**Railway Safety Report**

TSG 2017-2928

The Swedish Transport Agency’s 2016 Annual Report

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Road and Railway Department

The Business Development and Support Unit

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Preface

The 2016 Safety Report describes Swedish railway safety. It describes the level of safety in Sweden and Swedish safety work. The report is based on both the accident and near-accident reports submitted to the Swedish Transport Agency on a regular basis and also the safety reports submitted by railway undertakings and infrastructure managers annually to the Swedish Transport Agency.

The report also contains our assessment of Swedish safety trends.

The descriptions comply with the requirements set out in Directive 2004/49/EC of the European Parliament and of the Council, also known as the Railway Safety Directive. The report is to be submitted to the Government and the European Union Agency for Railways (ERA) by 30 September each year.

Norrköping, September 2017

Jonas Bjelfvenstam

Director-General

Assessment of the safety of the railway system

There continues to be a high level of safety within the Swedish railway system. The Swedish Transport Agency's assessment is based on Sweden meeting the targets the European Commission has set out for measuring railway safety. The targets are measured and followed up in the risk categories

* passengers
* employees
* level crossing users
* unauthorised persons on railway premises
* others
* society.

Although Sweden is meeting all targets, we want to do even better. It is necessary to continue to work actively on reducing the number of fatalities and serious injuries within the railway system. At the same time, it is of the utmost importance to maintain safety within the areas where serious injuries have occurred.

Most people who die or are seriously injured in the railway system are not authorised to be there. This is true whether or not suicide is included. There are several measures for preventing and making it difficult for unauthorised persons to access the tracks. Fencing off critical areas and increased camera monitoring are just two examples. A new measure tested during the year is to put out anti-trespass grids, pointed rubber mats resembling egg cartons, near the ends of platforms.

The second most common group of accident victims is level crossing users, i.e. those involved in accidents to persons caused by rolling stock in motion when crossing the railway. This type of accident often happens at "passive level crossings" where there are no safety devices such as audio and light signals for the road traffic. Reinforcing the protection at level crossings or entirely replacing them are two solutions that could reduce the number of accidents.

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# INTRODUCTION

This report compiles the safety position of the railway in Sweden in 2016. The intention is to describe the total safety work in the country and also assess railway safety trends. The descriptions and assessments form the basis for highlighting specific areas where special measures may be necessary. The Railway Ordinance (SFS 2004:526) lays down minimum requirements with regard to the content.[[1]](#footnote-1)

The report covers and follows up on the Swedish state railway operation. Independent railways, such as infrastructure managers with tracks for their own goods, and underground and tram networks are not included. This is because the European Union Agency for Railways (ERA)[[2]](#footnote-2) wants the report to be comparable with the reports from other EU countries. The ERA presents a summary of the European position every two years. (ERA, 2016b)

We have two main sources of data for this report. These are the Swedish Transport Agency's database, where accidents and near accidents are reported on an ongoing basis over the year, and the safety reports that operators – railway undertakings and infrastructure managers – submit to the Swedish Transport Authority on an annual basis. According to the Railway Act (SFS 2004:519), the safety reports shall also include reporting of accidents, the number of level crossings and other precursors.

Apart from the ERA, the other main recipient of the report is the Government. It also applies to authorities, research institutes, railway undertakings, infrastructure managers and other stakeholders with an interest in railway matters.

The division into chapters follows the template set up by the ERA. In the next chapter, we will present the national achievement of the safety targets. In Chapter C, we describe accident trends regarding railway safety in greater detail. We then report on the safety oversight performed in 2016, where, among other things, the results from the operators' activities are presented. Chapter E contains information on safety certificates and safety authorisations and Chapter F discusses changes in the rules and regulations. The penultimate chapter describes the application of the common method used for risk evaluation and risk assessment. The report ends with a few lines about exceptions to the Ordinance regarding appointing an entity in charge of maintenance, ECM.

# NATIONAL STRATEGY AND ACHIEVEMENT OF SAFETY TARGETS

All EU countries have national safety targets, based on the results between 2004 and 2009 (Directive 2002/49/EC of the European Parliament and of the Council, Article 8 and Annex II). This section describes and analyses Sweden's national safety target achievements and safety strategy compliance in 2016. We report the statistics both including suicides (linked to the Government's target) and excluding suicides (linked to the EU target).

## National safety strategy

The Swedish Parliament has decided that the overall objective of transport policy is to ensure socio-economically effective and long-term sustainable transport services for the public, and trade and industry throughout the country. In addition, the Parliament has resolved a functional objective (accessibility) and an HES objective (health, environment and safety). The objectives, which take an overall approach to all types of traffic, steer the focus for the activities of the authorities in the transport area (Government Bill 2008/09:9).

The government’s transport policy objective for safety, environment and health stipulates that the design, function and use of the transport system must be adapted to ensure that no one is killed or seriously injured. The general public's ability to access railway lines is seen as part of the design of the transport system. For this reason, the objective includes suicide and suicide attempts in the railway system.

The impact objective, which is the same as the national safety target, is followed up regularly. In addition to this annual safety report, Transport Analysis (2017) performs annual follow-up on the national achievement of targets and publishes official accident statistics for rail traffic.

The main task of the Swedish Transport Agency is to assume responsibility for regulation, licensing and oversight in the field of transport. Achieving transport policy objectives for safety in the railway system is an important component of this work. Follow-ups are based on operators' reports on accidents and safety. They follow definitions of accident types in accordance with our regulations on safety reporting (TSFS 2011:86).

## Main conclusions for 2016

### Total accident statistics, including suicides and suicide attempts

In 2016, 82 persons died, which is the second lowest number over a ten-year period. It is important to bear in mind that there has been a wide variation between years. It is therefore too early to determine whether the reduction is a downward trend or a coincidence. Preliminary information for the first six months of 2017 demonstrates a continual decline, which may indicate that the trend is moving towards a decrease. There was no great change in the number of persons seriously injured. (Chapter C contains a fact box on accident statistic terms.)

#### The total number of fatalities and seriously injured persons in the railway system. 2006-2016.

Source: Swedish Transport Agency

|  |  |
| --- | --- |
| Omkomna, inkl självmord | Fatalities, incl. suicide |
| Allvarligt skadade, inkl självmordsförsök | Seriously injured, incl. attempted suicide |

### Accident statistics, including suicides and attempted suicide

The majority of those who die in the railway system do so as a result of suicide. The ERA bases its safety objectives on accident trends and the objectives do not include suicide and attempted suicide. We will return with statistics on suicides and attempted suicide in Section C.

In 2016 there were 60 serious accidents. Thirteen people died in the railway system as a consequence of accidents that occurred, and 11 were seriously injured. Figure 2 shows the number of fatalities and people seriously injured in railway accidents between the years 2006 and 2016.

#### Number of fatalities and people seriously injured in railway accidents, excluding suicides and attempted suicide. 2006‑2016.

Source: Swedish Transport Agency

|  |  |
| --- | --- |
| Omkomna i olyckshändelse | Fatalities in accidents |
| Allvarligt skadade i olyckshändelse | Seriously injured in accidents |

There are few fatalities and persons seriously injured as a result of accidents and the variation over the years is relatively wide. This contributes to trends being difficult to distinguish.

### The EU safety objectives

The Commission has laid down railway safety targets for the Member States, also called Common Safety Targets (CST). These EU targets are expressed as a statistically calculated measurement per risk category, known as national reference values (NRVs).

The targets have been calculated on the basis of the Member States' reporting of accidents that have occurred involving fatalities and serious injuries to the Commission's statistical office, Eurostat, and to the ERA. They are based on corresponding accidents outcomes for the period 2004–2009.[[3]](#footnote-3) The NRV denotes the maximum permissible level for each risk category and is a calculation of the number of fatalities in railway accidents in relation to the number of train kilometres (in billions). The NRV thus indicates what the number of fatalities would be if one billion train kilometres were travelled. In Sweden around 150 million train kilometres are produced every year (Transport Analysis, 2017).

The follow-up of the Member States' achievement of objectives is done through the ERA calculating the NRV annually in accordance with an established method based on the number of fatalities and weighted serious personal injuries per billion train kilometres. For passengers, passenger train kilometres and passenger kilometres are used. The number of persons seriously injured is weighted by a factor of 0.1. This means that 10 seriously injured persons are regarded as one fatality in the calculation.

The risk categories are as follows:

* passengers
* employees
* level crossing users
* unauthorised persons on railway premises
* others
* society (calculated according to the results for the other risk categories).

The method is described in a Commission decision (2009/460/EC, Article 3 point d ). The Swedish Transport Agency has carried out preliminary calculations for the results for 2016. The values in the table should be interpreted as the number of fatalities per billion train kilometres. There is one exception: for passengers, passenger train kilometres or passenger kilometres are used.

##### Result of achievement of targets for the risk categories in 2016.

Common Safety Targets (CST)\*

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk category** | **Established NRV 2004-2009** | **Result 2015** | **Result 2016** |
| Passengers  (CST 1.1, base passenger train kilometres) | 3.54 | 0.88 | 0 |
| Passengers  (CST 1.2, base passenger kilometres) | 0.033 | 0.008 | 0 |
| Employees  (CST 2) | 2.86 | 7.41 | 2.63 |
| Level crossing users  (CST 3.1) | 64 | 43.8 | 34.2 |
| Others  (CST 4) | 14.2 | 0.0 | 13.2 |
| Unauthorised persons on railway premises  (CST 5) | 94.8 | 64.0 | 42.8 |
| Society  (CST 6, total CST  1.1 – CST 5) | 169\*\* | 115.8 | 92.8 |

Source: Internal calculations in accordance with defined method.

1. \* All values to be multiplied by 10-9.

\*\* The value does not summarise the values above in the table. The reason is a technical calculation matter, with the base differing between years.

Sweden has achieved all seven objectives. The risk categories for which targets are, according to our calculations, being achieved but that are nevertheless close to the limit value are the risk for employees and the risk for others (e.g., persons on platforms).

### Analysis

In 2014 and 2015, Sweden did not achieve the safety target for employees. In both years there was one employee fatality, which led to the national reference value for employees being exceeded. The target is based on the low number of employee fatalities in the period 2004–2009. This means that the number of fatalities must be zero if we are to achieve the target. There were no employee fatalities in 2016.

A few serious accidents during the period 2010 to 2012 led to the Swedish Accident Investigation Authority (SHK) and us observing that the risk for employees in the track environment had increased. In 2012, SHK decided to commence a thematic investigation on safety in connection with track work. The report was published in November 2014 and we are still working on SHK's recommendations, including competence and authorisation matters. (SHK, 2014) In Table 2, we report all accidents involving employee fatalities between the years 2004 and 2016.

##### Summary of the accidents that resulted in the death of railway employees during the period 2004-2016.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Date of event** | **Location** | **Type of accident** | **Number of fatalities** | **Staff category** |
| 10 September 2004 | Fjälkinge – Kristianstad central (Skåne County) | Level-crossing accident | 2 | Train driver and on-board staff |
| 1 February 2010 | Linghem (Östergötland County) | Accident involving person | 1 | Track worker |
| 4 June 2010 | Tomteboda (Stockholm County) | Accident to person | 1 | Track worker |
| 15 August 2011 | Tungelsta (Stockholm County) | Accident to person | 1 | Track worker/Tree-felling |
| 3 November 2011 | Örtofta (Skåne County) | Accident to person | 1 | Track worker |
| 20 September 2012 | Sundsvall C (Västernorrland County) | Derailment | 1 | Remote-control operator/Switching work |
| 08 December 2014 | Malmö freight rail yard | Accident involving person | 1 | Switching work |
| 21 January 2015 | Sällinge (Örebro County) | Accident to person | 1 | Train driver |

Source: Swedish Transport Agency

Works carried out on a track installation, e.g. when changing sleepers, are relatively often performed by contractors, who in turn engage subcontractors. The Swedish Transport Agency’s responsibility under the Railway Act includes railway undertakings and infrastructure managers. The infrastructure manager is responsible for following up and checking that contractors engaged are complying with regulations. We can check in connection with its oversight that the procuring organisation (the infrastructure manager) has procedures to cover these checks. We continue to focus on following up employees' authorisations and competence.

A factor that limits the Swedish Transport Agency's mandate is that work in the track installation is generally covered by working environment regulations. They mean that the stakeholders need to have procedures leading to a safe working environment. It is when an employee is hit by a train, or a railway vehicle in motion, that the traffic safety rules come into force. Then the accident is classified as a railway accident.

In this area, the regulatory framework can be perceived as unclear by those who have to apply it, and it can be unclear which of the regulatory frameworks should be used as a basis for targeted measures. We are collaborating with the Swedish Work Environment Authority to help those who are applying the regulatory framework.

The starting point for our oversight is the safety management system, which includes the operators’ routines for areas such as management and control, risk assessment, monitoring and operations. The operators’ responsibilities include monitoring, reporting, investigating and addressing safety deficiencies in their operations.

The Swedish Transport Agency checks through its oversight that this actually happens.

The risk to others also has a low target value and means that there must be a maximum of three fatalities a year if the target is to be achieved. In 2016, there were two fatalities and one person was seriously injured. Looking at the past ten years, it is more commonly the case that there are no fatalities or serious injuries.

#### Comparison between the risk categories employees, level crossing users and others, NRV (\*10-9)

Source: Internal calculations in accordance with defined method.

|  |  |
| --- | --- |
| Anställda | Employees |
| Plankorsningstrafikanter | Level crossing users |
| Övriga | Others |
| 2004–2009 | 2004-2009 |

Although the targets for employees and others have only just been achieved, there is a greater risk for level crossing users. They constitute a large percentage of fatalities and seriously injured in railway accidents, but only a small percentage of road traffic accidents.

Level crossings are therefore at risk of not being prioritised when the road system is being renovated, as there may be measures in other areas that are considered to be more effective, see also Section C.1.

The ERA compiles an annual summary of the Member States' achievement of the targets for the risk categories (ERA, 2016a). The ERA also issues a safety report every two years based on the Member States' safety reports. The latest report states the risk of dying in the railway system during the period 2010-2014. In Sweden, the risk was approximately 170 fatalities per billion train kilometres for the period in question. The average risk for the EU's 28 Member States was approx. 280 fatalities per billion train kilometres. (ERA, 2016b)

## Summary for 2015

The safety of the railway system in Sweden was assessed as high in 2015. We achieved six of the seven European safety targets. Overall, the accident statistics were at a "normal" level.

The entire railway industry continued to focus on safety work. Authorities, organisations and railway undertakings worked together and provided information to each other in order to find smart solutions and share good examples.

Internationally, the Swedish Transport Agency primarily took part in the European work by actively participating in different working groups. We united the industry to provide information and gain support for the Swedish position in international regulatory work. The introduction of the SERA (Single European Railway Area) Directive in Swedish legislation was a notable part of this. The Directive deals with the financing of and charges for the railway infrastructure, competitive conditions on the railway market and effective market supervision.

In our oversight, we continued to check that the undertakings are applying the Commission Implementing Regulation on the common safety method for risk evaluation and assessment (EU 402/2013) and Commission Regulation on a common safety method for monitoring (EU 1078/2012). We are still finding shortcomings when it comes to incorporating and applying these provisions.

## Areas in focus in 2017

We are continuing the work on incorporating the fourth railway package in Swedish legislation and the consequences the directives and regulations will have for us.

We will organise information meetings for, above all, smaller infrastructure managers with a lower awareness of safety. The aim of the meetings is to make the administrators aware of the responsibility they have for the safety of the railway tracks they manage, what form the regulations take and the changes planned. During the year, we will also organise an information meeting for railway undertakings on the requirements for monitoring and for training coordinators on the requirements applying to their activity.

Developing methods and procedures for safety oversight is work we will continue with, including finding methods for auditing and measuring the organisations' safety cultures

We are also continuing to work to encourage railway undertakings and infrastructure managers covered by the requirement for safety reporting to submit data. The matter will be raised, for example, in connection with oversight if we have noticed that they have not submitted all data. We are also sending out reminders with information to the effect that failure to report may result in an injunction.

# TRENDS IN RAILWAY SAFETY

This section describes the consequences and trends of accidents and precursors, which indicate whether or not safety trends are at risk of worsening. The descriptions include the number of people killed and seriously injured in railway operations, the number of serious accidents and the number of precursors. The definitions used follow Commission Directive 2014/88/EU. Table 3 defines the various safety terms used in this section.

##### Definitions of safety terms

|  |  |
| --- | --- |
| **Term** | **Definition** |
| Death | Police report on someone who died within 30 days of an accident. |
| Seriously injured | Police report on someone who was so seriously injured that they required at least 24 hours of hospitalisation. |
| Serious accident | An accident related to railway vehicles in motion that resulted in at least one person being seriously injured or extensive damage to railway vehicles, railway infrastructure, the environment or property that was not being transported by the railway vehicle and where the total costs of such damage are at least EUR 150 000, or the stopping of traffic for at least 6 hours. |
| Precursor | Indicators or risk factors for accidents. |

The rules have been partly transposed into Swedish law through the supplementing of forms used for reporting by operators as set out in the regulations on safety reporting. Operators who only drive goods on their infrastructure are not covered by the reporting. Suicidal events are reported but not included in the analysis of trends in railway safety.

Data collection takes place in two steps. There is immediate reporting around the clock from the operators to the Swedish Transport Agency's telephone helpline. Serious accidents and near-accidents are reported there. Safety-related faults and shortcomings that could have led to a serious accident are also included in the reports.

The second step is the operators’ annual accident and safety reporting. Approx. 230 permit holders were covered by requirements for accident and safety reporting in accordance with the Railway Act and the above-mentioned regulations.The reports in the year's report are based on responses from 204 operators.

The majority of those who did not submit an accident and safety report are municipalities and ports that provide side tracks so that other organisations are able to transport goods there. This may apply to connecting tracks between industrial premises and the national railway network. There are also railway undertakings that have not submitted a report. We stress the importance of submitting a report during various gatherings and meetings with operators.

## Reporting of accident trends

Here we describe statistics regarding both fatalities and serious injuries resulting from accidents and suicide and attempted suicide statistics.

### Fatalities and serious injuries resulting from accidents

In 2016, 13 persons died in railway accidents, which is the lowest figure since 2008. A peak was reached in 2010 when as many as 42 persons died in various types of accident. The majority of those killed in the railway are unauthorised persons who are in the track area without permission. It is also this category that has fluctuated most between the years. In 2016, 6 unauthorised persons died, which is the second lowest number in ten years.

Since 2006, there have been an average of 7 fatalities at level crossings. There were 5 in 2016. We can also state that there were no passenger or employee fatalities during the year. Figure 4 below reports the number of railway accident fatalities split into different categories of person. Figure 5 reports the same accidents but split into accident type.

#### Number of fatalities in railway accidents per category of person. 2006-2016.

Source: Swedish Transport Agency

|  |  |
| --- | --- |
| Obehöriga personer | Unauthorised people |
| Plankorsningstrafikanter | Level crossing users |
| Anställda | Employees |
| Övriga personer | Other persons |

#### Number of fatalities in railway accidents per accident type. 2006-2016.

Source: Swedish Transport Agency

|  |  |
| --- | --- |
| Tågkollision | Train collision |
| Tågpåkörning | Train collision with person |
| Tågurspårning | Train derailment |
| Plankorsningsolycka | Level-crossing accident |
| Personolycka | Accident involving person |
| Brand i rullande materiel | Fire in rolling stock |
| Annan olycka | Other accident |

When a person who has been on the track without permission has been run over and it has not been possible to confirm that suicide was involved, the event is classified as an accident and is included in the accident statistics. This means that part of the annual variation can be explained by the fact that fewer suicidal events could be confirmed in certain years.

Eleven persons were seriously injured in railways accidents in 2016, see Figures 6 and 7. This is the third lowest number in the last ten years. The persons seriously injured are primarily level crossing users and unauthorised persons accessing the track area, a total of 7 persons over the year. The remaining 4 persons seriously injured were employees:

Two of these were run over by a train in Markaryd.

An employee in a skylift was struck in Värö Bruk (Varberg) during switching work.

An employee was crushed between carriages in a siding and the carriage he was travelling in while switching side tracks in Kil.

#### Number of persons seriously injured in railway accidents. Category of person. 2006 – 2016.

Source: Swedish Transport Agency

|  |  |
| --- | --- |
| Obehöriga personer | Unauthorised people |
| Plankorsningstrafikanter | Level crossing users |
| Anställda | Employees |
| Övriga personer | Other persons |

#### Number of people seriously injured in railway accidents per accident type. 2006-2016.

Source: Swedish Transport Agency

|  |  |
| --- | --- |
| Tågkollision | Train collision |
| Tågpåkörning | Train collision with person |
| Tågurspårning | Train derailment |
| Plankorsningsolycka | Level-crossing accident |
| Personolycka | Accident involving person |
| Brand i rullande materiel | Fire in rolling stock |
| Annan olycka | Other accident |

The police are the main source of information about the extent of injuries, i.e. if the person died or was seriously or slightly injured. The police also provide their assessment of the cause and whether it was an accident or suicidal event.

It can be difficult to verify whether someone has been seriously injured as the police sometimes lack information about hospitalisations. If there is no information about the severity of an injury, we interpret this as meaning that the person was slightly injured. Therefore, there may be more seriously injured persons than reported.

### Fatalities and serious injuries resulting from suicide and attempted suicide

The Swedish Transport Agency, Swedish Transport Administration and National Board of Forensic Medicine have been classifying suicide using a new way of working since 2016, which means that suicide is now assessed in the same way for both road and railway. The statistics for suicidal events in the railway system will thereby be more reliable. The changes are minor and are regarded as falling within the error margin.

In the National Board of Health and Welfare's statistics for Sweden 2016, approx. 1 130 deaths were classified as suicide. The number of suicides in society has been relatively unchanged over the past ten years.[[4]](#footnote-4) Generally, more men than women choose to commit suicide and the split has been 70 percent men and 30 percent women through the years. (The National Board of Health and Welfare, 2017) We see a similar pattern in the railway. Of the 69 persons who committed suicide in the railway in 2016, 45 were men (or almost 65 percent). Compared with the previous year, this was a reduction of 17 persons in total. It is notable that the reduction between 2015 and 2016 only involved men.

In 2016, there were 6 suicide attempts with the persons surviving but with serious injuries. Figure 8 summarises the number of suicidal events, with both fatalities and serious injuries, in the railway between the years 2006 and 2016.

#### Number of suicidal events. 2006-2016.

|  |  |
| --- | --- |
| Självmord | Suicide |
| Självmordsförsök | Suicide attempts |

### Number of serious railway accidents (total)

There were 33 serious accidents in 2016. Accidents involving persons and level crossing accidents are the most common accident types just as before. This outcome is the lowest in the last ten years. None of the accident types stands out and there is a slight improvement in almost all accident types. It is notable that there is still a low number of serious train derailments (3), just as in 2015.

#### Number of serious railway accidents per accident type. 2006-2016.

Source: Swedish Transport Agency

|  |  |
| --- | --- |
| Personolycka | Accident involving person |
| Plankorsningsolycka | Level-crossing accident |
| Annan olycka | Other accident |
| Tågurspårning | Train derailment |
| Tågkollision (fr. 2014) | Train collision (from 2014) |
| Tågpåkörning (fr. 2014) | Train collision with person (from 2014) |
| Tågkollision och tågpåkörning (2006-2013) | Train collision and train collision with person (2006-2013) |
| Brand i rullande materiel | Fire in rolling stock |

The category, other accident, also includes collisions with persons, derailments and collisions connected with switching. In 2016, there were a few collisions with persons during switching.

It is primarily in connection with accidents involving persons and level crossing accidents that there have been fatalities. In addition to this, extensive material damage or serious traffic disruption has formed the basis for the classification of serious accidents.

### Number of precursors

The precursors that are followed up through the common safety indicators are:

broken axle

broken wheel

SPAD when passing danger point

SPAD when not passing danger point

failure affecting safety

track geometry fault

broken rail.

There were 1 228 precursors in 2016, see Table 4. The category affecting the total result most is the track geometry fault category. The great increase in the number of this precursor category from 2012 is due to the Swedish Transport Administration changing its follow up procedures then. With mechanically read measurement data, we are probably getting more correct values, which has led to this increase. It is unclear how much is due to an actual increase in the number of track geometry faults.

##### Number of precursors. 2006-2016.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Precursor** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| Broken axle | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 0 | 1 |
| Broken wheel | 8 | 2 | 1 | 0 | 4 | 4 | 1 | 1 | 2 | 0 | 4 |
| Unauthorised stop signal - passing | 187 | 217 | 275 | 362 | 341 | 297 | 328 | 298 | 249 |  |  |
| SPAD when not passing danger point |  |  |  |  |  |  |  |  |  | 96 | 222 |
| SPAD when passing danger point |  |  |  |  |  |  |  |  |  | 44 | 11 |
| Signal failure affecting safety | 6 | 6 | 12 | 9 | 1 | 2 | 1 | 1 | 3 | 0 | 9 |
| Track geometry fault | 79 | 102 | 87 | 115 | 68 | 70 | 590 | 783 | 1 422 | 1 117 | 914 |
| Broken rail | 241 | 187 | 218 | 235 | 62 | 55 | 34 | 53 | 39 | 73 | 67 |
| Total | 274 | 516 | 594 | 723 | 477 | 429 | 956 | 1 137 | 1 717 | 1 330 | 1 228 |

Source: Swedish Transport Agency. The Swedish Transport Agency’s summary of operators’ safety reports.

In 2015, two new terms were introduced to achieve more detailed information about unauthorised stop signal passage. The two subcategories are SPAD when not passing a danger point and SPAD when passing a danger point.

The number of SPAD when passing a danger point (11+222=233) increased in 2016 after a favourable trend from 2012–2015. There is some uncertainty in the application of the new designations, including what is to be counted as a danger point. The reduction in the number of ‘SPAD when passing a danger point’ from 44 to 11 is probably more due to a greater understanding of the terms in the reports than an actual decrease.

### Costs of serious accidents

2016 is the second year that the Swedish Transport Agency is reporting calculated costs of serious accidents. Serious accidents include costs of

material damage (not damage to goods)

environmental damage

fatalities and serious injuries (including suicidal events)

delays.

##### Costs of serious accidents 2016

|  |  |  |
| --- | --- | --- |
| **Costs** | **SEK** | **Euro\*** |
| Material damage | 59 747 418 | 6 308 859 |
| Environmental damage | 0 | 0 |
| Fatalities and serious injuries | 2 191 745 458 | 231 431 139 |
| Delays | 15 182 926 | 1 603 198 |

Source: Swedish Transport Agency

1. \* 1 EUR = 9.47 SEK. Calculated on the basis of the average exchange rate for 2016 (Riksbanken, 2017).

All in all, railway accidents generated costs to society of around SEK 2.3 billion, which corresponds to approximately EUR 240 million. Fatalities and serious injuries (including suicidal events) account for the greatest cost. A life is valued at just over SEK 2.7 million according to the reference values from the ERA and Eurostat.

The costs of restoring material damage caused to infrastructure or railway vehicles, environmental damage and delays are based on reports from operators. There are no reported costs for restoring material damage caused.

### Technical safety of infrastructure and infrastructure safety management

Accidents that can be linked to the design of the infrastructure take place largely in connection with level crossings, i.e. areas where roads cross the railway. We therefore focus on level crossings in this section.

The level crossings can be split into active and passive. Passive level crossings are those that have no protection or warning signs at all that are activated to protect road users when the crossing is not safe. This group includes, for example, level crossings that only have a cross sign.

The active level crossings have manual or automatic safety devices with or without warning signals. Warning signals refer to sound and/or light signals that alert road users. Protection refers to physical devices that prevent road users from making their way over the crossing, e.g. barriers or gates.

Table 6 contains all level crossings that the operators have reported. The table contains level crossings split between the Swedish Transport Administration and other infrastructure managers. The Swedish Transport Administration is responsible for the nationally managed infrastructure and has most level crossings and the greatest capacity to influence safety trends.

##### Number of level crossings, incl. distribution between Swedish Transport Administration and other infrastructure managers. 2015-2016.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **2015** | | | **2016** | | |
| **Level crossings** | **Swedish Transport Administration** | **Others** | **Total** | **Swedish Transport Administration** | **Others** | **Total** |
| Passive safety devices | 2 783 | 796 | **3 579** | 2 771 | 808 | **3 579** |
| Active safety devices, manual | 7 | 62 | **69** | 7 | 66 | **73** |
| Active safety devices, automatic user-side warning signals | 638 | 114 | **752** | 570 | 132 | **702** |
| Active safety devices, user-side automatic protection\* (including warning signals) | 2 061 | 85 | **2 146** | 2 092 | 81 | **2 173** |
| Active safety devices, automatic protection\* (incl. warning signals) with rail-side protection\*\* | 81 | 3 | **84** | 80 | 2 | **82** |
| **Total number of level crossings** | 5 570 | 1 060 | **6 630** | 5 520 | 1 089 | **6 609** |

Source: Swedish Transport Agency. The Swedish Transport Agency’s summary of operators’ safety reports.

1. Protection refers to physical devices that protect road users from making their way over the crossing, e.g. barriers or gates.

\*\* Rail-side protection means that the train is only permitted to pass the crossing when it is protected and free from intrusion.

According to the operators' safety reports, there are a total of 6 609 level crossings in Sweden. Just over half of these are passive level crossings. Of the total number of level crossings, almost 84 percent are in the Swedish Transport Administration’s system. About half of the Swedish Transport Administration’s level crossings are passive. The percentage is higher among the other infrastructure managers.

As from 2014 a record is made of what kind of level crossing the accident occurred at, which is in accordance with a new directive from the Commission (2014/88/EU). An approximately equally large number of the serious level crossing accidents happen at level crossings with passive protection as at level crossings with active protection.

#### Number of accidents with serious personal consequences broken down by type of level crossing. 2014-2016.

Source: Swedish Transport Agency

|  |  |
| --- | --- |
| Passiva skyddsanordningar | Passive safety devices |
| Manuella skyddsanordningar | Manual safety devices |
| Automatiska varningssignaler mot vägen | Automatic user-side warnings signals |
| Automatiskta skydd\* mot vägen | Automatic user-side protection\* |

1. \*Protection refers to physical devices that protect road users from making their way over the crossing, e.g. barriers or gates.

It is notable for 2016 that, of the accidents that occurred at level crossings with active protection, all accidents occurred at level crossings with both warning signals and user-side protection. This primarily involves persons crawling under barriers or vehicles driving around half barriers. Since this involves just a few accidents, we cannot draw any direct conclusions from this change.

Converting level crossings may be one way of reducing the number of accidents according to the Swedish Transport Agency. At the same time, the number of accidents at level crossings is a small proportion of the total number of road traffic accidents that occur every year. Infrastructure managers may therefore consider it more effective to invest in other measures to improve safety in the road system.

In its updated guidelines, the Swedish Transport Administration (2016) emphasises that safety at level crossings must be dealt with when a line is improved. This may be an increase in capacity or a material change such as extension to double tracks, simultaneous entry, new operating sites, the new EU signal system, the European Rail Traffic Management System (ERTMS), electrification, remote control or intermediate block signals.

The Swedish Transport Administration has also changed its procedures so that trains are stopped or need to reduce their speed when people are reported in a dangerous track environment. This requires good cooperation between the Emergency Service and the Police Authority so that the stoppages cause as little disruption as possible. In 2016, trespassing on the railway in Sweden cost society SEK 80 million, according to calculations from the Swedish Transport Administration (2017).

Further measures from the Swedish Transport Administration will be a new generation of installation protection that will be tested as part of a pilot project during the winter of 2017–2018. The tests using ‘anti-trespass grids’ are continuing, often at level crossings where people trespass on the rail environment. These obstacles look like mats with egg carton-like compartments that make it very difficult to walk on.

## Results of safety recommendations

The Swedish Accident Investigation Authority, which is a governmental authority with a mandate to investigate accidents and near accidents at sea, on land and in the air, issued a safety recommendation to the Swedish Transport Agency in 2016. We should ensure that the Swedish Transport Administration and other infrastructure managers carry out an oversight of their safety management systems.

We provide feedback on activities undertaken to the Swedish Accident Investigation Authority at half-yearly collaboration meetings. Annex C contains a report of the targeted recommendation and our activities.

## Other safety activities

We have followed up the Swedish Transport Administration's handling of signal safety drawings and their action plan for minimising buckling, see Annex C.

We participate in the National Coordination Group (GNS) for the railway sector led by the Swedish Transport Administration. The focus of one of their expert groups is level crossings and collisions with persons while the other focuses on track work.

Some examples defined by the expert groups in their action plans:

Address unprotected level crossings with visual range of less than five seconds.

Address viewing problems at level crossings with cross sign and stop light that have visual range of less than ten seconds.

Address level crossings with a particular and high risk.

Continue fencing work.

Continue testing "anti-trespass grids".

Work on the control of suppliers in order to address shortcomings in the application of A-protection (A-protection of an area means it is fenced off in connection with work).

Review and work with the most frequent deficiencies identified during workplace inspections.

Work towards strengthening accident and precursor management.

# SAFETY OVERSIGHT

The Swedish Transport Agency is the supervisory authority for the railway undertakings and infrastructure managers who have been issued with safety certificates or safety authorisations. The vast majority of oversight in the railway takes place at system level.

Railway undertakings and infrastructure managers shall have a safety management system and the safety provisions required in order to ensure safe activity. The system is the organisation railway undertakings and infrastructure managers have introduced to manage risks in their activity. It shall contain a description of responsibilities. It shall also demonstrate how the management's control is ensured at different levels within the undertaking, how personnel at all levels are affected and how continuous improvement of the system can be provided for.

The Swedish Transport Agency is also the supervisory authority for the transports that take place on the railway. Railway undertakings and infrastructure managers handling hazardous goods on the railway are affected by the Ordinance on the Transport of Hazardous Goods (SFS 2006:311).

We carry out an oversight of transports of hazardous goods together with other supervisory authorities[[5]](#footnote-5). During these joint oversights that are performed on several occasions over the year, we carry out checks of several kinds of transport at the same time. These locations may be ports and other nodes where loads of dangerous goods change transporter and type of transport.

We carry out oversight in order to monitor compliance with the Ordinance (2011:728) on Authorisation for Train Drivers. The ordinance primarily affects railway undertakings. The oversight is aimed at those who have permission to provide basic training and examinations for train drivers, permission to carry out health examinations or psychological examinations and holders of train driving licences.

We issue permits (certificates) to undertakings applying to be an ECM for freight wagons. Throughout the years, we have issued 5 such certificates, making us the biggest authorisation issuer in the market. The market's largest undertaking is also one of these 5 undertakings. Each such authorisation requires an annual oversight. Other certification bodies have, together, certified 3 undertakings.

## Strategies and plans

The safety oversight we carry out aims to maintain or improve safety in Sweden in relation to the common safety targets presented in this report.

There are great differences between stakeholders operating within a certain area of supervision. The type of operation conducted, size of the organisation and organisation's safety culture can vary. These differences mean that stakeholders have different impacts on the joint safety targets.

Our work needs to focus on the stakeholders and the areas constituting the greatest risk on any occasion, i.e., on so-called risk based oversight. This is a systematic way of working in order to analyse, evaluate and maintain control of risks through prioritisation within the oversight and follow up and monitor the results of the oversight. The risk-based work will in many cases mean that different operators require different oversight work from us.

We identify risk factors within each area on the basis of what is assessed as being able to affect the risk for operators in the area. Each risk factor is analysed, evaluated and graded in different point intervals on the basis of their contribution to risk.

For example, a more extensive undertaking has an increased risk and therefore higher points. All risk factors are evaluated and awarded points on the basis of facts about the respective operator. The points for all risk factors are totalled for each operator. (Swedish Transport Agency 2014).

As previously mentioned, the Swedish Transport Agency's telephone helpline is manned around the clock. Railway undertakings and infrastructure managers notify accidents and near accidents of a certain severity there as well as safety-related faults in the railway system that could have led to a serious accident. We use the events reported for the risk-based oversight.

In 2016, an analysis forum for rail traffic was started up within the Swedish Transport Agency. This is a forum with collective competence that aims to produce data and analyse the railway system so that the risk-based oversight is applied where it is of most benefit. The undertakings may have many interfaces with the Swedish Transport Agency and we need to create prerequisites for meeting them with a common message.

We confirm oversight activities for the following year during the annual operational planning process. The planning is done so that there is scope to be able to perform an oversight quickly if events reported indicate a need for this, what is called an event-driven oversight.

In 2016, the prioritisation of oversight of dangerous goods on the railway has focused on the entire system of senders, transporters and recipients. Underlying factors were monitoring that the system as a whole works on the basis of the responsibility of being a main participant.

The oversight of certificates issued to units responsible for the maintenance of freight wagons has focused on performing checks on the basis of the requirements in Commission Regulation (EU) No 1078/2012.

In addition to risk factors gathered, we use the following channels as contributions to plans and strategies:

* Information regarding accidents that have occurred and serious near-accidents and the investigations carried out by the Swedish Accident Investigation Authority.
* Information from the results of oversight activities.
* New, amended or removed rules and regulations (both national and international).
* Changes to oversight objects of such magnitude that they are notified to the Swedish Transport Agency (e.g. reorganisations and changes of ownership).
* Exchanges of information on how other business areas assess the organisation if there are several oversight areas with oversight of the same organisation. If an oversight area notices shortcomings in an organisation's quality work, this may be an indication that there are corresponding shortcomings in other authorisations the organisation has. For this reason, it is important to exchange information.
* Information about what impact the economy is having on a certain operator or group of operators. In certain oversight areas we have, as a result of a financial oversight and market monitoring, access to information on how undertakings are functioning financially, how market shares are changing over time and the competitive situation.
* In many oversight areas, there is too little data available regarding the Swedish industry to be able to identify trends and risks. For this reason, it is important to obtain other information from international collaborations.
* Notifications from the public, the industry or the media.

## Personnel

The personnel working on oversight can be split in two in terms of organisation:

* One part is responsible for the oversight of railway undertakings, of subsystems managed by railway undertakings, of the transport of dangerous goods, of training coordinators and examiners for train driver training, of authorisation for entities with responsibility for maintenance of freight wagons and keeps a register of train driver licences issued. During the year, they have increased the number from 15 to 16 administrators. The duties of 14 of these administrators include oversight.
* The second part is responsible for the oversight of infrastructure managers, subsystems managed by infrastructure managers and oversight of track owners and traffic operators in the area of trams and metros. Fourteen of the sixteen administrators in the group work on oversight as part of their duties.

The administrators also perform other duties in the Swedish Transport Agency’s core operations such as the maintenance of registers, examination of applications for authorisation and involvement as experts in international and national regulatory work.

On average, an administrator spends 45 percent of his or her annual working hours on oversight of railway undertakings. The percentage varies somewhat between administrators that perform oversight of infrastructure managers, as some have the issuing of authorisation as their main occupation and perform fewer audits. Those administrators that have oversight as their main occupation spend an average of 60 percent of their annual working hours on oversight.

In 2016, a total of approximately 29 000 hours was spent within the Swedish Transport Agency on oversight in the railway area. Of these hours, 23 600 were in the form of an oversight of infrastructure managers and railway undertakings.

## Competence

The results of oversight are dependent upon being done objectively and on verifications being performed to the extent required by the oversight. An oversight performed on site at an oversight object must be led by an audit manager along with at least one further auditor.

A auditor who has taken part in at least two oversights has the authority to be an audit manager. Both audit manager and auditor must have undertaken in-house oversight training and audit methodology in accordance with ISO 9001:2000 or the equivalent with approved results.

In order for an auditor to be allowed to visit a track area that is in use, it is a fundamental requirement that he or she has undergone a training course on the risks of visiting the track area or has obtained similar competence in another manner.

An auditor who has been recruited from the market outside the railway sector must also be provided with basic training in the functionality of the railway system in order to gain an understanding of the system. It takes at least a year for an auditor to become an audit manager. For those recruited with a knowledge of the railway area, this will be somewhat shorter.

## Decision-making

The Railway Act gives the Swedish Transport Agency a mandate to impose sanctions if the legislation or a decision by the authorities by virtue of the law are not observed. The options are injunctions and bans, which are both associated with a fine, as well as the revocation of authorisation.

The Act on Authorisation for Train Drivers (SFS 2011:725) prescribes the facility to issue injunctions, which may be associated with a fine, as well as the revocation of train driving licences or permits. The Act on the Transport of Hazardous Goods (SFS 2006:263) prescribes the facility to issue injunctions or bans, both of which may be associated with a fine.

Our rules of procedure regulate responsibility and authorisation for those parts of the organisation that are designated as being responsible for the core processes of issuing authorisation and oversight in the railway area. Auditors may delegate the ability to issue a ban on an operation directly on site. This notification must be formalised through a written decision by the manager involved within five days. This must be provided to the organisation that has received notification of the sanction.

A written decision must be formulated with sufficient clarity for the recipient to understand what has to be done in order for the sanction to be addressed. There must be a description of the case, a justification of the reasons for the decision and information regarding which legal basis is being invoked. It must also describe how the recipient proceeds in order to appeal against the decision.

It is the auditors who formulate and present the decision to the manager responsible with support from a lawyer. The decision is sent in the form of a letter with a receipt to ensure that any appeal is received by us within the statutory time frame.

Following an audit, we decided to revoke a railway undertaking's safety certificate part A and safety certificate part B for Sweden. The undertaking did not have an effective safety management system and thus the preconditions for the authorisation were no longer fulfilled. The Administrative Court and later Administrative Court of Appeal rejected the undertaking's appeal and the authorisation was revoked.

The Swedish Transport Agency can grant dispensation from health requirements for staff with duties of significance for traffic safety. We rejected a handful of applications for this dispensation. The Administrative Court upheld the Swedish Transport Agency in all cases where the parties concerned appealed.

## Coordination and cooperation

The Swedish Transport Agency works together with the supervisory authorities in Norway and Denmark, Statens jernbanetilsyn and Trafik- og Byggestyrelsen respectively. We hold at least one joint meeting every year at which we, inter alia, inform one another of future operational planning. We offer one another the opportunity to take part in planned oversight activities aimed at railway undertakings with cross-border activities. The supervisory authority invited then participates as an observer. We share with the Norwegian Railway Authority and the Danish Transport and Construction Agency the results of oversight activities performed at railway undertakings that also have operations in their countries.

In 2015, the Swedish Transport Agency entered into a Memorandum of Understanding with Statens jernbanetilsyn, the Norwegian Railway Authority. It contains statements to the effect that both authorities shall exchange information and notify one another of, for example, decisions made and operational planning.

The Norwegian Railway Authority took part as observer when we performed an oversight of an undertaking with safety certificate part A issued in Norway with operations, and a safety certificate part B, in Sweden.

In 2016, the Norwegian Railway Authority announced that a railway undertaking with safety certificate part A issued in Sweden had had an application for a safety certificate class B in Norway rejected. We performed a targeted oversight of the railway undertaking in question, where the competence management system was also checked. When the undertaking later submitted a request to the City court for reconstruction of the undertaking, we also carried out a focused oversight of vehicle maintenance. The undertaking was not allowed reconstruction and petitioned for bankruptcy, upon which its licence and safety certificate were revoked.

## Results of the operators’ activities

Our oversight of railway undertakings in 2016 identified the following areas where operators need to introduce activities:

* The system for documentation of safety-related information
* incomplete documentation of the personnel's competence.
* The document management system
* no new requirements identified
* the personnel have no access to and do not get the correct version of documents
* steering documents are not kept up to date.
* The application of the common safety method for monitoring the safety management system.
* The system for applying the common safety method for risk evaluation and risk assessment.
* The competence management system
* competence requirements need to be established for personnel with duties that are of importance for traffic safety
* personnel with duties with an influence on traffic safety need to be trained in the safety management system.

In the case of smaller infrastructure managers, we have identified through oversight that they need more information in order to understand better the rules and regulations that apply. We also need to follow up their application of the common safety method for monitoring the safety management system.

As a result of oversight, we have also identified that training coordinators and examiners need to focus on evaluating the training in order to ensure quality. This can be done through systematic audits and analyses of the entire or parts of the activity. There are also shortcomings regarding ensuring the established professional qualifications for instructors. These skills needs to be maintained in a systematic manner.

Instructors and psychologists that need to examine the health of train drivers require a special licence. We have noted that there is an incorrect perception that this special licence is also required in order to examine the health of other professional categories.

We have continued our oversight of the Swedish Transport Administration and their ability to guarantee that the correct authorisation and necessary competence exist in those contractors/subcontractors that perform work on their track installations.

In 2016, the Swedish Transport Administration has produced an action plan and described how it is working on it. Our follow-up of this work commences in 2017.

In 2016, we carried out an investigation into the safety culture at the Swedish Transport Administration. This shows that there are clear shortcomings in management and follow-ups. It is primarily the learning culture and systematic safety work that are assessed as being in great need of improvement. The Swedish Transport Administration will come back with an action plan in 2017. (The Swedish Transport Agency, 2017b)

# SAFETY CERTIFICATES AND SAFETY AUTHORISATIONS

## Guidance

The Swedish Transport Agency (2017a) provides information on the website about the different forms of authorisation, how an application for authorisation takes place as well as the fact that the fee for processing the authorisation must be paid before administration commences. The website also has guidance, including ‘Ett systembaserat angreppssätt, tillämpningsvägledning för utformning, införande och användande av ett säkerhetsstyrningssystem’ [‘A system-based approach, application guidance for the design, introduction and use of a safety management system’]. (ERA, 2010) Applications for authorisation are made electronically on the website. The system for applications contains guidance on what is to be completed and attached.

## Contact with other safety authorities

Statens jernbanetilsyn, the Norwegian Railway Authority was in contact with the Swedish Transport Agency in 2015. The reason was that a railway undertaking with safety certificate part A issued in Sweden had applied for a safety certificate class B in Norway. The undertaking did not fulfil the requirements for being granted part B in Norway. The railway undertaking applied again for authorisation in 2016 but still found it difficult to fulfil the requirements for being granted a safety certificate part B in Norway. The matter is described in greater detail in Chapter D.5.

No railway undertaking with safety certificate part A in another Member State or EEA country has applied for a safety certificate part B in Sweden.

## Procedural aspects

There have been certain shortcomings in the operators' documentation as a result of them not understanding the regulatory framework or not knowing how they should be interpreted or applied.

The Swedish Transport Agency is aware that many operators engage consultants to produce a safety management system. The consultants often use templates for the safety management system, which can mean the system is not adapted to that particular undertaking and its risks. Since there are many different ways of controlling risks depending on the nature and extent of the activity, templates should be avoided.

## Feedback

A party that applies for an authorisation that the Swedish Transport Agency issues may contact the Parliamentary Ombudsman with any complaints during the processing period. The Parliamentary Ombudsman may then choose to perform an independent examination to determine whether we have complied with the legislation applying in connection with an application process. We did not receive any complaints or comments during 2016 about the process of managing applications for new safety certificates or safety authorisations.

Operators may also express their opinions and complaints via referral comments on new regulations, via our industry council, at corporate meetings and during oversight.

# CHANGES IN THE REGULATORY FRAMEWORK

## Changes based on the Railway Safety Directive

The Railway Act and the Railway Ordinance together with associated regulations constitute the regulatory framework that has implemented the Safety Directive in Swedish law. The legislation entered into force on 1 July 2004. Thereafter, the legislation has been amended in line with the EU regulatory framework, including the Safety Directive, being amended.

## Changes in legislation and other regulatory frameworks

The changes in 2016 are described in Annex B.

# APPLICATION OF COMMON METHOD FOR RISK EVALUATION AND RISK ASSESSMENT

## The safety authority’s experience

The Swedish Transport Agency applies (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment, CSM-RA. This is often done in connection with applications for approval of technical subsystems.

The work on safety methods is constantly being developed. Since 2015, there have been two levels of construction target, measured in permissible number of faults per hour.[[6]](#footnote-6) The higher safety level is used in cases where more people could meet with an accident as a result of a fault. One example is incorrect changes at signal boxes, which could mean a collision between two trains occurring. The lower safety level is applied where individuals could meet with an accident as a result of fault, e.g., a collision with personnel on the track.

Recently safety methods have been augmented with acceptable quantitative safety requirements. The term is CSM-DT, where DT stands for "design targets". This requirement may be used in the design of technical systems where failures in functionality could lead to accidents.

The regulation must be applied to the applicant in connection with all changes to the railway system in a Member State. Such changes may be of a technical, operational or organisational nature. With regard to organisational changes, only changes that can affect operational or maintenance processes should be considered.

If a change is considered significant, the risk management process described in the regulation must be applied. If on the other hand the change is not considered significant, the undertaking’s own risk management process should be applied.

Generally speaking, the undertakings make good assessments, but small undertakings tend to deem the changes as less safety-sensitive or substantial than they might actually be. They often use accepted practice or reference systems when applying the risk management process.

When an undertaking considers a change significant, an independent auditor must be engaged. We monitor that the undertaking has processes and procedures for dealing with a significant change and engages an independent auditor who fulfils the requirements. We have not seen any failings among undertakings with regard to independent auditors. There is however a lack of understanding at some smaller undertakings that do not have the same personnel resources as the bigger railway undertakings.

## Feedback from the operators

Since the operating year 2011, both railway undertakings and infrastructure managers must use their annual safety reports to feed back on their experiences of applying the common safety method for risk evaluation and risk assessment.

Seventy-five percent (151 out of 204) of the railway undertakings and infrastructure managers who had submitted a safety report have not reported any of their experiences of applying the CSM-RA. Among those who answered questions on experience of the application of CSM-RA, 33 operators replied that they have experience of applying the method. A couple of the benefits they emphasise are a uniform process for risk management and a common view of cross-border traffic. An increased understanding of others' activities is also mentioned.

Those who have not applied the method feel that their railway operations are so small in scope that the method is not needed. They use other methods to evaluate risks, such as when a change is planned.

## Revision of safety rules that consider the common method for risk evaluation and risk assessment

There are no national safety rules for risk evaluations and risk assessments. The rules in the area are those that incorporate Article 9 and Annex III of Directive 2004/49/EC (the Railway Safety Directive) in Swedish legislation.

# GRANTED EXEMPTIONS FROM THE REGULATION ON ECM

In 2016 the Swedish Transport Agency did not grant any exemptions from the rule to appoint an ECM[[7]](#footnote-7) before a vehicle is put into service in accordance with Directive 2008/110/EC of the European Parliament and of the Council.

There are at present no railway undertakings or infrastructure managers in Sweden that apply the transitional rules of the ECM regulation. Those that were previously affected have had their safety certificates and safety authorisations renewed.

|  |  |
| --- | --- |
| Annex A | Common safety indicators |

All safety indicators we analyse can be found in Chapters B and C.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Annex B | | Changes in the regulatory framework | | | |
| **Laws and other national rules** | | **Legal reference** | **Date legislation entered into force** | **Description of change** | | **Reason for the introduction/change** |
| Regulation (EC) No 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety | |  | 15 June 2016 | Among other things, the European Union Agency for Railways is to issue joint safety certificates for the railway undertakings that conduct cross-border traffic. This means that an application for such a safety certificate must be submitted through the ERA's web portal One-Stop-Shop.  The Swedish Transport Agency is getting another way of working, including assisting the ERA prior to the issuing of a safety certificate. | | The Railway Safety Directive 2004/49/EC has been revised. |
| Directive (EU) No 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union | |  | 15 June 2016 | The European Union Agency for Railways shall issue approvals before vehicles to be used within one or more Member States may be placed on the market. This means that an application for approval must be submitted through the ERA's web portal One-Stop-Shop.  The Swedish Transport Agency is getting another way of working, including assisting the ERA prior to the approval. | | The Interoperability Directive 2008/57/EC has been revised. |
| Regulation (EU) 2016/796 of the European Parliament and of the Council of 11 May 2016 on the European Union Agency for Railways and repealing Regulation (EC) No 881/2004 | |  | 15 June 2016 |  | | Regulation (EC) No 881/2004 has been revised. |
| The Swedish Transport Agency’s regulations on safety management systems and other safety provisions for infrastructure managers of industrial tracks (TSFS 2016:29). | | Chapter 1, § 2 and Chapter 2, § 1 of the Railway Ordinance (2004:526) | 1 August 2016 | There have been some easements made with regard to the requirements in the safety management system for infrastructure managers with industrial tracks. | | Private infrastructure used for the private transport of goods and that can, in accordance with Article 2, be exempted from the requirements in the Safety Directive 2004/49/EG. |
| The Swedish Transport Agency's regulations on track installations that are not railway infrastructure (TSFS 2016:30). | | Chapter 1, § 4 of the Railway Ordinance | 1 August 2016 | The regulations contain minor language changes and they rescind the Railways Management Committee's regulations on track installations that are not railway infrastructure (JvSFS 2005:2). | | The regulations have been added to the Swedish Transport Agency's collection of regulations. |
| The Regulations (TSFS 2016:31) amending the Swedish Transport Agency’s regulations (TSFS 2015:34) on safety management systems and other safety provisions for infrastructure managers with safety authorisations and railway undertakings with safety certificates. | | Chapter 1, § 2 and Chapter 2, § 1 of the Railway Ordinance | 1 August 2016 | The regulations have been changed so that the requirements regarding the safety management system for infrastructure managers with industrial tracks are regulated through other regulations. | | The regulations were changed in order to avoid duplicating regulations in TSFS 2016:29. |
| Regulations (TSFS 2016:32) amending the Swedish Transport Agency’s regulations (TSFS 2015:35) on applications for authorisation for railway operations | | Chapter 1, § 2 and Chapter 3, § 12 of the Railway Ordinance | 1 August 2016 | The regulations have been changed with regard to conditions for applying for authorisation for infrastructure managers with industrial tracks. | | The regulations have been adapted to certain activities as infrastructure managers. |
| The Swedish Transport Agency’s regulations (TSFS 2016:96) on EU Control and EU Declaration of Conformity | | Chapter 2, §§ 5 and 10 of the Railway Ordinance | 1 October 2016 | The regulations follow the amendments to Annexes V and VI to Directive 2008/57/EC in accordance with the text in Annexes I and II respectively to Directive 2014/106/EU. | | Commission Directive 2014/106/EU amending the Interoperability Directive 2008/57/EG has been introduced. |
| Regulations (TSFS 2016:104) amending the Swedish Transport Agency’s regulations (TSFS 2012:135) on the technical specification for interoperability relating to the control-command and signalling subsystems | | Chapter 2, § 5 of the Railway Ordinance | 1 December 2016 | The regulations were repealed. | | Commission Regulation (EU) 2016/919 of 27 May 2016 on the technical specification for interoperability relating to the control-command and signalling subsystems in the European Union has direct application in Sweden and the regulation repealed Commission Decision 2012/88/EU. |

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| Annex C | Results of safety recommendations and other safety activities |

SHK (2016) has provided a safety recommendation. In the following annex, we describe the safety recommendation and the activities we are adopting as a result of the recommendation. We also describe the safety activities that we and the industry have adopted in addition to SHK's recommendations, see Table 7.

**Safety recommendation**

This is the wording of the safety recommendation: “The Swedish Transport Agency recommends, in consultation with the Swedish Work Environment Authority where required, that steps be taken to ensure that the Swedish Transport Administration and any other infrastructure managers affected carry out a review of their respective safety-management systems to assess their effectiveness for creating safe activity in the context of work on the tracks.”“ ”Such reviews should, in particular, look at the following:

The design of the rules, i.e. that the rules are clear and easy to understand and apply for the people who have to use them;

The effectiveness of training in ensuring that track workers understand how the rules are expected to be applied and why;

How the current follow-up tools encapsulate the actual application of the rules in day-to-day work, i.e. whether the rules are applied as intended;

Systematic feedback on experiences of application so that there is data for improving the regulations or the preconditions for performing safe work.“ ”The aim is to ensure that there is an implemented and effective system where individual employees also of contractors and subcontractors report deviations, shortcomings and suggestions for improvements.

What kind of holistic perspective is applied to health and safety planning, for example how the risks associated with all the individual activities involved in a work initiative in the track environment, including preparatory work and clearing away, are dealt with.

The distribution of responsibilities for health and safety management at a workplace in the track environment, including management of the risk of unintentionally ending up in the track area, e.g, preliminary work and clearing away.“ ”It should also be ensured that there is a a specially designated person with overall responsibility for health and safety management also outside the track area and safety zone, when people are working and visiting the track environment.” (SHK, 2016, p. 52)

**Efforts occasioned by the recommendation**

The oversight of railway permit holders performed by the Swedish Transport Agency is also for the purpose of monitoring the effectiveness of the safety management system. The work includes monitoring how safe activity in track installations is ensured by the infrastructure managers.

In 2016, we have an ongoing oversight of the application of Commission Regulation (EU) No 1078/2012 on a common safety method for monitoring the management systems at the Swedish Transport Administration, Öresundsbro Konsortiet and Inlandsbanan AB. The overview has focused on monitoring whether these permit holders have effective procedures for monitoring that the processes and procedures in the safety management system in its entirety are being applied correctly and achieving the expected results.

During 2017, we intend to carry out further oversights at the Swedish Transport Administration and other major infrastructure managers but with a more targeted focus on the areas indicated by SHK in its safety recommendation.

We will also contact the Swedish Work Environment Authority for consultation within the areas included in work environment responsibility and not therefore covered by the scope of the safety management system but that could in practice affect traffic safety when works in and around the track area are performed.

##### Safety improvements made by the Swedish Transport Agency and the industry beyond SHK's recommendations.

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| **Area of focus** | **Description of trigger** | **Safety measure(s) introduced** |
| Handling of signal safety drawings | During the oversight we performed in 2012, shortcomings were detected in the handling of drawings at the Swedish Transport Administration. Measures were then taken and the Swedish Transport Administration prepared an action plan to tackle the problem. During the follow-up verification in 2016, there were still deviations from the drawings out in the installations. | The Swedish Transport Administration has produced a new process for following up deliveries. Implementation of the process has commenced and will be completed by 31 December 2017. |
| Buckling | For a long time, the Swedish Transport Administration has been working on producing measures for minimising the amount of buckling. We have followed up their action plan and detected that the date for certain measures had been moved forward without us being notified. | Changes have been made in regulations, better control of neutral temperature and improved information for maintenance personnel. |

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Commission Directive 2014/88/EU of 9 July 2014 *amending Directive 2004/49/EC of the European Parliament and of the Council as regards common safety indicators and common methods of calculating accident costs.*

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1. The requirements in the Railway Ordinance are based on Article 18 of Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 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 (the Railway Safety Directive). [↑](#footnote-ref-1)
2. European Union Agency for Railways, formerly the European Railway Agency. [↑](#footnote-ref-2)
3. The reporting of accident data to the ERA, in the form of common safety indicators, started in 2007. (2006 was a trial year.) For this reason, the confirmed NRV is based on data from Eurostat. There are discrepancies in data between the two sources. [↑](#footnote-ref-3)
4. The number per 100 000 inhabitants has reduced somewhat in relation to Swedish demographic trends. [↑](#footnote-ref-4)
5. The Swedish Civil Contingencies Agency, the Swedish Work Environment Authority, the Swedish Police Authority, the Swedish Radiation Safety Authority, the Swedish Coast Guard and Swedish Customs. [↑](#footnote-ref-5)
6. The target values are 10-9 (0.000000001) and 10-7 (0.0000001) faults per hour. [↑](#footnote-ref-6)
7. ECM is a recognised term and stands for Entity in Charge of Maintenance [↑](#footnote-ref-7)