Dnr A-126/12

NIB Annual Report 2011

Swedish Accident Investigation Authority

Sweden

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1 INTRODUCTION

1.1 Legislation

The Swedish Accident Investigation Authority (SHK) is an independent body. Its activities are regulated by the Accident Investigations Act (1990:712), the Accident Investigations Ordinance (1990:717), and Ordinance (2007:860) with instructions for the Swedish Accident Investigation Authority.

On the bases of these provisions, the Railway Safety Directive (2004/49/EC) has been transposed into Swedish law.

1.2 Role and task

The Swedish Accident Investigation Authority (SHK) was established on 1 July 1978 with the task of investigating serious civil and military aircraft accidents.

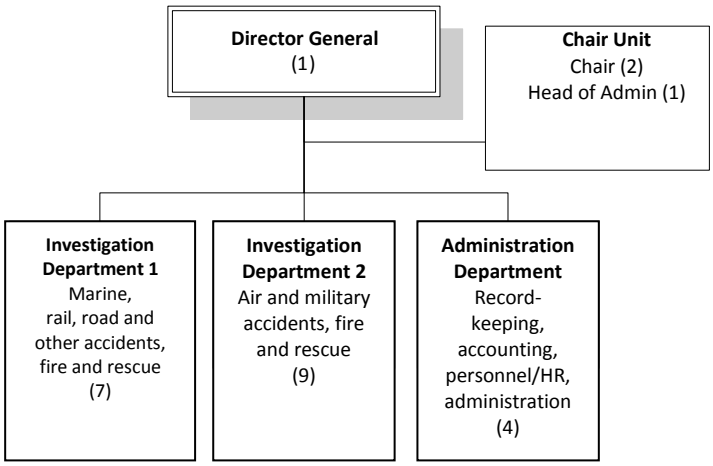
Its role was expanded on 1 July 1990 (bill 1989/90:104, report 1989/90:TU23, parliamentary letter 1989/90:265) when it was made responsible for investigating, from a safety perspective, serious accidents and incidents involving transport by sea and rail as well as other areas.

SHK's role was expanded again on 1 July 2007 (bill 2006/07:45, 2006/07:110, report 2006/07:TU13, parliamentary letter 2006/07:199) to include track-bound traffic. Accidents to be investigated are those caused by collisions between rail vehicles, by derailments, or by other events of significance to safety that result in at least one fatality or at least five serious injuries or which result in extensive damage to rail vehicles, to track systems, to property which was not being transported by the rail vehicle, or to the environment, and where the total costs of such damage are estimated at an amount equal to at least two million euro. Under the new legislation, the Swedish Transport Agency no longer investigates accidents involving track-bound traffic and SHK may not transfer investigations to the Agency.

SHK investigations aim to:

- Insofar as possible, map the sequence of events, the cause of the event, and damages and impacts in general.
- Provide a basis for decisions regarding measures aimed at preventing similar events from occurring or at limiting the impacts of such events.
- Provide a basis for an assessment of rescue services' actions in conjunction with the event and, if necessary, for improvements of the rescue services.

1.3 Organisation



2 THE INVESTIGATION PROCESS

2.1 Matters to be investigated

SHK has been investigating accidents and serious incidents in track-bound traffic since 1990. The Swedish Transport Agency is the regulatory body.

SHK investigates events in that occurred in Sweden.

An accident involving rail traffic (railway, metro, or railway operation) caused by collision between rail vehicles, derailment, or other event of significance to safety will be investigated if:

- there was at least one fatality or at least five serious injuries, or
- rail vehicles, track systems, property which was not being transported by the rail vehicle, or the environment have been damaged valued at at least two million euro.

An incident will be investigated if:

- it involved a serious risk of an accident,
- it suggests serious faults in rail vehicles or track systems, etc., or
- it suggests other significant safety deficiencies.

2.2 Authorities that cooperate in the investigations

A coordinator from each of the relevant regulatory bodies regularly follows the investigation.

2.3 The investigative work

Insofar as possible, SHK should attempt to map the sequence of events, the cause of the event, and damages and impacts in general. The SHK mission also includes providing the basis for an assessment of emergency services' actions in connection with an accident. When necessary, SHK

should make recommendations to the respective regulatory or safety authority on which to base decisions on suitable measures.

SHK's role does not include taking a position on matters of liability or damage claims. The investigations are aimed solely at improving safety.

Under current provisions, an SHK investigation should always include at least a chair and one lead investigator.

Considering the wide range of events that may be subject to an accident investigation, SHK must occasionally hire external experts who, using their respective expertise, work for SHK by gathering facts and performing analyses. SHK has contracts with experts in various fields for the most commonly occurring investigations. Those appointed as experts, regardless of where they are normally employed, represent only themselves and contribute their expertise in their capacity as experts.

At the end of the fact-finding phase, SHK convenes an accident meeting at which all the facts are presented. All those affected by the event are invited to participate in this meeting. Representatives of interest groups and trade associations are also usually invited.

3 INVESTIGATIONS

3.1 Investigations completed in 2011

Type of accident	Number of accidents	Number of victims		Property damage in € (estimate)
		Fatalities	Seriously injured	
Level crossing accident	1	2		0
Accident to person from train movement	1	1		
Incident	2			0

3.2 Investigations commenced and completed 2007-2011

Basis for investigation:

i = in accordance with the Railway Safety Directive

ii = in accordance with national legislation (possible areas that are excluded in Art. 2.2)

iii = voluntary investigations, other criteria (national legislation not referred to in the Railway Safety Directive).

Investigations completed in 2007

Event date	Title of investigation	Legal grounds	Completed
28/02/2005	Near-collision between SJ trains 186 and 181 in Gårdsjö, Västra Götaland County, 28 February 2005	I	15/3/2007
28/02/2005	Accident involving train 5525 in Ledsgård, Halland County, 28 February 2005	I	02/07/2007

Investigations completed in 2008

Event date	Title of investigation	Legal grounds	Completed
29/03/2006	Collision between passenger train 8789 and derailed wagon of freight train 49302 Linköping-Vikingstad, Östergötland County, 29 March 2006	I	21/07/2008
19/10/2007	Near-collision between SJ trains 67373 and 3743 between Stenungsund and Ytterbyn, Västra Götaland County, 19 November 2007	I	08/10/2008
13/12/2007	Level crossing incident between lorry and passenger train 2513 on Esplanaden, Sundbyberg, Stockholm County, 13 October 2007	I	12/19/2008
16/01/2008	Near-collision with unauthorised movement on the Alby-Ångebyn section, Västernorrland County, 16 January 2008.	I	18/12/2008

Investigations completed in 2009

Event date	Title of investigation	Legal grounds	Completed
07/08/2007	Near-collision between trains 90161 and and 52517 at Stockholm Central, Stockholm County, 7 August 2007	I	17/03/2008
26/09/2006	Shunting accident at Hallsberg, Örebro County, 26 September 2006	iii	24/03/2009
11/04/2008	Level crossing incident involving lorry with trailer and passenger train 3763 on the Stora Höga-Kode section, Västra Götaland County, 11 April 2008	I	31/03/2009

09/06/2008	Near-collision between a blocked-line operation for transport and train 3539 at Bryngenäs Station, Västra Götaland County, 9 June 2008	I	09/06/2009
19/01/2009	Near-collision with train 2510 in Västerhaninge, Stockholm County, 19 January 2006	I	25/06/2009
17/06/2008	Near-collision between train 7081 and blocked-line operation 76910 at Klockarbäcken passing loop on the Umeå-Brännland section, Västerbotten County, 17 June 2008	I	06/10/2009
29/07/2008	Near-collision between a blocked-line operation for transport and train 10093 at Torneträsk Station, Norrbotten County, 29 July 2008	I	03/12/2009
21/12/2008	Derailment during blocked-line operation 73664 at Kimstad Station, Östergötland County, 21 December 2008	I	15/12/2009
16/05/2005	Fire in metro train at Rinkeby Station, Stockholm County, 16 May 2005	I	2/12/2009
26/07/2007	Derailment of train 412 at Gnesta Station, Södermanland County, 26 July 2007	I	22/12/2009

Investigations completed in 2010

Event date	Title of investigation	Legal grounds	Completed
20/07/2007	Fire in tamping machine SPR 3208B on the Bräckeförs-Ed section, Västra Götaland County, 20 July 2007	I	27/01/2010
24/11/2007	Fire in rail maintenance vehicle DSS 1866B, Grötingen, Jämtland County, 24 November 2007	I	31/03/2010
05/08/2007	Near-collision between passenger train 219 and a shunting movement at Stockholm östra, Stockholm County, 5 August 2007	I	25/10/2010
04/06/2008	Accident, derailment of train 814 on the Rotebro-Upplands Väsby section, Stockholm County, 4 June 2008	I	21/12/2010

Investigations completed in 2011

Event date	Title of investigation	Legal grounds	Completed
02/05/2009	Incident involving rolling wagons on the Östavall-Alby section, Västernorrland County, 2 May 2009	l	02/02/2011
01/02/2010	Accident, track worker hit at Linghem interlocking area, Östergötland County, 1 February 2010	l	22/06/2011
13/03/2010	Near-collision between trains 9765 and 92 at Skutskärs-södra, Gävleborg County, 13 March 2010	l	09/03/2011
09/09/2010	Level crossing accident with train 3750 on the Solgården level crossing, Västra Götaland County, 9 September 2010	l	05/09/2011

3.3 Investigations commenced 2010-2011 but not completed

Investigations commenced in 2010

Event date	Title of investigation	Legal grounds
04/06/2010	Collision, Karlberg	i
12/09/2010	Collision between X2 train and excavator-loader, Kimstad	i
17/11/2010	Incident involving person, Skavstaby	i

Investigations commenced in 2011

Event date	Title of investigation	Legal grounds
27/01/2011	Collision, Frövi	i
09/06/2011	Near-collision, Nyhem–Grötingen	i
09/06/2011	Incident, significant faults and shortcomings, Slussen andMedborgarplatsen	i
01/11/2011	Near-collision, Hoting – Storuman	i
02/11/2011	Derailment incident, Malmö – Helgoland	i

3.4 Summaries of investigations completed in 2011

RJ 2011:01
Incident involving rolling wagons on the Östavall-Alby section, Västernorrland County, 2 May 2009

On Saturday, 2 May 2009, an incident occurred involving wagons rolling uncontrolled on the Östavall – Alby section.

Earlier that day, the wagons had been transported from Östavall to the timber terminal in Töva, and then run back to the timber terminal in Östavall again to be loaded with timber.

When the train got to Östavall, the driver had to move the locomotive to the other end of the trainset in order to back to the wagons to the timber terminal.

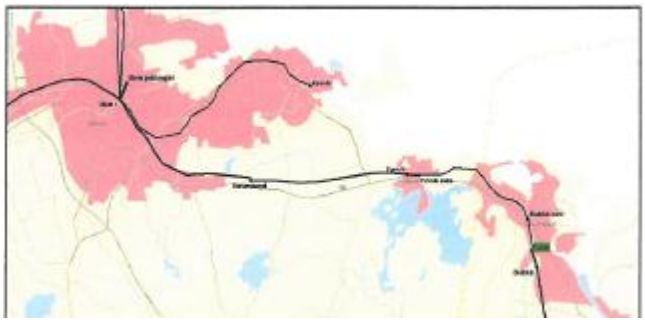
After the driver had backed into the timber terminal in Östavall, he decoupled the wagons and parked them in the terminal. He then drove the locomotive to Ånge at 14:35 as train 85090.

A private individual, who was in the vicinity of the railway in Östavall and noticed that there were wagons rolling, contacted the remote dispatcher in Ånge at 15:27 to report that there were wagons rolling in Östavall.

Just prior to the call, the remote dispatcher had noticed that there was a shorted track circuit in Östavall and had begun to investigate it.

The wagons rolled approximately 4 km on the up track before they stopped. The incident did not result in any injuries, but if a train had been on the up track towards Östavall, then a collision could have occurred.

RJ 2011:02
Near-collision between trains 9765 and 92 at Skutskärs-södra, Gävleborg County, 13 March 2010



On Friday, 13 March 2010, a near-collision occurred between trains 9765 and 82 at Skutskärs-södra.

Train 9765 was to transport timber to Furuvik-södra. The train consisted of two locomotives and 22 wagons and had been assembled at Gävle freight yard. Earlier, the wagons had come from Borlänge to Gävle. In Gävle, two diesel locomotives were coupled to the wagons instead of the locomotive that had been used from Borlänge.

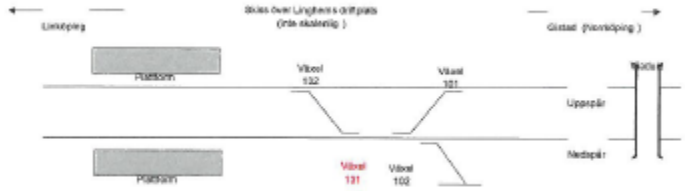
Train 9765 had travelled from Gävle towards Furuvik-södra and the driver had performed a deceleration test of the train at Bomansberget. The driver then noticed that the train braked very poorly and that the speed increased on the downward slope instead of decreasing.

Only after approximately 10 km did the driver successfully stop the train, which had by then passed a signal at 'stop' and driven up a point.

The direct cause of the event was blockage of the main brake pipe between the two locomotives.

One underlying cause was that it was not clear which brake testing requirements applied when coupling locomotives, the other cause was that there was not enough time in the driver's schedule to prepare the locomotives.

RJ 2011:03
Accident, track worker hit at Linghem interlocking area, Östergötland County, 1 February 2010



Linköping	**Sketch of Linghem interlocking area (Not to scale)**		**Gistad (Norrköping)**	Viaduct
Platform	Point 132	**Point 101**	Up track	
Platform	Point 131	Point 102	**Down track**	

On Monday, 1 February 2010, an accident occurred in Linghem in which a person removing snow from a point was hit and killed by a train.

A fault occurred on an insulated rail joint of the up track between Linghem and Gistad and caused delays in train traffic because the signal could not be set to 'clear',

The day prior to the accident, it became known that there might be more favourable weather on Monday and that it would then be possible to fix the faulty insulated rail joint. However, a prerequisite was that it had to be possible to set the points in Linghem and Gistad to run 'single-line working' on the double track section between Linghem and Gistad.

On Monday morning, a team of two were sent to Linghem to clear snow and ice from points 131 and 132. Since there were no pre-planned times to close the track for work, the persons decided instead to work without closing the track, either with a point released locally or with one person working while the other kept watch for approaching trains (work with signalman). Nobody had been designated in advance to take responsibility for creating a protection and safety plan, rather this was left to the persons in the team. However, this was never done. The persons in the team had an informal agreement whereby if one person worked on the track, then the other would act as signalman.

When one member of the team was to heat some stays of a point, he assumed that his fellow worker was going to watch for approaching trains, and so he started working. He suddenly heard something 'knocking' in the point, looked up to the right, and saw a train coming. He had just enough time to throw himself to the side before the train reached the work site. When the train had passed, he saw that his colleague was missing and realised that he had been hit.

The immediate cause of the accident was that there was no formally designated protection and safety leader who could make a risk assessment of the work and then establish proper

protection.

Underlying causes of the accident are shortcomings in control, management, and follow-ups of track-work protection. This led to the work being conducted without adequate protection from being hit by trains. Furthermore, there were shortcomings in the Swedish Rail Administration and Strukton Rail AB, which meant that it was not realised that work was being conducted with a form of protection that was not allowed under the applicable rules. Despite the fact that the shortcomings were known to the Swedish Rail Administration and Strukton Rail AB, no action had been taken.

RJ 2011:04

Level crossing accident involving train 3750 on the Solgården level crossing, Västra Götaland County, 9 September 2010

On 9 September 2010, an accident occurred involving train 3750 on the Solgården level crossing, which is on the Stora Höga - Stenungsund section, Västra Götaland County.

Two young women who were on the level crossing were hit and killed by train 3750. The level crossing, which is equipped with aural and visual signals, is a pedestrian and bicycle path that connects the housing estates – in the south part of the urban district east of the railway – with shops and services that lie west of the railway.

The direct cause of the accident was that the persons who were killed were on the level crossing at the same time as a train.

An underlying cause of the accident was that a risk analysis had not been performed regarding the impact of changes to the installation on other factors, such as changed conditions at level crossings. Had a further risk analysis been performed, it might have come to light that the existing protection at level crossings needed to be changed and adapted to the new circumstances.

The Swedish Transport Administration's safety management system has not been able to pick up systematic shortcomings in the oversight of level crossings.

3.5 Accidents and incidents investigated in the last five years

Rail traffic investigations 2007-2011

Investigations of accidents / incidents		2007	2008	2009	2010	2011	Total
Serious Accidents (Art. 19(1) and (2)	Collision				1		**1**
	Collision with an obstacle		1				**1**
	Derailment	1	1				**2**
	Level crossing accident				1		**1**
	Accident to person from train movement				2		**2**
	Fire in rolling stock						**0**
	Including dangerous goods						**0**
	Fire	2					**2**
	Incident	4	6	1	2	5	**18**
TOTAL		**7**	**8**	**1**	**6**	**5**	**27**

4 RECCOMMENDATIONS 2011

Date and time:	02/05/2009		
Location:	Östavall, Västernorrland County		
Event type:	Incident involving wagons rolling in uncontrolled movement		
Vehicle type and train number:	Lnps wagons.		
		***Present on board**:*	
Number present on board:	*Personnel:*	0	
	Passengers:	0	
Number of fatalities:	*Personnel:*	0	
	Passengers:	0	
Number of serious injuries:	*Personnel:*	0	
	Passengers:	0	
Number of minor injuries:	*Personnel:*	0	
	Passengers:	0	
Damage to rolling stock:	None		
Damage to railway infrastructure::	None		
Other damage:	No		
***Summary**:* see section 3.5			
Publication of final report:	02/02/2011		
Recommendation RJ 2011:01 R1	The Swedish Transport Agency is recommended to explore the possibility of developing standards on how the protection of parking tracks is to be organised in order to prevent vehicles from rolling out onto/near the connecting main line, even when there is not a reserved trainset on the main line		
Recommendation RJ2011:01 R2	The Swedish Transport Agency is recommended to investigate, in conjunction with oversight, whether operators' safety management systems are sufficient to pick up behaviour that may endanger traffic safety		

TRANSPORT STYRELSEN
Väg- och järnvägsavdelningen

Road and Rail Department

Swedish Accident Investigation Authority
Box 12538
102 29 Stockholm

Incident of rolling wagons on the Östavall - Alby section, 02/05/2009

The Swedish Transport Agency has received Report RJ 2011:01 – Incident involving rolling wagons on the Östavall - Alby section, Y county, 2 April 2009 – from the Swedish Accident Investigation Authority.

The aforementioned report recommends the Swedish Transport Agency to:

- to explore the possibility of developing standards on how the protection of parking tracks is to be organised in order to prevent vehicles from rolling out onto/near the connecting main line, even when there is not a reserved trainset on the main line (RJ 2011:01 R1),
- to investigate, in conjunction with oversight, whether operators' safety management systems are sufficient to pick up behaviour that may endanger traffic safety (RJ 2011:01 R2

The Swedish Transport Agency's actions in response to the Swedish Accident Investigations Authority's recommendations in Report RJ 2011:01

Recommendation RJ 2011:01 R1

The Swedish Transport Agency has placed the recommendation in its knowledge base for assessment and evaluation in its work on the national regulatory technical specifications, which will complement the European regulatory framework on technical specifications for interoperability (TSI) which are the basis for new builds and renovations of existing infrastructure. The Swedish Transport Agency will also contact the Swedish Transport Administration to obtain their views on the recommendation.

During 2011, the Swedish Transport Agency decided to conduct safety oversight of the track areas with parking tracks regarding access to and the application of track shoes, scotches, and other mobile equipment to prevent railway vehicles rolling when parked on parking tracks.

As a result of the above, the Swedish Transport Agency considers recommendation RJ 2011:01 R1 to have been addressed.

Recommendation RJ 2011:01 R2

The European *Train Drivers Directive* (2007/59/EC), which is the basis for the coming Swedish act of parliament ton *eligibility for train drivers* (bill 122), state that train drivers are to be selectively tested for occupational fitness and thereafter regularly examined for occupational, physical, and mental fitness. The health regulations for train drivers and other safety functions, which are being revised by the Swedish Transport Agency, determine the periodicity of examinations and how they are to be conducted.

The Swedish Transport Agency performs safety oversight in order to verify operators' use of their safety management systems in operations. The Agency checks, inter alia, the systems that the operator has in place in accordance with the provisions for *safety management systems for railway undertakings etc.* (JvSFS 2007:1(7c)) on verification of personnel suitability. The operators themselves are also required to review their systems for verification of personnel suitability and evaluate whether the systematic preventative safety measures are achieving their objectives (JvSFS 2007:1(11)).

The Swedish Transport Agency has decided to examine the recommendation by checking if there are legal grounds and how it may be implemented as part of safety oversight.

As a result of the above, the Swedish Transport Agency considers recommendation RJ 2011:01 R2 to have been addressed.

Yours faithfully

Signature

Birgitta Hermansson
Road and Rail Director, Swedish Transport Agency

Date and time:	13/03/2010		
Location:	Skutskär-södra, Gävleborg county		
Event type:	Incident - collision		
Vehicle type and train number:	Locomotives T44, No 268 and 346, 22 Laaps wagons, and train 92		
		***Present on board**:*	
Number present on board:	***Personnel:***	Not investigated	
	Passengers:	Not investigated	
Number of fatalities:	***Personnel:***	0	
	Passengers:	0	
Number of serious injuries:	***Personnel:***	0	
	Passengers:	0	
Number of minor injuries:	***Personnel:***	0	
	Passengers:	0	
Damage to rolling stock:	None		
Damage to railway infrastructure:	None		
Other damage:	No		
Summary: see section 3.5			
Publication of final report:	09/03/2011		
Recommendation RJ 2007:02 R1	The Swedish Transport Agency is recommended to ensure that the risk of single faults in connection with the establishment of a train's braking capacity is minimised by, for example, the introduction of checklists or the like.		
Recommendation RJ 2011:02 R1	The Swedish Transport Agency is recommended to examine how the rules for brake tests can be adapted to achieve greater clarity so that the braking tests ensure that the driver can brake the train.		
Recommendation RJ 2011:02 R2	The Swedish Transport Agency is recommended, in its oversight activities, also to check that the railway undertakings have systems which ensure that personnel have sufficient working hours to perform duties in accordance with the regulations.		
Recommendation RJ 2011:02 R3	The Swedish Transport Agency is recommended to conduct and document risk assessments when proposing changes in regulations which may affect traffic safety.		
Recommendation RJ 2011:02 R4	The Swedish Transport Agency is recommended to investigate whether protection requirements for train routes are sufficient to achieve sufficient safety in the railway system		

TRANSPORT STYRELSEN
Väg- och järnvägsavdelningen

Reference	Your reference	Document type	Page
TSJ 2010-403	J-22/10	**LETTER**	1/4

Road and Rail Department

Date	Your date	Administrator
31/05/2011	09/03/2011	Jerker Stubbans

Swedish Accident Investigation Authority
Box 12538
102 29 Stockholm

Near-collision between trains 9765 and 92 at Skutskärsödra, 13/03/2010

The Swedish Transport Agency has received the Swedish Accident Investigation Authority report RJ 2011:02 Near-collision between trains 9765 and 92 at Skutskärsödra, X county, 13 March 2010.

The aforementioned report recommends the Swedish Transport Agency to:

- ensure that the risk of single faults in connection with the establishment of a train's braking capacity is minimised by, for example, the introduction of checklists or the like (RJ 2007:02 R1),
- examine how the rules for brake tests can be adapted to achieve greater clarity so that the braking tests ensure that the driver can brake the train (RJ 2011:02 R1),
- in its oversight activities, also to check that the railway undertakings have systems which ensure that personnel have sufficient working hours to perform duties in accordance with the regulations (RJ 2011:02 R2),
- conduct and document risk assessments when proposing changes in regulations which may affect traffic safety (RJ 2011:02 R3),
- investigate whether protection requirements for train routes are sufficient to achieve sufficient safety in the railway system (RJ 2011:02 R4).

The Swedish Transport Agency's actions in response to the Swedish Accident Investigation Authority's recommendations in report RJ 2011:02.

Recommendations RJ 2007:02 R1 and RJ 2011:02 R2

The Swedish Transport Agency has planned to perform safety oversight in 2011 based on the events that occurred in 2010 involving poor braking capacity on freight trains. The safety oversight will include, inter alia, verification of the procedures that railway undertakings have in place to minimise the risk of single faults in connection with the establishment of a train's braking capacity, operating instructions for various types of locomotives, brake test directions for locomotives with multiple coupling, the competence of personnel who perform safety functions, the carrying out of instructions after transition from driving with radio control equipment to driving from the driver's cab, and verification of procedures and systems to ensure there are sufficient working hours in the duty roster for personnel who perform safety functions to execute the prescribed tasks.

As a result of the above, the Swedish Transport Agency considers that recommendations RJ 2007:02 R1 and RJ 2011:02 R2 will be addressed.

Recommendation RJ 2011:02 R1

In April 2011, the Swedish Transport Agency launched a feasibility study with a view to providing a basis for decisions and planning efforts to adapt and more clearly divide the Swedish Rail Agency traffic regulations, known as JTF, into regulations and a handbook. The feasibility study will be completed in late September 2011.

On 31 May 2009, JTF were introduced as national provisions for the Swedish railway network, with the exception of local and regional independent networks. Four amending regulations and a JTF Handbook have been published in the two years since its introduction. The JTF Handbook consists entirely of a loose-leaf system, which makes it easier for users to incorporate amendments in the form of annexes.

With the most recent amending regulations, TSFS 2010:163, the Swedish Transport Agency has also taken the first step towards a separation of the JTF Handbook from the regulations. The Swedish Transport Agency believes that there will be a continuing need to make amendments, for the foreseeable future, to the regulations and thus also to the Handbook.

The regulations currently contain detailed instructions and, in some places, dialogue flow charts. They thereby deviate from the requirements of the relevant ordinance (*författningssamlingsförordning*) (1976:725). The regulations in their current form would also be restrictive for railway operations and halt the streamlining of rail transport as regulatory changes take a long time on account of legal formalities. On the other hand, changes to a handbook can be made more quickly.

This is why the Swedish Transport Agency's strategy is to split JTF into regulations, with comprehensive traffic safety rules and requirements, and a handbook, with detailed instructions that follow these rules and requirements. The strategy includes issuing the rules

that are common and essential for traffic safety as national regulations, even for traffic on tracks with ERTMS (European Rail Traffic Management System).

The Swedish Transport Agency has determined that the recommendation to require brake tests is not affected, but rather it is the detailed instructions after a completed brake test which SHK believes should be clarified. The Swedish Transport Agency believes that clarification can wait until work begins to separate the regulations and the JTF Handbook.

The Swedish Transport Agency believes that a deceleration test and the previously prescribed brake test have the same purpose, i.e. to determine during movement whether the braking effect is the same as calculated and input into the train protection system. The difference in execution is that in a deceleration test the driver uses a technical aid (the train protection system) to evaluate the braking effect, while in the previously prescribed braking test the driver made a personal evaluation of the braking effect based on training and experience. The Swedish Transport Agency has determined that a deceleration test is a better tool for the driver to evaluate the braking effect than brake testing.

The Swedish Transport Agency has planned to perform safety oversight in 2011 based on the events that occurred in 2010 involving poor braking capacity on freight trains, which is presented in the above recommendation response.

The Swedish Transport Agency considers that recommendation RJ 2001:02 R1 will be addressed.

Recommendation RJ 2011:02 R3

In accordance with Regulation (2007:1244) on impact assessments, the Swedish Transport Agency performs impact assessments in connection with regulatory amendments and additions. Most regulations issued by the Swedish Transport Agency are amendments to existing regulations. It is then imperative that the impact assessment differentiates the new from the old. It is always the amendments that are subjects of impact assessments. In the case of regulations which are completely new from a formal point of view, the point of departure is thus that all rules should be subject to an impact assessment. According to the Swedish Agency for Economic and Regional GrowthI, if current provisions are transferred unchanged into new regulations, the Agency may focus the impact assessment on the provisions that are new or that have actually changed in substance.

Transport policy has several objectives. The *overarching goal* is socio-economically effective and long-term sustainable transport services. The *functional objective* of transport policy is to ensure accessibility, while there are also safety, environmental and health objectives. The different objectives are often in conflict with each other, that is to say that an action leading positively towards one objective often adversely affects another objective. As a result it is often necessary to weigh the various consequences against each other when a position is taken on whether certain actions – such as certain regulations – are worth implementing.

The impact assessment is a tool to evaluate whether regulation is really necessary and whether the positive impacts – the benefits – of a particular regulation outweigh the negative

consequences. It is also a tool used to ensure that regulations are drafted as well as possible so that the positive impacts will be as great as possible in relation to any negative ones. When the Transport Agency works on a regulation it should, if possible, put forward facts that demonstrate the existence of a problem, such as – on issues of safety regulation – data on the number of accidents that occur each year of the event types that the regulation is intended to prevent. Regulations often aim to prevent events of low probability, but which entail major consequences. The problem definition in the impact assessment thus describes the risk (probability) of events occurring, and the consequences should they occur. An unregulated area is never a relevant problem, as such. Regulation always entails an intrusion into the private sphere or the business realm, which in itself is negative. Society really wants to be regulated as little as possible and regulation should only be used when a problem is so great that the positive effects of the regulation outweigh the negative effects.

As a result of the above, the Swedish Transport Agency considers recommendation RJ 2011:02 R3 to have been addressed.

Recommendation RJ 2011:02 R4

The Swedish Transport Agency will contact the Swedish Transport Administration concerning this recommendation.

The Swedish Transport Agency has planned to perform safety oversight in 2011 based on the events that occurred in 2010 involving poor braking capacity on freight trains.

Sincerely

Signature

Birgitta Hermansson
Road and Rail Director, Swedish Transport Agency

Date and time:	01/02/2010		
Location:	Linghem, Östergötland County		
Event type:	Track worker hit		
Vehicle type and train number:	X2, 90509		
		***Present on board**:*	
Number present on board:	***Personnel:***	Not investigated	
	Passengers:	0	
Number of fatalities:	***Personnel:***	1	
	Passengers:	0	
Number of serious injuries:	***Personnel:***	0	
	Passengers:	0	
Number of minor injuries:	***Personnel:***	0	
	Passengers:	0	
Damage to rolling stock:	None		
Damage to railway infrastructure:	None		
Other damage:	No		
***Summary**:* see section 3.5			
Publication of final report:	22/06/2011		

Recommendation RJ 2011:03 R1	The Swedish Transport Agency is recommended, together with the Swedish Work Environment Authority, to take the necessary steps to ensure that track work is performed with adequate safety standards.
Recommendation RJ2011:03 R2	The Swedish Transport Agency is recommended to examine factors that may reduce the pressure of time that leads to the use of unauthorised working methods.
Recommendation RJ2011:03 R3	The Swedish Transport Agency is recommended, through its oversight, also to verify that the companies' safety management systems pick up operational deviations.
Recommendation RJ2011:03 R4	The Swedish Transport Agency is recommended systematically to use incident reports as the basis for taking immediate steps to prevent accidents and incidents.
Recommendation RJ2011:03 R5	The Swedish Work Environment Authority is recommended, together with the Swedish Work Environment Authority, to take the necessary steps to ensure that track work is performed with adequate safety standards.
Recommendation RJ RJ2011:03 R6	The Swedish Work Environment Authority is recommended, through its oversight, to verify that companies' systematic work environment efforts pick up operational deviations.

Swedish Accident Investigation Authority
Box 12538
102 29 Stockholm

Accident, track worker hit at Linghem interlocking area, 1 February 2011

The Swedish Transport Agency has received the SHK Report RJ 2011:03 *Accident, track worker hit at Linghem interlocking area, E County, 1 February 2011.*

The aforementioned report recommends the Swedish Transport Agency to:

- together with the Swedish Work Environment Authority, take the necessary steps to ensure that track work is performed with adequate safety standards (RJ 2011:03 R1),
- examine factors that may reduce the time pressure that leads to the use of unauthorised practices (RJ 2011:03 R2),
- through its oversight, also verify that the companies' safety management systems pick up operational deviations (RJ 2011:03 R3),
- systematically use incident reports as the basis for taking immediate steps to prevent accidents and incidents (RJ 2011:03 R4).

The Swedish Transport Agency's actions in response to the Swedish Accident Investigation Authority's recommendations in report RJ 2011:03

The Swedish Transport Agency and the Swedish Work Environment Authority have been in contact regarding recommendation RJ 2011:03 R1. The regulatory bodies have both taken action individually because the respective regulatory frameworks in the case address different legal entities.

The Swedish Transport Agency has written to the Swedish Transport Administration regarding recommendation RJ 2011:03 R2. The Transport Agency includes parts of the Transport Administration's reply in its response below.

Recommendation RJ 2011:03 R1

A number of accidents and incidents occurred in 2010 during work on or near in-service tracks. The Swedish Transport Agency requested the Swedish Transport Administration to take steps to increase safety. On 4 October 2010, the Swedish Transport Administration introduced tightened internal rules for work in the track area. The new rules were temporary and were to be replaced by more long-term measures by 15 April 2011.

In the spring of 2011, the Swedish Transport Administration presented the long-term measures to the Transport Agency, which included, inter alia, the following:

- The Swedish Transport Administration would develop a new safety policy,
- Together with subcontractors concerned, the Swedish Transport Administration would develop a checklist for risk assessment prior to work in the track area,
- The Swedish Transport Administration's planned audit programme would be complemented by workplace inspections to be carried out by independent auditors.

The Swedish Transport Agency wanted to ensure that the Swedish Transport Administration would continually monitor traffic safety in connection with work in the track area. The Agency issued an injunction (TSJ 2010-1860) to the Swedish Transport Administration to report the following to the regulatory body:

- by 30 September 2011, report how the checklist has been implemented in their organisation and those of the subcontractors concerned;
- by 1 October 2011, submit the first monthly report on workplace inspections;
- report to the Swedish Transport Agency the results of the at least 10 unannounced workplace inspections to be carried out between 01/06/2011 and 01/06/2012;
- serious deviations that occur during work in the track area to be reported by the next business day between 01/06/2011 and 01/06/2012.This goes beyond the usual accident reporting (JvSFS 2008:1) that is required of all operators

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As a result of the above, the Swedish Transport Agency considers recommendation RJ 2011:03 R1 to have been addressed.

Recommendation RJ 2011:03 R2

The Swedish Transport Administration submits that they implemented an internal advisory committee to find factors that contribute to the pressure of time. The results of the advisory committee indicate that there is much to gain from better planning of work in the track. The Swedish Transport Administration has therefore been working for some time to coordinate some of the maintenance measures at specific times when several actions can be performed simultaneously in a concentrated period of time. The Transport Administration also intends to work with railway contractors to further review the planning procedure.

The Transport Administration also points out that they are working on an injunction from the Transport Agency (see Recommendation RJ 2011:03 R1) and that those efforts will also affect the time pressure on work in the track.

As a result of the above, the Swedish Transport Agency considers recommendation RJ 2011:03 R2 to have been addressed.

Recommendation RJ 2011:03 R3

As part of the application process, the Swedish Transport Agency examines operator compliance with Article 7(j) of the *Regulations on Safety Management Systems* (JvSFS 2007:2) regarding deviation management systems. As part of system audits, the Agency verifies, inter alia, that those systems function properly.

As a result of the above, the Swedish Transport Agency considers recommendation RJ 2011:03 R3 to have been addressed.

Recommendation RJ 2011:03 R4

Under the Railway Act (2004:517), the Swedish Transport Agency issues permits to operators (infrastructure managers and railway undertakings) after examination of their safety management systems, etc. Safety management means that operators have procedures both to prevent accidents as well as to identify faults and shortcomings in operations and to correct them. After a permit has been obtained, the operators are fully responsible for their own operations with the help of their safety management, of which the Transport Agency should not be seen as a part.

According to the *Regulations on railway accidents and safety reporting* (JvSFS 2008:1), operators are to report accidents and incidents – of certain severity – in their operations to the regulatory body. This does not mean that once a report has been made the Swedish Transport Agency assumes responsibility for the notifier's operations and begins to analyse and assess which measures should be taken directly; that is incumbent upon the operator itself. An operator should not wait to commence remedial efforts nor for the regulatory body

to get in touch after one or more incidents and inquire what measures have been taken. The Agency may issue an injunction to the operator if similar incidents continue to be reported. An injunction does not mean that the Swedish Transport Agency assumes responsibility for the operations or decides which actions are to be taken, rather the operator must demonstrate indirectly that they are capable of taking measures that lead to decisions on improvements which increase safety, and these improvements have to be presented to the regulatory body. Ultimately, the regulatory body may revoke the operator's permit.

The Swedish Transport Agency conducts risk-based oversight and uses, inter alia, accidents and incidents reported by operators to the Agency's emergency telephone line to analyse potential risk areas for oversight. The regulatory body currently has a computerised case registry with a somewhat inadequate analysis function, but plans are on track to implement a new computerised case registry with a more developed analysis function in 2012.

As a result of the above, the Swedish Transport Agency considers recommendation RJ 2011:03 R4 to have been addressed.

Sincerely

Signature

Birgitta Hermansson
Road and Rail Director, Swedish Transport Agency

Date and time:	09/09/2010		
Location:	Solgården, Stenungsund, Västra Götaland County		
Event type:	Level crossing accident		
Vehicle type and train number:	Multiple units, X53 3264		
		Present on board:	
Number present on board:	***Personnel:***	Not investigated	
	Passengers:	Not investigated	
Number of fatalities:	***Personnel:***	0	
	Passengers:	0	
Number of serious injuries:	***Personnel:***	0	
	Passengers:	0	
Number of minor injuries:	***Personnel:***	0	
	Passengers:	0	
Damage to rolling stock:	None		
Damage to railway infrastructure:	None		
Other damage:	2 persons killed on level crossing.		
Summary: see section 3.5			
Publication of final report:	05/09/2011		
Recommendation RJ 2011:04 R1	The Swedish Transport Agency is recommended to ensure that the Swedish Transport Administration reviews level crossings so that the dangerous crossings are attended to, and creates updated action plans to address them.		
Recommendation RJ 2011:04 R2	The Swedish Transport Agency is recommended to ensure that the Swedish Transport Administration, in cooperation with relevant stakeholders such as municipalities and road maintenance authorities, systematically reviews the criteria that form the basis for decisions on level crossing protection, creates action plans, and addresses deficiencies found.		
Recommendation RJ 2011:04 R3	The Swedish Transport Agency is recommended, as part of its oversight, to verify that infrastructure managers inspect the installations that affect traffic safety, that the inspections are documented, and that deficiencies found during inspections are remedied.		

TRANSPORT STYRELSEN

LETTER

Date **29/11/2011**	Doc. No./Reference TSJ 2010-1419	Page 1/3
Your date **05/09/2011**	Your reference J-50/10	

Swedish Accident Investigation Authority
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102 29 Stockholm

[STAMP] (Reads: Swedish Accident Investigation Authority. Received 01/12/201.Doc No.J-50/10.File Annex 156.)

Level crossing accident on the Stora Höga - Stenungsund section, 09/09/2010.

The Swedish Transport Agency has received the SHK Report RJ 2011:04 *Level crossing accident with train* 3750 *on the Solgården level crossing, O County, 9 September 2010.*

The aforementioned report recommends the Swedish Transport Agency to:

- ensure that the Swedish Transport Administration reviews level crossings so that the dangerous crossings are attended to, and creates updated action plans to address them (RJ 2011:04 R1),

- ensure that the Swedish Transport Administration, in cooperation with relevant stakeholders such as municipalities and road maintenance authorities, systematically reviews the criteria that form the basis for decisions on level crossing protection, creates action plans, and addresses deficiencies found (RJ 2011:04 R2),

- as part of its oversight, verify that infrastructure managers inspect the installations that affect traffic safety, that the inspections are documented, and that the deficiencies found in the inspections are remedied (RJ 2011:04 R3).

The Swedish Transport Agency's actions in response to the Swedish Accident Investigations Authority's recommendations in Report RJ 2011:03

The Swedish Transport Agency has been in contact with the Swedish Transport Administration regarding recommendations RJ 2011:04 R1 and R2. The Transport Agency presents parts of the Transport Administration's reply in its response below.

Recommendations RJ 2011:04 R1 and R2

The Swedish Transport Administration has a project underway to develop a common model for management by objectives for rail safety, in the same manner as that currently used for road traffic. The model will include indicators with measurement standards in order to enable monitoring of rail safety development over time (level crossings will be a sub-area). The Swedish Transport Administration intends to conduct a systematic review of level crossing safety under the new model. The project's mission is also to establish stakeholder collaboration in order to work together on the development of a model with criteria that characterise 'Safe Level Crossing'. This stakeholder collaboration will evolve from today's 'Level Crossing Delegation', which is an established forum for collaboration on level crossing issues. The Transport Administration has revised document BVH 701 *Level crossings – build new or eliminate, choice of protection options,* which provides assistance when selecting level crossing protection.

In October 2011, the Swedish Transport Agency launched a safety review (TSJ 2011-1618) of the Swedish Transport Administration in order verify application of governing document BVF 701 *Level crossings - Decision on protective devices.* The review is a follow-up to a safety review carried out in 2008 of how the Swedish Rail Administration, as it was then called, dealt with altered traffic flows at level crossings; that review resulted in the drawing up of the governing document.

As a result of the above, the Swedish Transport Agency considers recommendations RJ 2011:04 R1 and R2 to have been addressed.

Recommendation RJ 2011:04 R3

The Swedish Transport Agency performs safety oversight of infrastructure managers regarding inspection of track systems pursuant to the Regulations (BVFS 1997:2) o*n the inspection and maintenance of track systems.*

During April – May 2011, the Swedish Transport Agency reviewed how the Swedish Transport Administration's dealt with acute faults and '*veckofel*' (faults that must be remedied within one week) detected and assessed in the course of safety inspections (TSJ 2011-636). The Agency will inspect the same operators with the same purpose in the first quarter of 2012. If deviations are found in the documentation of completed inspections or if deficiencies that have been discovered are not remedied within the specified time frame, the regulatory body has a mandate to issue an injunction to the operator.

As a result of the above, the Swedish Transport Agency considers recommendation RJ 2011:04 R3 to have been addressed.

Sincerely

Signature

Birgitta Hermansson
Road and Rail Director, Swedish Transport Agency