



EFRTC/UNIFE TASK FORCE ON TRACK MACHINES FINAL REPORT

SPECIAL GRATITUDE IS EXPRESSED TO MATISSA, PLASSER-THEURER, KIROW, ROBEL, VOSSLOH AND WINDHOFF WHICH TOGETHER WITH EFRTC ASSURED THE FUNDING OF THE STUDY.

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Authorisation for placing railway track construction and maintenance machines into service

Introduction

Two decades after the EU decision to revive European rail transport and one decade after the first interoperability directive, there still remain serious problems as a result of the hiatus between theory and practice, between a still incomplete body of community rules and their different applications and interpretations in EU Member States and national regulations.

This state of affairs also affects the approval process for running and working railbound railway infrastructure construction and maintenance machines.

As things stand today, it is virtually impossible for a railway construction company that has machines (and operatives) approved for national use to extend the scope of its activity beyond its national boundaries.

Admittedly, cross-acceptance, the name given to the mutual recognition of type approval, is a worthy intermediate target but, in Europe, with the exception of a few bilateral agreements (cf. illustration 3X NL), even this remains a distant goal. The real target is a single European approval process via a single European agency, valid for and in all Member States, which would enable cross-acceptance to be implemented.

In the present hybrid situation, national type approval processes, each the product of its own historical environment, continue, for the most part, to apply, the European regulations simply being grafted on to them. This national “minimum change” attitude only serves to create maximum complications and extra costs for all concerned. To make matters worse, the national authorities have different interpretations of European legislation.

The current simultaneous enforcement of different European and national regulations only serves to make the approval process more, rather than less, complicated and to drive up costs to irresponsible heights.

European Commission and EU Parliament railway policy is geared towards creating a single European railway area. The directives drawn up with this goal in mind, in our particular case essentially the relevant Technical Specifications for Interoperability (TSI) and the Machinery Directive, have force of law and have to be transposed into national legislation by the Member States. Unfortunately not all the regulations in these documents are mandatory and their enforcement therefore a matter of choice, a case in point being that of railway track construction and maintenance machines.

European standards, while not mandatory, can be applied by agreement. The directives deliberately abstain from making reference to specific standards to avoid giving them force of law. In addition, the basic technical provisions of a directive can and should be aligned on the corresponding standards, the standards concerned then being referred to as “harmonised”.

This would be a way of avoiding differing interpretations and unnecessary discussions at national level and would be a major step towards achieving a sound legal framework in this sector.

EU legal framework for OTM

OTM have to comply with the requirements of the following two bodies of law:

- The two railway directives (Interoperability 2008/57 and Safety 2004/49), in which OTM are considered railway vehicles, and
- The Machinery Directive 2006/42, which treats them as work machines.

The technical requirements of the Interoperability Directive 2008/57 have been spelled out in the so-called TSI (Technical Specifications for Interoperability). More specifically, OTM are concerned by the following TSI:

- TSI LOC&PAS (for locomotives and passenger coaches),
- TSI on NOI (noise),
- TSI on Diesel fuel emissions,
- TSI OPE (operation)
- TSI RST (railway safety in tunnels)
- TSI WAG (freight wagons in the case OYM is hauled in train).

According to the TSI on Noise, OTM have to comply with the same requirements as locomotives. Noise during working operations is not addressed.

According to the TSI LOC&PAS, OTM do not have to fulfil all requirements but its Appendix C sets out specific requirements for self-propelled and hauled OTM. Application of this TSI to OTM is left to the discretion of Member States. As a result, users of this TSI (in other words, machine manufacturers, railway construction companies, infrastructure managers, etc.) have the choice between national and European approval for OTM.

When running on the track, OTM are subject to Safety Directive 2004/49. Operators of OTM therefore need a safety certificate obtainable from the national safety authorities

When in “work” mode, OTM come under the Machinery Directive 2006/42. Furthermore, at the client’s end the party with civil liability for safety at the workplace may contractually impose additional requirements.

At present, there are therefore no specific requirements in European law with regard to the approval of OTM, their running and operation, other than in the afore-mentioned TSI.

The most relevant to OTM are TSI LOC & PAS which provide the definition for OTM and include special Annexe C relevant to OTM. They are currently still being divided into:

- TSI HST RST for high-speed rail (locomotives and passenger stock), and
- TSI CR LOC&PAS for conventional rail (locomotives and passenger stock).

Both of these TSI apply solely to the Trans-European Networks (TEN).

In its regulatory authority capacity, the European Railway Agency (ERA) has the task of improving railway safety and interoperability in Europe. It has been given the role of combining the above-mentioned provisions to make them into a single TSI LOC and PAS, valid for all networks. This work is currently in progress.

EU regulatory framework for OTM

European standards as the set of rules and regulations, while not mandatory, can be applied by agreement. The directives deliberately abstain from making reference to specific standards to avoid giving them force of law. In addition, the basic technical provisions of a directive can and should be aligned on the corresponding standards, the standards concerned then being referred to as “harmonised” with the presumption of conformity to TSI concerned.

This would be a way of avoiding differing interpretations and unnecessary discussions at national level and would be a major step towards achieving a sound legal framework in this sector.

Sadly the harmonisation process is still far from complete and, in the case of rail track machinery, it is not clear which European standards need to be harmonised and in what order nor what the timelines should be. Many of the standards concerned are, moreover, not specific to rail track machines but relate to railway vehicles in general.

The sheer number of EU standards to be taken into account - in the particular area at issue here some one hundred new standards or versions are produced each year – makes it difficult for manufacturers or users of track machinery to keep up-to-date with the latest developments.

Nevertheless, thanks to recent effort of CEN TC 256/SC1 WG 5 the standards related to OTM are carefully reviewed in the process of the revision of CEN 14 033 and its alignment as the future harmonised standard both to Interoperability and Machinery Directives.

This revision shall update all references to the standards used in TSI relevant to OTM and ensure

- the EN 14033-1 “Technical requirement for running” which covers the requirements to OTMs in travelling mode is a harmonised standard under the interoperability directive
- the EN 14033-2 “Technical requirements for working” covers the railway specific requirements to OTMs in working mode which are not covered by the machinery directive
- the EN 14033-3 “General safety requirements” which covers the requirements to OTMs in working mode will be a harmonised standard to the machinery directive

Current situation in OTM authorisation

Significant reduction of the costs and time for placing the track construction and maintenance machines (OTM – On Track Machine) in service can be achieved by harmonisation of authorisation procedures and processes. It is a pre-condition for the future cross-acceptance vital for opening of the market for construction, renewal and maintenance of the railway lines in Europe.

The current situation is, however, far from the above objectives - at present, it is hardly possible for contractor of one country to work in other country. Even though there are some examples of mutual acceptance through bilateral agreements, in practice there is no cross-acceptance of track machinery, works and staff in Europe at all.

A lot of effort was made by EFRTC members to contribute to standardisation work with a strong believe that standards as a set of harmonised and agreed rules and regulations will be applied. The results are rather frustrating – the application and in particular the interpretation of existing standards and dominance of specific national rules creates an environment in which the same type of track machine has to be certified each time for each country what multiples costs and its time consuming.

There are significant differences in the procedures, costs and deadlines for type approval of track machines in Europe. The table 1 illustrates these differences in terms of costs and time required for authorisation of track construction and maintenance machines.

With regard to costs, the range is starting from very low in Switzerland amounting € 3.500 for contractor, up to € 60 000 in Germany, € 80 000 in Spain, between € 150 000 – 200 000 in France and with highest costs in UK up to 20 % of the cost of OTM.

Concerning time required for authorization, it can vary between 2 to 12 months by country for the authorization of the same type of machine.

The EFRTC has therefore analysed the current situation to find out the major reasons for driving up costs to irresponsible heights costs high and for time consuming procedure which increased by factor 10 in the last 10 – 15 years. It was found that

- this is mainly due to the fact that track machines are considered as a rolling stock and shall be subjected to all design requirements, calculations and testing as for rolling stock, either self-propelled or hauled in train-set
- CEN standards 14 033 parts 1, 2 and 3 for track machines make reference to a huge number of other standards mainly applicable only for rolling stock; difficult to keep trace with their updates and interpretation by various national authorities – more transparency is needed
- In addition to CEN standards, there are many specific requirement of national authorities which have to be complied with even for proven machine type already placed into service in one country
- The authorisation is very dependent on expert(s) in charge, his know-how, experience and background, interpretation of standards and many other country national authority specific issues – there is a need for transparent rules and clear assessment criteria
- Many complex calculations and testing are required which in fact have already been completed for standard vehicle components and are also part of track machines such as e.g. frames, wheels, brakes, etc.
- Approval bodies very often do not care about cost, efforts and delivery delays due to the complexity of the authorisation (homologation).
- It shall be also avoided that the future TSI would impose further constraints / problems to already existing complex process of OTM authorisation (e.g. environmental constraints and noise restrictions).

The current situation is totally unacceptable to the private contractors who are under pressure from its clients – Infrastructure managers to reduce further the costs of track renewal and maintenance even if it is also in their interest to provide the best service for reasonable costs.

Specific features of OTM to be considered in authorisation procedures

OTM are specifically designed for the express purpose of building and maintaining railway infrastructure, and have twofold status. They are classed as railway vehicles and, at the same time, as railway and/or track building machines. They operate in a number of different modes, more specifically in their work setting and in their transport setting, in the latter case under their own power or hauled.

Inspection vehicles can be classed as OTM or as railway traction unit depending on operational mode, while rail-road vehicles are not.

In terms of outside appearance, OTM look like locomotives, passenger coaches or freight wagons, are built as standard railway vehicles, can be included as part of a train consist or operate separately, for example, in the case of tamper-liners.

By contrast with standard rolling stock, these vehicles are used for railway maintenance purposes. They are built in small series tailor-made to the needs of the individual client and market requirements and are almost never identical to other machines with the same end purpose.

It should also be noted that, in principle, OTM are not used to carry goods or convey passengers and are therefore neither freight wagons nor passenger coaches. They do not serve to haul other vehicles and can therefore not be classed as locomotives. They run relatively infrequently and clock up little mileage.

For approval purposes, they are therefore treated as both railway vehicles and construction machines.

Given their dual status, OTM have to comply with the requirements of the rail vehicle directives on interoperability, safety and noise when in transport mode, and to those of the machinery directive, when in “work” mode. Directives have legal status and must be transposed for national application.

As things stand today, OTM need to have “European approval” under the terms of Articles 22 or 23 of the Interoperability Directive 2008/57 in conjunction with TSI CR LOC and PAS or “national approval” under the terms of Articles 24 or 25 of the above-mentioned directive in conjunction with the particular national technical stipulations.

Furthermore, the machine’s manufacturer must also certify to conformity with the Machinery Directive 2006/42. This point will not, however, be more fully explored below.

Last but not least, when in transport mode, they must also comply with the Safety Directive. This is where the rail infrastructure companies or the infrastructure manager (IM) and the national railway undertakings (RU) play a role.

It should be pointed out at this stage that the exact same machine has to acquire type approval in each separate Member State, which only serves to multiply the cost of the operation and extend the amount of machine-down time. In addition, the approval conditions and technical specifications vary widely from one country to another.

To sum up

- it should be taken into account that On-Track Machines are manufactured in small numbers tailored to customer needs and travel much less over the network than other rolling stock – they are dedicated to perform the works and not to run on the network; therefore On-Track Machines should not be put into the same category as locomotives or freight wagons
- On Track Machines should be considered as mobile factory/plant either outside of EC directive and/or as a special case in the Directive (EC Machine Directive shall be considered)
- the application of TSI to OTM should not lead to further increase of efforts, expenses and delivery times but on contrary it should facilitate authorization processes and procedures
- transparency in national rules and regulations are first pre-condition for both – authorization for placing OTM into service and thus their cross-acceptance
- the approval/certification of machine type by manufacturer against TSI and standards shall be acknowledged Europe-wide and re-checking shall be strictly limited
- the authorization process for operation and working by national authorities shall be limited only to specific country requirements declared and known in advance
- it should be avoided that OTM authorized and placed into service in one country shall be subjected to the complex process of authorization in another country before placing in service (subject specific national requirements listed in the TSI and national reference documents).

Actions taken to remedy current situation

The current situation in OTM authorisation is totally unacceptable to the private contractors who are under pressure from its clients – Infrastructure managers to reduce further the costs of track renewal and maintenance even if it is also in their interest to provide the best service for reasonable costs.

The OTM type approval process must be therefore simplified with the clear intention of driving down the cost of the exercise and reducing the time required to obtain type approval. Mutual recognition of OTM type approval is an urgent necessity so that national markets for services on European railway infrastructure – construction, renewal and maintenance – can be further opened to competition and the competitiveness of European railway industry improved worldwide.

But making the type approval process less cost-intensive and less time-consuming is not all. It is also necessary to ensure the transparency of the approval process and the criteria applied in the body of EU regulations and in the national reference documents.

The OTM manufacturer's declaration of conformity with the TSI must be recognised throughout Europe and any further checks and verifications kept to the strict minimum. Additional requirements imposed in individual countries must be announced in advance and also acknowledged by the ERA.

The final objective shall be to rule out the need for national approval, minimizing the country specific country requirements and thus pave the way to European authorisation of OTM (see illustration).

To this the EFRTC as federation of the national association of railway trackworks contractors decided to take the actions to assure that the future legislative and regulatory framework will take into account their legitimate demands for the simplification of OTM authorisation for significant cost reduction and its cross-acceptance vital for opening of the market for construction, renewal and maintenance of the railway lines in Europe.

EFRTC has therefore set up the joint Task Force with OTM manufacturers with support of UNIFE in order to analyse current legislative and regulatory framework with the aim at making proposals for its improvement with regard to OTM authorisation. They aligned the timing of their investigations in line with the current ERA work for merging TSI CR LOC & PAS with TSI HR and the revision of CEN 14 033-1/2/3 and its alignment to Interoperability and Machinery Directives as future harmonised standards.

The joint EFRTC-UNIFE Task Force was composed of leading experts of private contractors, OTM manufacturers and industry members of UNIFE as representative speakers to ERA providing through its staff also competence in the knowledge of TSI revision process. The Task Force was led on behalf of EFRTC by representative of German leading private contractor and on behalf of UNIFE by CEO of Matisa. Eight major OTM manufacturers participated at the work of Task Force and contributed by funding the work of competent consultants selected by Task Force to support the ambitious objectives as stipulated in the remit given to Task Force by EFRTC General Meeting.

The remit of the study consists of

- Review of all articles of TSI CR LOC&PAS with regard to their relevance to OTM
- Identification of articles which are relevant to the authorisation of OTM subject the clause 7 enter into force (In case TSI will become mandatory for OTMs too)
- Comparison of coverage of OTM authorisation as defined by EN 14033 with relevant clauses of TSI
- Review of the harmonization of EN 14033 with TSI as stipulated in Annex ZA of the standard
- Identification of discrepancies between TSI and EN 14033
- Identification of the potential critical items for OTM authorisation and cross-acceptance in TSIs (LOC&PAS, CCS, SRT and NOISE).

The OTM Task Force has established a close cooperation with CEN TC 256/SC1 WG 5 which luckily worked in parallel with the same time schedule as TSI revision process on the revision of EN 14 033 standards. In this way the CEN WG 5 has regularly been briefed on intermediate findings of Task Force and reciprocally the Task Force was provided by any update of revised standard. The cooperation was strengthened by the fact that some Task Force members are also CEN WG 5 members and that CEN WG 5 Chairman was invited to participate at the work of Task Force. With the support of the competent consultants familiar with the authorisation of rolling stock and OTMs in several European countries it

was possible to complete the study within the period of less than one year i.e. before the completion of the revision of TSI LOC and PAS.

At the important milestones UNIFE helped to organise some informal consultation of intermediate findings with ERA experts. The final report of Task Force has been sent to ERA and results in form of proposals for TSI amendment have been forwarded to ERA through UNIFE as representative speaker to ERA.

Potential solutions

The final report of joint EFRTC - UNIFE Task Force provide guidelines to the potential solutions of the current problems with OTMs' authorisation. The output reviewed by OTM Task Force core group produce clear classification of items

- Where the request for the TSI change shall be written in ERA format
- To be reviewed by CEN TC 256/WG 5 in the current revision of EN 14 033-1
- To be considered for the inclusion in the Annex C of TSI Loc&Pas
- To be declared not applicable to OTM

Finally it includes

- OTM Task Force request for change of draft TSI text (supported by TC 256/SC1 WG5) agreed for the submission to UNIFE and ERA
- Order of the standards and their relevance to OTM
- Identification of the most costly requirements

There are two completely different trends that should be highlighted with regard to developments in the pipeline. Either the "European position" will in the longer term be extended and made mandatory in the TSI for OTM, or national type approval procedures will continue to be the norm for some time to come. Both options have their advocates and, behind the scenes, a large number of vested and conflicting interests are at play.

OTM manufacturers and operators argue in favour of the solutions towards European harmonisation as much as possible but respecting justified national specific conditions i.e.

- To assure that the OTM requirements will be considered in the current revisions of TSIs even if they will be not mandatory for TSI
- To assure that the relevant EN standards to OTM (in particular EN 14 033) are harmonised with the relevant TSIs (in particular TSI Loc&Pas).

Taking into account the fact that the authorisation of OTM will be still voluntary in the new revised TSI LOC and PAS there will be always two types of OTMs authorisation

- OTM-1 with full authorisation in accordance with TSIs
- OTM-2 applying national authorisation using EN standards

It was therefore important in the work of Task Force and CEN TC 256/SC 1 WG 5 to ensure that

- Relevant EN standards covers the essential requirements of the relevant TSIs
- EN 14033-x are harmonised standards for the TSI RST as well as the Machinery Directive
- for OTM-1 the mutual recognition is granted
- for OTM-2 the national approval is based on harmonised standards with TSI and multi-national approvals are performed only for specific national requirements agreed for cross acceptance procedures.

The requirements for OTM-1 will be in conformity with the TSI and listed in Annexe ZA of EN 14 033 harmonised standard. This means that if an OTM of category OTM-1 is approved for running on the track of one Member State, either under its own power or as hauled stock, this approval should also apply in all other Member States, along similar lines to today's practice for the majority of freight wagons.

OTM-2 shall comply with all common requirements for OTM, but not all the main requirements for OTM-1 in conformity with the TSI. National requirements have to be fulfilled for specific country items. Naturally, it would be best if these national requirements were also mutually recognised forthwith: a list of such requirements could form part of the harmonised standard EN 14033.

National type approval on the basis of harmonised standards and recognised national standards with specific country items accepted by ERA should so largely simplify and facilitate the mutual recognition process and thus cross-acceptance even if TSI remains voluntary for OTMs.

Approval of the vehicles for use in "work" mode will be covered by the Machinery Directive on the basis of a harmonised version of standard EN 14033-2.

Use of OTM in "work" mode, albeit not part of the scope of application of the TSI, should be covered in full in EN 14033-2/3 and on this basis culminate in bilateral or multilateral agreements.

Achievements and further prospects

OTM Task Force work resulted to some significant achievements as some of its proposals have now been accepted to be included in the in the new revised TSI RST. The most important are that

- OTM are now considered as a special category not falling into any other rolling stock vehicle
- all requirements related passenger vehicles are explicitly excluded to be applied for OTMs
- there are no additional requirements for specifications of brakes for OTM

Further, Annexe C relevant to OTM takes into account the OTM specifics for

- strength of vehicle structure including bogie frame and wheelsets,
- safety against derailment
- accept simplify procedures for dynamic running test and braking tests.

Nevertheless there are still some critical points driving costs high and making some obstacles to the mutual acceptance which we would need to resolve in the future, namely

- The scope of the application of ERTMS/ETCS for OTM (relevant to TSI CCS)
- Recording device which is still an open point in TSI OPE; there is no exception in TSI Loc & Pas for its application in OTM in comparison with traction units for time being, however, we are free to define our own specifications for OTM recording device in standard
- All service requirements concerning the documentation for maintenance and services are also applicable to OTM as ERA has not accepted EFRTC Task proposal for governing them through contracts between client and contractor in the case where any RU and/or IM are concerned.

It can be reasonably expected that due to the implementation of the OTM Task Force proposals the OTM authorisation process will be quicker and cheaper. This was the important first step for securing the legal position of OTM authorisation through TSI enabling

- the conformity of the OTM in relation to clearly recognised requirements to be guaranteed right from the design stage,
- conformity checks to be conducted in time and on a parallel to the construction and manufacturing process
- the risks inherent in the approval process itself and of potential delays to be reduced.

A further important step is that of Europe-wide mutual recognition of OTM in “running” mode. This would lessen

- the amount of time required to obtain authorisation for vehicle running, which would be achieved in one go, and would also lessen
- the risk with regard to approval for use in “work” mode, for which the national safety authorities may impose further requirements.

However, finally it should be pointed that the simplification of OTM authorisation and cross-acceptance will be not implemented without a support of ERA and national safety authorities providing authorisation for placing vehicles in the service. The EFRTC with support of its members therefore envisaged to take the next steps in the following direction:

- to start the dialog with NSA of major countries at the national level (e.g. German contractors and manufacturers have already met EBA and received its support for proposed approach to ERA)
- the same approach to be initiated in France, UK, Italy, etc. to assure that TSI requirements on OTM and harmonised EN 14 033 are transposed into the national regulations as the first step for mutual cross- acceptance of authorisation processes
- to continue informal contacts with ERA aiming at enhancing the authorisation process towards European cross-acceptance of OTM and thus opening the European railway construction and maintenance market.