



CRISIS MANAGEMENT IN THE MULTI-ACTOR ENVIRONMENT OF A CROSS-BORDER RAILWAY LINE

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SUMMARY

TP Ferro is operating and maintaining the high-speed line in the Mediterranean coast between Perpignan in France and Figueras in Spain. In coordination with the national authorities, it has set a specific organization for crisis situations involving its own resources, as well as two national administrations (Spain and France).

The extensive variety of risks imposes TP Ferro to take mitigation measures on all the components of the railway system: technical, human and organisational components. With this organization and mitigations measures, TP Ferro is attempting to reconcile two antagonistic requirements: minimizing the consequences to mobility of trains and ensuring the maximum level of safety during crisis and incident treatment.

INTRODUCTION

The global geopolitical and economical context is not a long and quiet river!

Armed conflicts, attacks, strikes, robberies and vandalism make part of the day-to-day life in our societies. Beside these physical threats, new types of threats appeared since several years. Finding their source in the multiplicity and the accessibility of information systems, they aim to cause human losses or material damages, extort money, stealing the know-how or degrading the reputation of established companies, or more generally, at destabilizing our political, economic, social and cultural organizations.

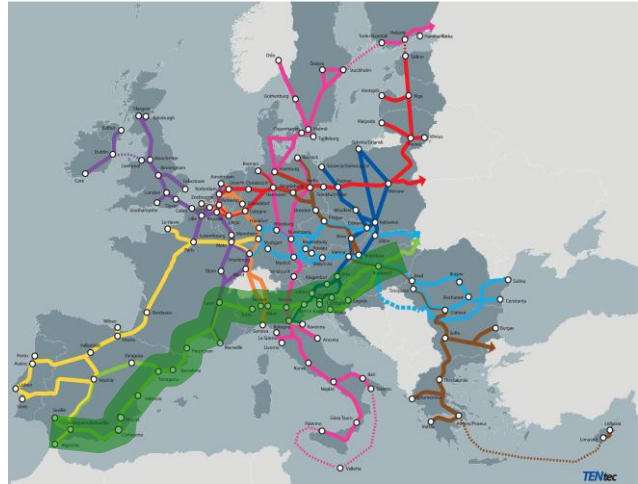
Maintaining a high level of safety and security in the line is TP Ferro's target n° 1. To achieve that, TP Ferro acts on both levels: upstream with specific preventive mitigations measures to avoid or minimise the potential threats and in real-time during accidents or attacks with an adequate crisis management process that involves several actors due to the bi-national context.

1. BRIEF PRESENTATION OF THE LINE AND TP FERRO

TP Ferro is a private rail Infrastructure Manager (IM) operating and maintaining the high-speed line between Perpignan in France and Figueras in Spain. The line, also called "*International Section*" makes part of the European Core Network. It is the sole and unique link with international UIC gage between Spain and Europe with



a capacity of more than 100 trains/day, equivalent to 10 million passengers/year and 20 millions of tons of freight/year.



The line is innovative from several points of view:

- It is the first mixed-traffic line where high-speed passengers' train running at 300 km/h and freight trains running at 100 km/h operate simultaneously; The coexistence of those two types of trains generate a new category of risks for persons and goods;

← 100 km/h

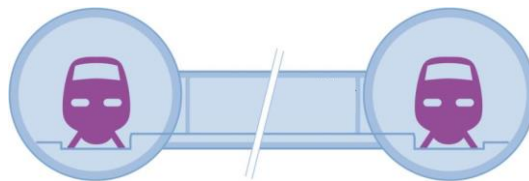


300 km/h →

- The line is cross-border: the half of the line is located into French territory, while the other half is located into Spanish territory; In case of accident, rescue operations are carried out jointly by TP Ferro, Spanish and French rescue services (several actors of different nationalities);



- A 8,3 Km double-tube tunnel is implemented below the Pyrenean chain connecting Spain with France, in addition to another 40 km of open-air tracks;



Given this complex context, during crisis situations, TP Ferro is attempting to reconcile two antagonistic requirements:

- minimizing the consequences to mobility in this major European Corridor
- ensuring the maximum level of safety

2. RISK MITIGATION

The extensive variety of risks imposes TP Ferro to take mitigation measures on all the components of the railway system:

- Technical components of the infrastructure
- Human components
- Organisational components

2.1 Technical components of the infrastructure

The measures regarding the technical components of the infrastructure and the way crisis & accidents parameters have been taken into account in the design of the line, are developed in chapter 4 hereafter.

2.2 Human components

At top level management, there is a direct involvement at the CEO/COO levels: Chief Operations Officer (COO) is directly involved in safety and security issues; He (she) has a specific authorisation to handle “defence & security” confidential matters and receives confidential notices and information from the national defence and interior security authorities regarding risks of attacks.

With a transversal position, a Safety Department handles both operations safety and security matters. The manager of the Safety Department has also a specific authorisation to handle “defence & security” confidential matters and is in contact with national defence and interior security authorities.

The IT Department – also with a transversal position – is closely monitoring the inbound/outbound data flows and prevents any cybernetic attacks to the Company’s network (servers, switches, personal computers).

At an operational level:

- Fixed security agents are positioned on a 24h/day basis at the critical sites of the line (control centre, tunnel portals, headquarter) to enforce access control; In addition to the monitoring of the area, they also monitor the tunnel portals by means of a CCTV system integrating an intrusion detection system;
- Mobile security agents (patrols) are monitoring the entire length of the line on a 7d/week basis during night time with aleatory patrol paths;
- Maintenance Department is closely monitoring the inbound/outbound data flows of the railway communications and interlocking/signalling systems to prevent any intrusion;
- Operations Department is monitoring the tunnel portals on a 24h/day basis by means of a CCTV system integrating an intrusion detection system;
- All TP Ferro' personnel (operations, maintenance, administration) receives a specific training in order to provide full awareness of the potential risks and explain the different safety and security measures;



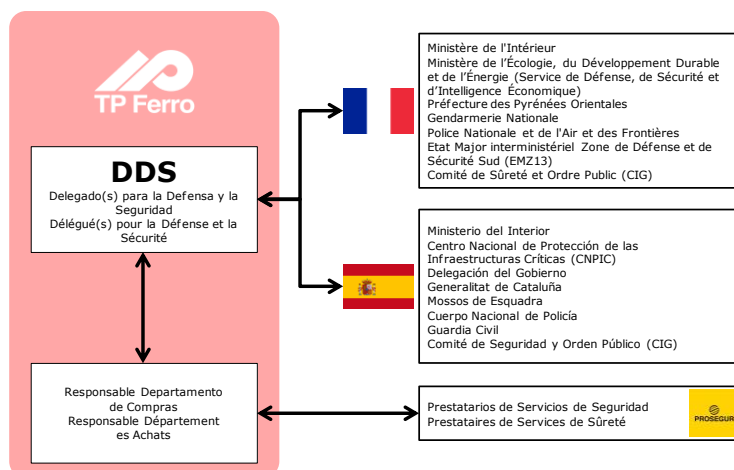
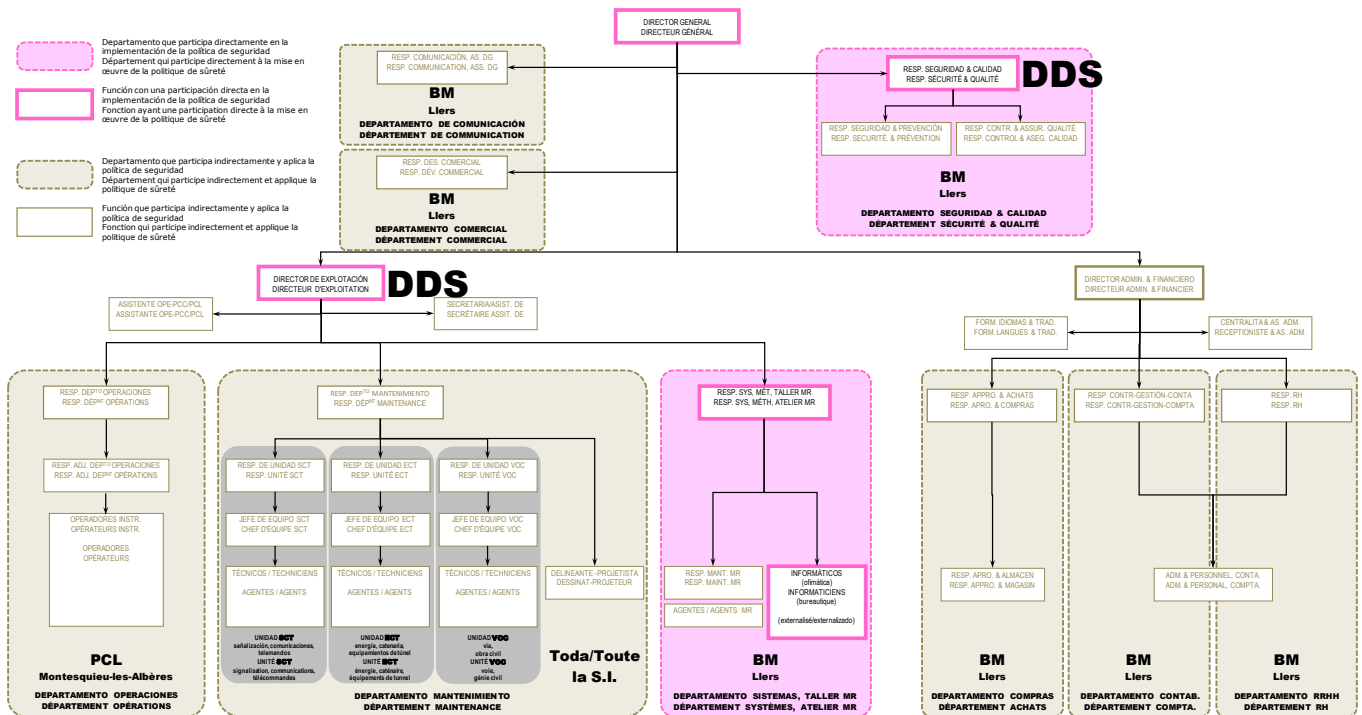
2.3 Organisational components

Several organisational components contribute not only to prevent external attacks but also to minimise their consequences and facilitate crisis management should they occur.

- Existence of a Security bi-national Committee formed by French and Spanish civil defence and interior security authorities and TP Ferro;
- Existence of a specific bi-national rescue plan (PSB) applicable to both French and Spanish civil defence and interior security authorities;
- Existence of a classified "Critical Operator" risk evaluation and safety documents;
- Contingency and safety plans in case of operational incidents or external attacks;
- Specific operations safety and security procedures;
- Guidelines for personnel in case of attack of any nature (physical, cybernetic, reputational, etc.);
- Training and awareness of all the personnel against all types of attacks: physical or cybernetic;
- Specific "security delegates" or "DDS" to exchange confidential information with the national defence and internal security authorities;
- Close cooperation between TP Ferro and national defence and interior security authorities (confidential notices regarding possible risks, exchange of information, etc...);

- Possibility to request the evaluation of personnel before recruitment by the national defence and interior security authorities;
- Access control;

TP Ferro implements a specific organisation regarding security matters and information exchange with national authorities, with identified tasks, as summarised in the following schemes.



3. PROTECTION AGAINST ATTACKS

TP Ferro is implementing measures to ensure protection against all type of attacks.

3.1 Protection against physical attacks

Protection against physical attacks aims to protect TP Ferro, its personnel and assets against several categories of threats: terrorism, activism, militancy and criminality. Several operative modes are considered such as explosives, chemical weapons, hostages, demonstrations, possession of tracks, robberies, damages or sabotage.

The target of the measures that are implemented is to prevent, dissuade, slow down, or minimize any potential attack: permanent watchfulness and discretion of the personnel, controlled access to the infrastructure, identification badge, fences, site security, patrols, CCTV, etc...

3.2 Protection against cybernetic attacks

Protection against cybernetic attacks aims to protect TP Ferro, its personnel and assets against several categories of threats: terrorism, activism, militancy and criminality.

The target of the measures that are implemented is to prevent, dissuade, or minimize any potential cybernetic attack: secured networks and computers, watchfulness of the personnel, training, early warning of attacks and permanent protection applications (firewalls, anti-viruses, etc.).

3.3 Know-how protection

Know-how protection is considered within a globalized context of economic "war" and industrial, technological or economic intelligence. It aims to protect TP Ferro against loss or plagiarism of its intellectual property and know-how. Two main operative modes have been considered: data "electronic" steal and blackmail to personnel.

The measures that are implemented aim to prevent, dissuade or minimize any attempt to steal or copy elements of TP Ferro's intellectual property: protection of documents with passwords, permanent watchfulness and discretion of the personnel, secured copies of the documents, secured network and computers, etc..

3.4 Classified data protection

TP Ferro handles classified information such as rescue plans, security and safety operational procedures, railway operations files and safety systems passwords. Classified documents protection aims to avoid weakening TP Ferro' safety/security measures by making public its documentations about also and mainly to protect TP Ferro against intrusion into the operations systems such as signaling, interlocking, communications and control-command.

Special measures are implemented: only authorized agents may have access to classified data according to specific privileges, classified data transmission to agents is made under strict follow-up with and signature, classified data are stored into a safe, expired data are destroyed, computers hosting classified information are encrypted, etc..

3.5 Protection of the reputation

TP Ferro is closely monitoring information that could represent a reputational risk for the Company and its Shareholders.

Special measures are implemented such as confidentiality of the documents and early detection of defamatory information.



4. HOW CRISIS/ACCIDENTS PARAMETERS HAVE BEEN TAKEN INTO ACCOUNT IN THE DESIGN OF THE LINE?

The line is designed following four main objectives:

- Early warning and detection any abnormal situation in order to bring the trains in standstill and prevent accidents to occur
- Minimizing consequences
- Facilitating the operational response and crisis management
- Offering good quality and uninterrupted communications to TP Ferro's staff and rescue authorities

To achieve these goals, several equipment and systems are implemented:

- Safety detectors on both open-air portion of the line and tunnel (fire/smoke detection, derauling detection, falling objects detection, etc);
- Secured radio-communication system dedicated to TP Ferro's staff (GSM-R);
- Secured radio-communication system allowing the rescue services to communicate between them despite they use different systems (TETRA-TETRAPOL);
- CCTV with integrated intrusion detection on the tunnel's portals;
- Two crisis rooms, one in Spanish territory and another in French territory;
- Crisis rooms equipped with several equipment: control screens showing the movement of the rescue vehicles, CCTV screens, individual desks with phone and internet access for each rescue service and police forces, video and phone conference facilities between the two crisis rooms, etc;
- Protection systems in the different networks;

5. PREPARATION AND CONTINUOUS IMPROVEMENT

In addition to the acquisition of technical knowledge, TP Ferro's personnel receive a complete training regarding incidents, accidents, attacks and crisis situations in general:

- Training regarding "technical" actions in case of accident/incident (fire, train derauling, etc.);
- Training and guidelines regarding actions in case of attack: bomb alert, unattended object, threats, blackmailing, cybernetic attack, hostage-taking, demonstrations, etc;

However, training "alone" is not sufficient to maintain a permanent high level of preparation given that attacks and accidents are (hopefully) not frequent. Training is complemented with annual crisis simulations (drills) simulating different types of situations, mobilising TP Ferro's personnel, civil protection and defences authorities of the two countries, fire brigades and police forces.

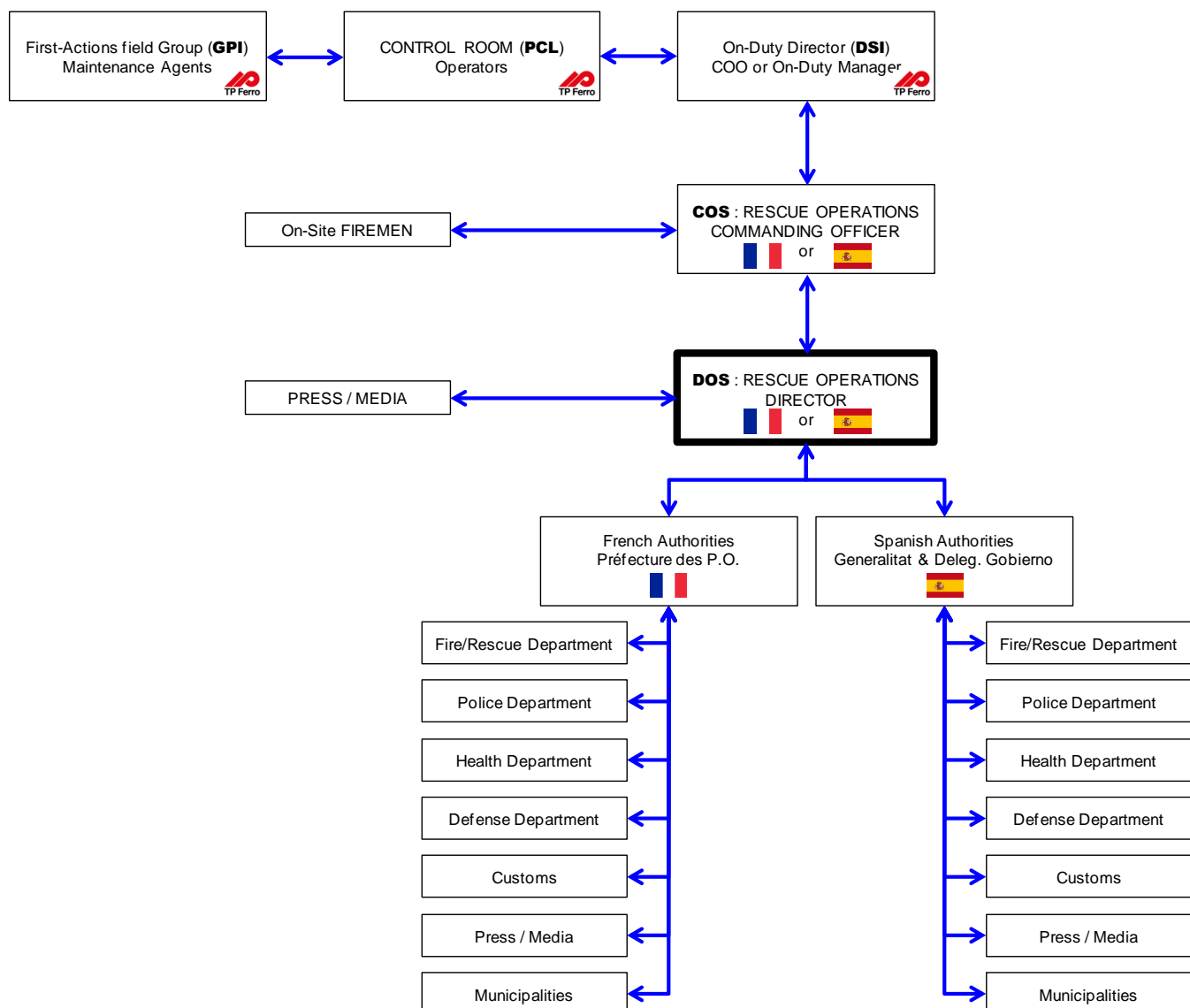
TP Ferro is also implementing a permanent improvement system based on internal controls and audits carried out by the Company's management or entrusted to specialised auditing or security firms. Generally speaking, thanks to its reduced size and to a adequate "change management", the Company, its personnel and its organisation are able to evaluate in a short period of time in order to react quickly in case of change of the typology of the accidents or threats.

Most of the internal procedures regarding crisis situations are drafted in cooperation with the rescue and defence authorities so that the TP Ferro's crisis organisation is consistent with the Authorities' organisation.

6. REPONSES TO CRISIS

6.1 General rescue organisation

The rescue organisation is shown in the following scheme.



During crisis situations, the main decision maker is the Rescue Operations Director (DOS) that can be French or Spanish according to a territoriality criterion: if the incident is located in the French portion of the line, the DOS is the French “*Préfet*”, if it is located on the Spanish side, the DOS is the Spanish “*Delegado de Gobierno*”.

The Rescue Operations Director (DOS) works in full coordination with all the actors into a “***Crisis Room***” located at TP Ferro’s Operations Control Center:



All key persons that participate in the treatment of the crisis and have commanding function on their respective organisations, are located into the *Crisis Room*: TP Ferro’s On-Duty Director (DSI), Rescue Operations Commanding Officer (COS), fire brigades, police officers, health/ambulance officers, defence officers, etc.

6.2 Coordination with two different national administrations (territorial administration, fire brigades, police, ambulances)

The Spanish and French national administrators have signed a Bi-national Rescue Plan called “PSB”. This plan is a master document that defines precisely all the aspects of the rescue operations:

- The authority (Spanish or French) that takes the lead of the rescue operations according to a territoriality criterion;
- Involved organisations (fire brigades, police, ambulances, administrations, etc.);
- Communications flows;
- Interfaces with TP Ferro’s organisation;
- Decision making process;
- Crisis centres of each national authority (Spain and France);
- Engagement of human and material resources;
- Operational modes of the rescue operations for each type of incident with several scenarios developed;
- Continuous improvement, training and simulation with annual rescue exercises (drills);

After six (6) years of operations, the coordination of the two national administrations proved its efficiency during both real incidents and accident simulations.

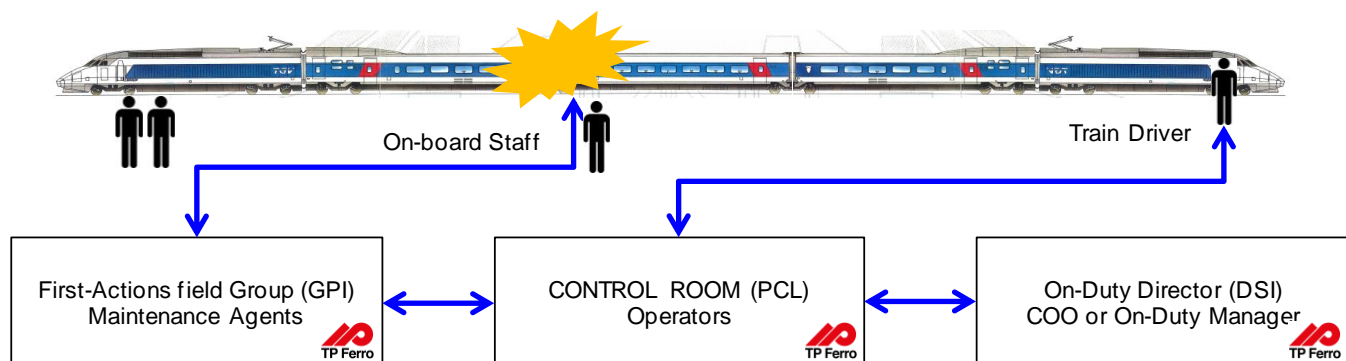
6.3 Coordination amongst TP Ferro staff

During crisis, TP Ferro engages various levels of operational response: the Control Center (PCL) is the central coordination centre that receives and transmits information and orders to the field staff and on-board personnel. The Control Center is also responsible of the safety of the engagement of the persons and vehicles in the field

ensuring the safety of the vehicles movement, as well as the safety against electric risks or smoke. The PCL is in permanent contact with the On-Duty Director (DSI) who is TP Ferro's top crisis manager.

The On-Duty Director is in permanent contact with the Rescue Operations Commanding Officer (COS) in order to define and implement in common the best

The coordination chart is as follow.



6.4 Coordination with trains' staff

Coordination with the trains' staff is made by TP Ferro's Control Center using the GSM-R system. All information received by the trains' staff is centralised in TP Ferro's Control Center and forwarded to the on-duty Director (DSI) who, subsequently, communicates with the Rescue Operations Commanding Officer (COS). In case of an unlike failure, communication is still possible through the fixed interphones located inside the tunnel cross passages every 200m.

Similarly, any orders or information transmitted towards the trains' staff is centralised in TP Ferro's Control Center in order to avoid confusion or contradictory orders.

Nevertheless, a field coordination is also made between TP Ferro's First Actions field Group (GPI) and the train's staff for issues such as evacuation, assistance to disabled passengers, etc..

It is important to notice that there is no direct communication between the trains' on-board staff and the rescue teams (fire brigades). All communications are made trough the Control Center that analysis the information received, avoiding the diffusion of contradictory information.

6.5 Maintaining safety while minimising impact to mobility during crisis situations

During crisis, TP Ferro has to comply with two antagonistic requirements:

- Ensuring safety during the treatment of the crisis
- Minimize the consequences to the mobility of the other trains

Safety during the treatment of the crisis is achieved by establishing specific operational measures such as power shut-off, track possession to avoid other trains to enter the incident zone, movement of rescue vehicles, lighting, ventilation of the tunnel to evacuate smoke, etc.. All these measures are described in detail into several operational procedures, so that there is no room for improvisation from the Control Center.

On the other hand, all necessary steps are taken to be able to return in nominal situation after the end of the crisis. Such steps: ...

- Begin during the proper crisis management by the choice of the best and most adapted crisis treatment scenario and strategy;
- Continue after the end of the crisis by establishing measures allowing the traffic to resume as soon as possible even in degraded mode, such as putting in service at least one (1) track out of two, authorizing traffic to resume with restrictions (speed restriction, crossing between trains, manual driving in a specific point), liberating the track as soon as possible of any train broken down with a stand-by rescue locomotive;

6.6 Communication flows and information management (internal and external)

The internal communication flows among the different actors involved in the crisis management are shown in the scheme of section 6.1.

The official external communication with the media is always centralised and ensured by the national authority that is in charge of the rescue operations (Spain or France according to the territoriality criterion). TP Ferro participates in the different press-conferences and has set specific procedures and guidelines for external communication with the media for all the Managers that participate in the On-Duty Director or “DSI” rolling shift (5-6 persons), in coordination with TP Ferro’s Communication Department. In particular and in order to avoid providing confusing information, it is very clear to all TP Ferro personnel that some information such as near of victims, interpretations of causes, etc, only can be given by the Authorities.

7. RELATIONS AND COORDINATION WITH SAFETY AUTHORITIES

TP Ferro has permanent contact with both “operational” railway safety authorities (AESF and EPSF) and physical security authorities against possible attacks (Ministries of the Interior and defence).

Regarding the physical security against attacks, TP Ferro has “security delegates” to exchange confidential information with the national defence and internal security authorities. TP Ferro receives confidential and classified notices regarding possible risks from the national defence and interior security authorities.

In parallel, TP Ferro has the possibility to notify “suspect” events to the authorities and request the evaluation of some key-personnel (e.g. technicians in charge of the maintenance of the safety systems) before recruitment by the national defence and interior security authorities;

CONCLUSION

Not applicable.

NOTATION (symbols and abbreviations)

Not applicable.