HOW COOPERATION BETWEEN NATIONAL SAFETY AUTHORITIES CAN ENRICH THE SUPERVISION PROCESS? STUDY CASE BASED ON THE CHANNEL THAT CONNECTS FRANCE TO UNITED KINGDOM

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BACKGROUND

Two hundred ninety.

Two hundred ninety is the number of trains that crosses the border between France and United Kingdom under the sea using the Eurotunnel channel every day (average number on second quarter 2022). Even if the UK left European Union on February 1st, 2020, train traffic has never stopped. Not only the Eurotunnel shuttles are still transferring trucks and cars between the French and British coasts, but also Eurostar trains are still connecting London to Paris, Brussels, and Amsterdam. Freight trains are also delivering goods on both sides of the sea.

That is the reason why the cooperation between National Safety Authorities (NSA) didn't stop at all. Due to the Brexit, this cooperation got reinforced more than ever to avoid a total traffic stop.

The major company on which this cooperation focuses is Eurotunnel, the infrastructure manager that maintains and operates the channel.

It represents two hundred kilometers of electrified tracks constituted by two loops (one on each terminal) and two tunnels. Eurotunnel also operates train services called the shuttle. Cars, buses and trucks embark and disembark on specific trains thanks to terminals located in each country. Each journey lasts thirty-five minutes whereas the ferry journey lasts ninety minutes with good weather conditions.

In April 2022, Eurotunnel operated on average eighty-six passenger trains (cars and buses) and one hundred fifty-nine truck trains per day.

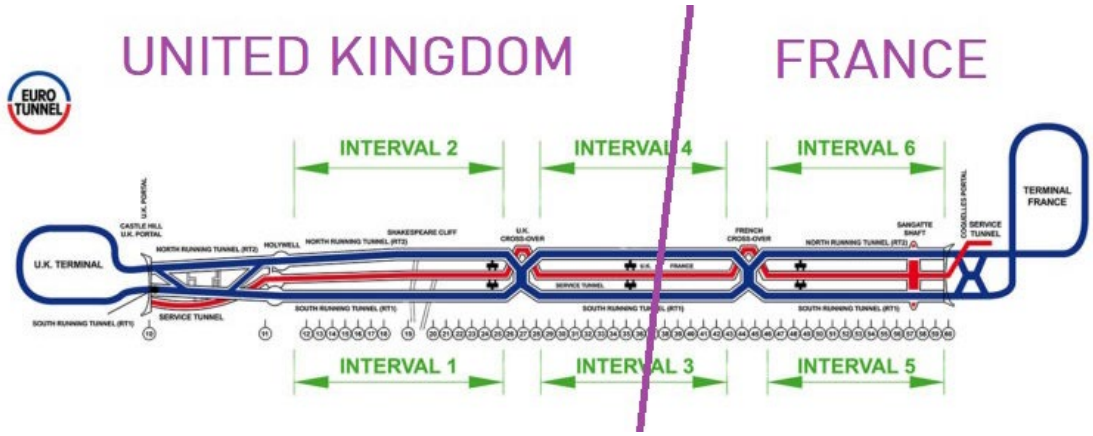

Fig.1: Eurotunnel track schema with state border

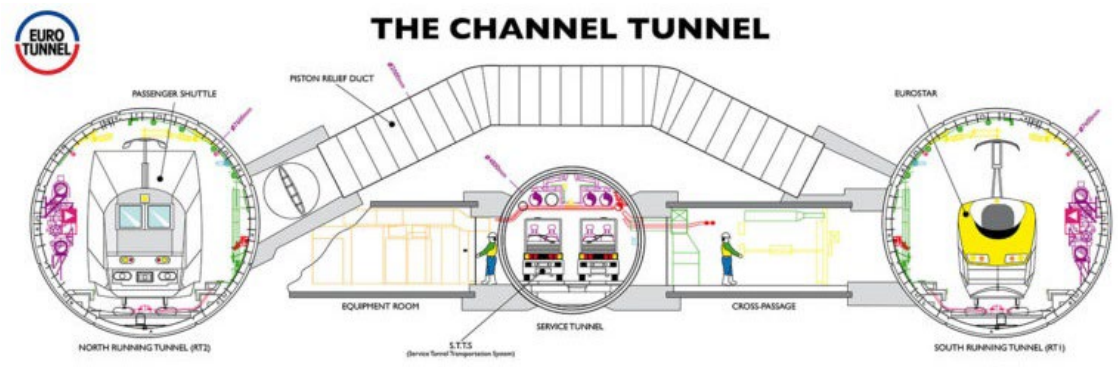

Fig.2: The Channel tunnel – section view

Since the opening of the tunnel, only one safety authority was existing: the Channel Tunnel Intergovernmental Commission (IGC). It carries out its duties in accordance with Article 10 of the Treaty of Canterbury. In the safety field it benefits from the advice of the Channel Tunnel Safety Authority (CTSA - Article 11 of the Treaty of Canterbury). The CTSA is composed of French and UK experts working for the Office of Rail and Road (ORR - UK NSA) and the Etablissement Public de Sécurité Ferroviaire (EPSF - French NSA). In the field of security, the IGC works in co-ordination with the "Joint Security Committee". It has also as a role of regulatory body.

After the Brexit, the IGC and EPSF competences borders evolved:

- The French NSA is competent on the French territory which stops in the middle of the channel under the sea,
- The IGC is competent on the British territory starting in the middle of the channel under the sea.

To supervise railway undertakings that crosses the border and the infrastructure manager that operates the cross-border section, the EPSF, the IGC and the ORR decided to collaborate.

The objective is to share the results of the controls realized in each country to better supervise the common operators. It's also a way to optimize resources, avoiding auditing the same topic twice the same year in the same company. That is the reason why a cooperation agreement has been signed by the EPSF, the IGC and the ORR to set the legal context of supervision and define the rules of their collaboration.

It is also a requirement of the European Union regulation (Regulation 2018/761 of 16 February 2018 establishing common safety methods for supervision by national safety authorities).

One of these collaboration's rules is to name a leading NSA on each control to facilitate communication. The leading NSA oversees the control organization. It will send the control specifications to the company, ask for documentation to understand the processes, plan the interviews, establish the questionnaires, supervise the "after interviews debrief" and send the report. All these tasks are shared with the cooperating NSA. Each NSA nominates one or two inspector(s) to complete all these tasks.

OBJECTIVE

The purpose of this article is to share our return of experience, including the difficulties and the good practices, from the leadership control realized in 2020 at Eurotunnel. This audit was led by the ORR and realized with the cooperation of the EPSF.

Cooperation between NSA is a crucial point of the European program to develop and increase cross border traffic. It is an answer to the interoperability requested by all in addition with other mechanisms such as the technology standardization and innovation.

METHODS

In December 2020, one year after the beginning of the covid-19 pandemic, and ten months after the United Kingdom “got Brexit done”, the ORR led a leadership themed audit at Eurotunnel with the cooperation of the EPSF.

This audit was scheduled according to the Channel Tunnel Safety Authority (CTSA) work plan.

The ORR, the IGC and the EPSF have similar NSA’s missions. The first mission is to deliver authorizations within its area of responsibility to railway operators according to their Security Management System (SMS). These authorizations concern railway undertakings, infrastructure managers, training organizations, vehicle authorization applicants and operating authorization for new installation (such as Eleclink, the one-gigawatt electrical cable that connects the Great Britain National Grid to the French one using the channel tunnel). The applicant demonstrates how it will undertake to achieve compliance with safety regulations and ensure coverage of the particular railway safety risks associated with the activities and/or equipment and installations covered by the application.

Once the authorization has been issued; The second mission is to realize systematic, regular checks to ensure that elements that justified the authorization continue to apply in the company during the authorization validity period (from one to five years). In the event of a company failing in such a check, the NSA may apply immediate provisional measures, which may include the scope of the authorization being restricted or suspended or the authorization being withdrawn. The safety of national rail system is monitored continuously. The NSA must conduct several different types of checks in order to perform its role successfully: regular schedules audits, ad hoc audits initiated on the basis of specific events and random inspections. In addition, the EPSF realizes operational checks to get a complete view from high level management to ground operations.

Other missions can be given to NSAs, differing from one state to another. For instance, the ORR regulates the rail industry's health and safety performance. It holds Network Rail and High Speed 1 to account, and it makes sure that the rail industry is competitive and fair. It is also the monitor of National Highways (roads), and it has economic regulatory functions in relation to railways in Northern Ireland and the UK section of the Channel Tunnel.

The ORR regulates the Channel Tunnel with the French regulatory body (Autorité de Régulation des Transports – ART), which has economic regulatory functions in relation to railways in France and the half of the Channel Tunnel that is situated in French territory.

The EPSF has also regulatory missions like ensuring that the regulatory framework is consistent considering the interplay between national and European provisions. It must therefore support the French Ministry of Transport in developing and adapting national regulatory texts. It also examinates certain rail system operating documents published by infrastructure managers and, in that context, is authorized to request the amend or withdrawal of such documents if necessary. In addition, it is responsible for developing and publishing technical documents, best practices guidelines, recommendations, and railways safety guides. To facilitate implementation of regulations by rail operators, the EPSF is responsible for promoting and disseminating the regulatory framework and any changes made to it. It provides all texts governing railway safety on its website and organizes regular meetings and seminars to promote understanding of the regulatory landscape.

The EPSF role in relation to the Channel Tunnel includes to participate in the construction of the IGC supervision plan and to realize inspections in the name of the IGC. In addition, the EPSF shares and cooperates with the ORR and the IGC its own supervision plan regarding the common operators (cooperation agreement).

This supervision plan is based also on each NSA's competences. Indeed, the inspections led by the ORR include half of health's aspects whereas the controls led by the EPSF only have safety performance aspects. These differences allow EPSF to investigate sometimes deeper safety performance on specific fields, and other times to balance between safety performance and safety people because the safety performance is generated firstly by the people.

The EPSF audits follow generally the following chronology:

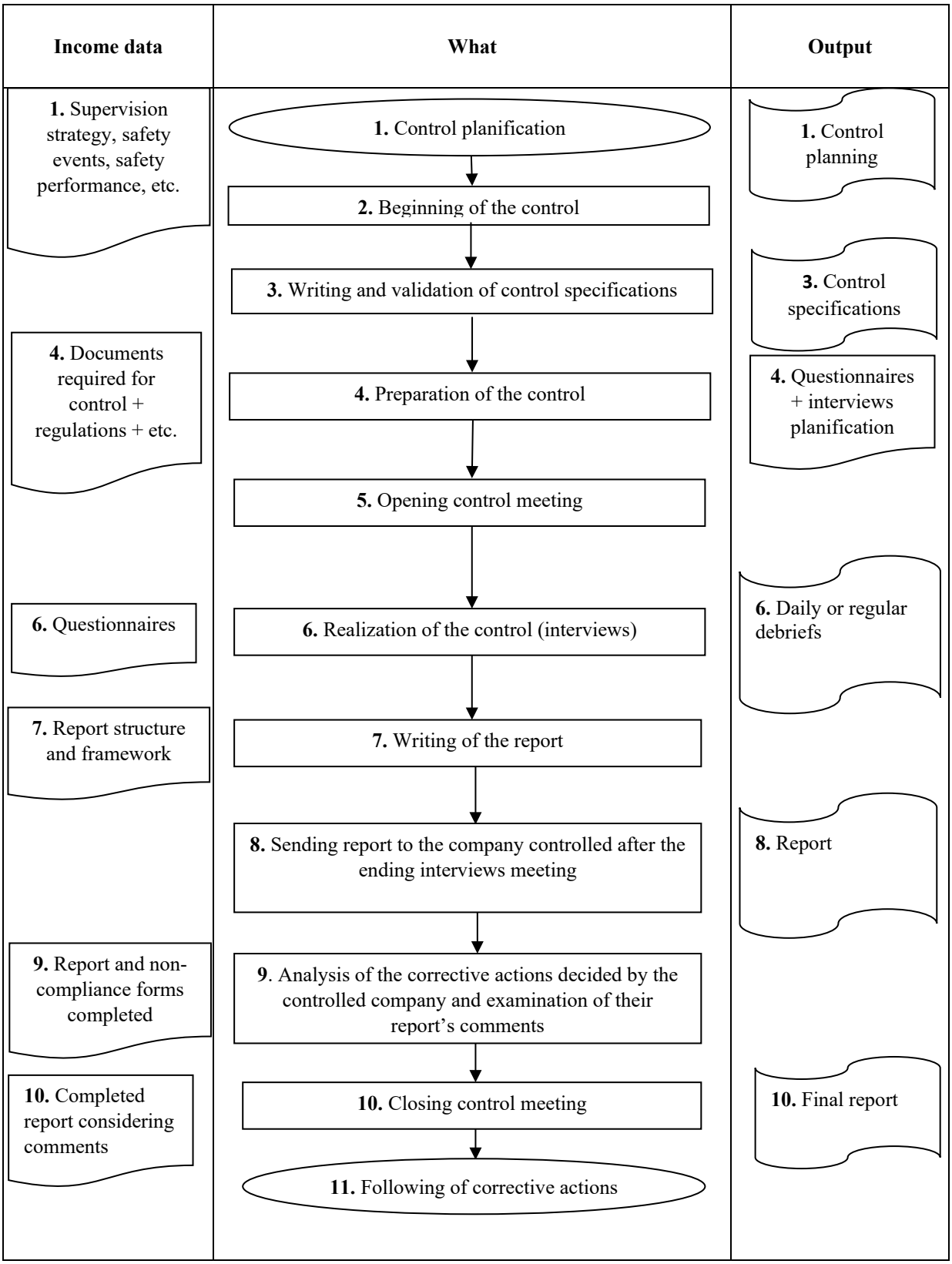

Fig.3 – Extract of controlling procedure published on EPSF website

1) The control planification is prepared at the end of year y for the period from January to December year y+1 by the Supervision Direction and validated by the EPSF General Director. This planification is regularly reviewed and adapted

during the year. The elaboration of the control planification follows the rules of the Supervision Strategy published on EPSF website.

2) Following the validation of the control planification and after the monthly review meeting, the control supervisor and control team (generally two inspectors) have a meeting to write the control specifications and validate the control planning (preparation phase, interview phase, writing report phase, and official meetings according to the controlling procedure).
3) The control specifications are sent to the audited company. This form precises the objectives of the control, the themes that will be investigated, the regulation references, etc.
4) The control team prepares the control studying the regulation references, the company's documents including the Safety Management System, the safety events in which the company is implicated, etc. The team also define the audit plan according to the themes to investigate, establish questionnaires, etc.
5) The opening control meeting aims to introduce the inspectors, the missions and organization of the EPSF, clarify the objectives of the control, review the interviews planning, etc.
6) The realization of the control (interviews) aims to collect proofs via investigation and questioning, making observations, etc. At the end of the day, or after every half day, a debrief is realized with the company to point the non-compliances and the situations that need to be clarified with complements (documentation, pictures, ground visit, etc.).
7) The control team writes the report using the standard EPSF framework. The structure of the report is adapted according to the audited themes figuring on the control specifications. The report includes appendixes like non-compliance forms, control specifications, interviews planning, regulation corpus, etc. The most important appendix is the non-compliance forms. The non-compliance forms are a summary of all the non-compliances notified during the interviews, classified by themes and by order of importance. The EPSF has decided to define eight major themes following the European regulation (Regulation 2018/762 of 8 March 2018 establishing common safety methods on safety management system requirements): Safety management, Competences, Operations, Internal control, Return of experience, Risk identification and management, Documented information and communication, Contractor management. The non-compliances forms are written and structured so that they can be understandable when they are read alone. They mention the regulation that are not complied, and the risks caused by the situation observed. A five levels scale is used to determine the overall theme (non-)compliance gravity (from compliance to most important non-compliance): Managed point, Fragile point, Reserve, Major non-compliance, Blocking point.
8) The ending interviews meeting aims to present the non-compliances forms with the justified gravity level to the audited company. After this meeting, the EPSF send the first version of the report including the non-compliances forms appendix. The audited company has fifteen days delay after the sending date to formulate comments on the report and propose its corrective actions to answer the non-compliances detected.
9) After reception of the report's comments and corrective actions plan, the EPSF evaluates if they are relevant and consistent. Comments can be accepted, and the report is modified, or rejected. Same process for corrective actions that have to cure the root of the non-compliances detected.

10) The closing control meeting aims to present the results of the audit, to check and to validate the corrective actions plan. It's also during this meeting that we decide how the EPSF will follow the realization of the corrective actions (generally documents that can prove that an action is closed). After this meeting, the final report is sent.
11) The EPSF follows the realization of the corrective actions, receiving the documents decided during the closing control meeting.

The EPSF Supervision strategy is elaborated taking in account two aspects:

The first one is a supervision plan considering in one hand some rules applied to authorized companies and on the other hand their SMS performance.

Concerning the rule applied to all authorized companies: During the authorization validity period, a company is audited at minimum two times on all its Safety Management System domains. The first control occurs in the year following the authorization date. The objective is to check that the SMS on which the authorization is based is effectively known and applied at every level within the company (from top management to ground operations). The second control occurs in the last twelve months of authorization validity period to ensure that the SMS is still applied and to prepare the renewal of the authorization. It's a good opportunity to identify points that could block the authorization renewal process.

SMS performance is assessed with the help of a tool developed by the EPSF called RESYGESS. Various data are used including authorization process feedback, audit and inspection noncompliance or other observed situations, incident and accident rate. The main outputs of this tool are the SMS performance assessment score, the trend of this assessment, and the background elements. In 2022, this assessment has been considered in regards with self-assessment obtained in each operator annual report on safety

The second aspect is an identification of unwanted events and technical processes as priorities for supervision. This identification is made with the help of data exploration techniques and experts point of views. The objective is to be sure to supervise operators' activities with the best risk related couverture.

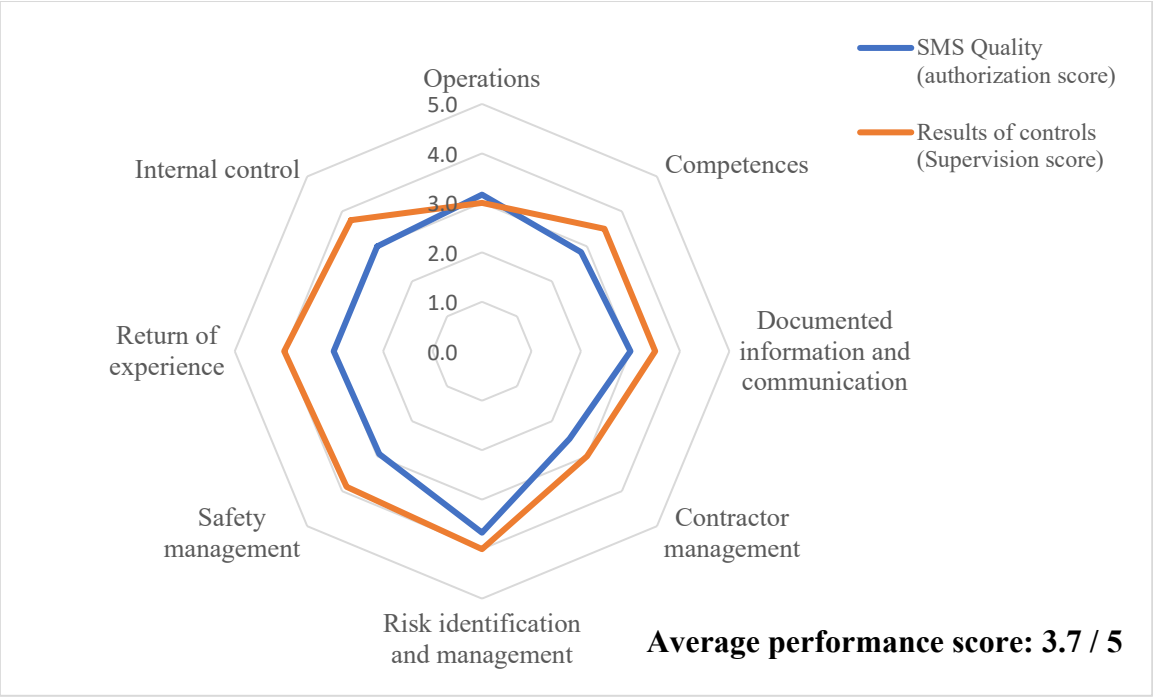

Fig.4 – Example of the SMS performance assessment from RESYGESS

In the SMS performance assessment, the two scores help to define the control strategy and assist the decision-making during the authorization's renewal. It allows to reinforce the supervision process on companies having a low performance score. Additional controls are then planned with different scopes and depth (from high level audits to ground operational controls) based on the strengths and weaknesses identified in each company.

The EPSF performance assessment method is based on its own assessment to measure the performance level about all regulatory criteria whereas the ORR uses a practical approach based on companies' auto-evaluations. This difference allows to prepare an audit with complementary views: the questionnaires will focus on the different weaknesses identified by each method.

PREPARATION PHASE

The first step in the control process is the preparation phase. It's a period dedicated to the company's SMS analysis to adapt the questions that will be asked during the interview and create eventually specific questions regarding the topics to audit and the position of the person interviewed. To illustrate on the 2020 Eurotunnel's inspection, the purpose was to examine and assess the standard of leadership in the upper levels of Eurotunnel management in France and in the UK against RM3 criteria for excellence. Specifically, with a focus on risk management including risk assessment and the competence and training of managers in the risk assessment and health and safety. The RM3 is the Risk Management Maturity Model; a tool developed by the ORR in collaboration with the rail industry for assessing an organization's ability to successfully manage health and safety risks, to help identify areas for improvement and provide a benchmark for year-on-year comparison. It sets out criteria for key elements of a health and safety risk management system. RM3 identifies the steps to evaluate an organization's progress through the five levels of maturity, from ad-hoc to excellent health and safety management capability.

The inspection took place in December 2020 during a COVID wave. To avoid COVID transmission, the interviews were planned mostly online via Teams. To have a ground vision, some physical site visits were planned too. Here is the planning decided:

Getlink (Eurotunnel's headquarter): CEO 1h30, Non-Executive Director and ex-CEO 1h, Chair of the Board Health & Safety Committee 1h.

Eurotunnel: CEO 1h30, Safety Director 1h, Operations Director 1h.

Eurotunnel Infrastructure Division: Infrastructure Director 1h

Site visits: Intermediate infrastructure manager, UK 30min, Intermediate infrastructure manager, FR – 30min, Infrastructure team leader, UK – 30min, UK Operatives + Safety Representatives and/or Safety Coordinator, Infrastructure team leader, FR 30min, FR Operatives (2 or 3, if possible, together, for 30min).

Eurotunnel Customer Services Division: Customer Services Director 1h

Site visits: Intermediate customer services manager, UK 30min, Intermediate customer services manager, FR 30min, Customer services team leader, UK 30min, UK Operatives/ Safety Representatives and/or Safety Coordinator, Customer services team leader, FR 30min, FR Operatives (2 or 3, if possible, together, for 30min).

Based on the positions of the people to interview, the ORR team and the EPSF team prepared questionnaires by their own using their own approach. ORR inspectors used mainly the RM3 method to focus the interviews on the weaknesses identified whereas EPSF inspectors used mainly the SMS to focus on the weaknesses identified. Then, the two teams put in common their questions and it appeared that they were totally complementary. Indeed, both methods led basically to the same weaknesses which confirms their efficiencies.

Nonetheless, the questioning process differed a little. The EPSF questions were asked regarding the final risk of accident and, as the European legislation states, the obligation for each company to manage their risks. The ORR questions were also risk based, but some had a cost of accident approach. Indeed, they challenge the safety barriers' prices regarding the accident cost estimation. It goes a little bit further than risk management as they take in charge that a company has financial obligations.

To facilitate this first phase, each team worked on its own native language to establish the questionnaires and sent it to the other one. Every team was composed of inspectors having language skills to understand and facilitate discussions in preparation phase. After two weeks of e-mail exchanges and video meetings, we agreed on a common questionnaire for each position to interview. We also agreed that the ORR team led the interviews with English native people, and that the EPSF team led the interviews with French native people.

Before and during the preparation phase, the EPSF team noticed that the ORR inspectors knew almost Eurotunnel's organization and processes by heart. This is explained by the different organizations the EPSF and the ORR have. The ORR is organized by lands, which means that the inspectors are dedicated to the same railway undertaking and infrastructure manager. This organization generates companies' expert inspectors according to the SMS and the processes. The EPSF organization is not land-based and allow inspectors to work on a wide diversity of SMS all over the national and international territory. Indeed, some international railway undertakings like Thalys or Lineas (freight

railway undertaking operating on six European countries) operate in France and are audited by EPSF inspectors. An inspector can then learn a lot from companies from all over Europe and extract the best practices observed in the controls.

INTERVIEWS PHASE

This phase lasted two weeks on which we virtually met the Eurotunnel top management and physically ground operators on each terminal. Unfortunately, due to COVID measures, it was not possible for the EPSF team to join the ORR on site interviews on the Eurotunnel's UK terminal. Same for the ORR team who could not participate the interviews on the Eurotunnel's French terminal realized by the EPSF team. This restriction also impacted the "team spirit" that is usually built-in collaborative inspections. Indeed, during lunch breaks or at the end of an interview's day, the two teams share convivial moments tasting each nationality's food and beverage specialties. These off moments are very important to debrief together and contribute to build a real team spirit in order to realize the best inspection as possible.

For the Teams interviews, live translation services were settled and provided by professional translators. The interviews were realized in the native language of the interviewee and the translation channel was available on phone. We had to deal with the video conference sound (generally computer headphones) and with the cell phone to get the translation. After the first day of interviews, we became experts of the Larsen effect. We also faced some internet disruptions which did not impact the interviews as there was always the ORR or the EPSF team connected to lead the debate.

A slight difference appeared in the audit interviews regarding each NSA's competence domain. As the ORR is competent on rail industry's health and safety, they focused some interviews on employee's safety like the electrocution and fire risks caused by a stripped wire. The EPSF is not competent on health safety, but the way this operational threat is handled reveals also how train safety risks are managed.

During and after the interviews, a debrief was realized to share the non-compliances identified and make sure each team were agreeing on the answers of the questionnaires. This work was crucial to make sure each team investigated enough on the weaknesses identified in the preparation phase.

REPORT WRITTING PHASE

After we interviews, as the inspection was led by the ORR, the EPSF team shared all its notes taken during the interviews, which means the questions and answers elaborated during the preparation phase. This allows ORR inspectors to write the report using their own notes and using the EPSF team notes to have a two-headed vision.

At the end, the report related all the statements that were identified during the interviews and shared during the debriefing sessions. Each domain is evaluated on the RM3 maturity five-levels scale from "Ad hoc" to "Excellence". This result differs from the EPSF scale which is based on the depth of the non-compliance only. The non-compliances are the same but the way to present them are different.

The report was sent six months after the interviews. This delay is longer than the EPSF usually practices (one to two months) but is explained by the binational validation.

RESULTS

Even if the competence domains and interview methods differ between the EPSF and the ORR, the weaknesses were investigated, and non-compliances were found jointly. The language difference, which can be seen as a barrier sometimes, became a success factor due to the ease of each team to interview people in their native language. The collaborative work between land-based inspectors knowing deeply the company they supervise, and national-based inspectors knowing a wide diversity of national and international SMS company they audit, enriched the inspection process. This generated deep investigations on specific subjects and high-level vision making sense in an interoperative context. The cultural differences brought also cost related questions and risk related ones, to enrich the questionnaires.

Unfortunately, the COVID really impacted the binational team spirit by blocking physical meetings and off debriefs. Both teams really missed these off moments that are part of the control process.

The main differences between a national EPSF control and this inspection appeared in the delays. Indeed, as it was realized by two NSAs, the final report must be approved twice.

CONCLUSION

The channel tunnel is a crucial link between France and the United Kingdom. It allows to transport people in trains (Eurostar), people in cars and buses (Eurotunnel passenger shuttles), goods (freight railway undertaking), goods on trucks (Eurotunnel freight shuttles) and electrical energy (through Eleclink cable).

The Brexit impacted the regulatory landscape deeply, making people and goods exchange more complex than it never was in the channel operation. This complexity really threatened the tunnel operation.

But the binational train traffic has never stopped, and the cooperation settled permitted to realize the 2020 leadership joint inspection.

Keywords: cooperation; supervision; return of experience; border; channel