

## RISK BASED DECISION MAKING IN TARGETING OVERSIGHT

Heidi Niemimuukko

Director of Audits

Finnish Transport Safety Agency

### SUMMARY

The European railway legislation has been stressing the importance of safety management and safety management systems for over a decade. This also requires the safety authorities to focus on management systems instead of only technical compliance. However it is not just the changes in the legislation but rather the changes in the governmental policies that requires many authorities to carefully plan their resource use.

To this end, we have launched two parallel programmes aiming at performance and risk based decision making, to guide our activities – especially oversight. The first one is an event based programme and the other one is an organisation profile based programme. At the moment, the development processes of these programmes are separate and they provide background information for planning supervision, safety measurements and perhaps in the future resourcing authorisations as well. These two programmes will be combined later to give us a more “complete risk picture” about the organisations and their activities.

This paper concentrates on the organisation profile programme. The profile is the authority’s subjective view on how the organisation in question has been managing its risks and operations. The profile consists of several factors that form the view together. The factors emphasise the basic elements of a safety management system, but include also more general factors like change in the activities or economics.

A new way of targeting oversight activities is not just for the authorities; according to the European legislation the RUs and IMs must monitor their own activities and management. The performance and risk based approach could be used by them as well, considering especially risks.

### INTRODUCTION

The changing world sets new requirements for everyone in the sector, not just the industry but governmental Authorities as well. The Finnish Transport Safety Agency is in transition from classical Compliance Authority to a dynamic Safety Authority. In order to fulfil our obligations with our resources and to create added safety value, we have to be more efficient than before. We have to do right things. That means we have a need for more advanced working methods.

One task in changing our way of working has been to rethink and remodel how we target oversight activities.

### APPROACH TO OVERSIGHT; RISK BASED OR PERFORMANCE BASED OR BOTH

For getting the best out of the meager oversight resources, like every governmental authority, we needed to address some important questions: what, who and how often do we supervise. The seemingly easy answer is to look at accident and incident reports and target activities that frequently or with great(er) mass pop up on the screen and to some extent this is what we still do. It is true that based on the reports we can see where the highest risks lie at a certain time. However, we thought that purely looking at reports is too reactive and the process is too slow. With our oversight resources it just is not possible to react to every report immediately – and considering consistent safety work that would be utterly wrong. Think about the shot-gun-model and think about severity instead of pure numbers!

How to be more proactive and still target the highest risks? The European railway legislation has promoted safety management for over a decade with an aim to have high performing organisations. This has been made by introducing safety management systems (SMS) for railway undertakings (RU) and infrastructure managers (IM). An SMS gave us the cue to be proactive. One of the most important items to oversee is the functioning of the SMS. And through supervising an SMS we reach another important and interesting question that has to do with the European goals; high performing, safe railway.

Is there a difference between targeting our oversight activities based on performance or risk?

To us not really. The European railway legislation is performance based. It gives the actors lot of freedom in choosing how they operate and manage their businesses but at the same time, the freedom brings responsibility. In order to steer our activities risk based we need to steer them performance based at the same time, or vice versa. This means that by evaluating the functioning e.g. the performance of an SMS, we automatically assess risks for the operation of the organization (Figure 1). For example, a good performance in change management shows an RU or IM is taking safety seriously.

... the organisation is willing and capable to keep its operational risks as low as reasonably practicable and has an effective system in place to manage risks in its activities and ensure compliance with the applicable regulations.

... the organisation is willing but its capability to manage risks is doubtful and it has not been able to demonstrate that it has a system to manage risks in its activities and ensure compliance with the applicable regulations.

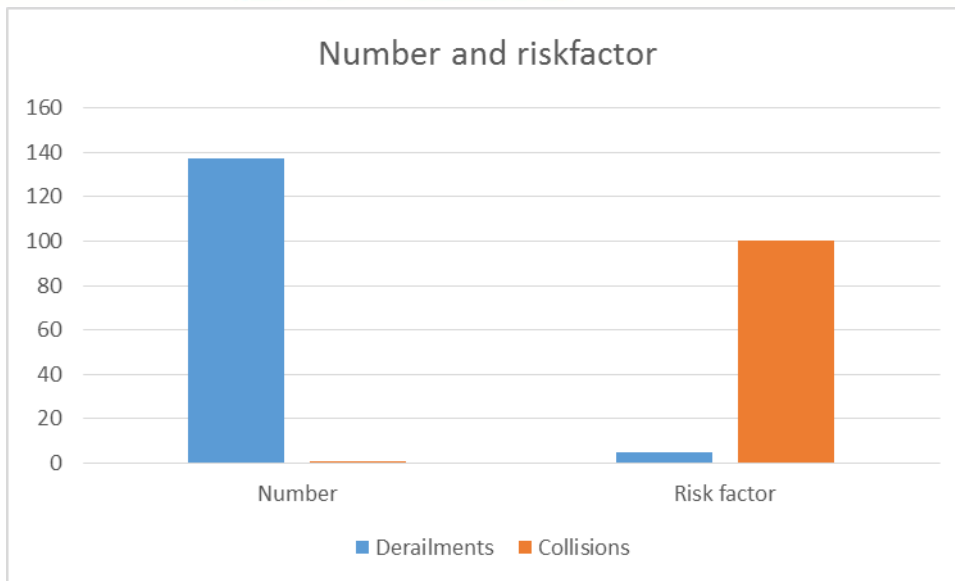
... the organisation is neither willing nor capable to keep its operational risks as low as reasonably practicable and it has not been able to demonstrate that it has a system to manage risks in its activities and ensure compliance with the applicable regulations.

**Figure 1: In short: if we have a clear picture of A, B or C, we can target our oversight activities based on risks and performance.**

To be able to assess the performance and thereby also the risks associated to a certain RUs or IMs activities, we in Finland have launched two parallel programmes. Like said earlier, incident based information along the organisational performance information is just as important in creating an as comprehensive picture as reasonably possible. At the moment the development processes of these programmes are separate, but they will be merged and even before this happens, results from both programmes are used in deciding on whom or what event or process to supervise and how often; simply put in targeting our oversight activities.

### Event based programme

The event based programme sounds like it's only analysing incident reports. However, it is much more. True, most of the information for the analyses comes from incident reports, but it's not just plotting a number of derailments versus collisions. It's also looking at the actual operational safety risk of certain types of incidents and the safety factors which prevent or contribute to certain incident types. For example comparing the number of derailments and collisions, we see that derailments are more probable but the consequences of collisions are far greater since most reported derailments are minor "one axel hopped off the rail"-type and we should concentrate oversight (and safety) efforts to collision prevention in this example. (Figure 2).



**Figure 2** Number of collisions and derailments vs. risk factor in collisions and derailments

Obviously deciding on what to supervise is never that black and white. There are many factors that contribute to how we plan oversight. It would be foolish to ignore derailments just because the risks often are minor compared to collisions. In some cases derailments can be a high priority event.

Since this is somewhat similar to what many of the authorities are doing, this paper will concentrate on the second programme, which is likely to provide new ideas for readers.

### Organisation profile based programme

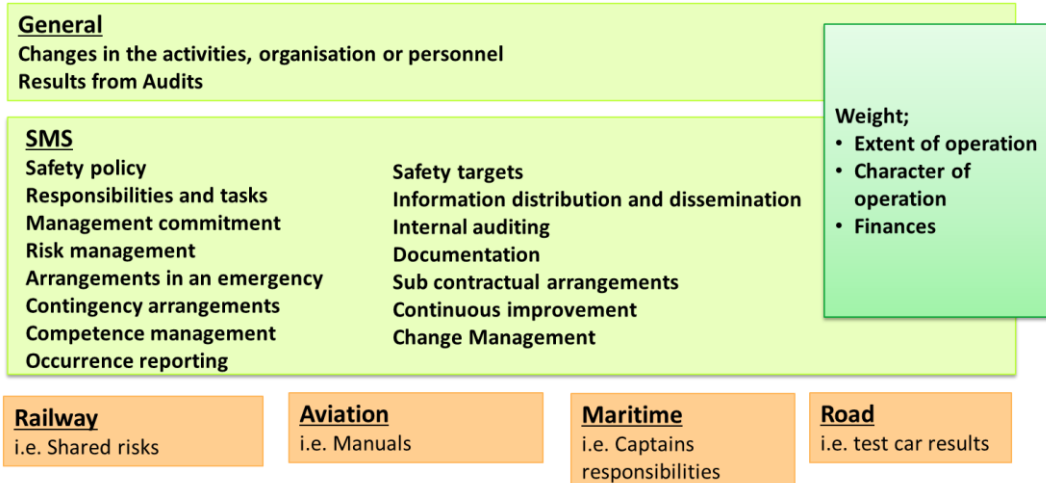
It was said earlier that the European railway environment puts a great emphasis on safety management and safety management systems. The other programme is creating a profile of our sector organisations, mostly RUs and IMs and naturally, the basis of the profile is the performance of the SMS. The data is gathered mostly in audits but relies much on the good cooperation between the organisation and the authority. Profiling an organisation and its performance is not very objective science. It is very subjective, like all risk assessment and can only record what is known, seen or felt by the inspectors. This is however why we see this as an important and good tool in not just targeting oversight, but also creating a trusting, cooperative environment between the organisations and the authority. The profile will serve as one, admittedly a very important one, background information for our decision making, but it will moreover function also as means to better communication between us and the organisations. Just as important as giving us information for our decision, is also the ability to help the RUs and IMs in their safety work. We do not wish to be the "old fashioned" compliance authority who only says what's wrong and demands corrections, but rather to be a companion and safety adviser who is communicating it's subjective picture of the organisations performances and seen performance and operational risks.

### PROFILING IN PRACTICE

#### Developing profiles

The yearly oversight program is built largely on profiling our customer organisations. We are making an organisation profile for each one of the RUs and IMs in order to have a picture – even a subjective one - of whether an organisation is willing and capable of managing its risks and has an effective and functioning (safety)management system, which can ensure solid safety culture. In reality, this is much of what our inspectors already have done in the past. It has been the gut feeling of an expert, but now the profile is more than just one person's gut feeling telling something is not quite without risk. The profile is always documented, up-to-date and never one person's opinion. Based on the profile we can make guided and well-documented decisions on whom to supervise, how often and what to focus on.

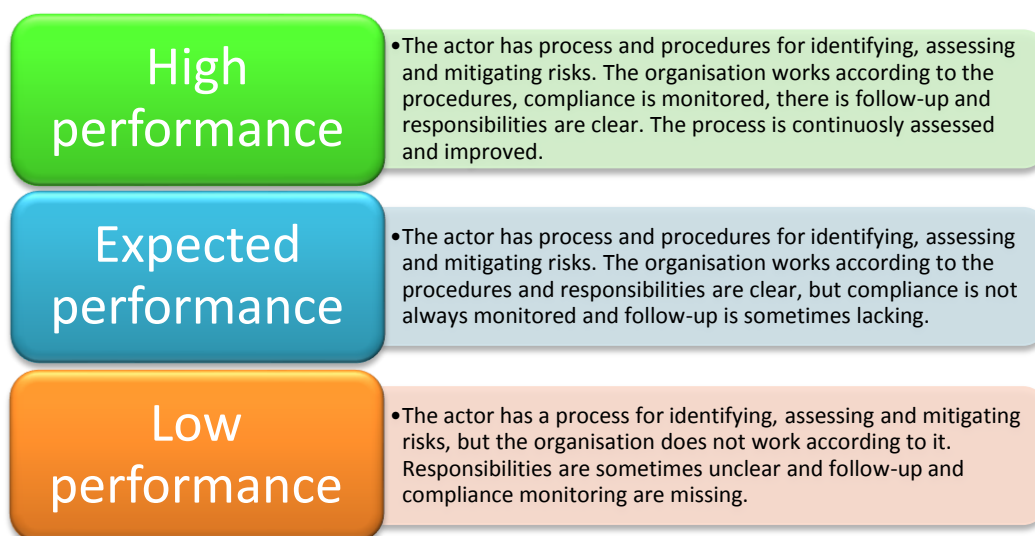
The profile consists of factors and assessment criteria for each factor. There are general items that concern changes in activities or staff in the past year but the main focus is on the safety management (Figure 3).



**Figure 3. Organisation profile factors**

Different factors have been given ranking criteria from low performance to expected/normal and high performance. It is naturally the low performance where also usually most of the risks lie and that are interesting for us. We will likely put our resources into overseeing low performance, but the high performance areas are important to communicate to the organisations as well!

The criteria for assessing performance are quite simple as the example seen in Figure 4 shows. They are giving guidance for the experts when they assess the performance of the organisations safety management system. The criteria seem somewhat black and white – with a three-level ranking it is unavoidable. A five-level ranking might have given the experts more room in their assessment task, since railway operations and living according to your management system are not always so black and white. At this time, however, it was the experts wish to have a three-level ranking.



**Figure 4. Criteria for factor Shared risks.**

We will assess next year if a five-level ranking might be more useful after all and whether it will make assessing easier or not.

## Keeping things up-to-date

In order to maintain the profile up-to-date, it will be reviewed at least twice a year and updated whenever relevant information is available, whether it is based on audits, changes in the management system documentation or accidents or incidents. Reviewing and updating a profile is always team work that also promotes sharing information among us.

It is always the responsibility of the inspectors to bring knowledge that might change the profile to others attention and call an assessment meeting. Discussion among the experts has always been good, but this will also promote the recording of the discussed issues.

As for where the profile is stored and how will it look like, we were fortunate to find out of an IT-system that works perfectly for our need. The National Emergency Supply Agency (NESA) had developed a tool, which allowed us to have an easy-to-use-interface instead of excel-sheets and the system also creates easy-to-decipher-reports based on the information stored in the system. Admittedly, we needed to get access to the system and have our own factors and criteria in the system, but that proved to be much easier than creating an entire IT-system from scratch.

## THE FUTURE

The profile provides important information for communication as the profile will be used as a discussion element in yearly management meetings between the authority and the organisation. We wish to give added value to our customers by not just pointing out their failures like the old fashioned compliance authority but really enforce the good and successful in the organisation too.

Since the IT system of the NESA already had features that might be beneficial for the organisation profile and especially communicating the profile to the organisations, we are planning to add those to our work streams. One of the most interesting features in the NESA system is the possibility for the customer organisations to do self-assessment. So far in our case, it is us, the Finnish Transport Safety Agency, Trafi, that will do all assessments and just communicate and discuss the results, but in the future it would be interesting to see how and if our assessment of organisations safety management performance differs from their own assessment and have discussions based on those results.

## CONCLUSIONS

Based on the profile we can make well-documented decisions on which organisation to supervise, how often and what to focus on. Adding to the decision making also the results from event based assessment will make justification on resource use even more transparent.

The road to a new way of thinking has been bumpy but rewarding. We needed to accept the fact that traffic systems are complex and include issues like commercial pressure and multiple levels of sub-contracting. But the development work will not stop here. We are evaluating our way of thinking and we will adjust our procedures based on the results and naturally also adding new ideas – like the self-assessment of organisations. We are also going to use the performance/risk assessment of organisations in resourcing approvals, especially when an RU or IM wishes to renew or update their safety certificate/authorisation.

Our customers have embraced this new idea very well and are perhaps as eager as us to gain all the possible benefits of this. After all, having an efficient, performing and safe railway is our common goal. And new way of targeting oversight activities is not just for the authorities; the RUs and IMs must monitor their own activities and management. The performance and risk based approach could be used by them as well.

It is safe to say that we are on a solid track to being a dynamic safety authority and partner for the sector.