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Operations and traffic management system TSI

Acceptable means of compliance on safety of passengers

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The present document is a non-legally binding opinion of the European Union Agency for Railways. The purpose of this document is to define ways of establishing compliance with the essential requirements of the relevant EU legislation. It is without prejudice to the decision-making processes foreseen by the applicable EU legislation. Furthermore, a binding interpretation of EU law is the sole competence of the Court of Justice of the European Union.

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Part 1

1.1. Introduction

RUs and IMs shall manage their operations and the traffic among others in accordance with the TSI OPE.

According to Article 2(33) of the Directive on the interoperability of the rail system within the European Union (Directive (EU) 2016/797, as amended), Acceptable Means of Compliance (AMOCs) are “*non-binding opinions issued by the Agency to define ways of establishing compliance with the essential requirements*”. Therefore, AMOCs define good practices also by referring to available standards, which the actors of the railway sector can use in their safety management systems as evidence that their operational procedures comply with high-level requirements set out in EU legislation (in this case the TSI OPE and the Common Safety Method on requirements for safety management systems – CSM on SMS (Commission delegated Regulation (EU) 2018/762).

1.2. Legal basis

The legal basis for AMOCs is the TSI OPE, and more precisely section 4.4.3 of its Annex, which requires the Agency to define AMOCs by means of technical opinions¹ on a number of topics. These are:

1. Safety of load
2. Checks and tests before departure, including brakes and checks during operation
3. Safety of Passengers
4. Train departure
5. Degraded operation.

This AMOC covers the topic “safety of passengers”.

The AMOC itself constitutes a non-legally binding opinion and its use is strictly voluntary.

1.3. Concept

As a general concept, the RUs/IMs are responsible to manage their specific operational and traffic management requirements in their SMS.

Article 4(1) (d) of the Railway Safety Directive (Directive (EU) 2016/798) states as follows:

“With the aim of developing and improving railway safety, Member States, within the limits of their competences shall:

d) ensure that the responsibility for the safe operation of the Union rail system and the control of risks associated with it is laid upon the infrastructure managers and railway undertakings, each for its part of the system, obliging them to:

- (i) implement necessary risk control measures as referred to in point (a) of Article 6(1), where appropriate in cooperation with each other;*
- (ii) apply Union and national rules;*
- (iii) establish safety management systems in accordance with this Directive”.*

¹ In accordance with Article 10 of Regulation (EU) 2016/796.

Article 4(3) (a) and (b) of the Railway Safety Directive states as follows:

“Railway undertakings and infrastructure managers shall:

- a) implement the necessary risk control measures referred to in point (a) of Article 6(1), where appropriate in cooperation with each other and with other actors;*
- b) take account in their safety management systems of the risks associated with the activities of other actors and third parties;”*

The same concept has been detailed in the requirements of the CSM on SMS, ANNEX I Point 3.1.1.1 (for RUs) and ANNEX II point 3.1.1.1 (for IMs):

According to these provisions, the organisation shall:

- a) identify and analyse all operational, organisational and technical risks relevant to the type, extent and area of operations carried out by the organisation. Such risks shall include those arising from human and organisational factors such as workload, job design, fatigue or suitability of procedures, and the activities of other interested parties (see Annex I, Section 1. Context of the organisation);
- b) evaluate the risks referred to in point (a) by applying appropriate risk assessment methods;
- c) develop and put in place safety measures, with identification of associated responsibilities (see Annex I, Section 2.3. Organisational roles, responsibilities, accountabilities and authorities);
- d) develop a system to monitor the effectiveness of safety measures (see 6.1. Monitoring);
- e) recognise the need to collaborate with other interested parties (such as railway undertakings, infrastructure managers, manufacturer, maintenance supplier, entity in charge of maintenance, railway vehicle keeper, service provider and procurement entity), where appropriate, on shared risks and the putting in place of adequate safety measures;
- f) communicate risks to staff and involved external parties (see Annex I, Section 4.4. Information and communication).

Therefore, it is the responsibility of RUs and the IMs to identify, assess, eventually mitigate, monitor and review continually their own operational risks.

Based on this principle, the AMOC is a proposed way addressed to the RUs to demonstrate compliance with the TSI OPE as a mean to manage operational risks, taking into account that the provisions of the TSI OPE cover the entire operational and traffic management subsystem, whilst every single RU or IM manages only part(s) of the subsystem.

The RUs should in compliance with the EU and national legal requirements define their operational context and consequently identify the risks occurring in their activities. Then, on a voluntary basis, they are free to assess and decide for themselves whether an adopted AMOC is applicable to the part of the subsystem they manage. An AMOC could be entirely or partially applicable to the RUs operational context; for example, a RU could be involved in the freight transport but not in the transport of dangerous goods, whilst an AMOC could deal with both.

If an RU evaluates this AMOC as applicable to the operational context and decides to use this AMOC, the RU should assess the risks the AMOC could cover within the operational activities to be performed. For example, initially and according to the applicable legislation, risks for passengers should be identified and mitigated – then the relevant part of the good practice in the AMOCs should be cross referenced with the risk in the RUs’ risk assessment processes. This should regularly be kept up to date as part of the monitoring activities for their operations.

As AMOCs are non-binding opinions issued by the Agency to define ways of establishing compliance with the essential requirements, the RUs are free to decide whether to apply the AMOC/part of the AMOC, or not. Nevertheless, the RUs are responsible for managing their operational risks.

AMOCs should be accepted throughout the EU by Member States and National Safety Authorities as examples of good practice.

According to TSI OPE point 4.4.2 and Appendix I, national rules² on the defined AMOC topics are generally not permitted. Therefore, if a Member State (MS) and/or a NSA/or any other entity requires a RU or IM to comply with additional national requirements, then that MS or NSA or the other entity will have to provide, in line with Article 8 of Railway Safety Directive, evidence as to why their national requirements provide a higher degree of risk control than that set out in the AMOC. However, AMOCs are not national rules and if a RU decides not to apply the AMOC and develop its own processes, it may do this and does not have to prove that its processes are as good or better than the good practice set out in the AMOC and it should ensure that its processes are adequate in controlling/mitigating the risks that it has identified.

As a result, the substantiated use of this AMOC can be taken into consideration by the Agency or the NSAs when a RU applies for a single safety certificate or authorisation, when the certification body assesses compliance of the applicant with the requirements of the CSM on SMS and the TSI OPE.

The certification body will check the sufficiency of the RUs' processes in controlling the risks and will check how the AMOC is used, if it is the case, by reviewing the risk assessment process of the RU to ensure that the AMOC good practice has been identified as a relevant control measure for the identified risk.

1.4. Responsibility

Each RU remain responsible for how this AMOC is used in their SMSs. They should ensure that they can identify which risks the AMOC provides controls against. The AMOC should not just be included in the SMS without the RU justifying its use through their risk management procedures and their document management system.

Each RU should perform analysis to identify which part of the AMOC is applicable to their operational context and, by the mean of a risk analysis, they are responsible for defining how to integrate the AMOC or part of that within their own SMS.

The Agency is not responsible for how the AMOC is used. It is particularly important that when the RU use this AMOC, that they provide return of experience and/or information from accidents and incidents to ensure that the content of the AMOC remains relevant and up to date.

The Agency should be informed of any return of experience which should be used to update the AMOC.

This AMOC is specifically for RUs and how they take forward the issue of the safety of passengers.

1.5. List of acronyms used in this text

- AMOC: Acceptable Means of Compliance
- CSM: Common safety method
- ECM: Entity in Charge of Maintenance
- ERA: European Union Agency for Railways or the Agency
- EU: European Union

² With the meaning of Article 8 of Directive (EU) 2016/798.

- FOP: Fundamental Operational Principles
- IM: Infrastructure Manager
- NSA: National Safety Authority
- RU: Railway Undertaking
- SMS: safety Management System
- TSI: Technical Specification for Interoperability
- TSI OPE: Technical Specification for interoperability relating to the operation and traffic management subsystem (Commission Implementing Regulation (EU) 2019/773)

Part 2

2.1. Introduction to the relevant part of the TSI OPE

Section 4.2.2.4.2. of the Annex of the TSI OPE on *Safety of passengers* states that the RU “*shall ensure that passenger transport is undertaken safely at the departure and during the journey*”.

2.2. Information on the scope of this AMOC

This AMOC provides guidance for RUs and other involved actors, such as IMs, on preventing the risk to passengers that may arise during the boarding or leaving a train or during other operations (train departure, train journey, people standing on the platform etc.). The issue of the correct platform length for the length of the train is an interface to be managed between the RU and IM.

Competence and who is responsible for undertaking the tasks are not covered in this AMOC, they should be covered as part of the RU’s SMS. These topics should also include any risks and control measures that are part of the RU’s strategy on human and organisational factors.

This AMOC does not cover items such as health & safety of passengers on stations, platform stepping distance, slips and trips at the station and platform, and cross over with other TSI’s (INF, PRM, Loc&Pas).

Technical issues in relation to vehicles are also not covered. The difference between TSI Compliant vehicles or existing non-TSI compliant vehicles which are permitted on the network are not discussed in this AMOC. For example, external door opening or closing should rely on the technical solution specified in the relevant TSIs. However, for non-TSI compliant vehicles operational solutions that adequately manage the risk is also acceptable. It is for the RU to decide how these risks are managed.

In individual Member States, the responsibility for the information provided on stations to the passengers may either be for the RU or IM. This is not covered in this AMOC but should be considered by the appropriate party in their SMS including the sharing of information on risks.

In relation to dealing with any emergency situation, this should be taken forward by both the IM and RU in accordance with the requirements in EU Regulations 2018/762 and 2019/773.

This AMOC covers the following stages:

- Boarding and leaving the train;
- Train departure;
- Train Journey;
- Arrival of train (including not at a platform and end of service);
- End of service;
- Coupling or decoupling of vehicles

2.3. Links to existing legislation on risk assessment

Fundamental operational principle (FOP)

The fundamental operational principle most relevant to the activity of safety of passengers is FOP 3:

FOP 3: Before a train begins or continues its journey, it shall be ensured that passengers, staff and goods are carried safely.

This principle concerns the train and its readiness for movement and therefore ensuring that the safety of passengers is considered

Risk assessment

The safety management system operational process shall cover how the safety of passengers is ensured.

Requirement 5.1.3 of Regulation 2018/762 states:

To control risks where relevant for the safety of operational activities (see 3.1.1. Risk assessment), at least the following shall be taken into account:

- (c) preparation of trains or vehicles before movement, including pre-departure checks and train composition;*
- (d) running trains or movement of vehicles in the different operating conditions (normal, degraded and emergency);*

Information from the output of the risk assessment should set out how the safety of passengers is ensured before the RU commences its operation and secondly, that the safety of the passengers will continue to be ensured throughout the journey. It should include information for staff members involved in train dispatching if they are part of the RUs or IMs or other staff including the driver and on-board staff. This information should form the basis of the SMS processes, procedures and instructions for staff.

The RU is responsible for integrating this AMOC into its own SMS by the mean of its risk management procedures.

2.4. Examples of good practice

The following Annex sets examples of elements of good practices that can be taken into account by the RU as evidence of compliance with the TSI OPE. It is a non-exhaustive list; therefore, the good practice should be integrated with additional requirements resulting from risk analysis performed by all involved actors for the parts of system under their responsibility.

ANNEX

1. Boarding and leaving a train

Safety requirements:

- Avoid conditions which may lead to falling into the gap between the train and the platform in the boarding area of the train;
 - Prevention from hazards caused by closing external doors;
 - Prevention of hazards caused by moving steps;
 - Prevention of hazards caused by ramps or lifts;
 - Train should not be moved when external doors are open;
 - Prevention of hazards to passengers leaving the train on the wrong side;
 - External doors should be opened on the correct side(s).
1. Boarding and leaving the train at scheduled stops, should both take place at standstill.
 2. The horizontal and vertical gap between the platform and the steps may vary depending on the configuration of the platform and the type of train. Where there is a risk of a potential fall between the train and the platform, the RU, in accordance with the arrangements set out in an operational risk assessment, should inform passengers of such particularities.
 3. In order to guard against the risk of falling out of the train, when it is at standstill, the RU should ensure the closure and, if the train permits, the locking of the external doors. The external doors should be closed before train departs according to the provision defined in the relevant TSIs.
 4. When designing and adapting a service, the determination of train composition by the RU should incorporate the length of the platforms of the stations served.
 5. The length of each train should, as far as possible, be compatible with the usable length of the platforms served, so that passengers can safely board or leave. If the train is longer than the platform, the following measures should, for example, be implemented:
 - deletion of a regular stop; and/or
 - A possible closure to part of the train. Staff on the platform, train crew, passengers should be informed that parts of the train are not usable; and/or
 - on board and audio announcement in order to explain the passengers which external doors are to be used for boarding or leaving the train; and/or
 - Ensure that those doors with no access to the platform, cannot be opened by the passengers during normal operation.
 6. Where, exceptionally, the operating conditions do not permit the above requirements to be met, the measures described in the section on **Coming to a standstill outside a platform** should be such as to ensure passenger safety.
 7. In order to prevent hazards of a passenger falling from a train, and where technical equipment is fitted, the RU should ensure the following:
 - close the external doors before departure and keep those closed when a train with passengers is moving or stopped in a place where passengers services are not foreseen;
 - if the external doors are fitted with a door locking device as defined in the relevant TSIs, those doors should be locked before departure and keep locked when a train with passengers is moving or

- stopped in a place where passengers services are not foreseen;
 - all doors that are not to be used by the passengers are to be closed and maintained closed for the whole journey;
 - make sure that the train boarding aids are blocked and in their secured position;
8. When the IM in charge of traffic management exceptionally needs to change the scheduled platform to a shorter one that cannot take the entire train, the IM should inform the RU in order to allow them to take the appropriate action.
9. Operational instructions for on-board staff should include conditions for taking care of persons with reduced mobility for boarding and leaving the train.

2. Train departure

Safety requirements:

- Prevention from hazards caused by closing external doors.
 - Prevention of hazards caused by moving steps.
 - Avoid conditions which may lead to falling into the gap between the train and the platform in the boarding area of the train.
 - External doors control and command system, as defined by the relevant TSIs, when present, should be active and effective.
 - The train is in the good running order and all the necessary checks and tests have been carried out.
1. The external doors should be closed before departure and those should be kept closed when a train with passengers is moving.
2. If the external doors are fitted with a door locking device as defined in the relevant TSIs, those doors should be locked before departure and kept locked when a train with passengers is moving.
3. Before the train departs, the attention of passengers should be drawn to the impending closing of the external doors and their departure by:
- an audible announcement inside and outside the train, according to the relevant TSIs; and/or
 - an acoustic and/or light device installed on the platform or on board when defined by the relevant TSIs; and/or
 - a member of staff authorising the departure who draws the attention of passengers and train staff by for example a whistle.
4. The RU's SMS operational procedures should specify the specific measures to be taken in the event of degraded situations, non-compliant composition, etc.
5. If passenger information signs are used in the coaches, these should be visible to the passengers. If passenger announcements and/or audible messages are used, these should be able to be clearly heard.
6. For trains with accompanying staff, before giving the authorisation for departure, the side external doors should be closed. However, in respect of certain types of trains, the door of the accompanying staff may remain open as long as it is necessary for operational reasons.
7. For a driver only operation, the RU should define appropriate operational procedure to be used before starting the train, including the use of technical devices as defined by the relevant TSIs. If technical devices are not available, the RU should consider as part of their risk assessment the appropriate

procedure to be taken, such as a visual check, etc.

8. For all passenger trains, the operating conditions to be fulfilled before departure are as follows:
 - closing the external doors (and where possible locked);
 - authorisation to move is issued or transmitted to the driver;
 - it is the scheduled time to depart, except when allowed to start before the scheduled time.
9. In case there are malfunctioning external doors, those doors should be protected and should remain protected for the whole journey, passengers and staff should be informed (for example by announcement and/or by a visual indicator). The train should have sufficient functioning doors to ensure the safety of the passenger service.
10. On some platforms, good visibility of passengers boarding and leaving is not possible. This includes curved platform, obstacles hampering visibility, multiple access to platforms, etc. In these situations, the RU should carry out a risk assessment of the situation and formalise specific operational procedures to be implemented.
11. Operational instructions for on-board staff should include conditions for taking care of persons with reduced mobility for boarding and leaving the train.

3. Train journey

Safety requirements:

- External doors should be kept closed and or locked while running;
 - Prevention of hazards caused by moving steps;
 - Prevention of hazards to passengers falling out of the train;
 - Prevention of hazard to passengers leaving by external doors opening outside of a platforms (e.g. for shorter usable length of platform).
1. The external doors should be closed before departure and those should be kept closed during the entire journey.
 2. If the external doors are fitted with a door locking device as defined in the relevant TSIs, those doors should be locked before departure and kept locked during the entire journey.
 3. In the event of danger, passengers should be able to alert staff who are in charge on the train. These staff should be able, if necessary, to bring the train to a stop, and provide and/or arrange passenger assistance and undertake necessary evacuation measures if this is needed.
 4. The RU should define the operational procedure to be applied by on-board staff to ensure the safety of passengers when exceptional circumstances do not permit normal operation.
 5. Each RU should include in their operational procedures the following issues:
 - accommodating passengers with reduced mobility;
 - opening of the external doors in an emergency to allow passengers to evacuate;
 - external doors should only be opened to allow passengers to leave/board when the train is within a platform;
 - informing passenger when only part of the train is in service.

4. Arrival of train (including not at a platform and end of service)

Safety requirements:

- Prevention of hazards to passengers leaving the train on the wrong side;
 - Each RU should ensure that the train length or the external doors to be opened are compatible with the technical parameters of the infrastructure (TSI OPE Appendix D1).
 - Prevention of hazard to passengers leaving by external doors opening outside of a platforms (e.g. for shorter usable length of platform);
 - Prevention of hazards to passengers caused by moving steps;
 - Prevention of hazards to passengers falling out of the train;
 - Avoid conditions which may lead to falling into the gap between the train and the platform in the boarding area of the train;
 - Prevention of hazards to passengers being injured during coupling and uncoupling;
 - Check of the train at the end of service to ensure that there are no passengers still on the train.
 - Within the framework of their responsibilities both the RU and the IM should ensure that, passengers only board and leave the train at designated locations and measures are taken in case of a stopping problem (i.e. the train external doors are not all aligned with the platform).
1. Any temporary changes to the usable length of the platforms, which can affect the safety of the passengers, the RU should have specific operational procedures to deal with this issue. Relevant information should then be provided to the passengers.
 2. For a train that comes to a stop outside a platform, this includes stops outside the usual points of service and/or incidents and emergency situations, the RU on-board staff should:
 - keep the external doors closed and, if possible, locked;
 - ask passengers not to attempt to get off the coaches;
 - if evacuation is needed, provide passengers with key safety information on how to leave the train safely, the timing of when this will take place and keep them updated on the latest information.
 3. Where it is necessary to move passengers through the coaches, the RU should as part of its operational risk assessment have operational instructions for the relevant staff. This should include an acoustic announcement or a passenger information systems installed in the coaches.

5. End of service

Safety requirements:

- to avoid passenger being left in a parked and locked train, opening the external door with the emergency handle and for example stepping out on a track with traffic.
1. In order to ensure that no passengers are present in the train, the following should be carried out:
 - closing external doors;
 - inspecting the train, for example by walking through the train or by having a confirmation by the on board cameras;
 - issuing of announcements in the train (repeat if possible);
 - provision of information on the display or other means of indicating that the train does not take passengers.

- extinguishing internal train lighting, if possible.

6. Coupling or decoupling of vehicles

Safety requirements:

- To control the hazard to passengers of having sharp movements during coupling and uncoupling operations.

The RU risks assessment should consider the measures necessary to ensure the safety of passengers when coupling/decoupling vehicles.

Examples of measures to be considered are:

1. Information in the form of voice announcements could be made to passengers.
2. Closing external doors on either side of the train.