



TITLE OF PRESENTATION: THE RAILWAY INFRASTRUCTURE MAINTAINERS ARE BECOMING THE ORGANISERS OF THE INDUSTRIAL SAFETY NECESSARY FOR THEIR WORK

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Background on the organisation of railway safety in France

In France, Decree no. 2000-286 on safety (1) on the French national rail network, and its application decrees, stem from the European directives concerning the interoperability of the railway systems.

These texts amend and complement the French law of 1997 (and its own application decrees) which created the French Infrastructure Manager, Réseau Ferré de France (RFF), and delegating from RFF to SNCF the actual infrastructure management task on the French National Network (RFN).

The European directives just mentioned require Member States of the European Union to specify, outside of the framework of the Technical Specifications for Interoperability (TSIs), the national rules and regulations that apply on the RFN in view of meeting the so-called "essential requirements", one of which is safety (1).

(1) Safety of: Customers and users,
Third parties and frontagers,
Personnel and contractors,
the environment.

Concerning France, RFF owner of the RFN and Infrastructure Manager, must take the (neutral and independent) advice of SNCF's Operations and Safety Department, *Direction du Système d'Exploitation et de Sécurité* about:

- railway undertakings holding a railway licence delivered by one of the Member States and applying for issuance or renewal of a Safety Certificate allowing them to run on the national rail network,



- any modifications to the railway system affecting safety and put forward by a "promoter", e.g. the tram-train, the TGV Est HST intended to operate at 320 km/h, the new European Rail Traffic Management (signalling) System (ERTMS),
- the safety standards or metric ("référentiel" in French) that every rail operator will have to meet,
- the level of safety of the railway system ("monitoring" of the RFN).

Thus, SNCF is all of the following at the same time:

- an infrastructure management company (managing traffic and maintenance of way),
- a passenger and freight carrier,
- a consultancy company serving RFF and the Transport Ministry in matters of safety.

Field addressed by this paper:

This paper deals with planned changes to the "referential", i.e. the rules and standards for the safety of railway infrastructure maintenance operations that are incompatible with (or hinder) rail traffic and therefore require that steps be taken to stop or delay any trains that might come down the line. For example, this referential must be applied in order to safely perform rail replacement or track levelling using heavy ballast tamping machines.

Review of the 3 safety principles that all persons taking part in work operations on the RFN infrastructure incompatible with (or hindering) train traffic must observe:

Principle No. 1: No operation on the RFN infrastructure that is incompatible with the running of trains (or hinders traffic) can begin without prior agreement by the department in charge of traffic.

Principle No. 2: No operation on the RFN infrastructure that is incompatible with the running of trains (or hinders traffic) can begin before the maintenance department has taken, or ascertained that others have taken, steps to prevent railway vehicles from being present on or coming into the geographical zone in which that operation is to take place.

Principle No. 3: The presence or the penetration of a vehicle in the geographical zone that must be cleared for an operation on the RFN infrastructure incompatible with (or hindering) the running of trains can be authorised only by the maintenance department in charge of that operation.

Why change the rules and what are the stakes?

In its recent history, in the course of work on the national network, SNCF has suffered railway accidents and either the internal audits that followed or analysis of the experience revealed that many others could have occurred.

A very broad analysis delving into the minutiae of the deviations from the referential established that it was the reference itself that needed to be modified.

The reference system, having grown more and more complex over the years to (hope to) palliate real anomalies, is made up almost exclusively of procedures and leaves practically no room for human intelligence, nor for man's capability to analyse and optimise.



Safety is then practiced by supervisors and operators alike with an obsession for complying with the "means" that sometimes leads to forgetting the "end": safety of traffic and persons.

Feedback from the field, especially that coming out of the annual safety workshops held at the Chairman's instigation throughout the company, confirms that the safety rules are perceived as obstacles to production rather than as the facilitators they should be.

Now, with the continual concern for cutting maintenance costs and improving productivity, SNCF could no longer tolerate the *status quo*. It had to reconstruct the whole "track work" system so as to guarantee safety thanks to the contributions from all track workers: organisers and performers, managers, supervisors and operators alike.

It is that system reconstruction that I propose to discuss in this paper.

What will not change:

- Application of Principles No. 1 and No. 3 above.

What will change fundamentally:

- The application of Principle No. 2 above.

In fact, today, with very few exceptions, only the department in charge of operations is capable of taking the necessary *ad hoc* measures to "protect any trains that might run" by switching ON the signals of the station or stations concerned, and clearing any such trains from the worksite track.

In taking these measures on behalf of the department in charge of maintenance, the department in charge of operations blocks traffic on a much greater portion of the network than the worksite proper.

A wider set of measures will be afforded in the new system by combining those possible within the maintenance department and/or those possible within the operating department, and more finely pinpointing the worksite.

- Allocation of roles and responsibilities:

Today, responsibilities are diluted and parallel (you need a person in charge of traffic safety – in station, a person in charge of the catenary, a person in charge of personnel safety, a "technical" person in charge, a person in charge of level crossings, and a person in charge of signalling plant).

Maintenance is therefore organised "according to rule".

Tomorrow, the responsibilities will be grouped geographically according to the maintenance operation. There will be one person in charge of each maintenance operation and one in charge of the work process, belonging to the department in charge of maintenance. The latter person will be in charge both of relations with the operating department and coordination of the different "geographical" persons in charge of maintenance operations.

Maintenance will therefore be organised "industrially".



Approach to the subject and innovative aspects for SNCF

What is truly innovative in the new track work system is the industrial approach to the production that is to be delivered, the management of targets to be attained rather than the procedural (rulebook) approach alone.

We can henceforth talk about a production process during which the rulebook serves to support humans in the face of shortfalls in material resources (other men and their competencies, plant, equipment and tooling).

As part of a systems rationale, all the responses that serve to achieve the performance objectives while at the same time meeting system requirements are possible, can be envisaged and are permissible.

Technique, operating plant and equipment and organisation – all can (and must) be put to good use, just as the skills of the staff.

Technical innovations become possible.

To carry out the work, the department in charge of maintaining the infrastructure acts as the "prime contractor" in railway safety and the department in charge of operations acts as the subcontractor. Today, the latter department is the only one to be able to take charge of coordinating operations affecting railway safety.

We are changing over from

a culture represented by the notions of:

- application solely of the regulatory response to a problem,
- deviations (non-compliances),
- and frequent exemptions from the rules,

to a culture founded on the notions of:

- achieving objectives and respecting requirements,
- calculating the possible responses to a given problem,
- assuming responsibility for choices and explaining them,
- thoughtfully optimising costs and benefits.

Results obtained or expected, successes, setbacks and lessons to be learned

- Managers and supervisors will be able to refocus on their duties of safety system designer; which in counterpart, will make it necessary for them to delegate the technical aspects to their appropriate assistants.

Their job is therefore enhanced.

- In the transition to a new system, there are always some people – those used to the current standard – who have difficulty adapting.



Current practice will come back naturally as the new system is put into daily practice, generally when you don't use its parameterising and optimising options.

- Today, safety operators, including the supervisory staff, do not always understand the "why" of such or such a procedure. Not all their obligations or limitations are explicitated: they don't know how much leeway they have.

Our survey of 1999 revealed that this promoted two types of possibly hazardous behaviour among managers:

- some took certain liberties about the procedures,
- others had trouble shaking the feeling of "not doing enough" or "going too far".

The new track work system will clearly improve this situation.

- The cost of maintenance will be cut back because the new track work system will allow:
 - to harness a new source of efficiency, not exploited before because it can absolutely not be envisaged in the present system,
 - better use of personnel's competence,
 - quicker removal of the work trains from the protected area,
 - to unburden the operating department as less staff will have to be dispatched to man normally unmanned stations/signalboxes during track works.

How do we get there?

As a first step, SNCF went to see in four neighbouring countries (Belgium, Switzerland, Italy and Germany) whether they had the same problems with "track work safety" and, if so (which was true everywhere!), how they dealt with the situation.

Next, the system was constructed *in camera* by a core project team averaging six persons during two years.

Then, once the "functional requirements" had been conceived, it was presented to about 1000 operational managers and supervisors in all the SNCF Regions (which amounted to about 35 meetings of 3 hours each) in order to collect as many remarks, questions, suggestions, criticisms or doubts as possible.

Also, and during the same period, a working party made up of personnel representatives was set up. This group however will become truly operational only once the much more applicative texts have been produced.

Thereafter, a shadow group of 12 persons, representing the major vocational categories that will be the future "users" of the new "referential", was set up and, as its name implies, it has been tasked to feed back to the "designers" the critiques of their work.

Finally, a big staging operation is being set up for change management that will concern 50,000 people, of whom about 10% are managers and 20% are supervisors and team leaders.



What are the main curbs on implementation and the main risks?

We have identified not only a number of hazards or "potential events" but also some answers.

Potential event: Increased work load for track work managers

In fact, managers and supervisors will have to focus more on their safety design/planning missions; in counterpart, this will entail delegation of the technical aspects to their assistants and deputies for the aspects concerned.

Their job is thus enhanced.

Potential event: Difficulty of persons accustomed to the current rules to adapt to the new rules

Current practice will come back naturally as the new system is put into daily practice, generally when you don't use its parameterising and optimising options.

Staff accustomed to the old system will therefore find their marks.

In the area of relevance, the planned system provides a good answer to the problem raised by the renewal of the "field" management looking for reference marks.

Potential event: Degradation of the safety level

Today, we know that there is some drifting from the rules and some unplanned procedures that are used without prior analysis of their worth.

Tomorrow, the industrial-type organisation will be the rule. Thanks to the broader referential framework, new procedures, some of which are actually forbidden today, will become available, provided they have been deemed to give a correct response to a safety problem identified by the organiser.

Potential event: Higher maintenance costs

One can fear that the cost of maintenance may increase at the beginning, in particular due to the investment in human resources that the project entails, e.g. for training.

Yet the benefits suggested above should allow to gradually amortise that investment over time.

The new track work system, as stated above, allows to:

- to harness a new source of efficiency, not exploited before because it can absolutely not be envisaged in the present system
- and better use of personnel's competence.



Conclusion

At SNCF, no real progress on the safety and productivity of track work is possible as long as the texts, which are the "image in application" of the current system, remain in force:

- the current system is deadlocked;
- all sorts of unranked requirements intermesh and, more seriously, sometimes hide one another;
- every attempt at change or revision bumps up against incompatibilities, contradictions or inconsistencies that end up having to be "managed" by field personnel;
- cooperation between the department in charge of operation and the one in charge of maintenance remains weak;
- cooperation between trades within the same department in charge of maintenance is not extensive enough;
- the "follow procedure" attitude remains predominant over the "build the process" attitude.

Nevertheless, it is crucial for the stakes and risks of this project to be assessed exactly. What is involved is a true and deep change of system as the concepts and principles are totally upset, even though the change is designed to not destabilise the operators.

Management behaviour (in the offices and in the field) needs to be altered radically.

The direct impact of the project on immediate safety and the number of players concerned make it a sensitive one.

Sensitive indeed, but also essential for the "delegate infrastructure manager", SNCF: safety and productivity go hand in hand.

This project represents a real opportunity for modernisation of a sector comprising 55,000 employees, providing improved safety and reduced costs.

References

Our main references are:

- our railway neighbours in Belgium, Switzerland, Italy and Germany,
- SNCF's analysis of field experience and audits,
- the feedback from the annual safety workshops held throughout the company,
- various research on the positive human contribution to systems reliability,
- a survey made in 1999 of people concerned by the maintenance of the national rail network (about 35,000 persons, including 3,000 managers and supervisors).