

Investigating to Prevent – (Some) Challenges of the National Investigation Bodies in improving rail safety

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The Railway Safety Directive, as set out in 2004, has established the requirement for each European Union Member-State to establish an independent National Investigation Body (NIB) with the task of investigating railway accidents and incidents, with the sole purpose of improving the safety of the Union rail system.

The NIBs have generally established themselves as a crucial player in the improvement of safety in the Union rail system, having now performed thousands of investigations enhancing the knowledge of rail accident causation and issued numerous safety recommendations that have decisively contributed to a safer railway system.

However, despite almost 20 years after the setting up of this requirement by the European Parliament and Council, the NIBs are still struggling with various types of challenges to fulfil their role within the rail system.

This presentation intends to briefly highlight and raise awareness on some selected challenges, as resulting from the experiences shared in the regular meetings of the European Network of National Investigation Bodies.

Why NIBs?

Before going directly to the topic of the presentation, it may be useful to clarify the reasons for the existence of the NIBs. After all, if the Infrastructure Managers (IMs) and Railway Undertakings (RUs) all have the obligation to have in place a system to investigate and learn from accidents and incidents, and the National Safety Authorities have the obligation to constantly monitor and assess the effectiveness of the Safety Managements Systems (SMS) implemented by IMs and RUs, one may wonder what is the purpose of the NIBs. After all, the railway system has been working and developed to a very safe transportation system for almost 200 years, without NIBs.

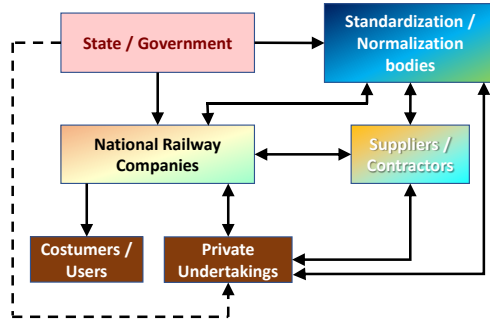
A key concept to this understanding is **independence**. In the current panorama of the rail sector, it is vital that the body that investigates accidents and incidents is free from all conflicts of interest that could interfere with its objectivity, including from any regulator or entity in charge of safety assessment or compliance. This was made perfectly clear in the extensive report prepared by Lord Cullen after the Ladbroke Grove accident in the UK, in 1999.

Furthermore, since the mid-1990s the railway sector changed drastically from a very integrated system to a system with the separation between infrastructure and operations, and the entrance of several different new actors, each with its own role and interface with the others, a scene currently framed by the Railway Safety Directive.

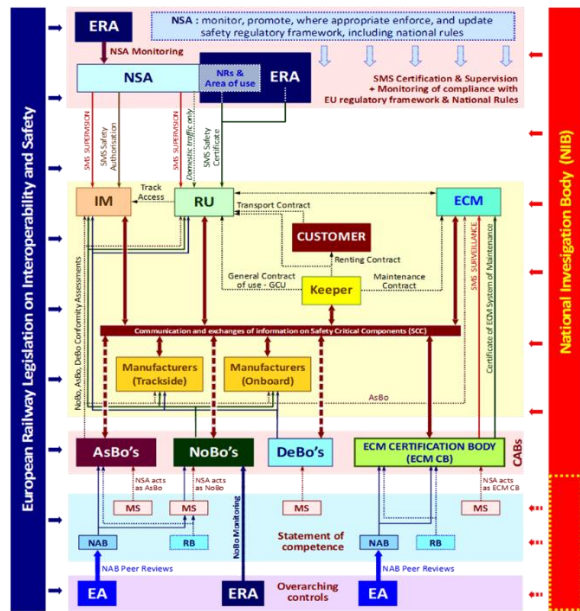
If we compare the illustrations for the rail sector of 30 years ago in a typical country and for the current rail sector, it becomes clear that the complexity has clearly increased even if just by the sheer number of actors and interfaces.

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The railway sector "in the old days" (simplified)



The railway sector today



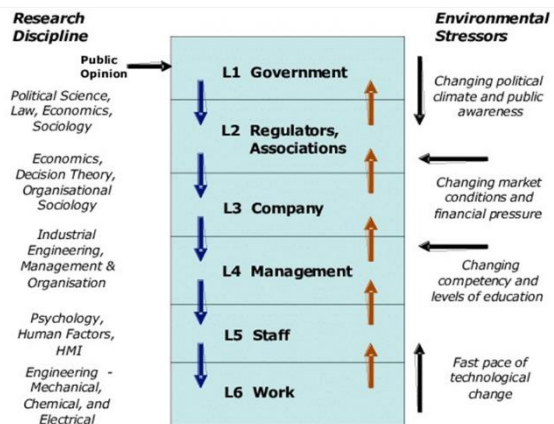
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The NIBs, through their legal status, have the power and obligation to look upon the workings of any of these parties relevant to the event under investigation.

Also, the NIBs will look at the whole socio-technical system associated with rail, from the front-line staff to the legal and regulatory framework, and have the right to issue safety recommendations to any organization, even the Government.

Therefore, it is clear that the NIBs have a statute and a scope well beyond that of any other party with the obligation to investigate safety events in rail.

Socio-technical System - Rasmussen 1997



Challenge #1: Sufficient and competent staff

The first and, perhaps, most critical challenge for the NIBs is being able to recruit and retain sufficient and competent staff to perform its duties.

The requirement of independence clearly means that investigations cannot be carried out by officials from the involved parties, as used to be the practice in the past. Furthermore, safety investigations require specific training and practice in relevant methods and disciplines, which can only be ensured by duly trained permanent staff, where a long experience in railway practice, although normally required, is just not enough.

This means that NIBs are in competition with the larger rail industry to attract and retain qualified personnel but also must have the means to be able to retain them after the effort and expense in training, as well as to be able to build on the experience gained with each investigation.

However, 16 years after the obligation for all Member-States to have fully functioning independent NIBs, there is still a considerable number of Member-States where the NIB

does not have staff to fulfil its obligations, where the NIB is not able to recruit or retain competent staff because the wages are not competitive with the industry, where NIB does not have the necessary budget to train its staff in the appropriate techniques.

This means that, in practice, the NIBs facing this challenge are not able to effectively fulfil their role in the rail system as designed by the European Union, namely the improvement of rail safety. In consequence, this means that the Member-States in these conditions are not fulfilling their obligations in what regards rail safety, a problem which must be addressed without hesitation if we want a safer, more effective and more efficient rail system.

Furthermore, the lack of sufficient and competent staff is also affecting the independence of NIBs by curtailing the freedom of decision and action.

There is the need for the European Commission to effectively monitor and act upon these cases, compelling Member States to guarantee the effective working of the NIBs according to the Rail Safety Directive.

Challenge #2: Players speaking different languages...

One of the steps in the safety investigation of accidents and incidents is the identification and analysis of differences between the designed or expected performance of the system and what really happened.

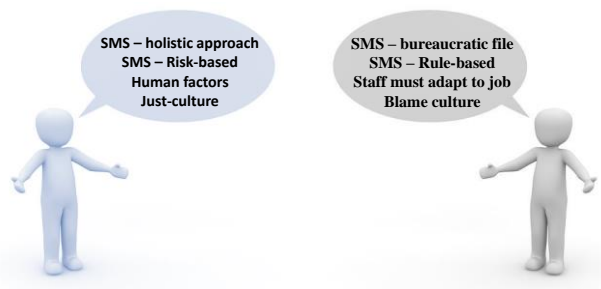
For this, the relevant parts of the Safety Management System of the involved IM and RUs are studied by the NIB, including the risk control measures put in practice by them and by the Entities in Charge of Maintenance (ECMs) and any other intervening organization, and the control and monitoring mechanisms in place to assess the performance of the system. The NIB will also consider the human and organizational factors involved, these meaning the personal and workplace conditions and framework in which the staff performs its duties, and how these were effectively considered in the risk management. This approach derives directly from the Railway Safety Directive's requirements and obligations imposed on IMs and RUs to undertake their activities.

However, 20 years after the introduction of the Rail Safety Directive, in a surprisingly high number of cases, the NIBs are still finding it difficult to discuss the effective implementation of the fundamental concepts of the SMS with IMs and RUs.

While the SMS must be an integrated and fully functional tool for the management of safety, it is many times seen by the parties involved in the accidents and incidents as a bureaucratic requirement just needed to obtain the safety authorization or safety certificate, without an effective practical application.

While the NIB is looking for a risk-based approach in the management of safety, as defined in the Railway Safety Directive, it finds that many IMs and RUs are still in the mindset of rail safety being rule-based "as it has always been".

While the NIBs are inquiring how human factors have been taken in account in the management of safety, and controlled, many times they are faced with answers like "staff must be responsible" and "the fault is on the member of staff". This implies the belief that each person with a safety



critical task must be individually responsible and with 100% reliability, something that not even the most advanced systems are able to attain, not recognizing the need to cover for the inevitable variability and known failure of human performance.

While the NIBs are looking for just-culture principles implementation, they are frequently faced with rail staff hiding safety incidents for fear of being punished by their companies.

In this context, the NIBs will have difficulty in discussing the factors involved in the accidents or incidents, as if different languages were being spoken. This lack of recognition or understanding of concepts fundamental to the Railway Safety Directive by parties involved in the accidents will later also make it difficult to address any safety recommendations. This suggests the need for more training of the sector and more intense supervision by the Safety Authorities, both National and European.

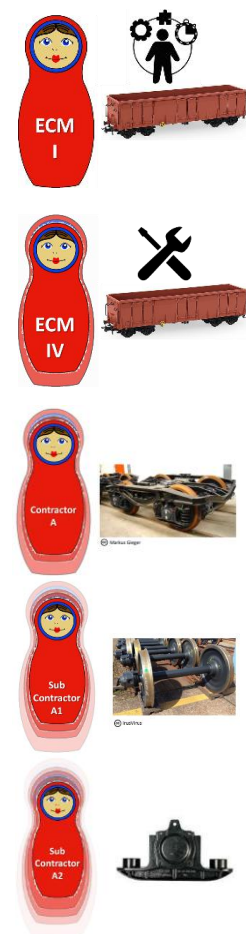
Challenge #3: A *Matryoshka* of players

The high number of players involved in the rail sector adds a considerable complexity to the investigations, especially in what relates to the interfaces and to how the IMs, RUs and ECMs control their service providers.

It has become more and more apparent in safety investigations carried out by the NIBs that the number of intervening parties is increasing, with responsibilities by each part of the system becoming diluted and, especially in what concerns the investigation activity, with information and its control being more difficult to locate.

Typically, in a derailment, obvious involved parties are expected to be the IM, the RU and the vehicles' ECMs. However, when the NIBs start probing, we will find that, maybe, the IM will have contracted track maintenance to a number of service providers, each of which may have subcontracted some part of the work to other entities; The RU may have contracted motive power and crew to other companies; Finally the ECMs may have contracted maintenance of the carbody to one company, maintenance of the bogies to another and maintenance of the braking system to yet another company. In turn, the company contracted by the ECM to maintain the bogies may have contracted maintenance of the wheelsets to a third company. This third company may have contracted the maintenance of the roller bearings to a fourth company, which may not necessarily be the one that in fact performs the task. And suddenly the NIB can face a situation where a derailment occurring in Romania involves a roller-bearing maintained in a back-shop in Portugal.

Besides the practical complexity that this adds to the logistics of the safety investigation (for which the NIBs must have the necessary means to be prepared), the experience of the NIBs evidences that the paper trail can be difficult to follow but, especially, that it is very much more difficult for the entity with overall responsibility for safety, in this case the ECM, to monitor and ensure the conformity of the work performed.



However, our experience shows that these “*Matryoshka*” situations are becoming more frequent and that efforts must be made to ensure effective controls by the IMs, RUs, ECMs and certification bodies.

Challenge #4: Implementation of Safety Recommendations

NIBs may issue safety recommendations resulting from the lessons learned from the investigations. In the majority of cases these will be addressed to the National Safety Authority, having other parties (IMs, RUs, ECMs, etc.) as end implementers or “actors of change”.

Safety recommendations must **all** be acted upon and timely and comprehensive justifications given to the addressee Authority, whether in case of rejection, which fortunately is not very frequent, or regarding the actions for implementation and status.

However, NIBs face situations when the addressees consider the safety recommendations as implemented when in fact nothing has really changed in the safety framework of the end implementers. This may be caused by insufficient criteria of the Safety Authority regarding the implementation of recommendations issued by the NIB or by a supervision oversight regarding the actions declared by the end implementers. In many other cases, NIBs see a long delay in the effective implementation of the safety recommendations, while accidents that could have been prevented continue to happen.



These situations, that seriously hinder the improvement of safety, must be decisively tackled by the NSAs and should also be made public in the NIBs annual reports as a way to advocate for the recommendations issued and bring public awareness to them, thus motivating the end implementers to effective implementation.

Challenge #5: Judicial versus safety investigations

The purpose of the investigations carried out by the NIBs is solely the improvement of rail safety and should in no case be concerned with apportioning blame or liability.

In compliance with the RSD, the Member-States should clearly establish in the transposition to national legislation that the investigation made by the NIB shall have full cooperation from the authorities responsible for any judicial inquiry in giving access to all relevant evidence as soon as possible, and that the NIB investigation should be carried out independently of any judicial inquiry.

This makes it completely clear that the safety investigation and the judicial investigation are completely separate and serve completely different purposes.

However, almost 20 years after the RSD, there are still Member-States where:

- NIBs do not have immediate access to basic evidence, this being seized by the judicial authorities;



- NIBs' reports are being used by the judicial authorities to build up their blame or liability apportioning cases;
- NIBs' staff is being called to Court to give evidence for apportioning blame or liability.

We cannot overstate the very negative effect that these bad practices can have in the improvement of rail safety.

When retaining information from the NIBs, the judicial authorities are directly preventing or delaying learning from the accident to prevent future accidents. Furthermore, when the involved parties are aware that their information or statements will be used for blame or liability, they will become more closed to the NIB's investigation and the safety learning may not be obtained from the accidents. Lastly, the concept of just-culture adopted in the RSD is not known or acknowledged by the judicial authorities, thus partly defeating its principle and benefit.

There is the need for the European Commission to effectively monitor and act upon these cases, compelling Member States to establish a legal status of the NIB investigations according to the Rail Safety Directive. Also, regarding the principle of just-culture, the legal framework in the EU must be improved to take it into account and specific training is needed for the prosecutors.

In conclusion, these few practical examples of the challenges faced in the activity of the NIBs evidence that there is still a lot of progress to be made in the maturity of the rail sector to be in line with the benchmark set by the Rail Safety Directive.

The NIBs are permanently doing their best to contribute decisively to the improvement of safety in the European Union rail system. However, they must be provided with the necessary means to fulfil their role, and the other actors in the sector must be prepared for a mature and constructive dialogue in extracting the maximum learning from accidents and incidents, for the benefit of rail safety and of the society.