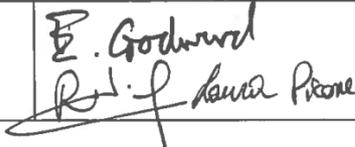
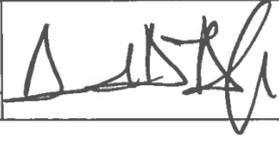


Making the railway system
work better for society.

Report

2018 assessment of achievement of safety targets

| | <i>Drafted by</i> | <i>Validated by</i> | <i>Approved by</i> |
|------------------|---|--|---|
| <i>Name</i> | Ernest GODWARD Gregory ROLINA Laura PICONE | Antonio D'AGOSTINO | Christopher CARR |
| <i>Position</i> | Project Officers and Trainee | Head of Sector | Head of Unit |
| <i>Date</i> | 04/04/2018 | 15/05/2018 | 23/05/2018 |
| <i>Signature</i> |  |  |  |

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1. Executive summary

This report presents the seventh assessment of achievement using the second set of Common Safety Targets (CSTs) and National Reference Values (NRVs) carried out in accordance with the Common Safety Method (CSM) defined in the Commission Decision 2009/460/EC [2], and in particular Article 4 of the Decision. The 2018 assessment is the ninth assessment of achievements of safety targets carried out by the Agency in accordance with the CSM (see the overview of annual assessments in Annex 5). The assessment concerns 26 of 28 EU Member States that have a railway system, plus Norway.

The NRVs and the second set of CSTs were established using Eurostat data for the years 2004-2009 and published as the Commission Decision 2012/226/EU [5] in 2012, which was later amended by the Commission Implementing Decision 2013/753/EU [6]. This assessment is based on Eurostat and Agency data for the years 2012-2016 that were retrieved from Eurobase¹ on 16 February 2018 and updated on 26 March 2018.

For all railway user categories, the respective NRV was lower than the corresponding CST.. As with the assessments carried out in the past, NRVs represent the safety targets – thresholds - used for the assessment as described in the CSM.

The results of the assessment of achievements of NRVs indicate other than acceptable safety performance in six Member States, as follows: “possible deterioration of safety performance”:

- › Bulgaria (Employees)
- › Bulgaria (Others);
- › Italy (Unauthorized persons);
- › Romania (Employees), and
- › Slovakia (Employees).

At the same time, the results of the assessment indicate that the railway safety performance remains acceptable at the EU level for all categories of railway users under consideration.

In accordance with Article 5 of the Method [2], the Member States for which there is a possible deterioration in safety performance in any category of user, shall send to the Commission a report explaining the likely causes of the results obtained.

The Agency considers that, as with any statistical method, the results obtained through this assessment should be used and considered with caution. In particular, the Agency recognises;

- A limitation in the data used for establishment of NRVs and for their assessment (data submitted by Member States to Eurostat via their national statistical offices);
- The need to update the NRVs used for the assessment; and
- The difficulty of using the Method in relation to categories involving small numbers of fatalities;
- The method is not to be used for proactive safety analysis.

The Agency conducted a consultation with the NSAs, NIBs and NRB on the value of quantitative safety targets, to support the revision of the Method. The key finding from the consultation was to continue with the present method with a an updating of NRVs where the current NRV was found to be incorrect or where the NRV was derived from another Member.

¹ Statistical database of Eurostat: <http://ec.europa.eu/eurostat/data/database>

2. Introduction

This report presents the results of the annual assessment of achievement of NRVs and CSTs in accordance with the requirements of the Commission Decision 2009/460/EC [2].

The CSM for assessing the achievement of CSTs and of NRVs is set out in Commission Decision 2009/460/EC [2] (hereafter also referred to as the Method).

In 2011, the Agency received a mandate from the Commission to:

1. prepare a second set of NRVs (CSTs) in accordance with the existing CSM in 2011;
2. propose a revision of CSM in 2015; and
3. propose a third set of NRVs (CSTs) in accordance with the revised CSM in 2015.

The first task from the mandate was accomplished by the Agency in 2011 with the proposal for the second set of NRVs (CSTs) published as Commission Decision 2012/226/EU [5]. The values for the second set of CSTs were calculated on the basis of the data from 2004 to 2009, which were supplied to Eurostat by statistical offices of Member States in accordance with Regulation (EC) No 91/2003 [3]. They were calculated using the methodology set out in points 2.1.1 and 2.3.1 of the Annex of the Method [2].

Following the accession of Croatia to EU in 2013, the Agency recommended the amendment of the second set of NRVs (CSTs) to incorporate the NRVs for Croatia. The second set of NRVs (CSTs) were amended through the Commission Implementing Decision 2013/753/EU [6].

As regards the second and third task from the mandate (revision of CSM and proposal of the third set of NRVs), the Agency carried out the necessary work in 2012-2014 with the Working Party on Safety Performance. This work was further reviewed by the Agency in 2015. A draft recommendation revision was prepared, but the Agency decided to recommend no change to the CSM at that time.

In 2017, the Agency conducted a new consultation with the NSAs, NIBs and NRB on the value of quantitative safety targets, to support the revision of the Method. The key finding from the consultation was to continue with the present method with a an updating of NRVs where the current NRV was found to be incorrect or where the NRV was derived from another Member.

This 2018 annual assessment is the ninth annual assessment carried out by the Agency so far, concerning the assessment of the achievement of the second set of NRVs and of CSTs with reference to the data available for the period 2012 - 2016. The data for the years 2012 - 2015 used for the assessment was taken from the Eurostat database, as set out in point 1.1 of the Annex of the Method [2]. In cases where data was not available in Eurostat database, the CSI data was used (see the input data overview in Annex 4). Following changes to Eurostat's data collection processes the data for railway safety is now collected via the Agency's Common Safety Indicators.

NRVs and CSTs were calculated for each Member State and for each of the following risk categories: Passengers (1.1 and 1.2), Employees (2), Level crossing users (3.1), Others (4), Unauthorized persons on railway premises (5) and Whole society (6).

3. Method for assessing achievement of safety targets

3.1. Data

To assess the achievement of NRVs, the Agency has used the Eurostat data for the four most recently reported years (2012-2015), in accordance with point 3.1.4 of the Annex of the Method [2]. The data for 2016 is the latest observed safety performance (OSP), as referred to in the first step of the assessment procedure, and for this assessment was wholly derived from the Agency's Common Safety Indicator data.

The data was extracted from the Eurostat database on 06 March 2018. The data were sent by Statistical Offices of Member States within five months after the end of the reference period for the 2015 datasets. According to the information from Eurostat, the data in datasets "rail_ac_catvict" and "rail_ac_catnbr" were last updated on 27 February 2018 and the data in dataset "rail_tf_trainmv" and "rail_pa_quartal" were updated on 04 January 2018. These updates were taken into account in the assessment. The consistency of data was verified by the Agency for year 2015 by comparing the Eurostat data with CSI data. There were no major differences².

Previously, the CSI data were compared to the Eurostat data. Due to changes in the data collection by Eurostat with effect from 2016 the CSI data only are used. The CSI data were extracted on the 21 February 2018 from the Agency's ERAIL-CSI database. The Annex 4 of this report highlights the instances where the CSI data had to be used in place of Eurostat values in previous years. The Eurostat data for carrying out the assessment for the categories level crossing users, unauthorised persons and others were inferred as described in the Annex of the "Report on the development of the second set of CSTs", as they are not directly available in Eurobase³. However, with this assessment these data are available within the CSI datasets and no inference has therefore to be made.

3.2. Definitions

The following definitions are used in the analysis:

- 'fatalities and weighted serious injuries (FWSIs)' means a measurement of the consequences of significant accidents combining fatalities and serious injuries, where 1 serious injury is considered statistically equivalent to 0,1 fatalities;
- 'passengers' means all persons being on board a passenger train;
- 'level crossing users' means all persons using a level crossing to cross the railway line by any means of transportation or by foot;
- 'staff' or 'employees including the staff of contractors' means any persons whose employment is in connection with a railway and is at work at the moment of the accident; it includes the crew of the train and persons handling rolling stock and infrastructure installations;
- 'unauthorised persons on railway premises' means any persons present on railway premises where such presence is forbidden, with the exception of level crossing users;
- 'others (third parties)' means all persons not defined as 'passengers', 'employees including the staff of contractors', 'level crossing users' or 'unauthorised persons on railway premises', and
- 'risk to the society as a whole' means the collective risk to all categories of persons listed in Article 7(4)(a) of Directive 2004/49/EC and Article 7 (1)(a) of Directive EU 2016/798.

² Minor differences may exist due to the minor differences of the reporting scopes for CSI data and Eurostat data. Two minor differences were identified: number of accidents in 2015 in Poland and number of train-kms in 2014 in Denmark.

³ In Eurobase only the following 3 categories of victims are available: passengers, employees and others.

3.3. Four-step assessment procedure

The four-step assessment procedure described in chapter 3 of the Annex of the Method [2] has been applied for each of the six risk categories:

- › passengers (1.1 and 1.2);
- › employees (2);
- › level crossing users (3.1);
- › others (4);
- › unauthorised persons on railway premises (5);
- › whole society (6).

There are four steps in the procedure for assessing the achievement of NRVs; these are described in the flowchart in Figure 1, which is taken from the Appendix 2 to the Annex to the Method [2]. The “yes-arrows” correspond to a passed result and the no-arrows to a failed result at each step.

The first step and first part of the second step are performed autonomously by the Agency using the Eurostat/CSI data. In the second part of the second step, the Agency has to use the input of the Member States concerned for the specifics of the single highest-consequence accident in the most recent years excluding the years used to set the NRVs.

The third and fourth steps are carried out by the Agency autonomously with the Eurostat data.

The detailed description of the content of the each step is available in chapter 3.2 of the Annex to the Method [2].

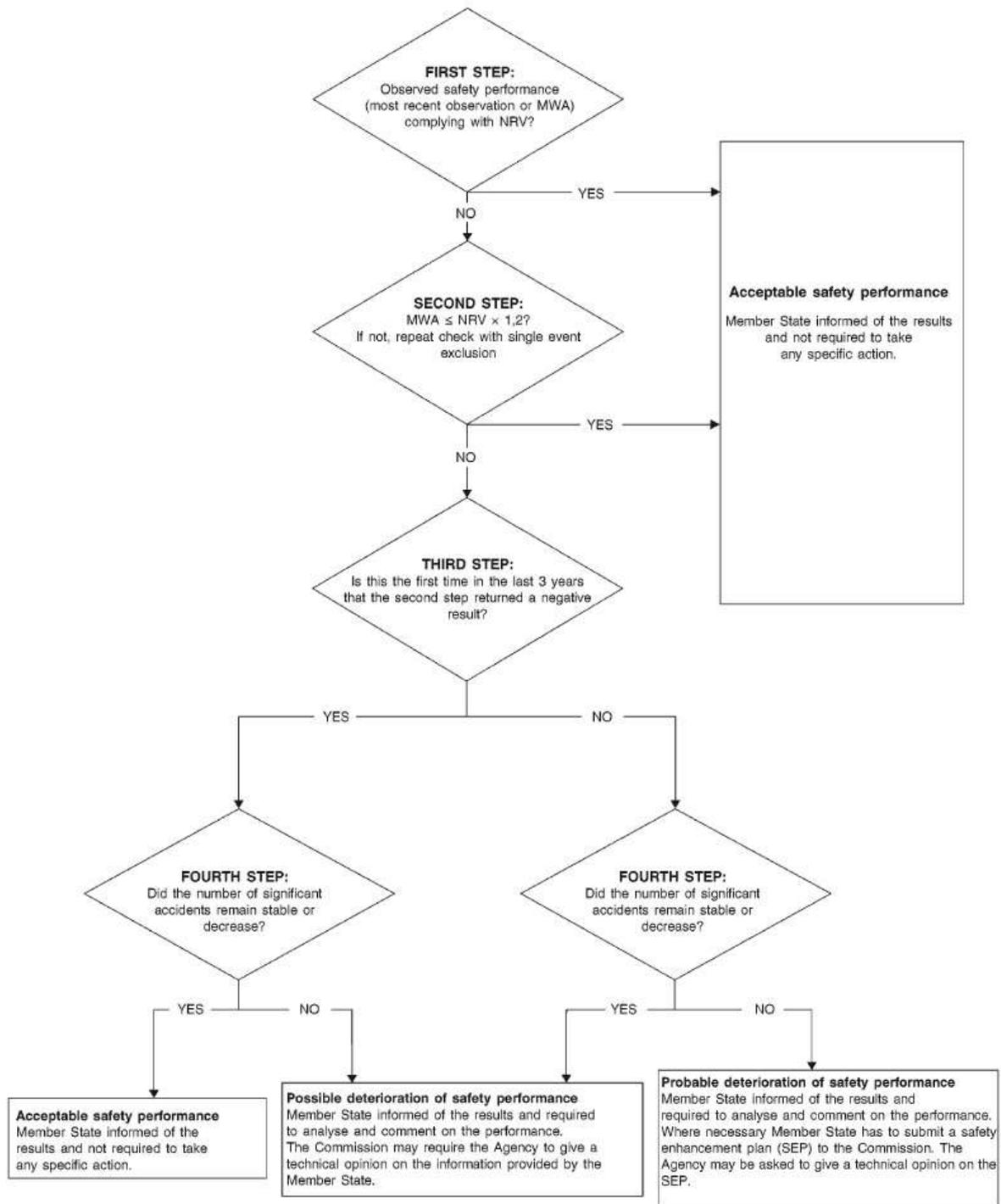


Figure 1 : Decision flowchart for the assessment procedure of CSTs

4. Results of the assessment

4.1. First and second step of the assessment procedure

The majority of Member States achieved a ‘passed’ result at either the first or second step of the assessment for all risk categories considered, indicating acceptable safety performance (see Figure 1). For seven Member States and Norway, there was a ‘failed’ result for one or more specific risk categories in the intermediate second step (see Annex and Table 1)⁴.

Table 1 : Intermediate results of the 2018 assessment: Member States failing after two steps of the assessment method - after applying the 20 % tolerance.

| Risk category | Passengers | | Employees | Level crossing users | Others | Unauthorised persons | Whole society |
|------------------------------------|------------|------|--|----------------------|---------|----------------------|---------------|
| | 1.1 | 1.2 | 2 | 3.1 | 4 | 5 | 6 |
| Failing after 2 nd step | None | None | Bulgaria Hungary Romania Slovakia | Bulgaria | Hungary | Italy | None |

Note: [] in Tables 1-4 and in Annex 3 refer to the fact that Norway is not a MS so the CSM does not formally apply to it.

According to the Annex of the Method [2] describing the assessment method, if the tolerance of 20 % is not met, the Agency shall ask the safety authority of the Member State concerned to provide the specifics of the single highest-consequence accident in the most recent years excluding the years used to set NRV, here namely in the period 2012 - 2016.

The single highest-consequence accidents were identified in cooperation with Member States (Table 2). Only if this single accident occurring in the period 2012 - 2016 was more severe, in terms of consequences, than the most severe single accident included in the data used for setting the NRV (years 2004-2009), then it will be excluded from the statistics for the revised calculation. The overview in Table 2 shows whether this was the case.

Table 2 : Single highest-consequence accidents in the period 2012 - 2016 for Member States failing after two steps of the assessment

| MS | NRV | Accident specifics (relevant highest-consequence accident in 2012-2016) | Excluded |
|----|-----|--|----------|
| BG | 2 | 12/07/2014 – Train derailment at the station of Kaloyanovetz resulting in 1 person killed (train driver) and 4 persons seriously injured (employees) | Yes |
| BG | 3.1 | 04/01/2014 – Level crossing accident at Dona Mahala – Banya crossing resulting in the death of 2 car occupants and 2 seriously injured car occupants | Yes |
| HU | 2 | 28/11/2016 -Level crossing accident Nyúl resulting in the death of the train driver and one other member of staff suffered serious injuries | No |
| HU | 4 | 26/12/2015 Accident between Csorna és Szil-Sopronnémeti stations, when a train hit two men who lost their lives | No |
| IT | 5 | 19/10/2012 – Accident to persons in Viareggio Station resulting in 3 persons killed (others) | Yes |
| RO | 2 | 29/11/2016 – Other event at Barsesti resulting in 2 persons killed (employees) | Yes |

⁴ The NRVs and CST for the risk category 3.2 were not established in the second set due to the lack of data reliability.

| | | | |
|----|---|---|----|
| SK | 2 | 23/01/2013 – Level crossing accident at section between railway stations Liptovský Hradok and Liptovský Mikulas, resulting in 1 killed (employee) and 1 seriously injured (passenger) | No |
|----|---|---|----|

The MWA were recalculated for NRVs of MSs where the single highest-consequence accident was excluded from the dataset. The final results of the second assessment step are summarised in Table 3.

Table 3 : Intermediate results of the assessment: Member States failing after two steps of the assessment method (after exclusion of the single highest-consequence accident).

| Risk category | Passengers | | Employees | Level crossing users | Others | Unauthorised persons | Whole society |
|------------------------------------|------------|------|---------------------------------|----------------------|---------|----------------------|---------------|
| | 1.1 | 1.2 | 2 | 3.1 | 4 | 5 | 6 |
| Failing after 2 nd step | None | None | Bulgaria Hungary Slovakia | Bulgaria | Hungary | Italy | None |

The values and the result of the second step are summarized in the Annex 3.

4.2. Third and fourth step of the assessment procedure

Third and fourth assessment steps were applied to the above cases leading to a ‘passed’ result – acceptable safety performance – for the majority of cases, except the ones summarized in Table 4. Since in some cases it was not the first time in the last three years that the second step returned negative result, the final result of the assessment is “possible deterioration of safety performance” despite the decreasing trend in significant accidents.

Table 4 : Final result of the assessment after applying all four steps of the assessment method.

| Risk category | Passengers | | Employees | Level crossing users | Others | Unauthorised persons | Whole society |
|---|------------|------|---------------------------------|----------------------|---------|----------------------|---------------|
| | 1.1 | 1.2 | 2 | 3.1 | 4 | 5 | 6 |
| Result after 4 th step: possible deterioration | None | None | Bulgaria Hungary Slovakia | Bulgaria | Hungary | Italy | None |

For **Bulgaria**, it was the third time in the past four years that the second step returned negative result in the category of Employees (2) and Level crossing users (3.1). Because of the methodology, since the number of relevant significant accidents has decreased, the result of the assessment is possible deterioration of safety performance in the category of Employees (2) and Level crossing users (3.1).

For **Hungary**, it was the second time in the past three years that the second step returned negative result in the category of Employees (2) and Others (4). Because of the methodology, since the number of relevant significant accidents has decreased, the result of the assessment is possible deterioration of safety performance in the category of Employees (2) and Others (4).

For **Italy**, it was the fourth time in the past four years that the second step returned negative result for the category of Unauthorised Persons (5). Because of the methodology, since the number of relevant significant accidents has decreased, the result of the assessment is possible deterioration of safety performance in the category of Unauthorised persons (5).

For **Slovakia**, it was the fourth time in the past four years that the second step returned negative result in the category of Employees (2). Because of the methodology, since the number of relevant significant accidents has decreased, the result of the assessment is possible deterioration of safety performance in the category of Employees (2).

This completes the ninth assessment on the achievement of the second set of CSTs and NRVs.

4.3. Analysis of the results

The ninth annual assessment of achievements of safety targets led to acceptable safety performance in the categories of passengers (1) and others (4) in all Member States. Possible deterioration of safety performance was identified in the categories of employees (2), level crossing users (3), others (4) and unauthorised persons (5).

Employees and unauthorised persons categories are the two categories in which unacceptable safety performance has been identified most frequently across all annual assessments (see Annex 6).

As regards the category of Employees (2), due to the small number of fatalities, for Member States failing in this category (between 1 and 2 fatalities per year), the negative results of the assessment may not necessarily reflect a trend in underlying safety performance. It may also reflect poor risk management in this category.

4.3.1. Trend in significant accidents

Although not required by the legislation, the Agency used the procedure to give information to the Member States on the possible trends in the number of significant accidents. The third and fourth step of the assessment procedure was applied to examine the data for a trend in the number of significant accidents, which might suggest that safety performance should be looked at more closely in the future. The Agency applied these steps to the data for those Member States and risk categories, which had passed either the first or the second step. The results indicated a ‘failed’ outcome in the following Member States and risk categories (Table 5).

Table 5 : Member States in which there was statistically significant increase in accident risk in 2016

| <i>Risk category</i> | <i>All significant accidents</i> | <i>Accidents involving level crossing users</i> | <i>Accidents to persons caused by rolling stock in motion</i> |
|---|----------------------------------|---|---|
| <i>Trend in significant accidents neither decreasing nor stable</i> | <i>France</i> | <i>Hungary</i> | <i>none</i> |

4.3.2. Data limitations

The previous assessments had found discrepancies between the Eurostat and CSI data for 2015 for Poland and Slovakia. These discrepancies had no impact on the result of Poland and the discrepancy was subsequently addressed through the Polish Statistical Office.

In the case of Slovakia, following the correction of Eurostat data by the Slovakian statistical office in 2013, in the Decision 2013/753/EU [6] amending the second set of NRVs (CSTs), the NRVs for categories of passengers (1.1 and 1.2), employees (2) and unauthorised persons (5) have been updated. However, this update did not take into account the category of the whole society (6), which should have been updated as well. The Agency had been alerted about this discrepancy by email from the Slovakian NSA on 22 March 2017. After applying the assessment to the correctly calculated NRVs, the result of the assessment was acceptable safety performance in the category of the whole society (6).

5. Conclusions

As result of the application of the CST methodology, railway safety remains acceptable (below the relevant EU reference value) in all categories of users due to the decreasing number of accidents. Nevertheless, the Agency remains concerned because:

- According to the latest CSIs reported (2016), the raw data reveals a slight increase of fatalities and an increase of serious injuries over a reduced number of accidents.
- Amongst the others, the number of passengers and workers fatalities and serious injuries is increasing or stable in the best case.

Because of the limitation in terms of data granularity and volume, it is once again not possible to draw further conclusions on trends in safety performance in all individual Member States in the framework of safety targets. This is especially the case for categories involving small number of fatalities (e.g. Employees), where the Method is necessarily limited to the small set of lagging indicators collected according to Annex 1 of the Railway Safety Directive [1]. In order to provide more proactive trend analysis, the Agency is developing proposals for wider occurrence reporting and will initiate a wider discussion with stakeholders about the value of numerical safety targets. This will be the basis for the future mandate to the Agency for revising or retaining the current CSM and CSTs.

The Eurostat database is the source of data having precedence over the CSI data, as set out in point 1.1.2 of the Annex of the Method [2]. There is still a limitation associated with reliance on the Eurostat data used for the establishment of the second set of NRVs (e.g. case of Slovakia, as mentioned in chapter 4.3.2.) and for this evaluation, as they are in some cases inconsistent with the CSI data collected by the NSAs and reported to the Agency.

Noting the constraints of using the current set of NRVs as set out in the Method, this 2018 assessment of achievements of safety targets identified “possible deterioration of safety performance” in four categories of railway users in four EU Member States.

In accordance with Article 5 of the Method [2], the Member States that achieved a negative result in this assessment, with a possible deterioration of railway safety in one or more categories, “*shall send to the Commission the likely causes of the results obtained*”.

The Commission may consider specifying the deadline and format of the report, since these are not provided in the Article 5 of the Method, as well as underlining the requirements on the content of the report.

Annex 1 References

| <i>N°</i> | <i>Description</i> | <i>Reference</i> | <i>Version</i> |
|-----------|--|--|---|
| [1] | Directive 2004/49/EC of the European Parliament and of the Council on safety on the Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (Railway Safety Directive) | 2004/49/EC (Railway Safety Directive) | Amended by Directive 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community and by Directive 2008/110/EC of the European Parliament and of the Council of 23 December 2008 amending the Railway Safety Directive and by Commission Directive 2009/149/EC of 27 November 2009 amending Directive 2004/49/EC of the European Parliament and of the Council as regards Common Safety Indicators and common methods to calculate accident costs |
| [2] | Commission Decision on the adoption of a common safety method for assessment of achievement of safety targets, as referred to in Article 6 of Directive 2004/49/EC of the European Parliament and of the Council | 2009/460/EC (CSM) | OJ L 150/11, 5 June 2009 |
| [3] | Regulation (EC) No 91/2003 of the European Parliament and of the Council on rail transport statistics | (EC) 91/2003 | Amended by Commission Regulation (EC) 1192/2003 |
| [4] | Commission implementing decision of 22 July 2011 on a mandate to the European Railway Agency on the revision of common safety targets and related common safety method for period 2011-2015 | C(2011) 5158 | 22 July 2011 |
| [5] | Commission Decision on the second set of common safety targets as regards the rail system | 2012/226/EU | 23 April 2012 |
| [6] | Commission implementing decision of 11 December amending Decision 2012/226/EU on the second set of common safety targets for the rail system | 2013/753/EU | 11 December 2013 |

Annex 2 Abbreviations

| <i>Abbreviation</i> | <i>Definition</i> |
|---------------------|--|
| Agency | European Union Agency for Railways (formerly European Railway Agency, ERA) |
| CSI | Common Safety Indicator |
| CSM | Common Safety Method |
| CST | Common Safety Target |
| EC | European Commission |
| ERAIL | European Railway Accident Information Links (Agency's database) |
| EU | European Union |
| MS | Member State |
| MWA | Moving Weighted Average |
| NSA | National Safety Authority |
| NRV | National Reference Value |
| OSP | Observed Safety Performance |

Annex 3 Intermediate results of the assessment (after second step)

| | Risk to passengers (1.1) | | | | |
|---------------------|-----------------------------|------------------------|---|-----------------------------|---------------------------------|
| | NRV (*10e-9) [2004-2009] | OSP (*10e-9) [2016] | OSP [2016] < NRV [2004- 2009] Yes/No | MWA (*10e-9) [2012-2016] | MWA \leq NRV*1,2 Yes/No |
| Belgium (BE) | 37,3 | 37,03 | Yes | | |
| Bulgaria (BG) | 207,0 | 61,14 | Yes | | |
| Czech Republic (CZ) | 46,5 | 44,46 | Yes | | |
| Denmark (DK) | 9,0 | 0,00 | Yes | | |
| Germany (DE) | 8,1 | 13,32 | No | 5,77 | Yes |
| Estonia (EE) | 78,2 | 0,00 | Yes | | |
| Ireland (IE) | 2,7 | 0,00 | Yes | | |
| Greece (EL) | 54,7 | 5,92 | Yes | | |
| Spain (ES) | 29,2 | 26,88 | Yes | | |
| France (FR) | 22,5 | 7,60 | Yes | | |
| Croatia (HR) | 176,9 | 5,18 | Yes | | |
| Italy (IT) | 38,1 | 63,46 | No | 3,11 | Yes |
| Latvia (LV) | 78,2 | 0,00 | Yes | | |
| Lithuania (LT) | 97,2 | 0,00 | Yes | | |
| Luxembourg (LU) | 23,8 | 0,00 | Yes | | |
| Hungary (HU) | 170 | 67,72 | Yes | | |
| Netherlands (NL) | 7,4 | 6,82 | Yes | | |
| Austria (AT) | 26,3 | 17,16 | Yes | | |
| Poland (PL) | 116 | 9,61 | Yes | | |
| Portugal (PT) | 41,8 | 6,64 | Yes | | |
| Romania (RO) | 57 | 0,00 | Yes | | |
| Slovenia (SI) | 25,3 | 0,00 | Yes | | |
| Slovakia (SK) | 62,1 | 23,12 | Yes | | |
| Finland (FI) | 9,0 | 0,00 | Yes | | |
| Sweden (SE) | 3,54 | 0,00 | Yes | | |
| United Kingdom (UK) | 2,73 | 1060,88 | No | 3,11 | Yes |
| Norway (NO) | 2,83 | 0,00 | Yes | | |

| | Risk to passengers (1.2) | | | | |
|---------------------|-----------------------------|------------------------|---|-----------------------------|----------------------------|
| | NRV (*10e-9) [2004-2009] | OSP (*10e-9) [2016] | OSP [2016] < NRV [2004- 2009] Yes/No | MWA (*10e-9) [2012-2016] | MWA ≤ NRV*1,2 Yes/No |
| Belgium (BE) | 0,318 | 0,275 | Yes | | |
| Bulgaria (BG) | 1,911 | 0,962 | Yes | | |
| Czech Republic (CZ) | 0,817 | 0,589 | Yes | | |
| Denmark (DK) | 0,110 | 0,000 | Yes | | |
| Germany (DE) | 0,081 | 0,110 | No | 0,055 | Yes |
| Estonia (EE) | 0,665 | 0,000 | Yes | | |
| Ireland (IE) | 0,028 | 0,000 | Yes | | |
| Greece (EL) | 0,503 | 0,084 | Yes | | |
| Spain (ES) | 0,270 | 0,166 | Yes | | |
| France (FR) | 0,110 | 0,033 | Yes | | |
| Croatia (HR) | 1,135 | 0,121 | Yes | | |
| Italy (IT) | 0,257 | 1,639 | No | 0,057 | Yes |
| Latvia (LV) | 0,665 | 0,000 | Yes | | |
| Lithuania (LT) | 0,757 | 0,000 | Yes | | |
| Luxembourg (LU) | 0,176 | 0,000 | Yes | | |
| Hungary (HU) | 1,65 | 3,206 | No | 0,751 | Yes |
| Netherlands (NL) | 0,0889 | 0,224 | No | 0,045 | Yes |
| Austria (AT) | 0,292 | 0,144 | Yes | | |
| Poland (PL) | 0,849 | 0,331 | Yes | | |
| Portugal (PT) | 0,309 | 0,200 | Yes | | |
| Romania (RO) | 0,61 | 0,000 | Yes | | |
| Slovenia (SI) | 0,362 | 0,000 | Yes | | |
| Slovakia (SK) | 0,883 | 0,869 | Yes | | |
| Finland (FI) | 0,110 | 0,000 | Yes | | |
| Sweden (SE) | 0,0329 | 0,000 | Yes | | |
| United Kingdom (UK) | 0,0276 | 0,009 | Yes | | |
| Norway (NO) | 0,033 | 0,000 | Yes | | |

| Member State | Risk to employees (2) | | | | |
|---------------------|-----------------------------|------------------------|---|-----------------------------|---------------------------------|
| | NRV (*10e-9) [2004-2009] | OSP (*10e-9) [2016] | OSP [2016] < NRV [2004- 2009] Yes/No | MWA (*10e-9) [2012-2016] | MWA \leq NRV*1,2 Yes/No |
| Belgium (BE) | 24,6 | 0,00 | Yes | | |
| Bulgaria (BG) | 20,4 | 35,01 | No | 38,02 | No |
| Czech Republic (CZ) | 16,5 | 17,80 | No | 16,00 | Yes |
| Denmark (DK) | 9,1 | 15,93 | No | 3,24 | Yes |
| Germany (DE) | 12,6 | 11,33 | Yes | | |
| Estonia (EE) | 64,8 | 0,00 | Yes | | |
| Ireland (IE) | 5,2 | 0,00 | Yes | | |
| Greece (EL) | 77,9 | 0,00 | Yes | | |
| Spain (ES) | 8,8 | 4,76 | Yes | | |
| France (FR) | 6,1 | 4,45 | Yes | | |
| Croatia (HR) | 73,7 | 60,86 | Yes | | |
| Italy (IT) | 18,9 | 0,27 | Yes | | |
| Latvia (LV) | 64,83 | 128,17 | No | 40,97 | Yes |
| Lithuania (LT) | 41,0 | 0,00 | Yes | | |
| Luxembourg (LU) | 12,0 | 0,00 | Yes | | |
| Hungary (HU) | 9,3 | 12,04 | No | 10,96 | Yes |
| Netherlands (NL) | 5,97 | 1,28 | Yes | | |
| Austria (AT) | 20,3 | 44,33 | No | 27,17 | No |
| Poland (PL) | 17,2 | 16,62 | Yes | | |
| Portugal (PT) | 53,1 | 0,00 | Yes | | |
| Romania (RO) | 22,3 | 5,00 | Yes | | |
| Slovenia (SI) | 40,9 | 0,00 | Yes | | |
| Slovakia (SK) | 2,71 | 45,66 | No | 27,42 | No |
| Finland (FI) | 9,21 | 2,06 | Yes | | |
| Sweden (SE) | 2,86 | 7,20 | No | 7,32 | No |
| United Kingdom (UK) | 5,17 | 0,35 | Yes | | |
| Norway (NO) | 2,82 | 0,00 | Yes | | |

| Member State | Risk to level crossing users (3.1) | | | | |
|---------------------|------------------------------------|------------------------|---|-----------------------------|---------------------------------|
| | NRV (*10e-9) [2004-2009] | OSP (*10e-9) [2016] | OSP [2016] < NRV [2004- 2009] Yes/No | MWA (*10e-9) [2012-2016] | MWA \leq NRV*1,2 Yes/No |
| Belgium (BE) | 138,0 | 115,87 | Yes | | |
| Bulgaria (BG) | 141,6 | 94,52 | Yes | | |
| Czech Republic (CZ) | 237,8 | 125,24 | Yes | | |
| Denmark (DK) | 65,4 | 15,93 | Yes | | |
| Germany (DE) | 67,8 | 51,17 | Yes | | |
| Estonia (EE) | 399,9 | 0,00 | Yes | | |
| Ireland (IE) | 23,6 | 0,00 | Yes | | |
| Greece (EL) | 710,3 | 793,58 | No | 550,38 | Yes |
| Spain (ES) | 108,7 | 34,26 | Yes | | |
| France (FR) | 78,7 | 57,09 | Yes | | |
| Croatia (HR) | 611,3 | 461,55 | Yes | | |
| Italy (IT) | 42,9 | 23,74 | Yes | | |
| Latvia (LV) | 239 | 139,8 | Yes | | |
| Lithuania (LT) | 522 | 142,9 | Yes | | |
| Luxembourg (LU) | 95,9 | 0,0 | Yes | | |
| Hungary (HU) | 274 | 240,7 | Yes | | |
| Netherlands (NL) | 127 | 78,3 | Yes | | |
| Austria (AT) | 160 | 156,5 | Yes | | |
| Poland (PL) | 277 | 288,4 | No | 283,46 | Yes |
| Portugal (PT) | 461 | 164,2 | Yes | | |
| Romania (RO) | 542 | 235,2 | Yes | | |
| Slovenia (SI) | 364 | 124,1 | Yes | | |
| Slovakia (SK) | 309 | 308,8 | Yes | | |
| Finland (FI) | 164 | 133,9 | Yes | | |
| Sweden (SE) | 64,0 | 42,6 | Yes | | |
| United Kingdom (UK) | 23 | 3,5 | Yes | | |
| Norway (NO) | 21,6 | 24,7 | No | 26,29 | No |

| Member State | Risk to 'others' (4) | | | | |
|---|-----------------------------|------------------------|---|-----------------------------|----------------------------|
| | NRV (*10e-9) [2004-2009] | OSP (*10e-9) [2016] | OSP [2016] < NRV [2004-2009] Yes/No | MWA (*10e-9) [2012-2016] | MWA ≤ NRV*1,2 Yes/No |
| Belgium (BE) | 2,86 | 0,00 | Yes | | |
| Bulgaria (BG) | 35,47 | 0,00 | Yes | | |
| Czech Republic (CZ) | 2,41 | 0,64 | Yes | | |
| Denmark (DK) | 14,15 | 19,11 | No | 6,51 | Yes |
| Germany (DE) | 3,05 | 1,06 | Yes | | |
| Estonia (EE) | 11,64 | 0,00 | Yes | | |
| Ireland (IE) | 7,00 | 0,00 | Yes | | |
| Greece (EL) | 4,51 | 0,00 | Yes | | |
| Spain (ES) | 5,54 | 4,76 | Yes | | |
| France (FR) | 7,71 | 0,00 | Yes | | |
| Croatia (HR) | 7,28 | 0,00 | Yes | | |
| Italy (IT) | 6,70 | 2,73 | Yes | | |
| Latvia (LV) | 11,6 | 0,00 | Yes | | |
| Lithuania (LT) | 11,6 | 0,00 | Yes | | |
| Luxembourg (LU) | 5,46 | 0,00 | Yes | | |
| Hungary (HU) | 4,51 | 0,00 | Yes | | |
| Netherlands (NL) | 4,70 | 0,00 | Yes | | |
| Austria (AT) | 11,1 | 1,96 | Yes | | |
| Poland (PL) | 11,6 | 0,00 | Yes | | |
| Portugal (PT) | 5,54 | 0,00 | Yes | | |
| Romania (RO) | 2,83 | 0,00 | Yes | | |
| Slovenia (SI) | 14,48 | 5,64 | Yes | | |
| Slovakia (SK) | 2,41 | 0,00 | Yes | | |
| Finland (FI) | 14,2 | 0,00 | Yes | | |
| Sweden (SE) | 14,2 | 6,55 | Yes | | |
| United Kingdom (UK) | 7,00 | 0,00 | Yes | | |
| Norway (NO) | 14,15 | 0,00 | Yes | | |
| Risk category 'others' has been excluded from the assessment | | | | | |

| Member State | Risk to unauthorised persons (5) | | | | |
|---------------------|----------------------------------|------------------------|---|-----------------------------|----------------------------------|
| | NRV (*10e-9) [2004-2009] | OSP (*10e-9) [2016] | OSP [2016] < NRV [2004- 2009] Yes/No | MWA (*10e-9) [2012-2016] | MWA \cong NRV*1,2 Yes/No |
| Belgium (BE) | 72,64 | 34,14 | Yes | | |
| Bulgaria (BG) | 900,20 | 560,15 | Yes | | |
| Czech Republic (CZ) | 301,26 | 29,88 | Yes | | |
| Denmark (DK) | 116,24 | 114,67 | Yes | | |
| Germany (DE) | 113,08 | 86,12 | Yes | | |
| Estonia (EE) | 1547,95 | 1194,67 | Yes | | |
| Ireland (IE) | 85,23 | 0,00 | Yes | | |
| Greece (EL) | 722,94 | 775,12 | No | 652,49 | Yes |
| Spain (ES) | 167,83 | 58,53 | Yes | | |
| France (FR) | 67,16 | 44,94 | Yes | | |
| Croatia (HR) | 676,30 | 334,75 | Yes | | |
| Italy (IT) | 119 | 140,8 | No | 145,25 | No |
| Latvia (LV) | 1314 | 302,9 | Yes | | |
| Lithuania (LT) | 2045 | 514,5 | Yes | | |
| Luxembourg (LU) | 79,9 | 0,0 | Yes | | |
| Hungary (HU) | 588 | 746,3 | No | 633,16 | Yes |
| Netherlands (NL) | 15,9 | 0,0 | Yes | | |
| Austria (AT) | 119 | 62,6 | Yes | | |
| Poland (PL) | 1213 | 840,2 | Yes | | |
| Portugal (PT) | 834 | 355,4 | Yes | | |
| Romania (RO) | 1388 | 816,9 | Yes | | |
| Slovenia (SI) | 236 | 0,0 | Yes | | |
| Slovakia (SK) | 1758 | 824,1 | Yes | | |
| Finland (FI) | 249 | 22,7 | Yes | | |
| Sweden (SE) | 94,8 | 57,0 | Yes | | |
| United Kingdom (UK) | 84,5 | 38,2 | Yes | | |
| Norway (NO) | 91,8 | 446,9 | No | 440,65 | No |

| Member State | Societal risks (6) | | | | |
|---------------------|-----------------------------|------------------------|---|-----------------------------|---------------------------------|
| | NRV (*10e-9) [2004-2009] | OSP (*10e-9) [2014] | OSP [2014] < NRV [2004- 2009] Yes/No | MWA (*10e-9) [2010-2014] | MWA \leq NRV*1,2 Yes/No |
| Belgium (BE) | 275,05 | 139,67 | Yes | | |
| Bulgaria (BG) | 1440,00 | 784,20 | Yes | | |
| Czech Republic (CZ) | 591,22 | 218,06 | Yes | | |
| Denmark (DK) | 217,92 | 116,26 | Yes | | |
| Germany (DE) | 203,16 | 136,14 | Yes | | |
| Estonia (EE) | 2107,86 | 301,81 | Yes | | |
| Ireland (IE) | 114,43 | 0,00 | Yes | | |
| Greece (EL) | 1535,77 | 1393,37 | Yes | | |
| Spain (ES) | 322,57 | 100,88 | Yes | | |
| France (FR) | 179,94 | 117,61 | Yes | | |
| Croatia (HR) | 1467,00 | 862,24 | Yes | | |
| Italy (IT) | 231 | 135,63 | Yes | | |
| Latvia (LV) | 1659 | 623,36 | Yes | | |
| Lithuania (LT) | 2588 | 607,36 | Yes | | |
| Luxembourg (LU) | 210 | 0,00 | Yes | | |
| Hungary (HU) | 1020 | 1044,44 | No | 929,93 | Yes |
| Netherlands (NL) | 148 | 120,00 | Yes | | |
| Austria (AT) | 329 | 257,51 | Yes | | |
| Poland (PL) | 1590 | 1155,02 | Yes | | |
| Portugal (PT) | 1362 | 495,40 | Yes | | |
| Romania (RO) | 0 | 1099,56 | No | 1351,08 | No |
| Slovenia (SI) | 698 | 129,70 | Yes | | |
| Slovakia (SK) | 1131 | 1182,89 | No | 1257,18 | Yes |
| Finland (FI) | 417 | 158,59 | Yes | | |
| Sweden (SE) | 169 | 112,61 | Yes | | |
| United Kingdom (UK) | 120 | 42,21 | Yes | | |
| Norway (NO) | 51 | 45,30 | Yes | | |

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Annex 4 Input data overview

The table below shows the instances in which the CSI data had to be used in place of Eurostat data, as they were not available in Eurobase.

| <i>Data category</i> | <i>Country and year</i> | <i>Remark (Eurostat)</i> |
|--|---|--|
| Fatalities and serious injuries (rail_ac_catvict) | None All (2016) | The Agency now provides the single data collection point |
| Rail accidents (rail_ac_catnubr) | PL (2015) All (2016) | The Agency now provides the single data collection point |
| Train movement for all trains Train-km (rail_tf_trainmv) | BE (2012, 2013, 2014, 2015) DE (2011, 2012, 2015) DK (2014, 2015) EL (2012) FR (2011, 2013, 2014, 2015) IT (2011) HU (2015) NL (2012, 2013, 2014, 2015) PT (2014) | Not published due to quality issues. |
| Train movement for passenger trains Passenger train-km (rail_tf_trainmv) | BE (2012, 2013, 2014, 2015) DE (2011, 2012, 2015) DK (2014, 2015) FR (2011, 2013, 2014, 2015) IT (2011) HU (2015) NL (2012, 2013, 2014, 2015) | Not published due to quality issues. |
| Train movement Passenger-km (rail_pa_quartal) | BE (2013, 2014, 2015, 2016) AT (2011, 2012, 2013, 2014, 2015, 2016) | Data are confidential. |

Annex 5 Overview of annual assessments

This assessment is the eighth assessment of achievements of CSTs carried out by the Agency. The table below provides an overview of the specificities of all assessments made by the Agency so far in respect to the years considered for these assessments.

| CST Assessment | Publication year | Year | | | | | | | | | | | | | |
|----------------|------------------|--------------------------------|------|------|------|---------------|---------------|------|------|------|------|------|------|------|--|
| | | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | |
| First | 2010 | 1st set of CSTs/NRVs | | | | MWA (4 years) | | | | OSP | | | | | |
| Second | 2011 | 1st set of CSTs/NRVs | | | | MWA (4 years) | | | | OSP | | | | | |
| Third | 2012 | 2nd set of CSTs/NRVs | | | | | MWA (5 years) | | | | | OSP | | | |
| Fourth | 2013 | 2nd set of CSTs/NRVs | | | | | MWA (5 years) | | | | | OSP | | | |
| Fifth | 2014 | 2nd set of CSTs/NRVs (amended) | | | | | MWA (5 years) | | | | | OSP | | | |
| Sixth | 2015 | 2nd set of CSTs/NRVs (amended) | | | | | MWA (5 years) | | | | | OSP | | | |
| Seventh | 2016 | 2nd set of CSTs/NRVs (amended) | | | | | MWA (5 years) | | | | | OSP | | | |
| Eighth | 2017 | 2nd set of CSTs/NRVs (amended) | | | | | MWA (5 years) | | | | | OSP | | | |
| Ninth | 2018 | 2nd set of CSTs/NRVs (amended) | | | | | MWA (5 years) | | | | | OSP | | | |

Annex 6 Overview of the results of all annual assessments

The results of all assessments carried out by the Agency are summarized in the table below.

Note: For countries in **bold**, the result of “probable deterioration”, for countries in *italic* “possible deterioration” of safety performance. In all other cases, the result was “acceptable safety performance”.

| Assessment year and CSI or Eurostat data year | Risk category | Passengers | Employees | Level crossing users | Others | Unauthorised persons | Whole society | |
|---|---------------------------------------|------------|-----------|--|---------------------|-----------------------------------|---------------------------------------|----------------------|
| | | 1.1 | 1.2 | 2 | 3.1 | 4 | 5 | 6 |
| 2010 | | | | Romania | Romania | Romania | Romania | |
| 2011 | | | | Lithuania | | | Romania Slovakia | |
| 2012 | | | | | | | Sweden | |
| 2013 | | Slovakia | Slovakia | Romania Slovakia Bulgaria | | Romania | Romania Slovakia Sweden | Romania |
| 2014 Assessment 2012 CSI data | Failing after 2 nd step | none | none | Bulgaria Lithuania Poland Romania Slovenia Slovakia Sweden | Bulgaria Norway* | Croatia Netherlands Romania | Italy | Slovakia Norway* |
| 2015 Assessment 2013 CSI data | Failing after 2 nd step | Spain | Spain | Romania Slovakia | Bulgaria Norway* | Belgium Hungary | France Croatia Italy Norway* | Slovakia Norway* |
| 2016 Assessment 2014 CSI data | Failing after 2 nd step | None | None | Bulgaria Hungary Romania Slovakia Sweden | Bulgaria Norway* | Hungary | France Italy Norway* | Slovakia |
| 2017 Assessment 2015 CSI data | Failing after 2 nd step | None | None | Austria Bulgaria Slovakia Sweden | [Norway] | None | Italy [Norway] | Slovakia [Norway] |
| 2018 Assessment 2016 CSI data | Failing after 2 nd step | None | None | Bulgaria Hungary Romania Slovakia | Bulgaria | Hungary | Italy | None |