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| Safety report for the railways 2015 |

September 2015

Foreword

Each year, the Danish Transport and Construction Agency’s safety report for the railways presents a comprehensive analysis of the development in the number of accidents and incidents as well as a review of the Agency’s safety-related activities. The report thus provides a status report on railway safety in Denmark.

Railway safety was again very high in Denmark in 2015. The number of both significant and minor accidents fell, and the Danish security target was met.

The number of significant accidents involving persons went down from 2014 to 2015, resulting in a lower five-year average for this category.

The number of deaths and serious injuries also fell for all categories of persons, except for seriously injured passengers which is at the same level as previous years.

The theme for this year’s safety report is the CSM-RA Regulation on risk assessment. The CSM-RA Regulation has been in force for several years and has presented some challenges to a number of undertakings. For this reason, the Danish Transport and Construction Agency has chosen the Regulation and the work on implementing it as the subject of this year’s report.

The Danish Transport and Construction Agency hopes that the report will contribute to the exchange of experiences and provide inspiration in the Danish railway sector.

The report will also be used to exchange experience among the EU Member States and will be submitted to the European Railway Agency (ERA).

Happy reading!

Jesper Rasmussen  
Deputy Director General

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| **ABOUT THE DATA IN THE REPORT:**  The data in the safety report are for 2015. The reason for the relatively late publication is that the Agency only receives the last data from the undertakings in June, and it is an extensive process to validate the information on incidents and accidents on the railways reported by the undertakings.  The Danish Transport and Construction Agency is required to publish the safety report and submit it to the European Railway Agency (ERA), but the Agency has chosen to design the report to also make it an interesting and relevant read for Danish stakeholders such as infrastructure managers, railway undertakings, the Danish Accident Investigation Board, politicians and the press.  The report therefore includes data from across the entire Danish rail network, including demarcated urban networks such as the metro and local railways, which would otherwise not be covered by the European reporting requirements. The reader must therefore be aware that the data in this report will be different from data reported for use in European statistics. |

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# Resumé

**Danmark har et højt jernbanesikkerhedsniveau**

Danmark har som mål, at der maksimalt må være 0,3 dræbte eller alvorligt tilskadekomne personer pr. mio. tog-km. Danmark har i alle årene siden 2004 opfyldt målsætningen og også i 2015 ligger sikkerhedsniveauet væsentligt under de 0,3 pr. mio. tog-km. I perioden 2011-2015 har antallet af væsentlige personulykker ligget på 0,13 pr. mio. tog-km. Dette placerer Danmark blandt de bedste lande i Europa.

**Antallet af væsentlige ulykker er faldet**

Både antallet af væsentlige og mindre ulykker er faldet fra 2014 til 2015. Det er fortsat personpåkørsler, der er den primære type af væsentlige ulykker på jernbanen. Også antallet af dræbte og alvorligt tilskadekomne er faldet i 2015 med 10 dræbte og seks alvorligt tilskadekomne.

**Antal selvmord på jernbanen ligger på et stabilt niveau**

Antallet af selvmord på jernbanen har været en smule svingende de sidste par år med et særdeles højt antal i 2012. Efterfølgende har niveauet ligget på ca. 30 selvmord om året, hvilket også har været tilfældet i 2015. Selvmord betragtes dog ikke som en jernbaneulykke.

**Styrelsen har efterlevet Havarikommissionens rekommandationer**

I 2015 har Trafik- og Byggestyrelsen modtaget to redegørelser fra Havarikommissionen til opfølgning. Styrelsen har ført tilsyn med disse hændelser samt implementeret tiltag i henhold til rekommandationerne, hvormed de alle er efterlevet. Trafik- og Byggestyrelsen har desuden valgt at følge op på en redegørelse, selvom Havarikommissionens undersøgelse ikke gav anledning til rekommandationer.

**Styrelsen ændrer praksis for sikkerhedscertifikater og sikkerhedsgodkendelser**

I slutningen af 2015 havde 13 virksomheder i Danmark gyldigt sikkerhedscertifikat og/eller gyldig sikkerhedsgodkendelse. I løbet af 2015 er der sket en række ændringer både i forhold til antal og indhold af sikkerhedscertifikaterne og sikkerhedsgodkendelser. Endvidere har styrelsen indført en ny praksis i anvendelsen af vilkår i forbindelse med udstedelse af certifikater og godkendelser.

**Virksomhederne har stadig problemer med implementering af sikkerhedsledelse**

Trafik- og Byggestyrelsen ser stadig, at enkelte jernbanevirksomheder mangler fuldt ud at implementere risikobaseret sikkerhedsledelse med udgangspunkt i virksomhedens risikoprofil. Det opleves også, at jernbanevirksomhederne har udfordringer med at implementere en række af de EU-regler, der er blevet vedtaget de seneste år. Styrelsen følger løbende op på problemerne.

Overordnet set vurderes problemerne dog ikke at være direkte sikkerhedskritiske for den høje jernbanesikkerhed i Danmark, hvilket afspejles i det lave antal hændelser.

**Dette års Sikkerhedsrapport har Risikovurderingsforordningen om tema**

Branchen har gradvist opnået større erfaring med brugen af CSM-RA, men der er fortsat behov for dialog og afklaring om brugen af forordningen mellem styrelsen og de daglige brugere. I 2015 gennemførte styrelsen en undersøgelse af assessormarkedet for at få de væsentligste udfordringer klarlagt. Konklusionen peger bl.a. på, at der er et begrænset udbud af CSM-RA kompetencer på markedet.

**Arbejdet med implementering af Jernbanesikkerhedsdirektivet fortsætter**

Jernbanesikkerhedsdirektivet er den europæiske lovgivning, der udgør rammen for harmoniseringen af sikkerhedsreguleringen i Europa. Trafik- og Byggestyrelsen har i 2015 fortsat arbejdet med at sikre korrekt anvendelse af de nye krav efter, at den nye CSM-RA-forordning trådte i kraft i 2013.

Summary

**Denmark has a high level of railway safety**

Denmark’s safety target is that the total number of fatalities or severely injured people per million train-km should not rise above 0.3. Since 2004, Denmark has met this target and in 2015 the safety level is once again considerably below the target of 0.3 per million train-km. In the period 2011-2015, the number of fatalities and severely injured people has been 0.13 per million train-km. This places Denmark among the best performing countries in Europe.

**The number of significant accidents has decreased**

Both the number of significant accidents and minor accidents has decreased from 2014 to 2015. It continues to be accidents to persons involving rolling stock in motion that are the primary significant accidents. Also the number of killed and seriously injured has decreased in 2015 with 10 people killed and six people seriously injured.

**The number of suicides on the railway is once again at a stable level**

The number of suicides on the railway has been somewhat fluctuating the past few years with a significantly high number in 2012. Since then, the number has been around 30 suicides per year, which has also been the case in 2015. Suicides are not considered as railway accidents.

**The Danish Transport and Construction Agency complies with all recommendations of the Danish Accident Investigation Board**

In 2015, the Danish Transport and Construction Agency received two accounts from the Danish Accident Investigation Board for follow-up. All accounts have been supervised and initiatives have been implemented in accordance with the recommendations. All recommendations are considered to be complied by.

**The Danish Transport and Construction Agency changes procedure for safety certificates and safety authorisations**

At the end of 2015, 13 companies had a valid safety certificate or authorisation in Denmark. In 2015, there has been a number of changes in relation to the amount and content of safety certificates and authorisations. Furthermore, the Danish Transport and Construction Agency has implemented a new procedure for issuing conditions when granting safety certificates and authorisations.

**The railway companies are still challenged by their safety management**

Some of the railway companies still need to fully implement risk-based safety management starting with their own risk profile. It has been detected that the companies are experiencing challenges in the implementation of the EU-rules passed last year. The Danish Transport and Construction Agency will continuously follow up on these challenges.

**This year’s safety performance report has the regulation on Common Safety Method on risk evaluation and assessment (CSM-RA) as a theme chapter**

The industry is becoming more experienced in using CSM-RA, but there is still a need for dialogue and clarification as to the use of the regulation between the NSA and the day-to-day users. In 2015, an investigation of the assessor market was conducted to understand the challenges better. The result shows e.g. a limited supply of proper CSM-RA competencies in the market.

**The work on the implementation on the Railway Safety Directive continues**

The Railway Safety Directive is the European legislation constitutes the framework within which the harmonisation of the safety regulation in Europe takes place. In 2015, the Danish Transport and Construction Agency has continued the work of making sure the new requirements, of the new CSM-RA-regulation that came into force in 2013, are correctly employed

Chapter 1. Railway safety in Denmark in 2015

Denmark still has a very high level of railway safety. The number of both significant and minor accidents has fallen since last year, and the Danish security target for the number of accidents involving persons was met in 2015.

## Reporting of data for the safety report

There are approximately 2 700 km of railway line in Denmark. Large parts of it are equipped with effective train protection systems, the purpose of which is to reduce the risk of railway accidents in collaboration with the operational staff.

There are approximately 300 railway accidents a year in Denmark. The vast majority of these accidents have few, if any, harmful consequences. For example, a collision between a train and a deer or a shopping trolley that has been left on the rails will only rarely have consequences for either rolling stock or passengers.

Railway undertakings and infrastructure managers are responsible for following up on the incidents that have occurred in their areas. In the most serious cases, the Accident Investigation Board Denmark helps establish the chain of events and possible causes of the incidents (see Chapter 2).

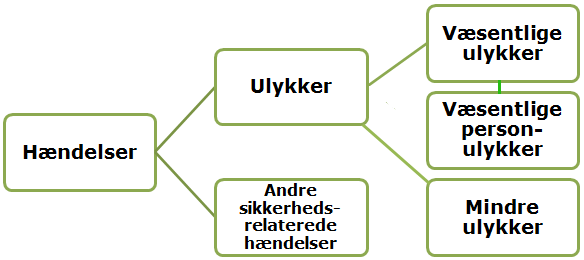
Each year, infrastructure managers and railway undertakings report all safety-related incidents to the Danish Transport and Construction Agency.

Based on the data reported, the Agency analyses the development of railway safety and presents the results in this chapter of the annual safety report[[1]](#footnote-3).

## Incidents on the railway

Incidents are described as accidents and other (safety-related) incidents[[2]](#footnote-4). Accidents are divided into significant accidents and minor accidents (see Figure 1). Data relating to significant accidents involving persons are also collected and evaluated as part of significant accidents[[3]](#footnote-5).

*Figure 1: Incidents and accidents*



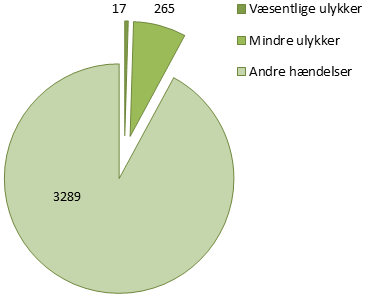
|  |  |
| --- | --- |
| Hændelser | Incidents |
| Ulykker | Accidents |
| Andre sikkerhedsrelaterede hændelser | Other safety-related incidents |
| Væsentlige ulykker | Significant accidents |
| Væsentlige personulykker | Significant accidents involving persons |
| Mindre ulykker | Minor accidents |

In this chapter, we will analyse railway safety in Denmark in 2015 and compare with data from previous years.

Due to the low number of incidents per year, there is a certain degree of statistical uncertainty in the calculations.

For this reason, the actual figures for 2015 are supplemented by a five-year average which is based on a larger amount of data.

*Figure 2: Number of reported incidents*



|  |  |
| --- | --- |
| Væsentlige ulykker | Significant accidents |
| Mindre ulykker | Minor accidents |
| Andre hændelser | Other incidents |

## Significant accidents

To separate accidents with and without major consequences, accidents are divided into *significant* accidentsand *minor* accidents*.*

Significant accidents are accidents that cause serious personal injury, death, damage of more than DKK 1.2 million or delays to train operations of more than six hours.

Seventeen significant accidents occurred in 2015, corresponding to 0.20 per million train-km. By way of comparison, there were 21 significant accidents in 2014. This results in a slight decrease in the five-year average which has steadily been decreasing for significant accidents over the period (see Figure 3).

For both significant accidents and minor accidents, railway accidents are analysed in the following categories: collision with a person, collision, other significant accident, accident at level crossing, derailment and fire. Suicides on the railways are not included in these categories, as they are not considered to be railway accidents (see page 21).

*Figure 3: Significant accidents 1999-2015 (per million train-km and year)*

*Suicides are not included.*

*The two graphs show the number in 2015 and the number for the five-year average for the period 2011-2015.*

|  |  |
| --- | --- |
| 5-årigt gennemsnit | 5-year average |

Significant accidents are divided into different categories, as shown in Figure 4 below.

Most of the significant accidents on the railways are collision with a person or accidents at level crossings. Collisions, fire or derailments, which are the accidents with the greatest potential for causing multiple injuries, are rare.

And, as shown in Figure 4, there were no fires or derailments in 2015.

Collisions with a person are still the most predominant type of significant accident on the railways in Denmark with a total of 10 collisions in 2015. This is still lower than in 2014, when there were 13 collisions with a person. The people who are hit by trains are mostly trespassers.

The number of accidents at level crossings fell from five in 2014 to two in 2015. On the other hand, the number of collisions went up from zero in 2014 to three in 2015.

Figure 4: Significant accidents broken down by type of accident 2015 (number per million train-km)  
Suicides are not included.

*The figure shows the number in 2015 and the number for the five-year average for the period 2011-2015.*

|  |  |
| --- | --- |
| 5-årigt gennemsnit | 5-year average |
| Personpåkørsel | Collisions involving persons |
| Kollision | Collision |
| Anden væsentlig ulykke | Other significant accidents |
| Ulykke i overkørsel | Accidents at level crossings |
| Brand | Fire |
| Afsporing | Derailment |

*Significant accidents are train accidents involving damage costing more than DKK 1.2 million, serious personal injury or death, or delays to train operations of more than six hours.*

## Significant accidents involving persons

While *significant accidents* designate accidents with major consequences, *significant accidents involving persons* designate accidents involving serious personal injury.

Significant accidents involving persons are a weighted total of the number of persons killed (weighted 1/1) and seriously injured (weighted 1/10) over the year on the railways. Figure 5 shows that the number of significant accidents involving persons dropped from 2014 to 2015.

*Figure 5: Significant accidents involving persons 1999-2015 (deaths/injuries per million train-km and year).*

*The red line indicates the Danish safety target. Suicides are not included.*

*The two graphs show the number in 2015 and the number for the five-year average for the period 2011-2015.*

|  |  |
| --- | --- |
| 5-årigt gennemsnit | 5-year average |

**The Danish safety target**

Denmark’s target is to maintain the high level of safety (measured with 2004 as the reference year)[[4]](#footnote-6).

Denmark’s safety target is that the total number of significant accidents involving persons on the railways per million train-km should not rise above 0.3 per million train-km[[5]](#footnote-7).

Compliance with the safety target is assessed on the basis of the number of significant accidents involving persons for all railway lines in Denmark. Significant accidents involving persons are given as a five-year average and compared to train-km travelled. Figure 5 above shows that the five-year average has been stable and low in the last five years.

The average number of significant accidents involving persons for the period 2011-2015 is 0.13 per million train-km. This is in line with previous years and below the Danish safety target of 0.3 significant accidents involving persons per million train-km, which is indicated by the red line in Figure 5.

The Danish safety target was thus met in 2015.

**The EU’s safety target**

The European Railway Agency publishes safety indicators and safety levels for EU Member States[[6]](#footnote-8). Denmark has a very high level of safety in comparison with the other countries.

Figure 6 on the next page shows the number of significant accidents involving persons in the EU in the period 2009-2014. Figure 6 only contains data up to and including 2014, as the European figures will only be updated when the European countries have submitted their safety reports (this report) in September for the previous year.

As is shown in Figure 6, the safety level for the Danish railway network for significant accidents involving persons (excluding the metro and local railways) is 0.15 fatalities and weighted serious injuries per million train-km in the five-year period 2010-2014[[7]](#footnote-9).

The European average, on the other hand, is 0.31 significant accidents involving persons per million train-km in the reporting period. This is almost twice as high as the Danish average for the period and slightly above the Danish safety target. Denmark is thus relatively low compared with the other European countries.

*Denmark’s safety target is that the total number of significant accidents involving persons on the railways per million train-km should not rise above 0.3.*

*Denmark has met its safety target in 2015 and ranks favourably in relation to the other European countries.*

Common safety targets for the whole EU were adopted in 2010 and revised in 2012[[8]](#footnote-10). The safety targets are based on the first four years of data collected at Community level (2004-2009).

The purpose of the European safety targets is to ensure a high level of safety on the railways across the whole EU.

*Figure 6: Significant accidents involving persons in the EU 2010-2014*

*The safety level is given as the number of deaths and weighted serious injuries over a 5-year period. Source: ERAIL (European Railway Accident Information Links) erail.era.europa.eu. Railway Safety Performance in the European Union 2014, European Railway Agency. [www.era.europa.eu](http://www.era.europa.eu/).*

|  |  |
| --- | --- |
| Storbritannien | UK |
| Irland | Ireland |
| Holland | Netherlands |
| Danmark | Denmark |
| Tyskland | Germany |
| Finland | Finland |
| Frankrig | France |
| Sverige | Sweden |
| Tjekkiet | Czech Republic |
| Italien | Italy |
| Østrig | Austria |
| Spanien | Spain |
| EU gennemsnit | EU average |
| Belgien | Belgium |
| Slovenien | Slovenia |
| Portugal | Portugal |
| Bulgarien | Bulgaria |
| Ungarn | Hungary |
| Kroatien | Croatia |
| Letland | Latvia |
| Estland | Estonia |
| Polen | Poland |
| Grækenland | Greece |
| Rumænien | Romania |
| Slovakiet | Slovakia |
| Litauen | Lithuania |
| Antal pr. mio. to-km | Number per million train-km |

**Deaths and serious injuries**

In 2015, 10 persons were killed and six were seriously injured on the railways.

The persons most vulnerable to railway accidents are trespassers.

This also appears from Table 1 below, which shows that eight of the 10 deaths and three of the six serious injuries were trespassers.

The table compares the number of deaths and serious injuries in 2014 and 2015 and shows both decreases and increases for the various categories during the last year.

*Table 1: Number of fatalities and serious injuries in 2014 and 2015 broken down by categories of persons*

*Suicides are not included.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Persons killed** | 2014 | 2015 | **Serious injuries** | 2014 | 2015 |
| Passengers | 0 | 0 | Passengers | 1 | 2 |
| Staff | 0 | 1 | Staff | 0 | 0 |
| Level-crossing users | 6 | 1 | Level-crossing users | 0 | 0 |
| Trespassers | 7 | 8 | Trespassers | 5 | 3 |
| Other fatalities | 1 | 0 | Other serious injuries | 1 | 1 |
| Total persons killed | 14 | 10 | Total serious injuries | 7 | 6 |

It is very rare that staff and passengers are seriously injured in railway accidents in Denmark.

However, one of those killed in 2015 was an employee. This employee was hit immediately before starting planned asphalt work at a level crossing. Several factors were found to have contributed to the accident, including reduced visibility caused by dense fog banks. This is the only incident in the period 2010-2015 where a member of staff was killed.

No employees were seriously injured in 2015.

The number of persons killed after having gained unauthorised access to the railway track increased by one, whereas the number of injuries in the same category fell by two.

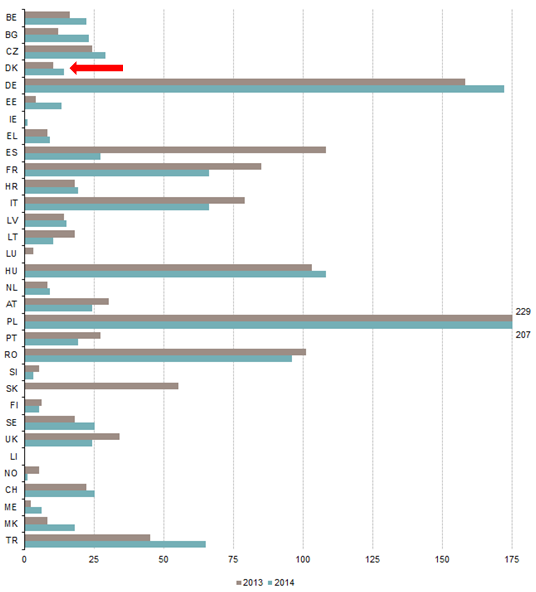
In addition, two passengers were seriously injured on two different occasions in 2015. However, these were not accidents but incidents. In one of the incidents, a passenger fell from a stationary train immediately after having boarded it and broke a leg. In the other incident, a woman fell on the platform after getting her hand caught in the train door. The driver managed to stop the train and called an ambulance.

The number of level-crossing users killed declined substantially, and this is typically one of the categories with the most fatalities.

However, the figures for 2014 and 2015 show a general picture of a relatively low number of fatalities and serious injuries on the Danish railway compared to other European countries.

This can be seen in Figure 7, which shows the number of fatalities in 2013 and 2014, where Denmark has a significantly lower number of fatalities than most other EU countries.

*Figure 7: Number of fatalities in railway accidents in the EU in 2013 and 2014[[9]](#footnote-11)*

*Source: <http://ec.europa.eu/eurostat/statistics-explained/index.php/Railway_safety_statistics>*

## Minor accidents

In this report, an accident is considered “minor” if it does not involve extensive material damage or serious personal injury.

265 *minor accidents* were registered in 2015.This is down from 325 *minor accidents* in 2014.

This reflects relatively large declines for virtually all types of minor accidents, except minor accidents at level crossings which went up from three to four from 2014 to 2015.

This also affects the five-year average, where the 2015 figures are all below the average for the previous years, as can be seen in Figure 8.

*Figure 8: Minor accidents broken down by type of accident 2015 (per million train-km)*

*Suicides are not included.*

*The figure shows the number in 2015 and the number for the five-year average for the period 2011-2015.*

|  |  |
| --- | --- |
| 5-årigt gennemsnit | 5-year average |
| Kollision | Collision |
| Anden ikke væsentlig ulykke | Other non-significant accident |
| Brand | Fire |
| Personpåkørsel | Collisions involving persons |
| Ulykke i overkørsel | Accidents at level crossings |
| Afsporing | Derailment |

Collisions still account for the largest share of minor accidents, although it has declined since 2014. The other categories are either on the same level as or below last year.

*Minor accidents are train accidents that may involve minor injuries or material damage of less than DKK 1.2 million.*

## Other safety-related incidents

The other safety-related incidents recorded by undertakings can be divided into *precursors to accidents* and *safety irregularities.*

Common to the two categories is that they involve safety failure that has not caused injury, but which could potentially have led to an accident. The difference between the two categories is that the Agency is only required to report data on *precursors to accidents* to the EU.

**Precursors to accidents**

Precursors to accidents can be divided into five types: Signal passed at danger, signalling failure, broken rails, broken wheels and track buckles.

Figure 9 shows that, also in 2015, the number of signals passed at danger was by far the most important precursor to accidents.

*Figure 9: Precursors to accidents broken down by type 2015 (per million train-km)*

*The figure shows the number in 2015 and the number for the five-year average for the period 2011-2015.*

|  |  |
| --- | --- |
| Signalforbikørsler | Signals passed at danger |
| Signalfejl | Signal failure |
| Skinnebrud | Broken rails |
| Defekte hjul og aksler | Broken wheels and axles |
| Solkurver | Track buckles |
| 5-årgt gennemsnit | 5-year average |

There were 396 incidents of signals passed at danger in 2015. However, this category covers both signals passed at danger by train and signals passed at danger with shunting rolling stock in areas with centralised traffic control and signals passed at danger with shunting rolling stock in areas without centralised traffic control.

The two latter types have a very low risk potential, since signals passed at danger with shunting rolling stock and work vehicles often occur in an area where there are no passenger trains and where the speed is low.

Only looking at the number of signals passed at danger by train in open track, this was 152 in 2015 compared to 142 in 2014 for the same type, i.e. a slight increase. Several major undertakings in the industry have reported increases in the number of signals passed at danger in 2015 in their safety reports. The greatest increase was seen on the line between Odense and Middelfart during a period of extensive infrastructure work in the summer of 2015.

During this work, the track continuously changed, which is indicated as a cause of the problem. As a result of the infrastructure work, a campaign was launched targeting drivers on this line.

In an open track, the safety impact of passing signals also varies greatly. If it only extends a couple of metres, this will present no danger in itself. The Agency will in cooperation with the industry prepare a classification of signals passed at danger according to risk potential in order to reduce the number of critical incidents.

The remaining types of precursors to accidents are generally at the same level as last year.

**Safety irregularities**

Besides precursors to accidents, undertakings also report safety irregularities to the Danish Transport and Construction Agency.

Safety irregularities are described in the following categories: Risk of a collision involving persons, irregularity at level crossing, non-technical signalling error, problems with gauge conditions, brake failure, track deformation, gauge conditions, vandalism and other irregularities.

*Precursors to accidents and safety irregularities are safety failures that have not caused injury, but which could potentially have led to an accident.*

*The Danish Transport and Construction Agency is only required to report data on precursors to accidents to the EU.*

In 2015, incidents involving risk of a collision with a person accounted for the most incidents at 655.

Two of the largest undertakings have also reported an increase in the number of incidents involving a risk of a collision with a person in their safety reports. One of the undertakings states that the reason for the increase is probably increased focus on the problem, but also that there is a real increase in situations with a risk of a collision with a person.

At the other end of the scale is track deformation with only seven irregularities.

**Incidents involving dangerous goods**

Two incidents involving dangerous goods were reported in 2015. None of these incidents had any serious consequences for the environment or people.

## Suicides on the railway

Suicide is not viewed as a railway accident in the traditional sense, because the causes of suicide are not directly related to the railway. For this reason, suicides and suicide attempts are not included in the statistics on which the above is based.

However, suicides on the railways should be considered and prevented on an equal basis with suicides in general.

It is important to monitor and try to prevent suicides on the railways, because they have serious repercussions for train drivers as well as any witnesses, and a general negative effect on the railways, including delays and, in severe cases, damage to rolling stock.

*Figure 10: Number of suicides on the railways in the period 1999-2015.*

*Suicides resulting in a fatality. Suicides are recorded on the basis of witness statements and police decisions.*

|  |  |
| --- | --- |
| Dræbte i alt 2015 | Dræbte i alt 2015 |
| Dræbte 5- årigt gennemsnit | Dræbte 5- årigt gennemsnit |

The number of suicides in the EU has been relatively stable at approx. 3,000 a year since 2010. This was also the case in 2014 with 2,895 suicides[[10]](#footnote-12).

As can be seen in Figure 10, the number of suicides on the railways has been on the increase since the late 1990s. 2012 was an unprecedented year with 44 suicides. In 2013-2015, the figures were relatively stable at between 29 and 31 suicides.

When compared with the number of kilometres travelled on the railways, the number of suicides on the railways in Denmark is relatively low compared with other European countries.

Looking at the number of suicides nationwide, suicides on the railways follow the general trend in Denmark.

Chapter 2: Follow-up of recommendations from the Accident Investigation Board and other incidents

In 2015, the Accident Investigation Board published two reports with recommendations for the Danish Transport and Construction Agency. In addition, the Agency chose to follow-up on a report from the Accident Investigation Board which had not given rise to any recommendations. The Agency considers all recommendations to have been complied with.

## The Accident Investigation Board’s duties and responsibilities

The overall objective of the Accident Investigation Board’s work is to identify opportunities to improve safety and prevent accidents. However, the Board is not responsible for attributing blame for the accidents.

Through its accident investigations, the Accident Investigation Board also provides an independent assessment of the underlying causes of an accident, thus giving authorities and undertakings the opportunity to rectify any errors and discrepancies based on its recommendations (recommendations for improvement).

As the recipient of a recommendation, the Agency must ensure that there is appropriate follow-up. Any action takes place in cooperation with the relevant responsible actors.

The Accident Investigation Board and the Agency have an ongoing dialogue on accidents and incidents that require particular attention and follow-up and which may have an immediate impact on railway safety.

In 2015, the Accident Investigation Board published two reports with recommendations for the Danish Transport and Construction Agency (see Table 2).

The Board’s recommendations and the Agency’s follow-up on the two reports are reviewed in the following.

In addition, the follow-up (at the Agency’s own initiative) on an incident involving a derailed IC train at Horsens Station will be described.

*Table 2: Reports from the Accident Investigation Board that the Agency followed up on in 2015.*

|  |  |  |
| --- | --- | --- |
| Report date | Incident | Incident date |
| 27-01-2015 | Fire/smoke in ER trainsets from 2010 to 2014 | 2010 to 2014 |
| 02-09-2015 | Car hit by train at level crossing 265 Thybanen (in Thisted) | 03-09-2014 |
| 24-09-2015 | IC train derailed during marshalling at Horsens Station | 04-10-2014 |

## Fire/smoke in ER trainsets from 2010 to 2014

In the period from 2010 to December 2014, the Accident Investigation Board registered 35 reports on fire and smoke incidents. None of these incidents resulted in personal injury or developed into large fires, but only caused damage to rolling stock.

In its report, the Board states that ER trainsets are not equipped with smoke detection systems.

Recommendations

In its report, the Board states that:

* smoke and/or fire incidents are experienced on ER trainsets
* ER trainsets and IC3 trainsets are the backbone of Danish intercity transport and transport passengers through the Great Belt Tunnel
* no risk assessment of smoke and fire in, among other places, the undercarriage has been performed.

The Board recommends that detection measures be reassessed.

The Accident Investigation Board’s report is available (in Danish) [here](http://www.havarikommissionen.dk/index.php?option=com_contentbuilder&amp;controller=list&amp;id=1&amp;limitstart=0&amp;contentbuilder_download_file=c59fc6b247672f9860a7cbc3eadfa63aa39a4ec9&amp;lang=da)

Follow-up by the Danish Transport and Construction Agency

On 17 February 2015, the Danish Transport and Construction Agency asked DSB (the Danish national rail company) to prepare an action plan for the assessment of risks associated with railway operations with IC3 and ER trainsets. This action plan was submitted by DSB on 6 March 2015.

On 19 May 2015, DSB submitted a report and risk assessment on fire/smoke in the mechanical and electrical installations for individual or combined operation (MF and ER) (*Redegørelse og risikobetragtning for brand- og røgudvikling i mekaniske og elektriske installationer for individuel eller litra samkørsel (MF og ER)*). The report describes 22 incidents on ER trainsets. DSB has classified the remaining 13 incidents in the Accident Investigation Board’s report as immaterial.

The report describes and assesses the risk of seven incidents due to fire and smoke in the traction motor of ER trainsets and 15 incidents involving smoke caused by dragging brakes.

In its report, DSB describes its remedial actions for these incidents and concludes that the risk assessment has not revealed any significant threats in relation to fire and smoke caused by the operation of these trainsets.

The Danish Transport and Construction Agency believes that DSB’s risk assessment has identified the possible causes and remedial action.

The Agency will follow up on whether DSB’s remedial action has had the expected effect.

The Agency regards the Accident Investigation Board’s recommendation as having been met.

## Car hit by train at level crossing 265 Thybanen (in Thisted)

The accident occurred on 3 September 2014 at a level crossing in Thisted on the line between Struer and Thisted. When passing the level crossing, a train collided with a passenger car that drove out in front of the train. The two people in the car died. There were no casualties in the train.

The level crossing was equipped with a warning signal system with four road signals without barriers. The warning signal system was activated at the time of the accident, the signals on the road were flashing red, and the bell was active.

The warning signal system is constructed in such a way that the red light in the warning system’s signals is a prerequisite for the train receiving the signal to traverse the level crossing.

Recommendations

The Accident Investigation Board’s investigation showed that:

* the warning signal system was working at the time of the accident
* the traffic conditions are complicated due to restricted view
* the level crossing is used as a short cut and passed by approx. 4 000 cars weekly
* the driver, who was believed to be familiar with the place and the course of the road, failed to stop at the stop line approx. 10 metres from the track.

In connection with the Accident Investigation Board’s investigation, it was revealed that there were defects in the signals facing the road. Among other things, the warning sign “A72”, which indicates that a level crossing without barriers is coming up, was missing.

The infrastructure manager and the Municipality of Thisted have previously agreed to install half-barriers or full barriers at the level crossing. According to the plan agreed, the changes to the level crossing are to be implemented in 2020 in connection with the signal programme.

Due to the complicated course of the road and the use of the level crossing by both local and through traffic, the Accident Investigation Board recommends:

* that the Danish Transport and Construction Agency ensures that the safety of this level crossing is reassessed, and, if it identifies any need for improvements, that it does not wait for the signal programme to implement these.

The Accident Investigation Board’s report is available (in Danish)[here](http://www.havarikommissionen.dk/index.php?option=com_contentbuilder&amp;view=list&amp;Itemid=163&amp;lang=da&amp;contentbuilder_download_file=29bd103cb1ff40984691e5dccfc2f505fb2478fa)

Follow-up by the Danish Transport and Construction Agency

After the accident and the Accident Investigation Board’s recommendation, the Agency asked Banedanmark to account for the safety-related measures taken in response to the accident and to describe the process in Banedanmark when an incident, for example at a level crossing, occurs.

Following a meeting with the Danish Transport and Construction Agency on 16 February 2015, Banedanmark prepared a new screening model to ensure that all incidents at level crossings will automatically trigger a new safety assessment.

In October 2015, Banedanmark submitted a report on the measures implemented after the accident at level crossing 265 in Thisted. In its report, Banedanmark states that a meeting with the Municipality of Thisted has been planned to discuss the safety of level crossing 265 and two nearby level crossings.

In February 2015, the Agency followed up on the above and found that Banedanmark has performed a new risk assessment of the three level crossings and is in the course of discussing risk-reducing measures with the Municipality of Thisted. The required warning signs have now been installed.

The Agency regards the Accident Investigation Board’s recommendation as having been met.

## IC train derailed during marshalling at Horsens Station

This incident occurred on 4 October 2014 during marshalling of an IC3 trainset at Horsens Station.

The trainset derailed during marshalling at Horsens Station after the driver had been given a clear signal. The station manager changed the points and the trainset derailed.

The Accident Investigation Board’s report:

It was noted in connection with the Accident Investigation Board's investigation that:

* train operations were abnormal at Horsens Station
* there were delays in traffic
* the station manager had only had a short break between shifts
* the station manager had had five consecutive shifts
* the incident occurred after working for more than 11 hours
* the correct safety cover had not been used.

Banedanmark did not identify any need for further measures after the incident.

The Accident Investigation Board had no recommendations.

The Accident Investigation Board’s report is available (in Danish) [here](http://www.havarikommissionen.dk/index.php?option=com_contentbuilder&amp;controller=list&amp;id=1&amp;limitstart=0&amp;contentbuilder_download_file=31ee9f34bb6a982338dead899bee16d5a082547e&amp;lang=da).

Follow-up by the Danish Transport and Construction Agency

Despite the fact that the Accident Investigation Board had no recommendations for this incident, the Agency chose to investigate several factors that may have had an impact on the station manager’s work, causing him or her to be unfit to perform safety-classified functions satisfactorily[[11]](#footnote-13).

The Agency chose to discuss this with Banedanmark in an inspection in January 2016, as it suspects that short breaks between shifts, long working hours and abnormal operating conditions may have been contributing causes of incidents.

Banedanmark is still working on root cause analyses and corrective actions, and the Agency will follow up on this in future inspections.

*The Accident Investigation Board Denmark is an independent safety investigation authority that investigates accidents and incidents in the Danish aviation and railway sectors.*

*The purpose of this is to prevent accidents by collecting and analysing information, drawing conclusions, including determining cause(s) and/or contributing factors, and preparing safety recommendations to improve safety.*

*The Accident Investigation Board does not attribute blame and responsibility.*

*Source: [www.havarikommissionen.dk](http://www.havarikommissionen.dk/)*

Chapter 3: Safety certificates and safety approvals

At the end of 2015, 13 undertakings had a valid safety certificate and/or authorisation in Denmark. In 2015, there were a number of changes in relation to the amount and content of safety certificates and authorisations. Furthermore, the Danish Transport and Construction Agency has implemented a new procedure for issuing conditions when granting safety certificates and authorisations.

## Safety certificates

A safety certificate is divided into part A and part B which cover a railway undertaking’s safety-related activities. Safety certificates are issued to railway undertakings, while safety authorisations are issued to infrastructure managers. You can read more about these in the next section.

The part A safety certificate includes general requirements for the undertaking, such as the content of a safety management system. A railway undertaking must have a part A safety certificate in the country in which it has its main activities. It is valid throughout the EU for a maximum of five years.

Part B covers the specific infrastructure used by the railway undertaking in a given country. A railway undertaking must obtain a part B safety certificate for each country in which it performs railway transport.

Before issuing part B, it must be established that the railway undertaking’s safety management system meets all national requirements and conditions in relation to the infrastructure to be used.

All railway undertakings with a part A safety certificate in Denmark also receive a part B safety certificate for operation in Denmark. The requirements for both certificates are considered in one process.

For railway undertakings with a part A safety certificate in another EU country, the application for a part B safety certificate is processed separately.

Table 3 shows the total distribution of safety certificates issued in Denmark on 31 December 2015.

*Table 3: Safety certificates issued in Denmark[[12]](#footnote-14)*

|  |  |
| --- | --- |
| Category | No. |
| Railway undertakings with safety certificates A and B | 9 |
| Railway undertakings with safety certificate B in Denmark only | 2 |

*A safety certificate is divided into part A and part B which cover a railway undertaking’s safety-related activities. A safety certificate is issued to railway undertakings.*

## Safety authorisations

A safety authorisation is issued to an infrastructure manager.

To obtain a safety authorisation, the infrastructure manager must have a safety management system and document to the Agency that it is able to control all risks on the rail network.

The infrastructure manager is responsible for the coordination of the railway undertakings operating on its rail network.

Table 4 shows the distribution of the safety authorisations issued in Denmark on 31 December 2015:

*Table 4: Safety authorisations issued in Denmark[[13]](#footnote-15)*

|  |  |
| --- | --- |
| Category | No. |
| Undertakings with safety authorisation | 7 |

A total of five undertakings have both part A and B safety certificates *and* safety authorisation, which means that they operate as both infrastructure managers and railway undertakings.

All in all, 13 enterprises in Denmark thus have a valid safety certificate and/or a valid safety authorisation.

## Changes in 2015

*A safety authorisation is issued to an infrastructure manager that documents to the Danish Transport and Construction Agency that it has implemented a safety management system and is able to control all risks on the rail network.*

Table 5 shows the changes in 2015:

*Table 5: Changes in safety certificates/authorisations in 2015*

|  |  |
| --- | --- |
|  | No. |
| New safety certificates/authorisations issued | 1 |
| Renewals of safety certificates/authorisations | 4 |
| Amendments of safety certificates/authorisations | 5 |
| Expired safety certificates/authorisations | 3 |
| Withdrawn safety certificates/authorisations | 1 |

A freight operator, who previously had a part A certificate in Sweden and a part B certificate in Denmark, chose to apply for new part A and B certificates in Denmark when its part B certificate expired. At the same time, it changed its organisation, which meant that Denmark now has a new freight company.

Four companies had their safety certificates and/or safety authorisations renewed when their existing ones expired.

In total, the Agency has issued three amended safety certificates and two amended safety authorisations in 2015. The amendments consisted in takeover of infrastructure, merger of operation, company merger and expansion of operation.

Two safety certificates and one safety authorisation expired in 2015.

The Agency revoked one part B safety certificate for a freight company after it identified critical shortcomings in the safety management system in its supervision.

## The Agency's guidance of undertakings

The Agency emphasises dialogue with undertakings. The Agency believes that dialogue and guidance have a greater positive impact than one-way communication and sanctions. Dialogue and guidance take several forms which will be described in the three following sub-sections.

**Written guidance**

The Agency’s website includes guidelines on how to obtain a safety certificate and safety authorisation.

Here, undertakings can find forms with associated guidelines for applying for safety certificates and safety approval. The same form is used for new issues, renewals and amendments of safety certificates or approvals.

The Agency has also issued a [safety management guide](https://www.trafikstyrelsen.dk/~/media/Dokumenter/03%20Jernbanesikkerhed/Vejledning%20i%20sikkerhedsledelse%2007_10_2013.ashx) in accordance with Danish Executive Orders 13 and 14 of 4 January 2007 and Commission Regulation (EU) No 1078/2012.

**Opening meeting**

When a new undertaking is considering applying for a safety certificate, the Agency offers to hold a preliminary meeting with the undertaking.

At the meeting, the undertaking is informed of the general requirements concerning documentation for the safety management system and requirements for documentation for compliance with the other safety requirements.

It is also informed about the impending certification process, including the extent of the supervision and due dates for submission of documentation.

When an undertaking has decided to apply for a safety certificate, it will also be offered an individual meeting.

**Individual meeting on safety management**

Since 2013, the Agency has offered undertakings individual meetings where the purpose and potential of the safety management system are discussed.

The purpose of these meetings is to balance expectations on the undertaking’s safety management systems and also explain how a safety management system is set up based on the undertaking’s specific activities and risk profile.

There was a particular focus on the following areas:

* Structure/content of the safety management system
* Requirements for safety management system documentation
* System definition and Risk profile
* Safety target

Monitoring and corrective actions, including internal audits and management evaluation.

## Decision process for decisions on the issue of safety certificates and safety authorisations

Decisions on new issue, renewal or amendment of a safety certificate or safety authorisation are taken by an internal certification committee in the Agency[[14]](#footnote-16) based on a recommendation drawn up by the lead auditor.

In the recommendation, the lead auditor must document that the audit has with sufficient certainty established that the undertaking’s implemented system complies with all requirements for a safety management system.

*The lead auditor is responsible for the preparation, implementation and follow-up of the supervision and is the Agency’s contact person for the undertaking.*

*The lead auditor leads the individual supervision visit and decides on the composition of the supervision team to guarantee the necessary competencies in the team.*

*The lead auditor manages and reviews the necessary documentation and ensures that the objective of the supervision is achieved.*

Based on the certification committee’s review of the documentation submitted and a clarification meeting, the certification committee makes a decision on whether the proposal can be accepted and whether to attach special conditions to the authorisation.

During the course of 2015, the Agency systematised the process for making new, renewed or amended safety certificates or authorisations subject to conditions.

If the Agency identifies any failures by the undertaking to meet all requirements for the safety management system when issuing a safety certificate or authorisation, the safety certificate and/or authorisation will be issued subject to certain conditions.

A typical example of this is when an action plan drawn up in response to a non-conformity has not been implemented, which means that the non-conformity cannot be closed before the certificate or authorisation is to be issued. The safety certificate and/or authorisation will then be issued subject to conditions.

The conditions describe what the undertaking must do, and the Agency will follow up on this separately until the requirements have been met, after which time the condition will be cancelled.

**Complaints and abolition of the right of appeal**

Previously, undertakings that wanted to appeal against a decision concerning railway safety could lodge this directly with the Agency or with the Railways Board.

This right of appeal was abolished on 10 July 2015 with the amended Railways Act.

In 2015, the Agency received one written complaint in connection with an undertaking that had applied for a permission for vintage train operation.

Read more about complaints and abolition of the right of appeal in Chapter 6 on the implementation of the Railway Safety Directive.

*Non-conformities are used when the Agency finds that the undertaking is not complying either with its own procedures or applicable regulations and requirements.*

*In these cases, a safety certificate or authorisation may be issued subject to one or more conditions describing the action to be taken by the undertaking. The conditions will be cancelled as soon as all requirements have been met.*

Chapter 4: Supervision of railway safety in 2015

The low number of significant accidents shows that Denmark has a high level of railway safety. However, the Danish Transport and Construction Agency believes that some railway undertakings have still not fully implemented risk-based safety management based on their individual risk profiles. In addition, they are experiencing challenges with the implementation of the EU rules adopted in recent years.

## The Agency as a supervisory authority

The Danish Transport and Construction Agency is the supervisory authority for the railway sector. Its supervisory tasks include the so-called audits of the undertakings’ safety management systems as well as technical inspections looking at the technical results of the safety management system. The Agency supervises all players in the railway sector.

A series of executive orders place requirements on the undertakings within such areas as railway safety, preparedness, training and authorisations to place into service.

Through its supervision of the undertakings, the Agency must ensure that they implement effective safety management systems, and that the relevant safety requirements are being met.

The Agency usually employs dialogue-based supervision, where there is an opportunity to acquire experience from the undertakings, but where there is also an opportunity for guiding the undertakings to best practice.

Supervision is planned on the basis of the Agency’s risk-based assessments of the undertakings so that efforts are concentrated where the Agency deems there to be the most and greatest risks.

Supervision planning and prioritisation

Since 2010, the Agency’s annual planning of audits has been based on a comprehensive and systematic risk assessment of undertakings. The method is described in the [Agency’s supervision strategy](http://www.trafikstyrelsen.dk/~/media/Dokumenter/03%20Jernbanesikkerhed/01%20Infrastrukturforvalter/Tilsyn/Tilsynsstrategi_jernbanesikkerhed_2011.ashx).

Unlike audits, inspections are not planned, but are rather carried out on an ad hoc basis.

The assessments are based on a basic assessment of the nature of the undertaking, as well as the experience gained by the Agency with the undertakings over the year.

The number of audit days for the coming year is determined based on the overall assessment of the individual undertaking. Likewise, the number of days may be increased in connection with renewals of safety certificates and safety authorisations.

[The Agency’s supervision schedule](https://www.trafikstyrelsen.dk/~/media/Dokumenter/03%20Jernbanesikkerhed/09%20Rapporter/Plan%20for%20Trafikstyrelsens%20sikkerhedstilsyn%202015%20%20Jernbane.pdf) for the railways for 2015 was published on 30 January 2015.

The supervision schedule provides an overview of when the Agency has planned follow-up supervision during the period of validity of the safety certificate or safety authorisation, and supervision to be carried out in connection with the renewal of safety certificates or safety authorisations.

**Changes to the supervision schedule**

In 2015, a number of significant changes were made to the supervision schedule.

These changes were partly due to changes in the undertakings. Among other things, a major renewal supervision was postponed to 2016 at an undertaking’s request. Also, company mergers, discontinued and newly started undertakings and revocation of a part B safety certificate for a freight company forced the Agency to change its schedule.

Follow-up supervision was postponed for a number of undertakings to later in the year or to 2016 due to internal changes in the undertakings or re-allocation of resources at the Agency.

## General inspection results in 2015

The Agency still believes that the undertakings are facing challenges with the systemic requirements relating to rail safety. These requirements are:

* Building up a risk profile, and using that risk profile as a starting point and focal point for the safety management system
* Documenting the safety management system at an appropriate level in such a way that it is used naturally in the undertaking
* Documenting requirements placed on the functions that perform safety-related tasks, and documenting that these requirements have been met.

In addition, the Agency has ascertained that the undertakings are having difficulties implementing a number of the EU rules adopted in recent years. These EU rules particularly concern:

* The drawing up and issuing of train driver’s licences
* The setting up of a certificate register for train driver’s licences
* The implementation of risk assessment/risk management in case of changes.

The Agency has reviewed the non-conformities issued in 2015 and concluded that the two most frequent non-conformities are errors in the drawing up of train driver’s licences and lacking or incomplete licence register in accordance with Railway Provisions no. 2-1-2011 (*Bestemmelser for Jernbanen nr. 2-1-2011*).

Non-conformities were found in about half of the undertakings in which these matters were included in the audits. The issue of train driver’s licences has been a focus area in 2015 and has been described separately below.

Finally, the Agency has found that undertakings are still having difficulties planning and performing internal audits, including registering any issues discovered, performing root cause analyses and taking corrective action.

In some undertakings, safety is very much up to one or two individual employees, who despite their high level of competence and experience are still not helped in their work by a well-functioning safety management system.

*The Danish Transport and Construction Agency is the supervisory authority for the railway sector.*

*Its supervisory tasks include the so-called* ***audits*** *of the undertakings’ safety management systems as well as* ***technical inspections*** *looking at the technical results of the safety management system.*

*The Agency supervises all players in the railway sector.*

## Supervisory results with focus topics in 2015

Focus areas are topics that will be supervised at all undertakings during the year. Focus areas are chosen when previous years’ supervision has shown that several undertakings are failing to handle and implement them correctly.

In the evaluation of the supervisory efforts in 2014, performed in connection with the annual supervisory planning, the following three topics were announced as focus areas in the supervision schedule for 2015:

1. *Contract management*
2. *Train driver’s licences*
3. *Undertakings’ risk profiles*

*1. Contract management*

Today more than ever before, undertakings are using sub-contractors for many types of assignments, such as maintenance of components, rolling stock and/or infrastructure.

When they enter into contracts, their safety management systems should ensure that all requirements for contract management are met.

In its supervision in 2014, the Agency found that many undertakings are not succeeding in meeting the requirements for the conclusion of safety-related contracts. For that reason, this focus area from 2014 was continued in 2015.

To reach all players in the industry and provide for exchange of experience and learning between railway undertakings, the Agency included contract management as a topic for its Safety Conference in October 2015.

Among the issues discussed at the conference were how to differentiate between the content of different contracts and the requirements that the safety management system must set up for the individual types of contracts.

In addition, the Agency’s supervision focused on clarifying the requirements for contracts under the CSM Monitoring Regulation (Regulation (EC) No 1078/2012) and the CSM-RA Regulation (Regulation (EU) No 402/2013) as well as the executive orders on safety management systems.

In 2015, undertakings generally increased their focus on contract management, leading several of them to implement changes to their safety management systems to comply with the contract management requirements. It generally seems that the undertakings have realised the importance of clearly defining requirements for services to be provided when contracts are concluded and later ensuring that they are provided as agreed.

The Agency thus concludes that the increased focus on contract management has caused undertakings to start the process of developing their safety management systems to ensure that the contract management requirements can be met.

The Agency expects to see results of this work in the planned follow-up supervision in 2016.

*2. Train driver’s licences*

In 2013, new EU rules on the issuing and drawing up of train driver’s licences came into force for all drivers.

To comply with these rules, all undertakings have had to change their train driver’s licences in accordance with the format prescribed by the EU and to set up a licence register to keep track of the licences issued.

In its supervision in 2014, the Agency found that several undertakings had not completed the driver’s licences correctly and that they did not always issue the licences following a process that complied with the applicable rules. For that reason, the Agency chose to focus on how to draw up train driver’s licences in its supervision of all railway undertakings visited in 2015.

After its supervision in 2015, the Agency concluded that the undertakings had only implemented the EU rules on train driver’s licences to a very limited extent.

Non-conformities were issued to about half of the companies visited for failure to meet the requirements for train driver’s licences and/or the licence register.

During 2015, the Agency followed up on the corrective action taken by the undertakings in response to non-conformities. Many of the undertakings are now implementing the EU requirements correctly. However, some undertakings still have not implemented the rules, and the Agency will follow up on these in 2016.

The Agency believes that the undertakings have generally lacked knowledge of the EU rules on train driver’s licences, both as regards the detailed rules on licences and the licence register and the fundamental purpose of having rules in this area.

Against this background, the Agency has provided guidance to the undertakings in the application of the rules as part of its supervisory activities in 2015. Also, the Agency focused on generally improving its guidance in this area to promote the undertakings’ understanding of the applicable EU rules on driver’s licences.

*3. Undertakings’ risk profiles*

An undertaking’s risk profile is a systematic analysis of the undertaking’s safety-related hazards, causes of hazards, precautions taken against hazards and how the undertaking establishes that the precautions have the intended effect.

The undertaking’s risk profile is an important focus point for safety management and the safety management system. The risk profile very much determines how the system management system is set up, ensuring that important risk areas are addressed by the procedures established by the undertaking.

In 2015, the Danish Transport and Construction Agency focused on the undertakings’ development and use of risk profiles for their safety-related activities.

A number of guidance meetings were held with all undertakings in 2013 and 2014 to introduce the requirement for a risk profile.

The Agency subsequently realised that it was a difficult process for the undertakings to establish a systematic risk profile to be used as the foundation for their safety-related work.

It is a lengthy process, but the Agency expects that most of the undertakings will have completed the work on systematising and implementing a risk profile in 2016.

Going forward, the Agency will focus on the risk profile, as it should be a fundamental part of the undertakings’ work with the continuous improvement of their safety management systems.

## Maturity assessment model

As part of its supervision, the Agency has since 2013 performed a maturity assessment of the railway undertakings’ and infrastructure managers’ ability to manage the risks involved in their activities.

The maturity model is generally only relevant to railway undertakings with a part A safety certificate and/or infrastructure managers with a safety authorisation. Undertakings that only have a part B safety certificate in Denmark are not included in the assessment (see Chapter 3 for more information on safety certificates and safety authorisations).

***The maturity assessment model***

In 2012 and 2013, the Agency established and developed a method to be able to measure the effect of the short-term objective that the undertaking should be able to manage its own risks. The Agency took as its starting point the fact that an undertaking’s ability to manage its own risks can be assessed by supervising compliance with regulations and through learning in the undertaking.

Based on this, the Agency has identified six central areas (indicators) in undertakings’ safety management systems which are deemed to be decisive:

1. Targets and action plans
2. Implementation of legal requirements
3. Recording of incidents
4. Management of corrective and preventive actions
5. Internal audits
6. Management evaluation

For each area, the Agency has formulated five levels of maturity (levels 1 to 5), based on which undertakings are assessed. The lowest level (1) means the undertaking has not implemented safety management.

The middle level (3) means the undertaking has implemented safety management that just meets the Agency’s requirements. A score of at least 3 is therefore the desired level.

The highest level (5) means that through its safety management system, the undertaking is proactively improving safety throughout the organisation.

Through annual supervision, the Agency has since 2013, when the method was used for the first time, thus assessed trends in undertakings’ ability to manage their own risks. The assessment also indicates whether or not the Agency’s monitoring activities work and provides undertakings with information on their own development in relation to the industry.

**Maturity assessment of undertakings 2015**

The overall picture of the development in 2014-2015 within the six indicators is shown in Figure 11 below.

The assessment published for 2014 was also 2.9, but one undertaking has been removed from the comparison, which means that the 2014 level has been adjusted to 3.0.

This is a list of all undertakings included, where each undertaking is included only once, even if it is both a railway undertaking and an infrastructure manager.

The list contains data from 10 undertakings. Undertakings for which a maturity assessment was not made in both 2014 and 2015 are not included on the list.

As can be seen in Figure 11, the overall assessment fell marginally from 3.0 in 2014 to 2.9 in 2015.

The Danish Transport and Construction Agency’s overall assessment is that several railway undertakings have still not fully implemented risk-based safety management based on their individual risk profiles.

This is believed to be one of the main reasons why the undertakings’ maturity level has not improved.

In addition, the Agency assesses that several undertakings have not built up the competencies required to implement and maintain a safety management system.

*Figure 11: Development in maturity assessment 2014-2015 (all undertakings)*

|  |  |
| --- | --- |
| Samlet Score | Total score |
| Mål og handlingsplaner | Targets and action plans |
| Implementering af lovkrav | Implementation of legal requirements |
| Hændelsesregistrering | Recording of incidents |
| Håndtering af korrigerende og forebyggende handlinger | Management of corrective and preventive actions |
| Intern revision | Internal audits |
| Ledelsens evaluering | Management evaluation |
| Score | Score |

Development in indicators

Two indicators have increased by 0.1 percentage points:

* Corrective and preventive actions
* Internal audits

These indicators were lowest at 2.6 in 2014 and 2.7 in 2015. This indicates that the undertakings are moving towards a minimum level of 3 within these areas.

Areas for follow-up

The results of the latest maturity assessment will be used going forward to boost the indicators that generally present a challenge and the undertakings with a result below average.

The minimum assessment to strive for within both areas is 3.

However, the Agency believes that its supervision does have an effect, not least as part of the dialogue and guidance required to support the undertakings’ own work on the development and operation of an effective safety management system.

The maturity model also shows that three indicators are still at or below 3:

* Implementation of legal requirements
* Management of corrective and preventive actions
* Internal audits

However, they are closer to achieving an assessment of 3 than in previous years, and the Agency will work to ensure that they are elevated to level 3 or above in these areas.

## Corrective actions implemented by the undertakings

The Agency has ascertained that a number of undertakings have set out to overhaul of their safety management systems in recent years. Several of them have almost started from scratch with a new IT platform and a new way of describing the system.

Many of the undertakings are currently developing their risk profiles and integrating this into their safety management systems.

These are the most significant corrective actions implemented by undertakings in 2015.

Generally, undertakings are getting better at following up on the non-conformities issued by the Agency. Several undertakings are managing them in the same systems as the non-conformities identified in their own internal audit and/or incident management.

Another common feature is that the undertakings’ corrective actions are not sufficiently based on a thorough root cause analysis of the problem. This can lead merely to the symptoms being rectified and not the underlying causes of the problems.

This situation has therefore still been a theme in the dialogue with the undertakings, which has meant that more undertakings are currently documenting and implementing concrete methods for root cause analysis.

## The Agency’s supervision resources

**Time spent on supervision in 2015**

In 2015, the Agency performed 127 audit days, relating to undertakings’ safety management systems in connection with safety certification and safety authorisation and the follow-up of these. By way of comparison, in 2014 there were 191 audit days.

Audit days are the number of days on which the Agency performed audits. Days on which inspections were performed are not included in this figure.

Table 6 on the next page shows the number of hours spent on supervision in the Agency. The number of hours shows a development from 2013 to 2015 and covers both time spent on audits and time spent on inspections.

The Agency’s supervision workload increased considerably from 2013 to 2014, and was then reduced again in 2015. This is due, among other things, to the fact that a large supervision was conducted in 2014 in connection with the renewal of an infrastructure manager’s safety authorisation. No supervision tasks on that same scale were performed in 2015.

In 2015, subject specialists were used for around 23% of audits. In comparison, subject specialists were used for around 30% of audits in 2014. The reason for this is that subject specialists were used to a particularly high degree in connection with the renewal supervision carried out for a major infrastructure manager. By way of comparison, subject specialists were used in around 50% of the inspections carried out in both 2014 and 2015.

The reason for this is that inspections are a more in-depth evaluation of a particular area of a more technical or railway-based nature.

*Table 6: Time spent on supervision broken down by audits, inspections and certification*

|  |  |  |  |
| --- | --- | --- | --- |
|  | 2013  *(hours)* | 2014  *(hours)* | 2015  *(hours)* |
| Audits (follow-up supervision)\* | 968 | 1683 | 3818 |
| Inspections | 1387 | 1381 | 743 |
| Certification/approval\* | 1846 | 3982 | 1006 |
| Total hours spent | 4201 | 7046 | 5567 |

*\*In 2013-14, “Certification/authorisation” includes both renewals and amendments. The method was changed in 2015, with renewals now being counted under “Audits”, because undertakings are no longer charged a fee for renewals.*

It is the Agency’s expectation that supervisory efforts will increase over the coming years as the number of players increases, and as a result of the restructuring of the division of responsibilities. Undertakings, for example, will have more opportunities to act themselves by using significance assessments, where they will no longer need to obtain the approval of the Agency. This means that the Agency instead will have to perform supervision to ensure that undertakings are managing their responsibilities correctly.

**Competence management**

No changes were made to the Agency’s competence management methods in 2015.

*Significance assessments are used to assess whether a change in infrastructure, rolling stock or maintenance or operational or organisational changes are so significant that the CSM-RA Regulation applies.*

**Staffing**

Supervision is normally carried out by a team of two employees from the Agency. When the object of the supervision is the undertaking’s safety management system, the two employees will normally have a background as auditors.

But if the supervision is of a more technical nature, the supervision team will usually be a person with audit competencies and a railway expert in the relevant field.

**Competency requirement**

The Agency requires employees who are involved in supervisory activities to have been trained to perform the task. Employees' competencies are assessed annually.

Thus, employees who perform the role of Lead Auditor shall have in-depth knowledge of and experience with management systems and have passed the examination in approved training as a Certified Lead Auditor.

The Agency has also prepared a competence profile designed to ensure that lead auditors have sufficient knowledge of the railways as well as legal knowledge within:

* movement on and by the railways
* standards and safety regulations
* basic infrastructure knowledge
* risk assessment
* administrative law and legislation.

## Cooperation with other countries' authorities in relation to supervisory activities

In 2015, Denmark did not sign any formal written agreements with national safety authorities in other countries in relation to supervisory activities in the rail sector, but exchanged experiences with the authorities in Sweden and Norway. In addition, the authorities exchanged information in connection with problems with common operators.

Denmark holds annual meetings with the authorities in Sweden and Norway. The purpose of these meetings is to exchange information on current issues relating, for example, to rail operators, new legislation as well as to achieve a common understanding and interpretation of EU legislation.

At the annual Nordic meeting in 2015, each country gave an account of the developments of the previous year and presented plans for the coming year. In particular focus at the meeting was a freight company, which at the time operated in all three countries, and which had problems implementing a safety management system.

It was agreed that the Danish and Norwegian authorities should participate in the renewal supervision to be performed by the Swedish authorities during the year.

Furthermore, it was agreed that the countries should inform each other on an ongoing basis about supervisory activities at undertakings that operate across national borders.

The countries also shared experience on ERA’s cross audits. Cross audits are the (voluntary) supervision undertaken by ERA to ensure that the national safety authorities’ supervision of undertakings is in conformity with the CSM Supervision Regulation (Regulation No 1077/2012).

In addition, the countries talked about their experience with undertakings’ use of the CSM-RA and CSM Monitoring Regulations.

Chapter 5: Theme – The CSM-RA Regulation

The CSM-RA Regulation is the primary piece of legislation governing authorisations for placing in service in the rail sector. The industry is becoming more experienced in using the CSM-RA Regulation, but there is still a need for dialogue and clarification as to the use of the Regulation between the Agency and the day-to-day users, just as there is still a need for more expertise in this area.

## The CSM-RA Regulation in general

After the adoption of the EU Regulation on the common safety method etc. (the CSM-RA Regulation (EU) No 352/2009) in April 2009, the Danish Transport and Construction Agency changes the authorisation process and documentation requirements for applications for authorisations for placing in service in 2010.

The Regulation has since been amended by CSM-RA Regulation (EU) No 402/2013[[15]](#footnote-17), adopted in 2013 and applicable in the Member States from 21 May 2015. According to the CSM-RA Regulation, the Member States must decide whether assessors are to be accredited or recognised.

The European Commission has also issued a Regulation[[16]](#footnote-18) containing a minor amendment to the CSM-RA Regulation concerning explicit risk estimation. In addition, new definitions were added, and two of the previously applicable definitions in the CSM-RA Regulation were amended. For more information, see the Danish Transport and Construction Agency’s website [here](http://www.trafikstyrelsen.dk/DA/Presse/Nyhedsarkiv/Jernbanesikkerhed/2015/07/Mindre-andring-i-forordningen-om-risikovurdering.aspx).

**Approval of assessors**

In response to the new rules stipulating that it must decide whether to accredit or recognise assessors, in 2014, the Danish Transport and Construction Agency issued an Executive Order[[17]](#footnote-19) on requirements for the accreditation of assessors in the rail sector.

The Executive Order concerns how an undertaking can obtain accreditation as an assessor in Denmark, as well as which requirements assessors must satisfy to remain accredited as assessors.

In the vehicle area, it has been decided that, if a vehicle is operated within the scope of the Interoperability Directive[[18]](#footnote-20), the assessor must be accredited in accordance with the Agency’s Executive Order on requirements for the accreditation of assessors in the rail sector.

In the infrastructure area, the assessor must be accredited by an accreditation body when it assesses the following railway infrastructure changes:

* Infrastructure project covered by a dedicated construction act or instrument
* Changes covering the European Rail Traffic Management System (ERTMS)
* Changes covering nationwide establishment of subsystems or nationwide replacement of subsystems

In Denmark, DANAK is in charge of the accreditation of assessment bodies, and at the end of 2015, DANAK had accredited two Danish assessment bodies within CSM-RA. However, foreign accredited assessment bodies are also active in Denmark and involved in various projects[[19]](#footnote-21).

If an assessor is not required to be accredited, the assessor’s work may be covered by either a generic or a case-by-case authorisation from the Danish Transport and Construction Agency.

With a generic authorisation of assessors, the assessment body/assessor in question is approved by the Danish Transport and Construction Agency within specific fields in the rail sector. This means that an assessment body may obtain general authorisation within certain fields and does not have to be approved for individual projects.

On the other hand, case-by-case authorisation of assessors is granted for a specific change to a vehicle or railway infrastructure and is largely similar to the previous scheme for authorisation of assessors. A case-by-case approval of an assessor only applies to a specific project.

The Danish Transport and Construction Agency has issued an Executive Order[[20]](#footnote-22), stipulating the requirements to be met for assessors to obtain generic authorisation or case-by-case authorisation, including requirements for the applicant’s railway safety competencies and independence. In addition, an assessment body must have established various procedures to obtain generic authorisation.

The Executive Order also contains requirements for experts.

The Agency still supervises the assessors authorised by it. The Agency will discuss specific projects with accredited assessors, if deemed necessary.

Another change resulting from the CSM-RA Regulation is that the proposer[[21]](#footnote-23) must produce a written declaration that all identified hazards and associated risks are controlled to an acceptable level. This declaration must be produced by the proposer in connection with a change covered by the CSM-RA Regulation.

*An assessor must be independent and competent, and provide a judgement, based on evidence, of the suitability of a system to fulfil its safety requirements.*

**The Agency’s assessor study**

In 2015, the Agency conducted a [study of the assessor market](http://www.trafikstyrelsen.dk/DA/Presse/Nyhedsarkiv/Jernbanesikkerhed/2016/02/Ny-undersoegelse-af-assessormarkedet-2015.aspx). The purpose of this study was to shed light on the assessment bodies’ and users’ experiences with the day-to-day work with the CSM-RA Regulation.

The study was based on responses to a questionnaire sent to assessors and interviews with Banedanmark and DSB.

The conclusions of the study suggest, among other things, that the issue of lack of CSM competencies on the market is a problem, that assessors relatively often are pressed for time and that the cooperation between the assessor and the proposer is not always productive. Based on the conclusions of the survey, the Agency presented proposals (see Table 7) for measures to address some of the challenges.

*Table 7: Proposals for measures concerning the use of the CSM-RA Regulation in Denmark*

|  |  |  |
| --- | --- | --- |
| Parties | Proposed measure | Description of measure |
| Proposer | Hazard workshops | Proposers are encouraged to give priority to and strengthen hazard workshops to be held in connection with hazard identification. For this measure to succeed, adequate resources and competencies must be allocated to the individual workshops. |
|  | Development of best practice | Proposers are encouraged to develop and follow best practice (if not already available) for good dialogue, preparation of scope of work, clarification of expectations for the level of documentation and agreements on schedules. |
| Assessors | Development of best practice | Assessors are encouraged to consider best practice for good dialogue with proposers, preparation of scope of work, clarification of expectations for the level of documentation and agreements on schedules. |
| Trafik- og Byggestyrelsen (Danish Transport and Construction Agency) | Focus on guidance activities | The Agency will strengthen its focus on guidance, particularly in relation to providing clear answers to inquiries and questions. |
|  | Boost the industry’s CSM-RA knowledge | The Agency will set up a “CSM-RA School”, offering both courses on the principles of working with the CSM-RA Regulation and an opportunity for dialogue between assessors and projects on the general cooperation. |

The proposed measures are naturally forward-looking, and the Agency is expected to continue focusing on activities and measures relating to the CSM-RA Regulation.

These measures will take different forms. Among other things, the Agency and Banedanmark will hold a workshop in May 2016 on the challenges of using the CSM-RA Regulation, just as the Agency will follow up on the CSM-RA School that was held a few years ago in the autumn of 2016.

## The infrastructure industry’s experience with the CSM-RA Regulation

From 2014, the Agency stopped receiving significance assessments from infrastructure managers. Instead, the Agency engages with Banedanmark and supervises its significance assessments, which account for the vast majority of assessments in the infrastructure area.

At the end of 2014, the Agency launched a dialogue with Banedanmark on the division of projects into significant and non-significant changes. This dialogue has been ongoing throughout 2015 and has resulted in an enhanced common understanding of the problems involved in splitting up specific projects. The dialogue meetings comprised, among other things, an in-depth discussion of when non-significant parts of projects may be separated out.

The Agency’s supervision of Banedanmark’s significance assessments showed promise, but there is still a need for dialogue and supervision going forward.

**Experience with appendices 1 and 2**

In 2014, the Agency introduced conditions concerning appendices 1 and 2 for authorisations for placing into service. According to these conditions, appendices for the safety assessment report (appendices 1 and 2) must be submitted, verifying that the planned change has been implemented safely and in accordance with the CSM-RA Regulation.

Appendices 1 and 2 must be provided within four weeks and six months, respectively, after placing into service. The requirement to submit appendices 1 and 2 reflects more stringent documentation requirements for the industry, and it was introduced because the Agency saw many projects where the final safety documentation was not submitted in time.

Appendices 1 and 2 have now been used for two years, and there is a marked improvement in the timely submission of the final documentation from the projects.

One of the challenges in 2015 has been that some projects have had to “face reality”, so to speak, with regard to the documentation requirements for appendix 1 and appendix 2. These projects are, for example, projects where changes are implemented over the course of a long period of time, and where the specific authorisation covers several constituents to be placed into service. The Agency is engaging with the individual projects to ensure that adjustments are made without jeopardising safety or interoperability.

***Appendix 1*** must contain the assessor’s assessment of whether changes that may affect railway safety have been implemented safely.

***Appendix 2*** *must contain the assessor’s assessment of the remaining safety activities to be undertaken in connection with the changes that may affect railway safety*.

## The vehicle industry’s experience with the CSM-RA Regulation

In 2015, the Danish Transport and Construction Agency was mainly presented with the undertakings’ interim system definitions and significance assessments for major projects. This is despite the fact that several railway undertakings had a duty to present *all* planned changes to their vehicles to the Agency, and not just the significant changes.

The interim system definitions submitted to the Agency so far have been of varying quality. The Agency’s assessment is that it depends a lot on the person who designed the preliminary system definition, despite the fact that the undertakings have prepared templates to ensure both a consistent approach and better quality. The main problem for the undertakings has been to design system definitions so that they could actually be used for the right purpose in relation to CSM, i.e. to identify hazards and risk aspects.

Similarly, the undertakings’ significance assessments have varied in quality, depending on who was responsible for them. Expert assessments in particular clearly appear to have been developed by individuals in the undertakings and not an expert assessment team. In addition, undertakings are still having major problems preparing significance assessments due to a lack of understanding of the significance criteria and thus the use of the six assessment criteria. The undertakings’ main challenge is to define which changes are significant to railway safety and which are not. They assess the significance criteria too late in the process, i.e. typically *after* the change is ready for implementation. This is not in compliance with the change management process, according to which undertakings must assess whether the change is significant *before* it is implemented. Consequently, the significance criteria are not always used as intended by the undertakings.

Based on the above, the Danish Transport and Construction Agency has maintained the requirement that all planned changes to vehicles must be presented to it by the undertakings that were already covered by the requirement. In addition, the Agency made another undertaking subject to the requirement to present all planned changes to vehicles to it in 2015.

During the course of the year, the Agency has tried to give more detailed feedback on the undertakings’ significance assessments. This feedback includes general comments on the material submitted and any instances of non-compliance with the principles of the CSM-RA Regulation. This detailed feedback will continue in 2016.

## The undertakings’ experience with the CSM-RA Regulation

Each year, infrastructure managers and railway undertakings operating in Denmark submit a safety report to the Danish Transport and Construction Agency.

In 2015, a total of 16 railway undertakings and infrastructure managers operated in Denmark, and they all described their experience with the methods from the CSM-RA Regulation in their safety reports. The vast majority of the undertakings stated that they were in a positive learning process, with the CSM-RA methods currently being implemented in their organisations, and that they are gaining further experience in the use of these methods.

It is also evident from the reports, that the undertakings are new to these methods. Several undertakings have spent 2015 developing specific parts of their safety management systems to integrate the CSM-RA methods in their workflows. Some of the undertakings will continue this work in 2016, and some state that this is a particular focus area for them.

Employees from six of the undertakings participated in courses on CSM Risk Management in 2015. These training activities will continue in 2016 for a few of the undertakings.

All the undertakings describe how the CSM-RA methods have generally been accepted in their organisations.

Nine undertakings partly or entirely use external assistance for the implementation of the CSM-RA processes. The reason for this is that many undertakings do not have the required competencies in-house and have not built up the necessary experience yet.

Several undertakings stated that they are having challenges using CSM-RA. Some describe that the process is costly, paper-intensive and difficult to define.

Some of the undertakings using external assistance report that it is difficult achieving a common understanding between the undertaking and the consultant. This includes both the efforts to find solutions to specific issues as well as the general question of the scope of the work on CSM-RA.

All in all, the undertakings’ 2015 reports show that their use of CSM-RA has increased. With this, they have strengthened their competencies in this field and gained more experience in the use of the CSM-RA methods. This is reflected in the more detailed descriptions of the pros and cons of CSM-RA.

In its supervision, the Danish Transport and Construction Agency has ascertained that four undertakings lack expertise in this area to such an extent that all their changes must be submitted to the Agency for assessment.

As shown in Table 7, the Danish Transport and Construction Agency will strengthen its focus on providing guidance to the undertakings on the use of the CSM-RA Regulation in 2016.

Chapter 6: Implementation of the Railway Safety Directive

The EU Railway Safety Directive is the legislative act that provides a framework for the harmonisation of safety regulations in Europe. In 2015, the Danish Transport and Construction Agency continued its work to ensure the correct application of the new requirements after the new CSM-RA Regulation came into force in 2013.

## Harmonisation of regulations

The purpose of the Railway Safety Directive[[22]](#footnote-24) is to ensure the development and improvement of safety on the EU’s railways and improved access to the market. The Safety Directive provides a framework for the harmonisation of national safety regulations, safety certificates for railway undertakings, tasks and roles for the national safety authority and the national investigation authority. The purpose of harmonising these regulations is to alleviate the administrative burden for undertakings and make it easier and cheaper to travel across Europe by train.

The following legislative acts from 2015 implement or supplement the Railway Safety Directive etc.:

* The Railway Act, Act No 686 of 27 May 2015
* Executive Order No 893 of 8 July 2015 amending the Executive Order implementing the Railway Safety Directive
* Executive Order No 1343 of 26 November 2015 concerning the reporting of data on accidents and precursors to accidents etc. to the Danish Transport and Construction Agency
* Executive Order No 1312 on notification and reporting of railway accidents and incidents to the Accident Investigation Board Denmark

In addition, the Danish Transport and Construction Agency has issued the following national safety rules[[23]](#footnote-25):

* Provisions governing operation and traffic management rules (DTR) in the rail sector, Executive Order No 11034 of 16 July 2015.

## The Railway Act

In 2015, the Danish Parliament adopted the new Railway Act, which entered into force on 15 June 2015 replacing the former Railway Act. The new Act primarily brings the old one up to date, implementing EU rules and introducing a clear, simple and operational Railway Act that provides the legal framework for accommodating more passengers and more cargo on the railways, including ensuring that railway transport is organised and performed in a way that guarantees safety, promotes traffic flow and benefits the national economy.

Another concern was that the Act should be easier to understand for the public at large. The amendments relating to railway safety are described below.

The new Act introduces the concept of “urban networks” to collectively refer to the local railways, the metro and the light railways. These railways have a number of common features, such as being exempt from the Interoperability Directive and thus the TSIs, for which reason it was considered expedient to refer to them as one entity. At the same time, the rules governing these railways have been adjusted and adapted in an effort to bring them together in one clear piece of legislation in the area, considering the decisions to set up light railways in Aarhus, Copenhagen and Odense.

In the new Act, the independence of the safety authority (i.e. the Danish Transport and Construction Agency) has been clarified further. The Act now expressly stipulates that the Agency acts independently when making safety decisions and is not subject to the Ministry of Transport and Building’s powers of directions.

The Danish Transport and Construction Agency’s supervisory powers have been strengthened with the new Act, extending its scope to other companies in the rail sector (suppliers/contractors) providing safety-related services. This is possible because these other companies can now obtain safety certification according to the same procedure as railway undertakings. However, the procedure is not as complicated as for railway undertakings, because contractors, for example, are not engaged in actual railway activities but services such as maintenance, marshalling etc.

This means that the Agency may now request documentation directly from the company providing the safety-related service. Before, it was only possible to supervise these companies through the contracts between the railway undertakings or infrastructure managers and the suppliers of safety-related services.

In addition, the new Act authorises the Agency to issue orders when a term or condition of a certificate or authorisation is violated. If the order is not complied with, the Agency may report the undertaking to the police in accordance with the rules on infringement of orders. Accordingly, the Agency may now issue an order to an undertaking that fails to comply with a condition to submit documentation.

The rules on the Accident Investigation Board have been clarified to emphasize compliance with EU law. In future, the Accident Investigation Board will only be responsible for investigating serious railway accidents. However, the Board may decide to investigate other cases, if deemed relevant for safety reasons.

**Abolition of right of appeal**

Until 10 July 2015, undertakings that wanted to appeal against a decision concerning railway safety could lodge this directly with the Agency or with the Railways Board. Decisions of the Railways Board were final, i.e. they could not be appealed to other administrative authorities. If one was dissatisfied with a decision of the Railways Board, it was possible to institute legal proceedings against the Board before the courts.

Decisions concerning safety certificates and safety authorisations could therefore not be appealed to the Ministry of Transport and Building or another administrative authority.

As a result of the new Railways Act1, the right of appeal to the Railways Board has been abolished. The right of appeal was abolished by an amendment to the Safety Approval and Safety Certificate Executive Order. The new rules came into force on 10 July 2015.

The reason for abolishing the right of appeal is that the Railways Board did not possess any safety expertise. There are no requirements for such right of appeal in EU law.

In most areas, it is possible to request within four weeks that the Danish Transport and Construction Agency reassess a case if an application has been refused or only partly granted. This is still possible. The decision made by the Agency after such request cannot be appealed.

If one is dissatisfied with a decision, this can always be challenged before the courts, cf. section 63 of the Danish Constitution. However, an appeal against a decision under section 115 of the Railways Act must be brought before the courts within eight weeks of the announcement of the decision. Otherwise, the decision is final.

The right of appeal was abolished by section 21 in Executive Order No 1244 of 10 November 2015 on the Danish Transport and Construction Agency’s duties and powers, right of appeal and promulgation of certain regulations of the Agency (the Delegation Order), just as it is stipulated in the specific executive orders in the field.

*As a result of the new Railways Act, the right of appeal to the Railways Board has been abolished.*

*The right of appeal was abolished by an amendment to the Safety Approval and Safety Certificate Executive Order. The new rules came into force on 10 July 2015.*

## Amendment of the Executive Order on implementation of the Railway Safety Directive

The Executive Order implements Commission Directive 2014/88/EU of 9 July 2014 amending Directive 2004/49/EC (the Railway Safety Directive) as regards common safety indicators and common methods of calculating accident costs.

The common safety indicators and common methods of calculating accident costs are set out in Annex 1 of the Railway Safety Directive. These are the data that the national safety authorities must report to ERA in the annual safety reports.

The safety indicators have been changed as follows:

* Collisions are divided into two types: *collision of train with rail vehicle* and *collision of train with obstacle within the clearance gauge*.
* Level crossing accidents are registered by type of level crossing.
* “Other person” is divided into two types: *other person at a platform* and *other person not at a platform*.
* Under the new rules, attempted suicides must also be reported.
* Signals passed at danger are divided into two types to distinguish between whether the danger point has been passed or not: *signal passed at danger when passing a danger point* and *signal passed at danger without passing a danger point*.
* Train protection systems (TPS) must be reported in both train-km and line-km[[24]](#footnote-26)
* TPS is divided into four types: 1) warning, 2) warning and automatic stop, 3) warning and automatic stop and discrete supervision of speed, 4) warning and automatic stop and continuous supervision of speed (ATC).
* Level crossings must now be reported in a new way under two categories: a) passive level crossing and b) active level crossing, including: manual, automatic with user-side warning, automatic with user-side protection and rail-side protected.

The Executive Order was issued by the Ministry of Transport and Building and entered into force on 15 July 2015.

## Provisions governing operation and traffic management rules (DTR) in the rail sector

The provisions were amended in response to the Commission’s new Regulation (EU) 2015/995 of 30 June 2015 relating to “operation and traffic management” (TSI OPE).

As “Provisions governing operation and traffic management rules (DTR) in the rail sector” referred to the previous Commission Decision relating to “operation and traffic management” (TSI OPE), the DTR was updated to bring it into conformity with the requirements of the new TSI OPE.

The most important amendments are the following:

* The rules on the appearance and use of the rear end signal have now been harmonised.
* Requirements for indication of braking performance. In future, indication of both deceleration requirements and brake weight percentage may be used as agreed between the infrastructure manager and railway undertakings.
* Appendix B now contains common operational principles and rules within the following areas:
  + Departure of the train
  + No authorisation for train movement at the expected time
  + Complete failure of front-end lights
  + Complete failure of rear-end signal
  + Failure of the audible warning device of a train
  + Failure of level crossing
  + Failure of voice radio communication
  + Running on sight
  + Assistance to a failed train
  + Authorisation to pass a signal showing a stop aspect/indication
  + Anomalies in line-side signalling
  + Emergency call
  + Immediate actions to prevent danger to trains
* Appendix C has been rewritten and is now structured better, but without any change in content.
* Appendix D has been changed to a list of elements that the infrastructure manager has to provide to the railway undertaking.
* A new Appendix F has been added, and this contains minimum elements relevant to professional qualification for the tasks associated with “accompanying trains”.

Finally, references to TSI SRT (tunnel safety) have now become superfluous, as TSI OPE covers DTR.

The provisions were issued by the national safety authority, the Danish Transport and Construction Agency, and entered into force on 20 July 2015.

## Executive Order concerning the reporting of data on accidents and precursors to accidents etc. to the Danish Transport and Construction Agency

The Executive Order implements the new and amended requirements in Annex 1 of the Railway Safety Directive, cf. above, which primarily concerns addition of new categories and subdivision of other categories.

In addition, the Agency has chosen to change and add two new national categories to provide for reporting of more valid data in cooperation with the industry.

The two new national categories:

* Accidents when boarding and alighting, depending on whether the train is in motion or at standstill
* Accidents with the electric traction system, depending on whether the train is in motion or at standstill/no train.

Finally, for the sake of clarity, the Agency has chosen to bring precursors to accidents and safety irregularities together under “precursors to accidents”.

This is because a precursor to an accident and a safety irregularity are both considered indicators of safety and are reported with a view to implementing preventive measures to avoid actual accidents.

The amendments apply to data for the year 2016 reported in March 2017. The current database will be used until the end of March 2016. At the same time, the new database will be ready for use from 1 January 2016.

The Executive Order was issued by the Danish Transport and Construction Agency and entered into force on 1 January 2016.

## Executive Order on notification and reporting of railway accidents and incidents to the Accident Investigation Board Denmark

The Executive order was amended in response to the new Railways Act to bring the wording of the Executive Order and references to the provisions of the Act in line with the new Act.

In addition, definitions of serious hazard, serious accident and vehicles have been added. The definition of serious hazard has been added to clarify which accidents and incidents must be reported to the Accident Investigation Board by the railway undertakings and the infrastructure managers.

Finally, the provision on reporting has been amended.

The Executive Order was issued by the Ministry of Transport and Building and entered into force on 01 January 2016.

*The new Executive Order on reporting of data on accidents in the rail sector to the Danish Transport and Construction Agency implements the new and amended requirements in Annex 1 of the Railway Safety Directive.*

*The amendments apply to data for the year 2016 reported in March 2017. The current database will be used until the end of March 2016. At the same time, the new database will be ready for use from 1 January 2016.*

Annex A: The railways in figures

*Table 8. Information on railway infrastructure*

| **Railway infrastructure** | **2015** |
| --- | --- |
| Number of infrastructure managers | 9 |
| Total length of lines (km)\* | 2633 |
| Total length of track (km) | 3958 |
| Length of electrified lines (km)\* | 642 |
| Lines with ATC, ATC train stopping/ACT equipment (km) | 1434 |
| Total number of level crossings | 1113 |
| * Automatic level crossing with warning signal system | 159 |
| * Automatic level crossing with warning signal system and half or full barriers | 652 |
| * Automatic level crossing with warning signal system, half or full barriers and track-side protection in the form of detection in the road or similar | 98 |
| * Manually operated level crossing with warning signal system | 3 |
| * Manually operated level crossing with barrier system | 11 |
| * Level crossing without protection | 261 |

*Figures from railway infrastructure managers. Source: infrastructure managers' safety reports for 2015.*

*However, data marked \* are from table BANE41 from Statistics Denmark.*

*Table 9. Information on railway undertakings*

| **Railway undertaking** | **2015** |
| --- | --- |
| Number of railway undertakings | 14 |
| Number of locomotives | 129 |
| Number of units (passenger transport)\* | 736 |
| Number of train drivers | 2308 |
| Volume of passenger transport (million passenger-km.)\* | 6808 |
| Volume of freight transport (million tonne-km.)\* | 2603 |
| Volume of passenger transport (million train-km)\* | 80.1 |
| Volume of freight transport (million tonne-km)\* | 3.3 |
| Total number of kilometres travelled (million train-km.)\* | 83.4 |

*Figures from railway undertakings. Source: railway undertakings’ safety reports for 2015.*

*However, data marked \* are from Statistics Denmark.*

Annex B: Safety indicators for 2015

**Data**

The statistical data in the annex were recorded by railway undertakings and railway infrastructure managers in the period 2011-2015. Some of the figures in the report are based on data that go back to 1999, but data for private and local lines is only available to a limited extent before 2003.

Data are reported in accordance with the Reporting Executive Order[[25]](#footnote-27). The definitions used can be found in Annex C and are described in greater detail in the guidelines on the reporting of accidents, precursors to accidents and safety irregularities that can be found on the Danish Transport and Construction Agency’s website.

Some categories of data contain relatively small quantities of data, and can give rise to big fluctuations in the statistics from year to year. This is why 5-year cumulative averages are calculated for comparison with annual figures.

**Overview of national safety indicators**

*Table 10. Safety indicators for 2015*

| **Indicators** | **Total in 2015** | **Total in 2015/million train-km** | **5-year average/million train-km** |
| --- | --- | --- | --- |
| Significant accidents | 17 | 0.20 | 0.23 |
| Minor accidents | 265 | 3.18 | 3.83 |
| Precursors to accidents | 491 | 5.89 | 6.39 |
| Safety irregularities | 2798 | 33.55 | 30.93 |
| Persons killed\* | 10 | 0.12 | 0.12 |
| Serious injuries | 6 | 0.07 | 0.10 |
| Suicides (deaths) | 30 | 0.36 | 0.38 |

*\* The figures for ‘persons killed’ exclude suicides, as these are given separately.*

*Table 11. Indicators relating to significant accidents*

| **Significant accidents** | **Total in 2015** | **Total in 2015/million train-km** | **5-year average/million train-km** |
| --- | --- | --- | --- |
| Collision of trains | 3 | 0.04 | 0.01 |
| Derailment | 0 | 0.00 | 0.01 |
| Level-crossing accidents | 2 | 0.02 | 0.05 |
| Collisions involving persons | 10 | 0.12 | 0.14 |
| Fire | 0 | 0.00 | 0.00 |
| Other significant accidents | 2 | 0.02 | 0.02 |
| **Total significant accidents** | **17** |  | |

*The figures for number of significant accidents do not include suicides. \*zero indicates that the 5-year average is extremely small (value < 0.01).*

*Table 12. Indicators relating to persons killed*

| **Persons killed** | **Total in 2015** | **Total in 2015/million train-km** | **5-year average/million train-km** |
| --- | --- | --- | --- |
| Passengers | 0 | 0.00 | 0.00 |
| Staff | 1 | 0.01 | 0.00 |
| Level-crossing users | 1 | 0.01 | 0.04 |
| Persons on railway property without permission | 8 | 0.10 | 0.07 |
| Other | 0 | 0.00 | 0.01 |
| **Total persons killed** | **10** |  | |

*The figures for persons killed do not include suicides. \*zero indicates that the 5-year average is extremely small (value < 0.01).*

*Table 13. Indicators relating to serious injuries*

| **Serious injuries** | **Total in 2015** | **Total in 2015/million train-km** | **5-year average/million train-km** |
| --- | --- | --- | --- |
| Passengers | 2 | 0.02 | 0.02 |
| Staff | 0 | 0.00 | 0.01 |
| Level-crossing users | 0 | 0.00 | 0.02 |
| Persons on railway property without permission | 3 | 0.04 | 0.04 |
| Other | 1 | 0.01 | 0.02 |
| **Total serious injuries** | **6** |  | |

*The figures for serious injuries do not include attempted suicides.*

*Table 14. Indicators relating to minor accidents*

| **Minor accidents** | **Total in 2015** | **Total in 2015/million train-km** | **5-year average/million train-km** |
| --- | --- | --- | --- |
| Collision of trains | 98 | 1.18 | 1.45 |
| Derailment | 0 | 0.00 | 0.10 |
| Level-crossing accidents | 4 | 0.05 | 0.07 |
| Collisions involving persons | 33 | 0.40 | 0.58 |
| Fire | 59 | 0.71 | 0.77 |
| Other minor accidents | 71 | 0.85 | 0.86 |
| **Total minor accidents** | **265** |  | |

*The figures for serious injuries do not include attempted suicides.*

*Table 15. Accidents and incidents involving dangerous goods*

| **Accidents and incidents involving dangerous goods** | **Total in 2015** | **Total in 2015/million train-km** | **5-year average/million train-km** |
| --- | --- | --- | --- |
| Accidents involving dangerous goods | 0 | 0.00 | 0.02 |
| Incidents involving dangerous goods | 2 | 0.02 | 0.01 |

*Here is listed any incident or accident that must be reported in accordance with chapter 1.8.5 of the RID/ADR*

*Table 16. Indicators relating to precursors to accidents*

| **Precursors to accidents** | **Total in 2015** | **Total in 2015/million train-km** | **5-year average/million train-km** |
| --- | --- | --- | --- |
| Broken rails | 33 | 0.40 | 0.45 |
| Track buckles and other faults in the relative position of the track | 0 | 0.00 | 0.02 |
| Signal failure | 57 | 0.68 | 0.58 |
| Signals passed at danger | 396 | 7.75 | 5.25 |
| Broken wheels and axles | 5 | 0.06 | 0.08 |
| **Total precursors to accidents** | **491** |  | |

*Precursors to accidents have no harmful consequences.*

*Table 17. Indicators relating to safety irregularities*

| **Safety irregularities** | **Total in 2015** | **Total in 2015/million train-km** | **5-year average/million train-km** |
| --- | --- | --- | --- |
| Risk of collision with person | 655 | 7.85 | 6.38 |
| Irregularity at level crossing | 139 | 0.86 | 0.57 |
| Track deformation | 7 | 1.67 | 1.47 |
| Non-technical signalling error | 266 | 0.08 | 0.12 |
| Gauge conditions on track | 144 | 3.19 | 3.13 |
| Vandalism | 216 | 1.37 | 1.68 |
| Other irregularity | 1329 | 2.59 | 1.91 |
| **Total safety irregularities** | **2756** |  | |

*Safety irregularities have no harmful consequences.*

Annex C: Definitions used

**Accidents**

– *Accident* is understood to mean an unwanted or unintended sudden incident or a specific chain of such incidents that has harmful consequences. Accidents are broken down into the following categories: train collision, train derailments, accidents at level crossings, personal injury caused by moving rolling stock, fire and other[[26]](#footnote-28).

– *Train collision* is understood to mean a train collision, including a collision with obstacles within the structural gauge limits (collision), a head-on collision between two trains or a collision between the front and rear of two trains or a sideways collision between part of one train and part of another train, or a train in collision with shunting rolling stock or objects that are fixed in place or are temporarily on or near the track, except at level crossings, if the objects have been lost by crossing vehicles or persons.

– *Derailment* is understood to mean any incident in which at least one of the train’s wheels comes off the rails.

– *Accidents at level crossings* is understood to mean accidents at level crossings involving at least one railway vehicle and one or more crossing vehicles, other crossing users, e.g. pedestrians, or objects temporarily on or near the track if these have been lost by crossing vehicles or users.

– *Personal injury caused by moving rolling stock* is understood to mean injury to one or more persons who are either hit by a railway vehicle or by an object attached to or which has been dislodged from the vehicle. The definition also covers persons who fall out of railway vehicles, and persons who fall or are hit by loose objects while travelling in railway vehicles.

– *Fire on rolling stock* is understood to mean fires and explosions, including of loads, under way between a departure station and a destination, including while stopped at the departure station, the destination or while stopped on the way and while shunting.

– *Other types of accident* is understood to mean all accidents other than train collisions, derailments, accidents at level crossings, personal injury caused by moving rolling stock and fire on rolling stock.

**Significant accidents versus minor accidents**

– *Significant accidents* is understood to mean any accident involving at least one moving railway vehicle and which results in at least one person being killed or seriously injured, or in the extensive destruction of rolling stock, track or other plant or the environment or in extensive delays in train operations. Accidents in workshops, warehouses and depots are excluded.[[27]](#footnote-29)

* *Extensive destruction of rolling stock, track or other plant or the environment* is understood to mean destruction valued at least DKK 1.2 million.
* *Extensive disruption to traffic* is understood to mean that train traffic is at a standstill for six hours or more on a main line.

Minor accidents are accidents not causing serious injuries or death and where any material damage is below DKK 1.2 million.

**Suicide**

– *Suicide* means an act to deliberately injure oneself resulting in death, as recorded and classified by the competent authorities.

**Dangerous goods**

– *Dangerous goods* is understood to mean substances and objects that may not be transported under the Regulation concerning the International Carriage of Dangerous Goods by Rail (RID), or may only be transported under conditions defined in the RID.

– *Accidents in connection with the transport of dangerous goods* is understood to mean any accident or incident that must be reported in accordance with Chapter 1.8.5 of the RID or the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

**Precursors to accidents**

– *Precursors to accidents* is understood to mean broken rails, track buckles, signal failure, passing a stop signal, broken wheels and axles on rolling stock in operation.[[28]](#footnote-30)

– *Broken rails* is understood to mean any rail that has broken into two or more pieces, or any rail from which a piece of metal has broken away, leaving a hole more than 50 mm long and more than 10 mm deep on the running surface.

– *Track buckles and other faults in the relative position of the track* is understood to mean a fault in the continuum or geometry of the track which for safety reasons requires the immediate closure of the track or a reduction of the permissible speed.

– *Signal failure* is understood to mean any failure in the signal system, either on the infrastructure or on the rolling stock, which results in a less restrictive signal than required.

– *Passing a stop signal* is understood to mean any situation where any part of the train travels further than allowed.

– *Broken wheels and axles* is understood to mean a breakage that affects the key components of the wheel or axle, thereby creating a risk of accident in the form of derailment or collision.

**Safety irregularities**

*Safety irregularities* means an event in the railway area that has not resulted in an accident or precursors to accidents, but which could have had an impact on railway safety, including risk of   
collision with person caused by moving rolling stock, brake failure, irregularity at level crossing, track deformation, signalling failure, non-technical signalling   
error, problems with gauge conditions, excluding personal injury caused by moving rolling stock, vandalism or other.

**Personal injury**

*Personal injury* is recorded according to five different types of person (passenger, employee, level-crossing users, unauthorised persons on railway property and others) and according to the seriousness of the injury (fatality, serious injury and less serious injury).

– *Passenger* is understood to mean anyone who undertakes a journey by railway, excluding train staff. In accident statistics this also includes persons who attempt to board or alight from a moving train.

– *Staff, including contract staff* is understood to mean any person employed in connection with a railway and who is at work at the time of the accident. The definition includes train staff and persons operating rolling stock and infrastructure plant.

– *Level-crossing users* is understood to mean anyone who uses a level crossing to cross the railway with the help of a vehicle or on foot.

– *Persons on railway property without permission* is understood to mean all persons on railway property where this is prohibited, excluding level-crossing users.

– *Other persons* is understood to mean all persons not covered by the definitions of passenger, staff, level-crossing users or persons on railway property without permission.

– *Fatality* is understood to mean a person who is killed immediately or dies within 30 days as a result of an accident. Suicides are not included.

– *Seriously injured person* is understood to mean a person who has been admitted to hospital for more than 24 hours as a result of an accident. Attempted suicides are not included.

– *Less seriously injured person* is understood to mean a person who has suffered injury. Deaths and serious injuries are not included.

**Costs**

– *Costs of environmental damage* is understood to mean costs that must be met by railway undertakings and infrastructure managers, estimated on the basis of their experience, in returning a damaged area to its condition before the railway accident.

– *Costs of material damage to rolling stock or infrastructure* is understood to mean the costs of purchasing new rolling stock or constructing new infrastructure with the same functionality and technical parameters as the rolling stock or infrastructure damaged in the accident, as well as the costs of returning rolling stock or infrastructure that can be repaired to its condition prior to the accident. Both parts must be estimated by the railway undertakings and infrastructure managers on the basis of their experience. Costs of leasing rolling stock to replace damaged vehicles that are not available are also covered by this definition.

**Level crossings**

– *Level crossing* is understood to mean any level crossing between the railway and roads and paths that is recognised by the railway infrastructure manager, and which is open to general traffic. Platform crossings and walkways over tracks that may only be used by employees are not covered by this definition.[[29]](#footnote-31)

– *Level crossing with automatic protection or user-side warning signal system* is understood to mean a level crossing where the protection or warning signal is activated by the approaching train.

– *Track-side protection* is understood to mean a signal or other operational safety system that only allows trains to pass if the level crossing is protected on the user side, and no one is about to cross; this is checked by means of monitoring or detection of obstacles.

– *Level crossing with manually operated protection or warning signal system* is understood to mean a level crossing where the protection or warning signal system is activated manually and is not linked to a railway signal that only allows the train to pass if the protection or warning signal system has been activated.

– *Unprotected level crossing* is understood to mean a level crossing where no form of warning system or protection is activated if users cannot use the crossing safely.

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**Safety report for the railways 2015**

ISBN

1. Cf. Executive Order No 575 of 25 May 2010 concerning the reporting of data on accidents, precursors to accidents and safety irregularities, etc. [↑](#footnote-ref-3)
2. ”Other safety incidents” includes both *precursors to accidents* (that are reported to the EU) and *safety irregularities,* which do not have to be reported to the EU. The legislation makes this distinction, but for the sake of readability this report does not differentiate between these two types. [↑](#footnote-ref-4)
3. See Annex C for definitions of terms used in this report. [↑](#footnote-ref-5)
4. The unit number of deaths and weighted serious injuries is abbreviated to FWSI: *fatalities and weighted serious injuries*. [↑](#footnote-ref-6)
5. The Danish safety target was laid down in [Den fælleseuropæiske jernbane – En strategi for høj sikkerhed og smidig gennemførelse i Danmark. Februar 2009](https://www.trafikstyrelsen.dk/~/media/Dokumenter/03%20Jernbanesikkerhed/06%20Jernbanen%20fremover/TS_SikkerhedStrategi_2009_Digital.ashx) *(The Common European Railway System – A Strategy for a High Level of Safety and Flexible Implementation in Denmark.* [February 2009](https://www.trafikstyrelsen.dk/~/media/Dokumenter/03%20Jernbanesikkerhed/06%20Jernbanen%20fremover/TS_SikkerhedStrategi_2009_Digital.ashx) [↑](#footnote-ref-7)
6. Railway Safety Performance in the European Union 2014, European Railway Agency. [www.era.europa.eu](http://www.era.europa.eu/). And ERAIL (European Railway Information): <https://erail.era.europa.eu/> [↑](#footnote-ref-8)
7. Please note that where the figures in the rest of this chapter concern the entire Danish rail network, those given in figure 6 relate to the Danish rail network excluding the metro and local railways. This is because metros and railways that are functionally distinct from the rest of the rail network, and that can only be used to transport passengers in local, urban or suburban areas, are not included in the official European statistics. The total safety level for the Danish railway (including the metro and local railways) in respect of the number of significant accidents involving persons in the period 2011-2015 stood at 0.13 fatalities and weighted serious injuries per million train-km, as described on page 13, while the figure is 0.15 excluding the metro and local railways. [↑](#footnote-ref-9)
8. The common safety indicators (CSI) are reported, cf. Annex I to the Safety Directive. Published in Denmark in Order No 1293 of 23 November 2010. [↑](#footnote-ref-10)
9. Please note that Figure 7 contains the figures for 2013-2014, while the figures in this report are from 2014-2015. This is because the European figures will only be updated when the European countries have submitted their reports (including this report). Please also note that the Danish figures reported to the European statistics do not include figures from the metro or the local railways, as they are not part of the European railway network and are thus not to be reported to ERA. Figure 7 is included here to show how Denmark is doing compared to the other European countries with regard to the number of fatalities on the railways. [↑](#footnote-ref-11)
10. The 2015 figure will only be published in 2016. [↑](#footnote-ref-12)
11. According to Section 69(1)(6) of the Railway Act. [↑](#footnote-ref-13)
12. A list of all undertakings with a safety certificate may be found on the Danish Transport and Construction Agency’s website: <http://www.trafikstyrelsen.dk/DA/Jernbane/Tilladelser-og-sikkerhedscertificering/Sikkerhedsgodkendelse-og-sikkerhedscertifikat.aspx> [↑](#footnote-ref-14)
13. A list of all undertakings with a safety authorisation may be found on the Danish Transport and Construction Agency’s website: <http://www.trafikstyrelsen.dk/DA/Jernbane/Tilladelser-og-sikkerhedscertificering/Sikkerhedsgodkendelse-og-sikkerhedscertifikat.aspx> [↑](#footnote-ref-15)
14. The certification committee is constituted on an ad hoc basis and consists of the head of unit responsible for supervision and at least one supervisory employee who did not participate in the supervision team during the relevant certification supervision. [↑](#footnote-ref-16)
15. Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009, as amended by Commission Implementing Regulation (EU) No 2015/1136 of 13 July 2015. [↑](#footnote-ref-17)
16. Commission Implementing Regulation (EU) No 2015/1136 of 13 July 2015 amending Implementing Regulation (EU) No 402/2013 on the common safety method for risk evaluation and assessment. [↑](#footnote-ref-18)
17. Executive Order No 359 of 8 April 2014 on requirements for the accreditation of assessors in the rail sector [↑](#footnote-ref-19)
18. 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. [↑](#footnote-ref-20)
19. See ERA’s register of all assessment bodies in Denmark: <https://eradis.era.europa.eu/safety_docs/assessments/bodies/default.aspx> [↑](#footnote-ref-21)
20. Executive Order No 654 of 8 May 2015 on authorisation of assessors and experts in connection with authorisation of railway infrastructure and vehicles. [↑](#footnote-ref-22)
21. The proposer is the same as a contracting authority and is defined in Article 3(11) of the CSM-RA Regulation. [↑](#footnote-ref-23)
22. Directive 2004/49/EC, as amended by Directives 2008/110/EC, 2009/149/EC, 2012/34/EU and 2014/88/EU 2014. [↑](#footnote-ref-24)
23. In accordance with Article 8, Article 16(2)(f) and Article 18(b) of the Railway Safety Directive. These do not implement nor supplement the Railway Safety Directive. [↑](#footnote-ref-25)
24. Previously, only ATC had to be reported and only in line-km. [↑](#footnote-ref-26)
25. Executive Order No 575 of 25 May 2010, as amended. Please note that a new Reporting Executive Order entered into force on 1 January 2016 and will be applied to data reported for 2016. [↑](#footnote-ref-27)
26. §3 of Exec. Order No 575 of 25 May 2012 on the reporting of data on accidents, precursors to accidents and safety irregularities, etc. to the Danish Transport Authority, *as amended* [↑](#footnote-ref-28)
27. Commission Directive 2009/149/EC of 27 November 2009, Annex 1. Implemented by Exec. Order No 1293 of 23/11/2010. [↑](#footnote-ref-29)
28. Section 3(2) of Exec. Order No 575 of 25 May 2012 on the reporting of data on accidents, precursors to accidents and safety irregularities, etc. to the Danish Transport Authority. [↑](#footnote-ref-30)
29. Exec. Order No 1142 of 07/12/2011. Executive Order on safety measures at level crossings managed by Banedanmark that are open to general traffic [↑](#footnote-ref-31)