An Innovative European Rail Industry Safety Management System

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SUMMARY & CONCLUSIONS

ALSTOM Transport has been a major actor in the Railway Industry for decades and has always been committed with its Clients and their National State Authorities, to deliver Railway Products and Maintenance Services with the highest standard of Railway Safety.

The challenge is at least to maintain the level of public safety confidence during a period of major restructuring around the world. Rail Business Actors must remain vigilant and continue to play a pro-active role. High levels of safety being achieved, we must not ignore the fact that residual risks still remain.

ALSTOM Transport Senior Management Committee understands that Railway Safety is an essential requirement for the business. Therefore, it decided to go one step further with the definition and deployment of an Innovative Safety Management System (SMS) for all its activities worldwide.

1 THE RAILWAY BUSINESS HAS SIGNIFICANTLY CHANGED IN THE RECENT PAST YEARS

1.1 *The European Market as a Motor to the Change*

- *New European Directives*

The European railways are known with a long history. National Railways played a fundamental role in the development of economies; the solutions adopted were primarily to meet requirements of each Member State.

The situation was no longer competitive. It had to change to meet an increasing transport demand and the creation of the internal European market with fundamental principles such as free movement of goods and persons, and open competition.

European Directives have been published in 1991 to develop and rule an Interoperable European Railway Network. They specify the principles for organizing Railways between the Member States with two main vectors: the Infrastructure Managers (IM) and the Railway Operators or, as officially said, the Railway Undertakers (RU). They require separate accounting for Infrastructure and Operation. Technical rules for crossing borders are now based on the Technical Specification for Interoperability (TSI).

- *European Railway Safety Directive [EC 2004-49]*

This EC 2004-49 specifies a Policy for Railway Safety and the process for regulating Railway Safety with cross-acceptance between Member States.

Policy

It states first that "safety levels in the Community rail system are generally high, in particular compared to road transport. Safety must be maintained during the current restructuring phase. It also states that "in line with technical and scientific progress, Safety should be further improved, when reasonable practicable considering rail transport mode competitiveness".

Organization and Responsibility

EC 2004-49 requires Member States to separate the National Safety Authorities (NSA) that provides National Regulations from the Accident Investigation Body. IM and RU should bear the full responsibility for the Safety of their own system. This does not preclude the Industry from assuming responsibility the delivered products and services.

European Railway Agency

The European Railway Agency (ERA), created in 2004, is mandated by the EC to develop the essential tools specified in the Directive to frame the regulation, before 2009:

Common Safety Indicators, Common Safety Targets, Common Safety Methods and Safety Management Systems:

- Art 5: Common Safety Indicators (CSI) to monitor the performance of the Railways. Member States shall collect data and publish CSI in annual reports.
- Art. 7: Common Safety Targets (CST) to specify Safety levels to be reached by the different parts of the Railway System in each State.
- Art. 6: Common Safety Methods (CSM) to provide evidence that CST are achieved.
- Art. 9: IM and RU to establish Safety Management Systems (SMS) to ensure achievement of the CST.

National Safety Rules (NSR)

In application of this Directive, Member States shall establish binding National Safety Rules (NSR).

Safety Certificate and Authorizations

- Art. 10: RU shall provide a Safety Certificate in order to get access to the infrastructure.
  Safety Certificate shall include:
  - ✓ Certification of RU SMS approval.
  - ✓ Certification of approval that Operational Safety Requirements are met for the relevant network (TSI, NSR, Acceptance of Staff's Certificates and authorization to operate the stock used by the RU).
- Art. 11: IM must gain a Safety Authorization from the Member State National Safety Agency to be allowed to manage and operate a rail infrastructure.
  Safety Authorization shall include:

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- ✓ Authorization proving their SMS approval
- ✓ Authorization proving acceptance of provisions to meet requirements for the safe design, maintenance and operation of the Infrastructure.

1.2 *The European challenge*

In this context, Europe has an extraordinary challenge to take forward:

- ✓ Significant change in railway organisations.
- ✓ Duality between the TSIs and the NSR.
- ✓ TSIs focus on minimum interface requirements to achieve interoperability between countries where the NSR re-enforce legacies and specificities.
- ✓ Duality and transitions between the European regulations and the Member States regulations.
- ✓ From total probabilistic approach to total deterministic approach.

Here below is the UNIFE proposed concept. It is founded on the French Policy GAME (that is to maintain the level of safety) and the German Policy (EBO). It is also based on the concept of "Boundary Hazard".

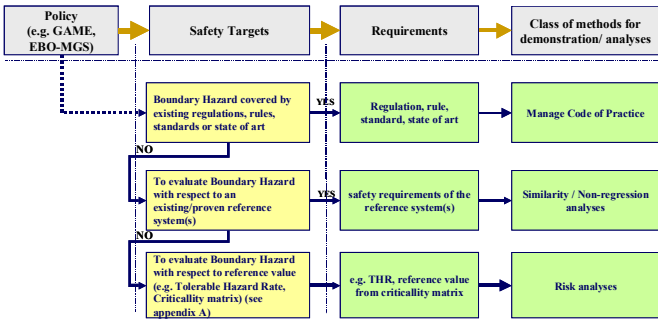

Figure 1 - UNIFE Proposed Concept

1.3 *From Manufacturing to Integration of Innovative Solutions*

Industry was used to produce Rolling Stocks that were mostly designed by/with its Customers. The latest would assume full design responsibility, and establish the Safety Files. As a consequence Customers were the ones to be on the front line during any investigation and any legal trial.

It is now totally a different ball game. Industry does design, procure and commission, and does propose maintenance services.

2 *RAILWAY SAFETY IS A RISK AND AN OPPORTUNITY FOR THE BUSINESS*

2.1 *Performance of the Business*

Safety is often considered as a business performance risk.

Quality, Cost and Delivery (QCD)

Industry performance could be highly impacted by the consequences of an accident. Its image would be dramatically affected. It could be affected by process issues for obtaining Safety File Approvals.

Image

Safety contributes to the image of the Company and of the products.

Legal

The legal impact of an accident relates to the legal system of each country. The Company and its key Personnel could be suit under civil or criminal law.

2.2 *Opportunity for the Customers*

Safety is an opportunity to develop the Business. It is a competitive advantage that the Industry will take forward in a competitive and open market.

Three main areas for consideration: Commitment from Management, Networking and the Safety records.

Commitment from Management

The Senior Management Commitment provides evidence that the Company cares about Safety.

Network

Our "Core Competence Network" is the organised network of the Company Safety Experts

Key added values are:

1. Continuous monitoring of accidents (Safety Issue Log)
2. Immediate warning to the Company relevant platforms.
3. Continuous development, exchange of experience.
4. Proposal for specific and/or independent expertise when Project is experiencing safety issues.
5. Continuous monitoring of the development of regulations and of standards.

Records

Safety database are not universally established. Accidents are rare events. There is no culture of transparency.

Feedback from the Customer is usually positive. Some formally announced that they did select their supplier for its safety care.

3 *STRATEGY OF ALSTOM TRANSPORT IN RAILWAY SAFETY*

3.1 *Background*

The organization provides three main branches: REGION, OPERATION and SUPPORT which roles and responsibilities are defined as follows:

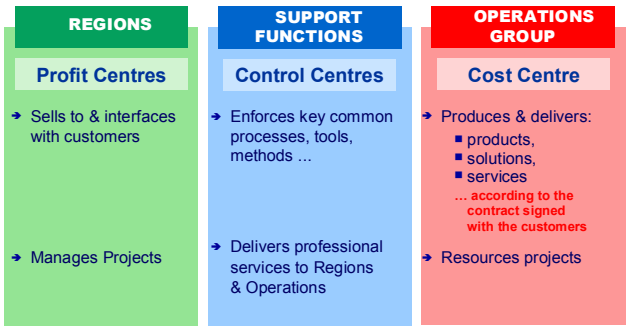

Figure 2 - Organization of ALSTOM Transport Company

6. REGIONS: They are Northern Europe, Southern

Europe, NAFTA, IBAM (Spain, South America), Asia-Pacific)

7. OPERATIONS: Product Lines (e.g. Rolling-Stock Engineering, Signaling, Maintenance, Global Solutions, Components).
8. SUPPORT: Finance, HR, Business Excellence (Quality), Technical Expertise, Communication.

3.2 *Worldwide strategy in Railway Safety*

Strategy

Our Senior Management Committee decided to implement a Worldwide Safety Management System (SMS).

The motivation were:

1. To manage Company and Business risks.
2. To provide Safety Assurance to Management and Customers.
3. To develop a Company culture and common practices.
4. To promote Safety as a competitive edge.

The signature was provided in July 2005, and the "ALSTOM Transport Railway Safety Policy and Organization" (DE-06-POL-001) was published.

Policy Principle

- Compliance with the national regulations, contract requirements, relevant standards and best practices.
- In absence of national regulation, the Policy GAME shall be proposed to the Client.
- Communication to the Customer any assumptions that are within his scope of responsibility.

3.3 *Fundamentals*

Rules

The rules for Railway Safety are defined, communicated and maintained by the Technical Department in close cooperation with Business Excellence to ensure consistency with company processes.

Responsibilities

Responsibilities of OPERATION and REGIONS are to organize activities to ensuring appropriate deployment.

OPERATION is accountable for the development of products and services. It shall further ensure that work-packages established for contract operation comply with the Company Safety Policy and Organizational statement. Each platform nominates a Safety Assurance Manager (SAM). Each Product Line nominates a Safety Assurance Director (SAD).

REGIONS are accountable for the performance of contracts. It shall ensure that each project has defined and implemented a Safety Plan compliant with the Company Safety Policy and Organization.

Each REGION nominates a Region Safety Officer (RSO).

Verification

TECHNICAL verifies of the application of the rules. The verification is integrated to the existing processes of design reviews and/or audits:

1. Gate reviews for each major milestone in Tenders and Projects.
2. Safety Design reviews, prior to Gate reviews.
3. Tender & Project Situation reviews.
4. Site Audits

1- insufficient *Performed Informally*	*2 - minimum* *Planned and Tracked*	*3 - significant* *Standardised*	*4 - advanced* *Quantitatively Controlled*	*5 - world class* *Continuously Improving*
No policy, targets or direction on Product Safety issues. Local teams act locally, ad-hoc approach adopted, based on current knowledge or what applied to the last project Customer reactive and control processes are minimal. No feedback or return on experience	Meet minimum contractual and legal requirements Product Safety issues are considered and some effort is made to address these A management structure with responsibilities is identified	Systems and processes are in place to meet Product Safety requirements Gaps are identified in safety management and transition plans are developed in order to address these Monitoring and reviews are undertaken, feedback is received and acted upon	Full compliance achieved in most areas of Product Safety Mature and robust systems operate and users are competent and familiar in the application of these Safety is managed effectively and KPIs provide the ability to control Product Safety issues.	Full compliance in all areas of Product Safety Predictive and proactive management of safety issues is adopted in businesses and projects Integrated systems deliver the tools and information to deliver product Safety and help improve business safety performance.

Figure 3 - Maturity Levels for Audits

These reviews and audits are based on checklists that:

1. list essential requirements
2. support assessment of Tender & Project and Site by using a grid of maturity.
3. Results are reported and outputs presented graphically.

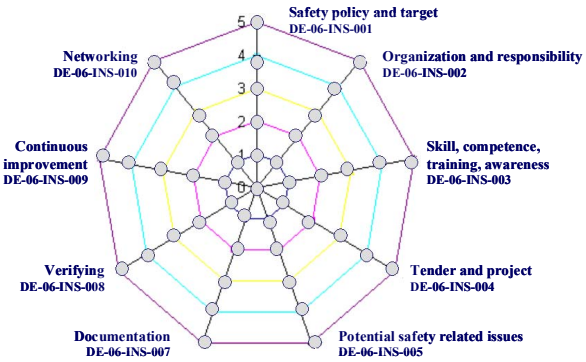

Figure 4 - Typical Maturity Chart

4. Gaps are analyzed, areas of improvement are identified and action plan agreed

This basic approach has key advantages:

- To facilitate communication, deployment and monitoring.
- To develop Safety based on a continuous improvement process.
- To easily assess maturity

Networking

Networking is a key element to develop the performance of the Company:

4 THE SAFETY MANAGEMENT SYSTEM OF ALSTOM TRANSPORT

4.1 *Safety Management Systems (SMS)*

What is a SMS ?

There are different management systems: Quality Management Systems (QMS), Project Management Systems (PMS), Environment Health and Safety Management Systems).

Like these systems the SMS objectives are:

- To support the deployment of the strategy of a Company
- To implement a process-based rather than a hierarchical-based

It is consistent with and relies on established management

systems (QMS in particular), using similar formats and contents.

The SMS specificities are:

- Safety requires guarantees and not value creation.
- Safety culture is an essential element that has high significance for employees and communication.
- Safety requirements are generally statutory.
- Importance of external scrutiny
- Importance of experience and integration

A voluntary Policy from the Company

The European Directive has established the principle of a SMS for IM and RU. It specifies the TOC for these SMS.

Today there is no good reference for a Railway Business SMS. Nor is there any legal obligation for the Supply Industry to develop a SMS.

Therefore the development of a SMS by the Company is a voluntary act as a result of the Company Policy. The ALSTOM Transport SMS is among the first.

4.2 *Policy Documents*

The prime element of the SMS is the Company Policy. Railway Safety is confirmed as a core process of the Company. All documents produced are easy accessible from the Intranet Home Page along with policies, manuals and instructions. From the date of the SMS publication the Company has one year for deploying it before it fells into the scope of Quality audits.

4.3 *Manuals*

The second element of the SMS is a Manual and a set of Instructions.

The manual addresses 9 areas further detailed by an Instruction:

Safety Policy and targets: To explain the Policy in Railway Safety. It specifies a process in establishing annual targets for the deployment throughout an appraisal process.

Organizational Structure and Responsibilities: To explain management roles and responsibilities, and the process owners.

Skill, competence, training and awareness: To define requirements to develop Safety Experts skill and competence.

Process for safety management (tender & project): To define the minimum requirements for the Safety Plan for each tender and project.

Process for safety management (safety related issues)**:** To address management of Safety Related Issues and Crisis Communication.

Safety documentation: To further detail the Quality Assurance requirements for managing Company Safety Related Documentation.

Verifying (Site, Design, Gate, Tender and Project reviews): To define rules to verify implementation of the Railway Safety Policy and organization statement DE-06-POL-001 and the manual DE-06-MAN-001.

Process for continuous development: To define the requirements for establishing the RoE in Railway Safety.

Networking: The share of information, skill and expertise in Railway Safety is a fundamental element of the SMS.

In addition to this documentation a checklist, written in a non-expert language, specifies the essential requirements of this documentation.

4.4 *Safety Organizations*

The third component of the SMS is the safety organization.

Figure 5 - Typical List of Functions

Job descriptions have been established and titles for safety positions are standardised. There are around 50 managerial positions in Safety that are being fulfilled in ALSTOM Transport. It includes Safety Assurance VP, Directors, Managers for Platforms, and Region Safety Officers.

5 *CORE COMPETENCE NETWORK RAILWAY SAFETY*

It is fourth element of the SMS.

5.1 *Mission Statement*

The Company established in 2000 a network of Safety Experts. The network is called “Core Competence Network Railway Safety” or “CCN Railway Safety”.

5.2 *Activities*

The CCN has prepared the SMS described by this paper.

It is in charge of medium term development actions (e.g. return of experience).

It has a day-to-day operational role in managing the Plan Do Check and Act (PDCA) process

It is directly involved in the reporting system for potential safety issues (e.g. Quasi-accidents).

5.3 *Members*

The CCN Leader reports to TECHNICAL.

- All identified Safety Experts are members of the CCN.
- Participation to workshops
- groups (e.g. ERA, EN50129)
- Monthly management meetings with experts, monthly reports with TECHNICL
- Yearly Safety Councils
- Prepararraining packages for the safety experts

6 WAY FORWARD

There is a long way to go. This Safety Management System has been published in February 2006. Its deployment is closely monitored. There is a target to review and propose improvements within nine months time.

So far key success factors includes:

- Commitment from the Top Management
- Tenders and projects have been first targets to provide direct added value and visibility.
- The reporting system of potential Safety Issues
- SMS integration with other internal processes.
- SMS documentation is basic. Rules are written using non-expert language.
- Monthly meetings of executive CCN members

7 CONCLUSIONS

The ALSTOM Transport Senior Management Committee understands that Railway Safety is an essential requirement for the Railway Business. The Railway Safety Policy and the Company Statement are re-enforcing the existing practices of the different units of the Company. It prepares the Company for the future challenges of the Railway Business.

The Safety Management System (SMS) of ALSTOM Transport, of which the Safety Manual is an essential component, shall be deployed and implemented by all layers of management, process owners and employees of the Company.

The Safety Management System (SMS) of ALSTOM Transport shall contribute to establish the reference within the Railway Business.

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