competitive benefit, this must be passed on to the RU in reduced access charges that more than offset the cost of fitting and managing the on-board cab signalling equipment.

In summary:

Harmonisation of the railway network is only possible in the long term, because of the enormous costs involved in short-term retrofit changes. Innovation is not necessarily a goal of interoperability. Interoperability facilitates an open railway market, but it does not create the market itself, and true interoperability makes the sector as a whole more competitive by opening up the market for the supply of railway products and services.

2. DEVELOPING A COMMON APPROACH TO SAFETY

NSA and NIB networks

The NSA and NIB networks set up and managed by ERA are fundamental tools for developing a common approach to safety, which is the principal objective of the Railway Safety Directive and which, in turn, will help break down an important barrier to a growing market.

The functioning of the networks is described in sections 2.4 and 2.6.

2.1. CSTs and CSMs

2.1.1. Common Safety Targets (CSTs)

According to Article 7 of the Rail Safety Directive, Common Safety Targets (CST)s define the safety levels that must at least be reached in each Member State, expressed in risk acceptance criteria for certain groups of individuals and for societal risks.

In 2006 the Commission adopted a mandate[1] to the European Railway Agency to draw up a recommendation to the Commission on the first set of CSTs to be based on an

[1] Commission Decision of 9 February 2006 concerning mandates to the European Railway Agency for developing technical specifications for interoperability under Directive 2001/16/EC and common safety targets, common safety methods and common safety requirements for safety certification under Directive 2004/49/EC.

examination of existing targets and safety performance in the Member States, to ensure that the current safety performance of the rail system is not reduced in any Member State.

Following the definition, in 2006, of the concept of National Reference Values (NRV) and the development, in the same year, of the measuring units for NRV and CST, the Agency focused the activities of the CST Working Group on developing the methodology for calculating and assessing achievement of NRV and CST.

Due to the limited availability and the reduced degree of EU-wide harmonisation of quantitative information on safety performance of railways in Member States, the methodology focused on the development of NRV and CST for national railway systems as a whole, and had to be based on the analysis of short time series of Eurostat and CSI statistical data on railway accidents and related consequences.

The high degree of stochasticity and annual oscillation of these data made it necessary to develop a methodology by which NRVs are calculated through a weighting averaging algorithm and the CSTs are derived from the correspondent NRV, depending upon the acceptability of the values themselves. For both the NRV and the CST the assessment of achievement is based on a multi-step semi-quantitative decisional model, which requires an in-depth analysis of the safety performance in close cooperation with the relevant Member States.

The Agency's recommendation on this subject to the Commission was submitted on 29 April 2008 after consulting the NSAs of all Member States and the social partners.

The corresponding draft Decision of the Commission was approved by the Committee and was adopted on 5 June 2009. A second recommendation of the Agency, due by end of February 2009, will establish the values to be officially attributed to NRV and CST, based on the methodological recommendation.

2.1.2. Common Safety Methods (CSMs)

According to Article 3 of the Rail Safety Directive, Common Safety Methods (CSMs) are methods to be developed to describe how safety levels and achievement of safety targets and compliance with other safety requirements are assessed.

In 2006 the Commission adopted a mandate[2] to the European Railway Agency to draw up a recommendation to the Commission on the first set of CSMs to be based on an examination of existing methods in the Member States. The first set of CSMs will describe how the safety level, and the achievements of safety targets and compliance with other safety requirements, are assessed, by defining risk evaluation and assessment methods.

The recommendation on the first set of CSMs was delivered by the Agency to the Commission on 6 December 2007 together with a detailed report on the development of this recommendation. It describes a general framework applicable to the different areas where risk assessment will be required in future. It is intended for assessing and managing the risks inherent in processes and /or equipment. Special focus has been given

[2] Commission Decision of 9 February 2006 concerning mandates to the European Railway Agency for developing technical specifications for interoperability under Directive 2001/16/EC and common safety targets, common safety methods and common safety requirements for safety certification under Directive 2004/49/EC.

to interfaces between parties, while leaving a margin of freedom to these parties to apply their own safety methods and tools for managing the risks they are solely responsible for.

The scope of risk assessment has been extended to include demonstration of compliance (needed to obtain safety approval of the change envisaged) with the safety requirements identified during risk assessment, as well as hazard log management (which continues after approval of the change).

The scope of application of the CSM for risk assessment includes technical, operational or organisational changes to the railway system (e.g. new lines, new equipment, new rules, organisational changes, etc.). The applicant's evaluation of the significance of the changes should be based on expert judgment, using criteria defined in the recommendation.

Risk assessment has been defined as the overall iterative process comprising the systematic use of all available information

– to identify the hazards (Hazard identification),

– to estimate the risks (Risk analysis) and

– to determine if this risk can be accepted (Risk evaluation).

Risk evaluation is thus understood to be that part of the whole risk assessment process dealing with the acceptance or not of a risk.

The risk acceptability should be evaluated by using one or a combination of the three following risk acceptance principles:

– The application of Codes of Practice

– A comparison with reference systems

– An explicit risk estimation.

This risk acceptance for the third principle should be based on criteria which may be either quantitative or qualitative.

The decision on the correct application of the CSM to the system under assessment must be validated by independent assessment bodies in order to obtain safety approval of significant changes.

In 2008, the Agency continued in dedicated task forces with its work on:

– the definition of and criteria for significant changes,

– the identification of risk acceptance criteria to be used in explicit risk estimation and

– the development of the roles and responsibilities of assessment bodies.

These issues were discussed intensively in 2008 at several meetings with Member States and the resulting draft Commission Regulation received a favourable opinion from the Committee in November 2008. The first CSM regulation was adopted on 24 April 2009.

2.2. Safety certification of RUs and safety authorisation of IMs

The development of railway safety certification and authorisation is based on two pillars: on one hand, at national level, the transposition of European legislation into national law requiring the implementation of safety management systems for railway undertakings and infrastructure managers; on the other hand, at European level, the development of a common method for the assessment of conformity with the requirements set down in Articles 10 and 11 of Directive 2004/49/EC and based on a mandate issued by the Commission in 2006[1]. The latter issue is dealt with in the 'Safety Certification' sector of the Agency in cooperation with the ERA Working Group on Safety Certification and Authorisation, representing sector associations and national safety authorities.

Both safety certificates and authorisations are made of two parts. Regarding the safety certificate, the Part A Certificate confirms the acceptance of a railway undertaking's safety management system and is, once issued in one Member State, valid throughout the European Union. The Part B Certificate is network-related and confirms the acceptance of the railway undertaking's provisions to operate safely on the respective network. Both parts are issued separately. Regarding the safety authorisation, again the Part A confirms the acceptance of an infrastructure manager's safety management system and the Part B Authorisation confirms the acceptance of the provisions to run the network safely. However, both parts of the authorisation are issued in one.

The common method for conformity assessment, addressed to the national safety authorities, will harmonise their decision-making criteria when assessing railway undertakings and infrastructure managers and deciding on the issue of the certificate or authorisation. As a first step towards this method, 'Safety Management System Assessment Criteria' were published in May 2007, and since then have been progressively implemented by the national safety authorities. An impact assessment on the usability and the consequences of usage began by the end of the year.

The general concept which underlies the development of the common method is shown in the table below, indicating that some work still needs to be done, especially regarding the Part B Certificate and Authorisation.

	Part A Cert + Auth (SMS in general)	**Part B Certificate (Network related)**	**Part B Authorisation (Network related)**
	SMS requirements and	**Part B requirements**	**Part B requirements**

	basic elements		
Given by	Article 9(2), 9(3), 9(4) SD[3]; Annex III SD	Recommendation according to Article 15 SD (2008)	Recommendation according to Article 6(3)(b) SD (2009)
Described by	Article 9(1); 'Abstract/Description' in 'SMS Assessment Criteria' (2007)	'Purpose' in Recommendation according to Article 15 SD (2008); Annex II SD; Annex IV SD; Results of RUs SMS element adaptation	Recommendation according to Article 6(3)(b) SD (2009); Results of IMs SMS element adaptation
	SMS Assessment Criteria	**Part B Assessment Criteria**	**Part B Assessment Criteria**
Given by	'SMS Assessment Criteria' (2007)	Recommendation according to Article 6(3)(b) SD (2009)	Recommendation according to Article 6(3)(b) SD (2009)
Described by	Guidelines of Use	Guidelines of Use	Guidelines of Use
	SMS Assessment Procedures	**Part B Assessment Procedures**	**Part B Assessment Procedures**
Given by	Recommendation according to Article 6(3)(b) SD (2009)	Recommendation according to Article 6(3)(b) SD (2009)	Recommendation according to Article 6(3)(b) SD (2009)
Described by	Guidelines of Use	Guidelines of Use	Guidelines of Use

2.3. Monitoring of safety performances

The Common Safety Indicators working group developed and agreed in 2007 on common definitions of CSIs and methodologies to calculate the economic impact of accidents. The activity is expected to result in a ERA Recommendation for the revision of Annex 1 to Directive 2004/49/EC, released at the end of 2008.

The CSI working group has also identified parts of Annex 1 to be improved; in particular, the methodologies to calculate the economic impact of accidents and the level crossing classification will represent substantial developments of the current Annex 1.

[3] SD= Railway Safety Directive (Directive 2004/49/EC).

The Agency has also been cooperating with Eurostat for the purpose of harmonising Regulation (EC) No 91/2003 to Directive 2004/49/EC; ERA and Eurostat developed a joint proposal for harmonisation, which was officially submitted for approval to the 'Eurostat working group on railway statistics', during the meeting held in Luxembourg on 25 and 26 June 2007. However the working group did not approve the proposal. More recently it was agreed that rail accident data should only be reported by ERA under the railway safety directive.

The Agency began in 2007 with the activity of disseminating best practices to prevent level crossing and trespasser accidents, which represent around 95% of railway fatalities, as well as suicides.

As far as level crossings are concerned, the Agency organised a seminar on safety at level crossings in Lille on 11 October 2007, for representatives of National Accident Investigation Bodies and National Safety Authorities. Expert speakers gave presentations on current best practice and which recommendations at European level could address common problems. The Agency also participated as an external contributor in the project on level crossings, SELCAT, which aims to propose a standard for reporting level crossing accidents in European countries and to set up a common level crossing accident information system.

The exchange of knowledge by the SELCAT partners has also given important input to the development of common definitions of CSIs.

Trespassing accidents and suicides are normally not the focus of the safety management of railways, although they represent something like 85% of all fatalities. Apart from the human suffering and grief involved, these events have serious consequences for the railways in forms of interruptions to traffic, trauma for involved persons etc. The costs are quite important: estimates from the Agency indicate €150 million per year for EU railways; if societal impact is taken into account costs could be as high as €1.5 billion!

Therefore ERA took the opportunity to organise a seminar on this subject in April 2008 with guest speakers from Europe, the United States and Canada.
The aim of the seminar was to facilitate the exchange of knowledge on policies at national level, reporting systems, cause analysis, cooperation between railways and other organisations/ authorities, measures applied and their effectiveness as well as recent research on the subjects. Most speakers at the seminar demonstrated that accidents to trespassers and even suicides are preventable to a certain degree and that effective programmes can be put in place.

2.4. Rail accident investigation

The Investigation bodies now notify ERA of decisions to open an investigation, submit copies of final investigation reports for publication and submit an annual report on the investigations carried out, the recommendations made and associated safety actions. This reporting commenced according to the Safety Directive in April 2006.

To facilitate reporting and to meet the requirements for public availability of accident reports, a public database of safety reports was established. To enable the sharing of lessons learned from accidents, some of the Member States have also submitted reports made by the NIBs prior to this date.

In 2006, 124 investigations were opened and notified to ERA. 81 reports were finalised in 2006 or prior to 2006. From these reports 330 recommendations for the improvement of safety were issued. All established NIBs report investigations according to Article 19 of the Safety Directive; some IBs also investigate other accidents and incidents under their remit by national law and submit these to the Agency.

A study has been commissioned and contracted to Lloyds Register Rail with the aim of developing an archive back to 1990 of historical accidents, to improve the time series of accident information available on the public safety database.

3. DIFFICULTIES AND CHALLENGES

Better regulation and reduction of administrative burdens

In the context of the renewed Lisbon Strategy, refocused on growth and jobs, the Commission has launched a comprehensive strategy on better regulation to ensure that the regulatory framework in the EU contributes to achieving **growth and jobs**, while continuing to take into account the **social and environmental objectives** and the benefits for citizens and national administrations. The EU's Better Regulation policy aims at simplifying and improving existing regulation, to better design new regulation and to reinforce the observance and the effectiveness of the rules, all this in line with the EU proportionality principle.

Against this background and in the framework of the **programme for simplifying legislation**[4] the Commission proposed consolidating and merging the Railway Interoperability Directives (96/48, 2001/16, 2004/50) in its proposal of December 2006, which has resulted in the adoption of Directive 2008/57/EC.

Regulation is important and necessary, but implementation can also entail costs. Some of these expenses are linked to legal obligations to provide information to either public or private parties. They are called administrative costs.

The Commission's Better Regulation strategy is aimed at measuring administrative costs and reducing administrative burdens. According to estimates, it would be feasible to reduce administrative costs by as much as 25% by 2012. This would have a significant economic impact on the EU economy — an increase in the level of GDP of about 1.4%.

The Action Programme for Reducing Administrative Burdens in the European Union, presented by the European Commission in January 2007, focuses on information obligations in thirteen selected priority areas including company law, employment relations, taxation/VAT, statistics, agriculture, and transport. Its aims are to measure administrative burdens in these key sectors and identify information obligations that should be reduced.

In the Transport Area, Directive 2004/49/EC was selected for an in-depth study; the study was carried out 2007-2008 and is expected to deliver its final results in 2009. Preliminary findings seem to indicate that the production of the safety report causes the highest administrative costs to railway undertakings. However these costs cannot be considered an 'administrative burden' because such a reporting mechanism is necessary if the State is to fulfil its public responsibility in terms of railway transport safety, and

[4] See COM(2005) 535 and COM(2006) 690: Implementing the Community Lisbon programme: A strategy for the simplification of the regulatory environment.

also because Directive 2004/49/EC has actually harmonised the requirements imposed by Member States on Railway Undertakings so as to facilitate cross-border certification.

3.1. Completing the interoperability work (TSI revision, extension of the scope, etc.)

3.1.1. TSI revision

The Agency is currently finalising the development of the TSIs for Conventional Rail that were mandated with, as their geographical scope, the trans-European Network. This includes: infrastructure, energy, rolling stock (locomotives, EMUs/DMUs, passenger coaches), telematics applications for passengers. The adoption of those TSIs is expected by 2010.

The Agency is currently working on the revision of the following TSIs: freight wagons, operation and traffic management, control-command and signalling. The adoption of such revised TSIs is also planned for 2010. This does not preclude that the Commission modifies those TSIs in the case of urgent issues, as was the case for the TSI on wagons that was amended through Commission Decision 2009/107/EC[5].

For the other TSIs, a process of change management is in place, as explained in section 4.5.

3.1.2. Extension of the scope

The scope of the two Interoperability Directives (Directive 96/48/EC in the case of the High-Speed and Directive 2001/16/EC in the case of conventional rail) is limited to trans-European rail network as defined in Decision 1692/96/EC. Consequently, existing TSIs and TSIs under revision covered only the trans-European rail network.

Directive 2004/50/EC provided for the progressive extension of the scope of Directive 2001/16/EC when new TSIs are to be adopted or existing ones revised. In order to implement this provision in a proportional manner, in 2007 the Commission mandated ERA to analyse the feasibility of extension of geographical scope of new revised TSIs. The results of that analysis were delivered in April 2009 and will be subject to discussion in the Committee. The scope will be progressively extended to the whole network and all vehicles, provided that an agreement is reached and an impact assessment shows the economic benefit of doing so.

The new Interoperability Directive has confirmed the intention to progressively extend the scope of the future TSIs to the whole rail system, including track access to terminals and main port facilities serving or potentially serving more than one user. However, Member States will retain their right for derogations to the application of TSIs where specific conditions exist and sound justification is made.

3.2. Major barriers to interoperability and possible solutions

The barriers to interoperable railway system cut across different areas. Some might be found in existing legacies from the national approaches to railway development and the

[5] Commission Decision of 23 January 2009 amending Decisions 2006/861/EC and 2006/920/EC concerning technical specifications of interoperability relating to subsystems of the trans-European conventional rail system (OJ L45 of 14 February 2009).

substantial investments needed to achieve technical standardisation. Others are related to difficulties in setting up the legal and institutional framework.

For more than a century the development of the railways has been implemented nationally. The technical standards and operating rules in each railway were based on national requirements rather than on a common European approach. As a result international rail transport in Europe became complex and costly to operate. This segmentation is still a barrier to a Europe-wide rail area even though substantial financial, political and human resources have been invested in the integration of the railway systems.

Interoperability is a long-term objective, since its implementation entails high costs for the rail sector. The lifespan of rail assets is long, ranging from 30-40 years for rolling stock to a century for infrastructure. Therefore to ensure the feasibility of technical harmonisation, the migration to an interoperable rail system is based on the introduction of interoperability requirements for new, renewed and upgraded rail subsystems. This requires time and consequently progress is to be expected in the medium to long term.

Another barrier to interoperability is the continuation of national practices entailing diversities where European actions for harmonisation have already started. This may be caused either by an incomplete EU framework or by loopholes for differences in interpretation.

While the legal framework covering the HS rail system is already completed, the one for the CR rail system is still under development. The CR TSIs related to the infrastructure and energy subsystems as well as traction units and passenger carriages are not yet finalised and adopted. It would be difficult to discontinue or at least to limit diversification of national practices until the legal framework is complete.

The emergence of more different interface solutions might also be caused by the so-called ‘open points’. The open points come into being when agreement on a certain issue is not reached and it remains unregulated by the EU. A possible solution to the problem is the closing of open points when TSIs are being revised. However, what is important to consider is that not all requirements have to be fulfilled under all circumstances for obtaining interoperability. Economic considerations and regional specifics need to be taken into account. For example, in some cases of existing lines, interoperability between countries may be reached on a local and isolated scale.

Another potential barrier is related to the integration of a subsystem into the railway system at the time of the procedure of placing in service specified in the interoperability directive. Before a NSA gives an authorisation for placing in service, the subsystem must be shown to be compatible with the railway systems as a whole. The Directives 96/48/EC and 2001/16/EC mentioned this aspect but did not give details, although integration also implies integrating with other subsystems that are covered in the TSIs. In particular this is the case for the TSI and the subsystem operation. There is a risk that requirements that are not covered (sufficiently) in the TSIs are solved by operational procedures. This in turn can create unforeseen hazards, but also it can introduce further differences between operational procedures and thus reduce interoperability. This aspect of ‘integration’ has been improved in the new interoperability Directive and is also addressed in the Commission Regulation on CSM on risk analysis that is expected to be adopted in April 2009 and which should enter into force in July 2009.

3.3. Implementing cross-acceptance

Cross-Acceptance is the generic term for the application of the principle of mutual recognition of national rules, acceptance processes, and authorisations. Although they all fulfil the same essential requirements, different national rules currently prescribe different solutions. Because they all deliver the same essential requirements (except where compatibility with specific non standard infrastructure is required) it follows that the different national rules in respect of each requirement could all be recognised as equivalent and vehicles where not covered by TSI be required to comply only with any one of (instead of all of) the national rules related to a particular requirement.

In respect of open points in the TSIs, lack of mutual recognition of national rules creates a significant obstacle to interoperability, as has been revealed by the study on ERTMS certification.

In practice, mutual recognition is at the moment usually confined to bilateral or multilateral agreements. This is because as well as having different rules Member States currently have different checking and authorisation processes carried out by different bodies in each country. Furthermore the criteria for authorisation are often not written as national rules but are unwritten 'custom and practice', rely on individual inspectors' judgment, or are hidden in 'project safety cases' not accessible to all parties, and are therefore not very transparent or repeatable.

Solving this problem was the very objective of the Commission proposals of December 2006, which have resulted in the new Railway Interoperability Directive adopted on 17 June 2008, as well as the modifications to the Railway safety Directive and the Regulation establishing an Agency adopted on 23 December 2008.

It is now the challenge of the Agency with its partners to review the common list of the parameters to be checked when placing a vehicle in service, to develop a common approach to the processes used for publishing, checking and authorising against national rules and to establish equivalence between those rules so that all the opportunities for mutual recognition may be exploited.

3.4. Global approach to safety certification

The present situation, following Directive 2004/49/EC, requires mandatory certification of the safety management system (SMS) only for railway undertakings (RUs) and infrastructure managers (IMs). The safety certificates for RUs and safety authorisations for IMs are issued by the national safety authorities (NSAs). Content, requirements and basic elements of the SMS are given by Article 9 and Annex III of the Safety Directive. The criteria and procedures for carrying out the SMS assessment are currently developed by the Agency as the Common Safety Method (CSM) for conformity assessment, mandated by the Commission according to Article 6(3)(b) of the Safety Directive.

To obtain a certificate, RUs and IMs need to demonstrate that their SMS ensures the control over all risks associated with their activity, including the supply of maintenance and material and the use of contractors. For RUs in particular, this means, they have the final responsibility for their train when it starts operating. However, in a changing European railway market with more and new interfaces and shared risks, it also means that they have to ensure control over 'imported risks'.

To deal with this issue the Agency proposes a global, sector-wide approach to safety certification, making all players (RUs, IMs, wagon keepers, maintenance workshops, maintenance suppliers, manufacturers, etc.) follow a similar structure in their SMS. A support tool for this may be a European standard for SMS design and implementation, mirroring Article 9, Annex III and the CSM on conformity assessment. The standard should be built using modules to allow each party to extract the relevant parts for its contribution to operation. The application of such a sector-wide approach to safety certification, in connection with the standard and the possibility of third party assessment, would allow facilitation of mutual acceptance of Part A Certificates and permit NSAs with less capacity to get help by accredited bodies. It could also be used as a tool for handling shared risks and responsibilities between the operating players. It would also allow for different types of voluntary or mandatory certification, tailor-made for each party.

This idea of the SMS standard was discussed with the Member States and the Committee in 2008 but it was not possible to reach a majority on a mandate to be given to the European Standardisation Bodies. This approach is currently being revisited by the Agency.

As far as the entity in charge of maintenance is concerned, the question was raised at the time of the drafting of the TSI on Freight Wagons. This TSI should include, like all the TSIs, provisions to be observed for maintenance, and it was necessary to describe the requirements to be met by the entity in charge of maintenance (ECM). However the three associations representing the sector for freight wagons (CER/UIC, ERFA and UIP) were not satisfied by the TSI requirements and requested the certification of the keeper by an approved authority or body. This subject was discussed by the Council and the European Parliament during the amendment of then Railway Safety Directive and the resulting compromise was firstly an obligation, for all wagons, to designate an ECM, and secondly for each ECM, an obligation to be certified by an ad hoc body, which could either be an approved body recognised by a national safety authority, or the national safety authority itself.

All the details concerning the requirements to be respected must still be developed for an ECM to be certified, the criteria to be used by the certifying body to check respect of the requirements, the requirements covering certifying bodies, procedures, time limits for implementation, special cases, etc. For this purpose, the amendment of the Safety Directive provides that the European Railway Agency work out a recommendation and that the Commission adopt the necessary measures at the latest two years after it has come into force, thus by 2012.

Further to repeated requests by the industry and in order to accelerate the implementation of such a system on a voluntary basis, a draft MoU aiming at setting up a provisional voluntary system of certification of ECMs in the case of freight wagons was drafted in 2008 by the working group on ‘the role of the keeper’ composed of some Member State representatives as well as CER/ERFA/UIC/UIP representatives, chaired by DG TREN.

The Commission presented the draft MoU at the 50th meeting of the RISC Committee. As several Member States supported the principles set out in the MoU, a signature of the MoU is expected in the first half of 2009.

This issue will be closely followed by the Commission, which remains in contact with the stakeholders.

3.5. Managing the transition period

Railways within the EU are undergoing significant change. The regulation of national networks by a single national railway operator is no longer an appropriate model following a number of key European Directives. As far as the use and management of freight wagons is concerned, RIV was the industry's main agreement on rules for international and national traffic. RIV was widely applied within and outside the EU.

The European Directives on interoperability and safety are being implemented and the new COTIF protocol of 1999 has entered into force; this has resulted in replacement of the provisions of RIV by EU provisions, supplemented by the new GCU[6] agreement.

A number of questions have been discussed in workshops and meetings held in 2005 and 2006 regarding the practical application of these provisions during a transition period. The transition period will effectively last until all the TSIs are adopted, the infrastructure and rolling stock registers provided for in Article 24 of the interoperability directives are in place, National Safety Authorities are set up and able to authorise the placing in service of rolling stock, registration bodies are established to ensure vehicles are entered in the NVR register provided for in Article 14 of the interoperability directives, and Member States have fully transposed the Interoperability and Safety Directives.

It is clearly essential that each actor knows his/her responsibilities and which provisions he/she has to apply during this transition period.

The results of these workshops, organised and chaired by the Commission, to which representatives of some Member States, National Safety Authorities, OTIF SG and representatives organisations such as CER, ERFA, UIC and UIP actively contributed, are summarised in a 'transition guide from former RIV/UIC regime to new TSI/GCU regime'.

The transition guide identified some issues that required action:

– Existing wagons marked in accordance with RIV: this issue has been solved by Article 21(12) of Directive 2008/57/EC;

– Registration: to ensure from 1 May 2006 the registration of new, renewed or upgraded vehicles. This issue has been definitely solved with Commission Decision 2007/56/EC adopting a common specification of the National vehicle Register (NVR);

– The role of the keeper: this issue has been solved with the modification of the railway safety directive (see section 6.5);

– The TSI OPE: ERA has already issued a recommendation for the revision of Annex P in order to avoid any misuse or misunderstanding;

– Maintenance rules: ERA is evaluating the completeness of the maintenance requirements of the TSI WAG in the context of the revision process of TSI WAG;

– Inscriptions and signs: the Commission asked UIC/ERFA/UIP to assess the consistency between the GCU and the TSI WAG (including Annex B);

[6] The GCU can be found under: http://www.gcuoffice.org.

– Maintenance rules for existing wagons marked in accordance with RIV: they are in principle those provided for in the former regime (RIV and relevant part of UIC 433): this issue has been solved by the modification of the TSI WAG that was adopted by the Commission on 23 January 2009[7].

3.6. The 1520 gauge system

In its mandate C(2006)124 of 9 February 2006 the Commission asked the Agency to perform an analysis of the relationship between the 1435 mm and the 1520/1524 mm railway systems as far as technical and operational aspects are concerned, together with a strategic evaluation on the possibility of future convergence between the two systems (keeping apart the gauge differences).

In its recommendation of 31 August 2008, the Agency recommended that the different structural and operation subsystems and transversal aspects of the EU 1520/1524 mm gauge railway system be considered in the Technical Specifications of Interoperability in the following way:

a) The Infrastructure Subsystem of the EU 1520/1524 mm gauge lines should be included in a common TSI with the 1435 mm and other gauges.

b) The Energy Subsystem of the EU 1520/1524 mm gauge lines should be included in a common TSI with the 1435 mm and other gauges.

c) The Command Control and Signalling Subsystem of the EU 1520/1524 mm gauge lines should be kept in a common TSI with the 1435 mm and other gauges.

d) Freight wagons of the 1520 mm gauge, including those intended to be operated in the common freight wagons operation system with third countries, should be excluded from the scope of the TSIs.

   The Freight Wagon TSI should keep, among others, specific cases for:

   - Finnish 1524 mm gauge freight wagons
   - Double gauge 1520/1435 freight wagons.

e) Locomotives, traction units and passenger coaches of the EU 1520/1524 mm gauge should be included in a common TSI with the 1435 mm and other gauges. This TSI should include, among others, the following specific case:

   - Type ‘P’ specific case allowing application of national technical rules for the locomotives, traction units and passenger coaches intended to be occasionally operated in third countries.

f) Operation of the EU 1520/1524 mm gauge network should be kept in a common TSI with the 1435 mm and other gauges

g) TAF of the EU 1520/1524 mm gauge network should be kept in a common TSI with the 1435 mm and other gauges. Specific Cost/Benefit Analysis for 1520

[7] Commission Decision 2009/107/CE, OJUE L45 of 14.02.2009 p.1 .

has to be carried out. The results of this Cost/Benefit Analysis should be taken into consideration at the revision of this TSI.

The Telematic Applications for Freight Services TSI should include, among others, a type 'P' specific case for the traffic from/to third countries.

h) The Telematic Applications for Passenger Services TSI, which is being drafted by the Agency, should include the EU 1520/1524 network.

i) The Safety in Railway Tunnels related measures for the infrastructure, energy, command-control and signalling, rolling stock and traffic operation and management subsystems of the EU 1520/1524 mm gauge system should be kept in a common TSI with the 1435 mm and other gauges.

j) The Persons with Reduced Mobility related measures for the infrastructure and rolling stock of the EU 1520/1524 mm gauge system should be kept in a common TSI with the 1435 mm and other gauges.

k) The noise emission limits of the EU 1520/1524 mm gauge rolling stock should be treated in the TSI in a manner consistent with what is indicated in paragraphs d) and e), i.e.:

- Freight wagons of the 1520/1524 mm gauge, including those intended to be operated in the common freight wagons operation system with third countries, should be excluded from the scope of the TSIs. Finnish 1524 mm gauge freight wagons and double gauge 1520/1435 freight wagons should be included in the TSI.

- Locomotives, traction units and passenger coaches of the EU 1520/1524 mm gauge should be included in a common TSI with the 1435 mm and other gauges. The TSI should include a type 'P' specific case allowing application of national technical rules for the locomotives, traction units and passenger coaches intended to be occasionally operated in third countries.

In drafting and revision of these TSI, special account should be taken regarding the preservation and improvement of the existing interoperability of the EU 1520/1524 mm gauge rail system with third countries. To this end, the Agency will continue its collaboration on technical and operational aspects with railway institutions and organisations from third countries.

3.7. Interoperability with third countries in the context of OTIF and OSJD, including cross-border issues

Rail traffic does not stop at the border of the Community. Although from a legal point of view the situation is quite clear in terms of which Community rules apply to railway undertakings, staff, vehicles and products inside the Community, we need to recognise that a number international agreements exist between one or more Member States and one or more third countries. These agreements have a different status (with or without legal effect) and are signed at different levels, be it at Infrastructure Manager level, Railway Undertakings level, National Safety authority level or State level. These agreements are not static: similarly to the Community *acquis*, they have developed progressively.

The Commission intends to produce in 2009 a Report on the status of development of the external relations of the Community in the railway domain.

Three groups of non-EU countries should be considered:

– those implementing Community legislation fully, or intending to do so (candidate countries, EEA countries, Switzerland, parties to the future Balkans Treaty, etc.)

– those which are part of COTIF 99, which a number of EU Member States also apply;

– those which are part of OSJD, which a number of EU Member States also apply.

If the first group does not bring particular issues, the relations with the second and third groups are more problematic because of inconsistencies on specific technical matters between the international agreements and the Community legislation.

COTIF 1999 introduces uniform laws on various aspects of international rail operations for passengers and freight, e.g. uniform contractual terms and conditions on compensation for delays and damages for death or personal injury relating to passenger travel on international routes. It also covers technical admission of vehicles and rules on dangerous goods contracts for the use of infrastructure for international traffic. The fact that Member States have ratified COTIF 99 places them in an uncomfortable situation because they are bound by both legal regimes, and, at the same time, the current 'disconnection clause' of COTIF 99 is not considered as safeguarding legal certainty. The other problem is that Member States are not competent to take positions in an international agreement when the subject is covered by Community exclusive competence.

In the case of OTIF, both problems can be solved by an accession of EU to COTIF 99, and the Commission is in the process of negotiating that accession, for which a mandate from the European Council was given in 2003.

Pending the accession of EU to COTIF 99:

– Member States have been instructed to make reservations against three COTIF appendices: CUI, APTU & ATMF;

– The Commission is supporting the process of revision of the relevant Appendices;

– The Commission is coordinating the positions of the Member States in the implementation work related to the technical appendices. This includes the development of COTIF technical specifications on the basis of the TSIs, as well as, for example, the adoption of vehicle registers which are fully compatible with Commission Decision 2007/756/EC on national vehicle registers.

The situation with OSJD has some similarities.

The Commission carried out two studies: one on international agreements in 2006, one more specific on OSJD in 2007. Both studies confirmed that some OSJD rules governing specific subjects were not entirely consistent with some provisions of Community legislation.

In addition, the current ongoing revision of the OSJD statute into an international organisation with legal personality has prompted the Commission to request, at the end of 2008, that the nine EU Member States which are also part of OSJD refrain from

entering into any proposed negotiations, because Member States no longer have competence on these issues.

Further, the Member States concerned have been asked to provide the Commission with all relevant information regarding the proposed negotiations, in order to enable the Commission to assess whether it would be appropriate for the Community to enter into these negotiations itself.

3.8. Urban transport and the scope of interoperability and safety directives

An issue that appeared recently relates to the scope of Directive 2008/57/EC as far as lines and vehicles used for local, urban or suburban services are concerned. Some provisions of the Directive allow the Member States to exclude parts of the infrastructure and part of the vehicles from the scope of the Directive when some conditions are met, such as, for example, to be a 'metro', a 'tram' or a 'light rail system'. This means that this infrastructure and these vehicles are presumed to be part of the original scope of the Directive. On the other hand the TSIs that were adopted under Directives 96/48/EC and 2001/16/EC were developed with the assumption that such lines and vehicles used for local, urban or suburban services were not part of the scope. Furthermore the new directive asks for an extension of the scope of the TSIs which is currently being studied by ERA and the question of the extension of the scope to this sort of lines and vehicles is again at stake.

If it is confirmed that such lines and vehicles used for local, urban or suburban services are within the scope of the Directive, depending on its transposition at national level, there will be a need to evaluate the economic impact of imposing TSIs on such lines and vehicles. Such impact may be negative for the objective of facilitating the free movement of trains across the network, but may be positive from the angle of the authorisation process or cross-acceptance process of railway products between Member States. Thus it must be investigated if it is possible to develop TSIs that would only retain a positive impact for the industry.

These issues are currently being considered by the Commission, in consultation with relevant stakeholders (mainly UITP and UNIFE) and the following way forward is being explored:

– Member States could exclude urban rail from the scope of their national law when implementing the Interoperability Directive. At the same time Member States could clearly define to which category of infrastructure a given line belongs on a section per section basis; this would clearly define the borderline for the application of the Interoperability Directive;

– the Commission could issue a mandate to CEN, CENELEC and ETSI for the development of harmonised standards for use in the field of urban rail. Compliance with such standards would give presumption of conformity with the essential requirements. However, the essential requirements of Directive 2008/57/EC are not applicable as such to urban rail and alternative solutions are being discussed, such as, for example, issuing firstly a programming mandate without referring to essential requirements.

4. RESULTS OF THE PUBLIC CONSULTATION

Measuring progress

The progress of interoperability can be assessed by examining various aspects, of which the following are perhaps the most relevant:

– the number of interoperability constituents and subsystems certified under TSI provisions;

– the number of locomotives, wagons and coaches that can cross borders without technical and operational difficulties.

The second element includes 'practical' interoperability such as that in place for Thalys services. As the market is more and more consolidated at European level, operators tend to improve the interoperability of their rolling stock, especially for freight and high-speed services.

If we consider the first element, we can see that apart from ERTMS, few rolling stock and operations have been made interoperable in the sense that they fully meet TSI provisions and have received a certificate. For conventional rail, this is due to the fact that important TSIs are very new and/or not available yet. For high-speed rail, it seems that difficulties come from the structure and/or content of TSIs.

As for ERTMS, its deployment is progressing and section 4.3 has shown that the stabilisation of the CCS TSI and the development of corridor strategies should speed up the implementation of this technical specification.

As far as safety is concerned, progress of implementation of the Directive is not directly linked to the quantity of changes in the field because the very objective of the Directive is to make sure that safety is not negatively affected by market opening. This entails developing a set of common tools, such as CSIs, CSMs and CSTs. It is thus the pace of development of these tools, their effectiveness and the safety performance measured in the field, taken together, that will help us in understanding the impact of this legislation.

However, as an important part of the assessment is based on multiple factors and somehow subjective, the Commission decided to organise a public consultation on the indicators to be used, on the progress really registered and on future challenges.

This chapter on conclusions and recommendations is draws heavily on the results of the public consultation.

4.1. Interoperability

4.1.1. Objectives of the legislation

In terms of creating a single European rail area, two main industry organisations both agreed that the basic rules should be defined clearly and all in one place. The scope and detail of some of the TSIs had gone far beyond what was strictly necessary. Therefore interoperability should offer a simple yet consistent and clear approach. This should be the collective Member State aim of the revised Interoperability Directive, because current feeling is that the meaning of interoperability was not understood properly.

As for objectives being fulfilled, some comments were indicated that they might make it easier to develop international rail services.

It was repeated that each and every Member State should be subject to the same processes and deadlines. Definitions do need improving: for example the meaning of 'interoperability constituent'. It was suggested that one way to improve this is by using application guidelines (informal non-binding advice) to clarify areas of misunderstanding.

On essential requirements, 68.6% agreed or partly agreed that the requirements met objectives. Again there were similar comments about the need that they be appropriately focussed, as this is not always the case. On voluntary European Standards, it was noted that some were developed before the related TSI and therefore did not always coincide. 65.7% agreed or partly agreed with the publication of voluntary European Standards. A problem identified in the authorisation of vehicles was its complexity: the need to use conformity assessment of subsystems and certified interoperability constituents.

The mixed use of certified and uncertified 'interoperability constituents' necessarily meant duplication of stock-keeping work.

4.1.2. Indicators

On general indicators (measuring the progress of developing a safe and interoperable rail system) comments indicated that the manner in which implementation took place had an effect on interoperability, since it is only the largest interoperability projects that are known and can be used as models of implementation. The consequence is that networks retain their national characteristics. However, 92.3% agreed or partly agreed that national implementation of EU legislation was a good measure of progress.

The interoperability indicators were too simplistic and needed to be more sophisticated, to take account of the differing life-spans of infrastructure etc. It may therefore be better to measure specific parts of TSIs rather than the whole TSI. This would then at least recognise partial compliance and provide a picture of progress toward full compliance.

4.1.3. Implementation the Directive and role of the competent bodies

In relation to whether there has been adequate implementation of the directives across Member States, some comments indicated a feeling that although implementation had been correct there was still a question over national approaches, which is evident in the working parties of ERA, where national structures have developed differently. The resulting processes are therefore different too.

Another respondent agreed with the view that implementation was patchy but considered that the corridor approach would be a good way to drive forward harmonisation. 72.9% agreed or partly agreed that EU legislation on safety and interoperability had been adequately implemented in the respondents' countries, as compared to 75.7% across EU Member States

On surveillance by authorities, there were some comments suggesting that Member States adopted an inconsistent approach to legislation, but 34.3% actually gave no opinion on this issue. Although safety appeared to be well covered interoperability legislation was poorly monitored through lack of administrative capacity. The continued process of homologation (type approval) will necessitate more technically trained staff. A current consequence of this, as noted, is that there is a question over the amount of

authority still in the hands of the Infrastructure Managers, as the National Safety Authorities (NSA) build up their expertise. Almost as many respondents gave no opinion (34.3%) as agreed or partly agreed (38.6%) that the authorities had sufficient mandate and enough administrative capacity to fulfil the aims of the directive.

There were comments on the role of the notified bodies (NOBOs), specifically that the split in tasks between them and the NSA was supported.

4.1.4. Impact on infrastructures and vehicles

Regarding the degree of interoperability of infrastructure in individual Member States, some commented that there was always a degree of interoperability since the trains moved across networks freely, without necessarily being TSI compliant. 38.6% of the respondents agreed or partly agreed that their country's infrastructure had a sufficient degree of interoperability (30% gave no opinion.)

There was a question raised by a number of respondents on the value of conformity assessment and verification of subsystems in relation to locomotives that had such long (50-100 years) lifespans. It was suggested that a simpler verification system be created. Lack of transparency and poor data hampered the take-up of TSI-compliant systems, as did adherence to legacy systems. Fuller interoperability will be made piecemeal and cause high financial expenditure in the medium and long terms. Another respondent seemed to support this view, suggesting that cost effectiveness should be a key consideration as the real benefits of interoperability would not be realised for 50-100 years.

One respondent highlighted that there was simply not enough capacity to make interoperability meaningful, in part caused by lack of investment. Therefore bottlenecks should be targeted.

ERTMS implementation is an example of the difficulty of implementing interoperability because the specifications were continually changing and there was a lack of interface development, leading suppliers to offer different solutions which were not always compatible. Another respondent said that national divergences lead to differing solutions.

There were some detailed comments on how interoperable vehicles were, in Member States specifically and in Europe generally. 42.9% of respondents agreed or partly disagreed that vehicles had a sufficient degree of interoperability in their own country (24.3% disagreeing), which was comparable to 47.2% of respondents agreeing or partly agreeing the same about vehicles across the EU. In that case 28.6% fully or partly disagreed.

Some respondents said that because the conventional rail TSI had not yet been adopted, not even new rail vehicles would be interoperable. Only the vehicles intended for international use were interoperable but were very expensive. There were some comments about the need for more readiness to accept the integrity of vehicles between Member States. Rather than vehicles being re-examined, compatibility should be more strictly assured.

A number of respondents made the comment that the TSI on freight wagons did not necessarily increase the amount of interoperability. The previous regime (RIV) had ensured a better level of interoperability[8].

Another respondent confirmed the high cost of interoperable rolling stock and said that approval processes for them were very time-consuming.

Interoperability of vehicles across Europe was stated to be severely restricted and hindered by individual Member State differences. More sensible requirements should be drawn up for vehicles in national categories and these did not have to be as stringent as requirements for international vehicles.

On ERTMS issues, there was some consensus that national rollout was being done at the appropriate speed, since it was being done under financial constraints. The key was to ensure the maintenance of services while modifications were being made. The nature of development lead naturally to caution before investment. (38.6% agreeing or partly agreeing that the speed was appropriate, but a sizeable 31.4% giving no opinion.)

In relation to ERTMS implementation across Member States, there was agreement between respondents that the speed of deployment was too slow, and that this depended on a number of factors including financial capacity, incumbent asset age and government priorities. One respondent noted that each Member State had differing priorities and that this could lead to uncoordinated implementation. It was thought that delayed implementation may take place so as to avoid intervening updates.

Another respondent said that there was need for a defined action plan with binding objectives and a fixed deployment end date. Additionally, ERTMS deployment should be concentrated along corridors, which would be the best way to ensure cross-modal competition. In relation to ERTMS implementation across the EU, 40% gave no opinion, none of the respondents agreed and only 24% partly agreed.

Regarding harmonised power supplies, around a third of the comments received agreed that there should be no move toward harmonised power. Some commentators said if this were to be introduced it would need a cost benefit analysis. Recent analysis has shown that the benefits are not currently justified. However, as one respondent said, such a system has advantages but for practical reasons any move toward it should be on a piecemeal basis along priority routes.

4.1.5. Compliance with legislation

Just a little over half of the respondents (55.7%) agreed or partly agreed that infrastructure managers in their own countries complied with European legislation (31.4% had no opinion), whereas slightly fewer respondents (45.7%) agreed or partly agreed that IMs across the European Community complied with the legislation. On this question 50% of the respondents had no opinion. It was also commented that there was compliance but that it was not always very clear or obvious.

On the issue of railway undertakings complying with EU legislation nationally, only 27.2% agreed or partly agreed, whereas 34.3% agreed or fully agreed that RUs across Europe complied.

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[8] This problem has been solved with the adoption of the Commission Decision amending the relevant TSIs on 23 January 2009. .

On Notified Bodies and whether they were carrying out their duties in compliance with EU legislation in the respondent's country, 41.5% of the respondents agreed or partly agreed. One respondent also commented that there was a feeling that notified bodies were operating too strictly and beyond their remit, as defined.

There was high 'no opinion' on the sufficiency of the number of Notified Bodies in respondents' individual countries (42.9%) and across the European Union (57.1%). These figures were complemented by additional comments by some respondents saying that it was not necessarily the number of Notified Bodies that was important, but how they operated, and whether there was competition between them if more than one existed.

As to the price paid for services provided by the Notified Bodies, only 10% of respondents said the price was correct, with 74.3% expressing no opinion.

4.1.6. TSI architecture

Actual (technical) interoperability may be better than on paper. Vagueness and inaccessibility of requirements, especially on such issues as maintenance and testing, are obstacles of a bureaucratic rather than a technical nature. Implementation of the rolling stock cross-acceptance provisions now being put into legislation, together with adaptations to operational procedures, will help interoperability to advance even without TSIs.

The challenge of specifying the interfaces between train sets, locomotives and the infrastructure (apart from control command and signalling) is now in the hands of ERA, developing the TSIs. ERA could tackle all interface issues in a pro-active and comprehensive manner, which is not an easy task.

A TSI that might be helpful in tackling interface issues in a pro-active and comprehensive manner should:

– define a limited number of base types for infrastructure;

– define a limited number of base types for rolling stock;

– choose a limited number of logical infrastructure / train combinations.

These would be inspired largely by those types of infrastructure and rolling stock already in existence, combined with insight into new developments.

For each of these combinations the requirements for infrastructure, rolling stock and operations (including train composition) have to be defined such that the proper (i.e. effective, safe, healthy and environmentally correct) functioning of the combination is ensured. Ideally, one should be able to use these requirements separately to develop infrastructure and rolling stock projects and then have a guarantee of fit. The key is that when rolling stock meets the requirements belonging to a given combination of type X rolling stock and type Y infrastructure, and infrastructure meets the requirements belonging to that same combination, than the proper functioning of that rolling stock on that infrastructure under operational procedures defined for that same combination is guaranteed beforehand and accepted.

Although it is acknowledged that the real world cannot be squeezed entirely into this theoretical model, it can be helpful in structuring the problem and solutions. In terms of requirements it would mean that for each base type of infrastructure, there are general

requirements and additional (hopefully limited) requirements for that infrastructure to work together with a particular type of rolling stock, and conversely.

Next to serving as a structure to help define the future desired state, the structure might prove useful in defining the status quo and implementation paths. Such a system would make the basic choices 'for which trains will my infrastructure be OK to travel on?' and 'on which infrastructures will my rolling stock be able to travel?' transparent and manageable in terms of which requirements to meet. Of course such a system cannot be developed easily to cover all possible situations. It would have to start from a solid scope as a basis and then grow, responding to practical needs.

In relation to the TSI architecture and views on the current allocation of TSIs to different parts of the railway system, 37.1 % of the respondents to the public consultation thought that another structure should be used. A supporting comment indicates that while the current allocation was not ideal, changing it might be counterproductive, but some improvements could possibly be made by ERA imposing more consistency.

4.1.7. Scope and content of TSIs

As to content of TSIs, some of the respondents (31.4 %) thought it inappropriate and in need of change. A number of respondents commented on content. All called for change, aiming at clarity, appropriate detail (not too much not too little), not necessarily in the TSI, and that the suite of TSIs should be completed as quickly as possible so as to achieve their objectives as quickly as possible.

4.1.8. Implementation strategy: national and European implementation plans versus corridors

The idea that on a Europe-wide scale the benefits are expected to outweigh the costs (why else would we do it?) should be connected to short-term choices to be made on a national and regional scale. For the migration strategy, the corridor approach now used for ERTMS could be extended to the other subsystems, as exemplified by some corridor cooperations taking place already. To get things going and create a critical mass, one cannot cope without financial instruments to compensate those that run the risk of paying more than their fair share, using profits generated elsewhere.

As to the results of the public consultation, there was quite an even distribution of opinions. 38.6 % thought that other approaches should be implemented. However, 28.6 % thought the current approach was correct and 27.1 % thought that the corridor approach was the most appropriate. As one respondent said, the approach perhaps needed to reflect the circumstances. In some cases (for example for ERTMS) a corridor approach would seem best, but in others the decision should be based on the business case.

4.2. Safety

4.2.1. Achieving Safety Objectives, Common Safety Targets, Common Safety Methods

Of those that responded on this issue, there seemed to be some consensus that safety objectives could be achieved through coordinated action. Although it is important to note that this could result in an increased administrative burden.

Also there was some doubt as to whether a single level of safety could be achieved, given the many differences within the rail sector. There was some consensus that this should be left to the individual companies to achieve.

Clearer guidance on how the objectives could be achieved would be beneficial. A slight concern about inadequate statistical information on safety indicators and targets was noted, as was incomplete incident reporting.

Common Safety Methods should not be seen as the universal cure to safety issues; their scope is not exactly aligned with TSI requirements, but they should be higher-level aspirational and not prescriptive aims.

On Common Safety Targets, comment was received indicating that they were not yet appropriate and to a large extent safety levels were determined by legacy systems in place. Increased safety will be achieved with the gradual introduction of new assets and subsystems.

4.2.2. Safety Performance Reporting System and Safety Reports

There was some opposition to Common Safety Indicators. One consultee said that using indicators may not be a reliable means by which to assess and make comparisons of safety, given the wide divergence of implementation across the Member States.

Another consultee seemed to share this view, stating that the safety and investigation reports were generally poor in data utilisation and that these reports lacked homogeneity.

4.2.3. Role of NSAs

Comments from some of the respondents indicated that in some cases NSAs were not mature enough, or were too concentrated in safety rather than interoperability. In some cases NSAs were not appropriately empowered, some having too much and others too little.

There was some comment that the work by NSAs could bring considerable benefits, specifically closer working between Member State and NSA, and exchange of experience and best practice. Another respondent advocated the same information exchange and suggested that the ERA could facilitate this.

There was some contention that there was a lack of separation between infrastructure managers and NSA.

In response to whether NSAs were appropriately empowered there were mixed views; one respondent considered it too soon to judge in their own country, and another thought that NSA powers were variable, some having too much others too little. However, 37.1% had no opinion of this of their own national NSA while 64.3% had no opinion of other NSAs.

Another commented that there was too little homogeneity across Europe.

4.3. Role of the Agency

4.3.1. Focus and role of ERA and its work programme

There were a number of comments on the priorities and work programme of the ERA. While some supported the role of the ERA in rationalising a body of complex rail

legislation, the general impression was that there needed to be more prioritisation of its work into what is important and what is urgent.

This would then help the ERA to meet its set objectives, introduce more consistency and be more responsive to the Sector. Proposed changes should be continually appraised because bad changes risk alienating the sector to the benefits of harmonisation.

One respondent suggested that within the ERA there should be a body to review final documents.

4.3.2. Extension and responsiveness of role

Although the ERA was thought to be necessary for the effective development of the European rail area, it was also thought to have added to the general level of bureaucracy in the system. There was also a general view that the role of the ERA should be extended or augmented to include moderating or policing functions. It should be more responsive to the sector, in terms of the sector being able to support and provide it with information.

There were mixed views about the relationship between the ERA and the sector. There was a suggestion that there should be more end-user representation in its panel of stakeholders. Others thought that its work was far too dominated by technical experts. Again on ERA's relationship with the sector, one respondent thought that increased dialogue with the sector would benefit the competitiveness of rail with road, while another questioned whether the balance between ERA and industry was correct.

4.4. Responding to business and societal needs (ERA)

In relation to rail safety and interoperability responding to business or societal needs, just about a third of the respondents (32.9%) said there was not enough orientation towards society. However 24.3% thought there was not enough economic orientation

There were some comment on the need for greater orientation of policies to economic needs. The benefits of legislation should be proved by in-depth cost benefit analyses over both short and long term. Any negative analysis should mean legislation should not proceed. This was seen as a means of improving competitiveness in rail and with other transport modes.

4.5. Culture, knowledge transfer and feedback

The railway culture in Europe, although changing, is still not very much interoperability oriented. The word 'interoperability' is now being heard, but the meaning is still not very much in line with the eventual goals of an open railway market. This cultural change needs to be further stimulated.

A better understanding of EU rail policy objectives and instruments in the railway community at large (i.e. outside the limited circle of those directly involved) is a key success factor. The complexity of the legislation and the associated TSIs and their application is such that only experts are capable of applying these rules properly and even then it is not always guaranteed. The only way to become familiar with interoperability is to apply the rules. However, the process of familiarisation could be supported pro-actively by organising the necessary transfer of knowledge in seminars, training etc.

Feedback on working with specifications and assessment procedures is vital, which is one of the reasons why not only making things interoperable, but also assessment and certification, should become normal practice. In the end, all efforts to reach interoperability and create interoperable constituents and subsystems and integrate them into the railway system are in vain if the concrete results of these efforts, the interoperable constituents and subsystems, are not recognised and accepted.

5. CONCLUDING REMARKS

This report aimed to assess the impact, in the field and on safety, of the EU legislation on interoperability of the Community rail system.

From a strictly legal point of view the legislation has been implemented in all Member States, except in one case where infringement proceedings are still open.

From a technical point of view one needs to distinguish between the two strands of activity:

– in the interoperability field, no doubt the setting up of ERA has accelerated the development of TSIs and other tools. However there are fears that the progress of implementing interoperable solutions is too slow and that economic benefits do not always accrue at the right time or to the right parties;

– in the safety field, Member States have done their job in implementing NSAs and NIBs, and ERA has developed a set of common tools in a few years. It is however too early to judge the effectiveness of these new structures and tools. An important benefit of this legislation has been increasing exchange of experiences and best practices between experts from all Member States through the numerous working parties set up and managed by ERA.

The difference between the two strands is that whilst in the safety field there is a clear vision on how to reach the objectives of the Directive, the development of interoperability has revealed a number of problems that were hidden and that are probably the reasons for poor performance from a technical point of view. The problems range from methodological issues such as migration strategy, links between legislation and standards, simplification of TSIs and architecture of TSIs, to more concrete technical or economic problems such as closing open points, extending the scope of TSIs, interfaces with urban transport, interfaces with the 1520 gauge of the Baltic States, and managing the transition period.

This report gives the Commission the opportunity to highlight those issues. The Commission intends in the near future to prepare a Communication reviewing its policies on the interoperability and safety of the Community railway system.

ANNEX 1

LIST OF TSIs

High-speed rail system (HS)				
Scope/Subsystem	**TSI**	**Document No**	**Publication OJ**	**Applicable since**
infrastructure	INF	Commission Decision 2002/732/EC	L 245/143 (2002)	1/12/2002
	INF Revision	Commission Decision 2008/217/EC	L 77/1 (2008)	1/07/2008
energy	ENE	Commission Decision 2002/733/EC	L 245/280 (2002)	1/12/2002
	ENE Revision	Commission Decision 2008/284/EC	L 104/1 (2008)	1/10/2008
control-command and signalling	CCS	Commission Decision 2002/731/EC	L 245/37 (2002)	1/12/2002
	CCS Corrig		L275/3 (2002)	1/12/2002
	CCS Revision	Commission Decision 2004/447/EC	L 155/67 (2004)	31.04.2004
	CCS Revision	Commission Decision 2006/860/EC	L 342/1 (2006)	7/11/2006
	CCS Revision	Commission Decision 2007/153/EC	L 67/13 (2007)	6/03/2007
	CCS Revision	Commission Decision 2008/386/EC	L 136/11 (2008)	1/06/2008
rolling stock	RST	Commission Decision 2002/735/EC	L 245/402 (2002)	1/12/2002
	RST Revision	Commission Decision 2008/232/EC	L 84/132 (2008)	1/09/2008
	RST Corrig	/	L 104/80 (2008)	1/09/2008
operation	OPE	Commission Decision 2002/734/EC	L 245/370 (2002)	1/12/2002
	OPE Revision	Commission Decision 2008/231/EC	L 84/1 (2008)	1/09/2008
maintenance	MAI	Commission Decision 2002/730/EC	L245/1 (2002)	1/12/2002
	MAI Corrig		L 275/5 (2002)	1/12/2002
Conventional rail system (CR)				
Scope/subsystem	**TSI**	**Document No**	**Publication OJ**	**Applicable since**
control-command and signalling	CCS	Commission Decision 2006/679/EC	L 284/1 (2006)	28/09/2006
	CCS Revision	Commission Decision 2006/860/EC	L 342/1 (2006)	7/11/2006
	CCS Revision	Commission Decision 2007/153/EC	L 67/13 (2007)	6/03/2007
	CCS Revision	Commission Decision 2008/386/EC	L136/11 (2008)	1/06/2008

rolling stock – noise	NOI	Commission Decision 2006/66/EC	L 37/1 (2006)	23/06/2006
rolling stock – freight wagons	WAG	Commission Decision 2006/861/EC	L 344/1 (2006)	31/01/2007
	WAG Revision	Commission Decision 2009/107/EC	L 45/1 (2006)	1/07/2009
traffic operation and management	OPE	Commission Decision 2006/920/EC	L 359/1 (2006)	11/02/2007
	OPE Revision	Commission Decision 2008/231/EC	L 84/1 (2008)	1/09/2008
	OPE Revision	Commission Decision 2009/107/EC	L 45/1 (2006)	1/07/2009
telematic applic for freight	TAF	Commission Regulation 62/2006/EC	L 13/1 (2006)	19/01/2006
High-speed rail system (HS) and conventional rail system (CR)				
Scope	**TSI**	**Document No**	**Publication in OJ**	**Applicable since**
safety in railway tunnels	SRT	Commission Decision 2008/163/EC	L 64/1 (2008)	1/07/2008
persons with reduced mobility	PRM	Commission Decision 2008/164/EC	L 64/72 (2008)	1/07/2008

ANNEX 2

LIST OF ERTMS PROJECTS

(Not necessarily exhaustive)

line	country	status	km	put into service
Wien–Nickelsdorf	Austria	In service	67	2006
Wien–Linz	Austria	Under construction	190	2009
Attnang P.–Salzburg	Austria	Under construction	71	2009
Wels–Passau	Austria	Under construction	83	2009
Sofia–Burgas	Bulgaria	In service	250	2001
Paris–Meuse–Lorraine (LGV Est)	France	Testing	300	2009
Luxembourg Border–Baudrecourt	France	Under construction	80	2009
Spanish Border (Figueras)–Perpignan	France	Testing	25	2009
Juteborg–Halle/Leipzig	Germany	In service	40	2005
Berlin–Juteborg	Germany	In service	124	2006
Belgium Border (L3)–Aachen	Germany	Under construction	15	2009
Corinth–CCA (Communication Center in Acharnes)	Greece	In service	110	2006
CCA– Athens Airport	Greece	In service	40	2006
Bajánsenye(border)–Boba	Hungary	In service	102	2001
Hegyeshalom(border)–Hegyeshalom-Komárom-Budapest	Hungary	In service	178	2001
Torino–Novara	Italy	In service	91	2006
Austrian Border (Brenner)–Bolzano–Trento–Verona–Bologna	Italy	Under construction	236	2009
Bologna–Firenze	Italy	Under construction	78	2009
Roma–Napoli	Italy	In service	204	2005

Milano–Bologna	Italy	In service	219	2008
Novara–Milano	Italy	Under construction	34	2009
Luxembourg network (partially)	Luxembourg	In service	100	2007
Bucarest–Campina	Romania	In service	50	2002
Bratislava–Leopoldov	Slovakia	Under construction	64	2009
Leopoldov–Puchov	Slovakia	Under construction	94	2009
Madrid–Lerida	Spain	In service (L1) / Testing (L2)	460	2005 (L1)
Lerida–Tarragona	Spain	In service (L1) / Testing (L2)	98	2006 (L1)
Tarragona–Barcelona	Spain	In service (L1) / Testing (L2)	60	2008 (L1)
Figueres–French Border (Perpignan)	Spain	Testing	20	2009
Madrid–Segovia	Spain	In service (L1) / Testing (L2)	90	2007 (L1)
Segovia–Valladolid	Spain	In service (L1) / Testing (L2)	110	2007 (L1)
La Sagra–Toledo	Spain	In service (L1) / Testing (L2)	21	2005 (L1)
Cordoba–Antequera	Spain	In Service (L1) / Testing (L2)	100	2007 (L1)
Antequera–Malaga	Spain	In service (L1) / Testing (L2)	55	2008 (L1)
Zargoza–Huesca	Spain	In service (L1)	80	2006
Umea–Nyland	Sweden	Under construction	190	2009
Mattstetten–Rothrist	Switzerland	In service	45	2006
Lötschberg Base Tunnel (Frutigen–Raaron)	Switzerland	In service	35	2007
Luzern–Lenzburg (Seetal Line)	Switzerland	In service	30	2007
Betuwe line (Totterdam–German Border)	The Netherlands	In service	160	2007

HSL South	The Netherlands		93	2008
Amsterdam–Utrecht	The Netherlands	Testing	30	2009
Cambrian Line	United Kingdom	Under construction	218	2009

ANNEX 3

DEROGATIONS

Directive 96/48/EC

MS	Details of Communication	Basis of derogation	TSI and Scope
DE	Letter of notification from German Permanent Representation of 16.07.2007	Article 7(a)	WAG TSI TGV POS (BR 475) trains ICE 3 MF (BR 406F) trains
FR	Letter from French Ministry dated 09.04.2008 (A/501461)	Article 7(a)	TSI RST 24 train sets TGV DAYSE
FR	Letter from French Ministry dated 08.06.2007	Article 7(a)	HS TSI RST TGV POS ICE 3
FR	Letter from French Ministry dated 05.06.2007 (A/34313)	Article 7(a)	HS TSI INS, ENE, CCS LGVEE (Ligne grande vitesse Est Européenne)
UK	Letter of notification from Permanent Representation 04.07.2007	Article 7(a)	Maintenance TSI CTRL-DS class 395 trains Hitachi
UK	Letter of notification from Department of Transport of 12.07.2008 A/512095	Article 7(e)	TSI RST Replacement of damaged Pendolino Trainsets

Directive 2001/16/EC

MS	Details of Communication	Basis of derogation	TSI and Scope
DE	E-mail from German Ministry of Transport of 19.06.2008 A/507168	Article 7(a)	CR TSI WAG
DE	Letter from German PR of 21.05.2008 ref. VBS 452.01/3 (A/504634) (initial E-mail EBA dated 09.05.2008)	Article 7(a)	CR TSI WAG
DE	Letter from German PR of 25.03.2008 ref. VBS 452.01/3 (A/500196) (initial E-mail EBA dated 27.02.2008 and 11.03.2008)	Article 7(a)	CR TSI Noise CR TSI WAG
DK	Letter from National Rail Authority dated 29.01.2008	Article 7(d)	CR TSI CCS
FR	Letter from French Ministry dated 26.03.2008 (A/500469)	Article 7(d)	CR TSI Noise 15 wagons benzène ERMEWA
FR	Letter from French Ministry dated 14.01.2008	Article 7(d)	CR TSI Noise 10 wagons ERMEWA
FR	Letter from French Ministry of 18.12.2007	Article 7(d)	CR TSI Noise 9 wagons ERMEWA
FR	Letter from French Ministry dated 27.09.2007	Article 7(a)	CR TSI Noise 13 voitures pilotes de réversibilité aptes à 200 km/h 61 voitures pilotes de réversibilité aptes à 160 km/h
FR	Letter from French Ministry dated 19.07.2007 (A/)39157	Article 7(a)	CR TSI Noise 10 hydraulic diesel locomotives type G2000-3
FR	Letter from French Ministry dated 18.07.2007 (A/39154)	Article 7(a)	CR TSI Noise 160 diesel locomotives type BB 460 000
FR	Letter from French Ministry dated 07.06.2007	Article 7(a)	CR TSI Noise CR TSI WAG Arbel Fauvet Rail (AFR)
FR	Letter dated 26.04.2007	Article 7	CR TSI WAG (whole) and CR TSI Noise (whole) 45 Modalohr NA wagons
IRL	Letter of 30 January 2008	Article 7(a)	CR TSI Noise

MS	Details of Communication	Basis of derogation	TSI and Scope
	(A/83068)		
LV	Letter from Latvian Permanent Representation dated 03.08.2007	Article 7	CR TSI CCS Projet 'Modernisation du système de gestion de circulation des trains (couloir ferroviaire Est-Ouest de Lettonie) — 2ème phase'
UK	Letter dated 27.10.2008 from UK Permanent Representation	Article 9(a)	TSI SRT Transport of London: fleet of 54 Class 378 Electric Multiple Units (EMUs)
UK	Letter dated 29.09.2008 from UK Permanent Representation	Article 7(a)	TSI SRT Thameslink project: two fleets of Class 377/5 Electrostar EMUs
UK	Letter dated 19.09.2008 from UK Permanent Representation	Article 7(a)	TSI SRT London&Birmingham Railway ; fleet of 37 four-car class 350/2 Desiro EMUs
UK	Letter dated 23.05.2007	Article 7(a)	CR TSI WAG (Section 4) 105 Bogie Box wagons
UK	Letter dated 19.03.2007	Article 7(a)	CR TSI WAG (Section 4) Barber Easy Ride Bogie Design bogies
UK	Letter dated 14.03.2007	Article 7(a)	CR TSI WAG (parts) and CR TSI Noise (parts) 72 coal hopper bogie wagons
UK	Letter dated 07.03.2007	Article 7(a)	CR TSI WAG (whole) and CR TSI Noise (whole) 180 swan-necked freight wagons
UK	Letter dated 07.02.2007	Article 7(a)	CR TSI Noise (whole) 16 Class 66 locos

Directive 2008/57/EC

MS	Details of Communication	Basis of derogation	TSI and Scope	Status (Closed/Open)
UK	Letter of 21/4/09 (A/17369)	Article 9(a)	HS & CR CCS TSI ERTMS Cambrian Line Derogation	Open
NL	Letter of 5/12/08 (A/523166)	Article 9(a)	RST, PRM & SRT	Open
SE	Letter from Swedish PR of 16.01.09 (A/6496)	Article 9(a)	CR TSI Noise	Closed
UK	Letter of 19/9/08 (A/515437)	Article 9(a)	SRT TSI (Safety in Railway Tunnel) 37 four-car class 350/2 DESIRO Electrical Multiple Units	Closed
UK	Letter of 29/9/08 (A/516436)	Article 9(a)	SRT TSI (Safety in Railway Tunnel) 2 fleets of Class 377/5 Electrical Multiple Units	Closed
UK	Letter of 27/10/08 (A/519073)	Article 9(a)	SRT TSI (Safety in Railway Tunnel) 54 class 378 Electrical Multiple Units	Closed
FR	Letter of 08.08.2008 from French Ministry	Article 9(d)	HS TSIs 28 train sets TGV DASYE	Open