

# ISITEP

## D6.3.1- EUROPEAN CROSS-BORDER COLLABORATION SURVEY

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## **PUBLISHABLE EXTENDED ABSTRACT**

In order to provide Inter System Interoperability for Tetra-TetraPol Networks it is essential to examine the current state of Cross Border collaboration, the user requirements that could be covered in terms of efficient collaboration and the case under which proper collaboration is not an option but a necessity. In this context, D6.3.1 provides an analysis of the end user requirements, a research on resource sharing over country borders and an analysis on the possible improvement of reaction times. Survey results are included throughout and various cases and events are examined.

*The document is classified as Public as it does not deal with any potential security frameworks and mechanisms of the ISITEP security solution for network interconnection and there are no national security sensitive issues in the document.*

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## 1 INTRODUCTION

The ISITEP project pursues the vision of allowing first responders of European ISITEP federated countries to seamlessly interoperate by overcoming current operational and technological barriers. New European entrants will be easily federated into the ISITEP European network to achieve seamless interoperability.

To achieve ISITEP's vision the project will develop a framework encompassing procedures, technology and legal agreements to achieve a cost effective solution for PPDR interoperability.

Through the proposed framework, PPDR agencies may achieve, in the short term, a cross-national interoperability that leverages existing technologies and is open to the benefits offered by emerging technologies in the long term. The framework is expected to offer an economically sustainable solution compliant with service procedures and regulatory frameworks.

In this context, Task 6.3.1 within WP6.3 "Business sustainability" focuses on performing a Pan European Survey for the identification of various cross-border collaboration cases.

### 1.1 Document scope

This deliverable (D6.3.1) is the first deliverable issued by WP6.3. In order to provide a business model for implementing the roaming between PPDR forces in European countries and the enhancement of cross-border collaboration between them, D6.3.1 (European cross-border collaboration survey) will include an Analysis of the End-user Organizational and Operational aspects associated to cross-border incidents and investigation of resource sharing over country borders (human resources, equipment, financial aid).

Finally, estimations of reaction time in various operational scenarios under existing framework and estimations of reaction time in various operational scenarios by directly established cross-border communication interoperability will be provided.

## 2 DEFINITIONS AND ABBREVIATIONS

### 2.1 Definitions

This section intends to capture the definitions of some key terms used in the document for the purpose of increased consistency. Most of the definitions are obtained from official 3GPP and ETSI documents:

**Access control:** the prevention of unauthorized use of resources, including the use of a resource in an unauthorized manner.

**Authentication:** the act of positively verifying that the true identity of an entity (network, user) is the same as the claimed identity.

**Confidentiality:** the property that information may not be available or disclosed to unauthorized individuals, entities or processes.

**Data integrity:** the property that data has not been altered or destroyed in an unauthorized manner.

**Encryption:** the conversion of plaintext to cipher text.

**Key:** a sequence of symbols that controls the operations of encipherment and decipherment.

**Key management:** the generation, selection, storage, distribution, deletion, archiving and application of keys in accordance with a security policy.

**Migration:** act of changing to a location area in another network (either with different Mobile Network Code and/or Mobile Country Code) where the user does not have subscription (e.g. ITSI in TETRA) for that network. In this document, migration is used as a synonym of roaming.

**Plaintext:** information (including data) which is intelligible to all entities.

**Profile:** the capability of particular equipment. This is defined separately for individual subscriber terminals and individual infrastructures.

**Provision:** the act of supplying a given service (Note: A communication system may be capable of supporting a service. However, it may not supply the service to certain subscriber terminals for which the service is not subscribed.)

**Repudiation:** denial by one of the entities involved in a communication of having participated in all or part of a communication.

**Roaming:** utilization of a mobile terminal in a network other than the one where the mobile is subscribed but on which the mobile can still be located and operated by agreement between the respective network operators.

**Security assurance:** it is the confidence that a network product / terminal / system meets its specific security objectives. Assurance is usually verified by performing an evaluation.

**(Security) certificate:** it is an official document attesting that the evaluation of the network product / terminal /system against some security assurance specifications was conducted correctly and was successful.

**Security domain:** a set of entities and parties that are subject to a single security policy and a single security administration. The network security design can consider different domains and sub-domains to surround and delimit the responsibilities in network management and security control.

**Security service:** a service provided by a layer of communicating open systems which ensures adequate security of the systems or of data transfers.

**Security threat:** a security threat is defined as a potential violation of security. Examples of security threats are loss or disclosure of information or modification/destruction of assets. A security threat can be intentional, like a deliberate attack, or unintentional due to an internal failure or malfunctions.

## 2.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

Acronym	Definition
3GPP	3rd Generation Partnership Project
AI	Air Interface
AIE	Air Interface Encryption
AIM	Air Interface Migration
ASSI	Alias Short Subscriber Identity
AuC	Authentication Center
CCK	Common Cipher Key
CDR	Call Detail Record
DCK	Derived Cipher Key
DoS	Denial-of-Service
DDoS	Distributed DoS
E2EE	End to End Encryption
ESI	Encrypted Short Identity
GCK	Group Cipher Key
GTSI	Group TETRA Subscriber Identity
GW	Gateway
IOP	Interoperability Profile
IP	Internet Protocol
ISI	Inter System Interface
ISSI	Individual Short Subscriber Identity
ITSI	Individual TETRA Subscriber Identity
KMC	Key Management Center
KSS	Key Stream Segment
LI	Lawful Interception
MoU	Memorandum of Understanding
MNI	Mobile Network Identity

MPLS	Multi Protocol Label Switching
MS	Mobile Station
MT	Mobile Terminal
NGN	Next Generation Network
OTAK	Over The Air re-Keying
OTAR	Over The Air Rekeying
PC	Professional Computer
PDA	Personal Digital Assistant
PEI	Peripheral Equipment Interface
PMR	Professional/Private Mobile Radio
PPDR	Public Protection and Disaster Relief
PS	Public Safety
PSTN	Public Switched Telecommunications Network
RS	Random Seed
SC	Security Class
SCK	Static Cipher Key
SDS	Short Data Service
SFPG	Security and Fraud Prevention Group
SIM	Subscriber Identity Module
SwMI	Switching and Management Infrastructure
TAA1	TETRA Authentication and key management Algorithm suite 1
TE	Terminal Equipment
TEAx	TETRA Encryption Algorithm number x
TEDS	TETRA Enhanced Data Services
TEI	Terminal Equipment Identity
TETRA	TErrestrial Trunked Radio
TG	Talk Group
VLAN	Virtual Local Area Network
VoIP	Voice over IP
VPN	Virtual Private Network
WS	Work station

### 3 ANALYSIS OF THE END-USER ORGANIZATIONAL AND OPERATIONAL ASPECTS ASSOCIATED TO CROSS-BORDER INCIDENTS

#### 3.1 Definition of Roles. Aspects Analysis

The main roles that have been identified are:

##### - End user/First responder organisations

- a. Radio terminal users migrating and communicating cross-border, including leaders in the field
- b. Control room personnel – leaders and operators
- c. End user support services - responsible for radio terminal programming and other support related to the end users' network usage.

##### - Network owner/operators

- a. National body responsible for network security, capacity, coverage and robustness. Responsible for implementing ISI in the network and for developing procedures to allow foreign radio terminals to migrate to and from the national network.
- b. Operation centers for 24/7 monitoring and maintenance of the network.

##### - Network suppliers/manufacturers

Network suppliers/manufacturers sell and develop PPDR network technology and develop new functionalities to be implemented in the networks, such as ISI – cross network communication gateways.

#### 3.1.1 The first responders

##### - Intervention teams on the field.

Officers on the field have first to care about their professional core missions and tasks (security, rescue, and fight against crime). They have to spend a minimum of time and capacity with radio transmission.

Therefore, the radio procedures (synonym: methods) they apply must be kept as simple as possible. In particular:

- a. A first golden rule is that terminal manipulations (like talk group selection) shall be strictly limited.
- b. A second golden rule is that radio procedures to be used in specific or unusual cases, like major events, emergency or cross-border interventions, shall be kept as real like as the usual business radio procedures.
- c. The intelligence of the radio communication functional model will be limited to, basically, the ability of selecting the talk group that is requested by the dispatcher and/or the operations leaders.

##### - Their leader(s) on the field (integrated in intervention teams or in mobile command rooms) or in control rooms.

The leader must firstly have the intelligence of the mission and the way to perform it. In particular, besides the basic officer radio communication knowledge, they need to master the radio scheme of their mission, i.e. who has to speak with whom, and, in the application of the Functional Radio Model

(FRM), on which talk groups. A deeper knowledge of the FRM (e.g. which talk groups are to be used in all the possible situations) is the domain of radio communication specialists.

- Their dispatcher(s) or operator(s) in the control rooms.

The dispatchers support the intervention teams on the field and their leaders:

a. In the execution of their professional core missions and tasks.

Depending on the governance model, dispatchers will only assist and coordinate the teams on behalf of an end chief, or will also have the lead on them. Therefore:

An information flow is needed between the teams on the field and their dispatcher(s).

Mostly, both voice and positioning are required. In the case of autonomous teams, positioning remains necessary, so that dispatchers keep control (emergency calls management included) on all teams operating on the territory they are in charge.

b. By managing their radio communications.

Therefore:

- They must have a solid understanding of the Functional Radio Model (FRM) and the related operational radio procedures to face an evolving or an unexpected situation.

- They often have some extra features at disposal on their console to regulate, in real time, the radio communications: combining (patching) of groups, remotely programming extra groups on terminals (DGNA) and remotely selecting groups on terminals.

### 3.1.2 The back-office support teams

The back-office support teams are the manufacturers, the network operators, the end-user (PPDR) radio communication services.

They are responsible for:

a. The technical-operational conception, design and implementation of the radio communication system.

b. The data bases provisioning, the adjustments of technical-operational parameters and the technical maintenance.

Note:

Some PPDR organisations could be tempted to delegate data base provisioning or technical-operational parameters programming to their dispatchers, in order to be able to regulate the traffic by adapting, in real time, some radio group priorities. This approach is, however, a risk, if not perfectly controlled.

c. The FRM development and the related operational radio procedures.

The roles of these entities will be further specified in SP3, when the model for agreements will be developed, which formalize the interoperability realisation between countries.

## 3.2 Gathering Information from End Users

End-user requirements document D2.2.2 –Security Requirements will be reclaimed with direct feedback from end-users with a European cross-border collaboration survey. The Survey Questionnaire template can be found in the Appendix A.

We used an end user survey form in order to receive immediate and direct feedback from the involved parties. The Survey consists of a set of questions used to assess a participant's preferences, current status, and pain points related to cross-border operations. As a research method, surveys allow us to count or quantify concepts. A sample or subset of the broader audience is used, the findings of whom can be applied to a broader set of authorities.

### 3.2.1 Survey Questionnaire Results

The results of the questionnaire are presented in the following paragraphs. With *Italics* are the questions, and with normal text decoration the responses.

#### 3.2.1.1 Response from Norway

*“Describe the process of an initialization of a cross-border Operation (Flow diagram if possible)”*

The cooperation method depends on whether the operation is pre-planned or if it is the occurrence of an emergency event. By pre-planned cooperation, is planned at supervisory level. Upon acute events there is a direct cooperation between the involved police districts.

*“Is there any standard Operating Procedure (SOP) to control such cross-border operation?”*

Yes, each district which has a border with neighboring countries has plans for handling assignments related to the border and assistance to neighboring countries.

*“Are there, currently, any steady state operations (on-going) (e.g. Common fire patrols...)?*

*If yes, is there any resource sharing (Net, equipment, other resources, Med)?”*

No, not currently.

*“Who is planned to manage foreign resources?”*

We follow the regular procedure for management. It is the country receiving assistance that manages resources from the country that provides assistance.

*“Lately we became witnesses of an incident in the US which took place at some state borders, where police force of one state arrested fire dpt force of another state due to their refusal to move their vehicles during a MEDEVAC( Medical Evacuation).*

*Who is in charge in a case where national forces of different branches (Police, Fire brigade etc) operate on the same scene?”*

In Norway, the police supersede all shared resources where there are efforts from different agencies. This also applies to forces / crews coming from neighboring countries. In Sweden, it is the rescue service which leads joint efforts.

By assistance from resources of other countries, in an incident in Norway, the head of each agency contacts the police manager at the location. He/she disposes assistance resources as if they were

Norwegian forces. Similarly, in Sweden, the head of each agency that assists from Norway contacts the manager of the rescue service at the site.

*“Who is in charge of a cross-border operation where forces from different states (nations) operate on the field?”*

It is the police of the country where the event takes place that determine who has the lead.

In Norway, it is the police who leads the effort at the site. This is true whether it is just a pure police operation or if it is a joint operation with personnel from fire and health as well.

In Sweden, the police lead as long as it is a sheer police operation, but if there is effort from several agencies, the rescue service is the leader.

*“During cross-border operation, where do the forces report and who is the decision maker?”*

Reporting lines follow the decision lines. That is, assisting units report to manager on site cf. previous question. Feedback is also provided to their own country management in relation to the status and the administrative conditions of the forces.

*“What is the approach in the case of different SOP?”*

Assisting crews follow the policies and plans of the country in relation to where the incident takes place. This means that Norwegian police officers, who assist in Sweden, follow the Swedish routines and vice versa for the Swedish police in Norway.

*“Is there a centralized command post or a launched command post?”*

*\* Who is responsible to deploy men and operate that post?*

It depends on the nature of the assignment. Normally, the team leader establishes CO in the proximity of the incident. In Norway, the police team/incident leader establishes and directs the CO.

*“Is there a cost estimation table for cross-border forces deployment?”*

Each agency normally carries its own costs. If it is the case of extended operations in the neighboring country, then other agreements are worked out.

*“Is there communication interoperability between different branches of national forces (Border police - Fire fighters/brigade - Med)?”*

Yes, close to the border a solution for TMO has been established. Otherwise, DMO is used.

*“According to previous experience & knowledge (if any)*

*\* What is the reaction time to various operational scenarios (cases that you have already encountered)?”*

Response time is the same as in incidents in Norway. We assist in the same way with the same response as if the incident were to be in Norway.

*“Currently, during border operations, do you use a common or different Operational (OPS) and Service Supply (OSS) communication network?”*

Tetra and GSM / Satellite phone are used for communication. Currently, there is a "Pandora Solution" (a back-to-back solution) that works in the border area (very limited area). This is used if possible. Outside this area, Tetra DMO talk groups are used locally. Other communication takes place using commercial GSM / Satellite phone.

### 3.2.1.2 Response from Belgium

*“Describe the process of an initialization of a cross-border Operation (Flow diagram if possible).”*

#### a. Formal guidelines

For Belgium, between an unforeseen event and a planned event.

During an unforeseen event the goal is that the dispatcher contacts the dispatcher of the others involved. Therefore, several protocols and (daily tested) permanent connections between the different countries exist. After this first contact (by radio and phone) a permanent predefined (and also regularly tested) communication line will be established. Nationwide is the goal that the participants of the event switch from their routine talkgroup to a predefined talk group (with the possibility of being connected with the major communication line) from the moment the dispatcher orders to do so. Further in time and depending on the evolution of means and tasks, more and more predefined talk groups will open.

Planned event: the ‘organizer’ asks the owner of the network (or by delegation) for some talk groups and the EUE will be prepared (technical and procedural) for the adjusted talk groups (e.g. talk groups, combining of talk groups/networks).

This is the same for the fire department but they work mostly with the DMO-functionality.

#### b. Best Practices

As described above, there is also a real-time contact by phone between the dispatchings in the participating countries.

*“Is there any standard Operating Procedure (SOP) to control such cross-border operation?”*

#### a. Formal guidelines

Yes, written in protocols which are initially based on the Schengen Agreements. The protocols will be executed by the dispatchings.

The main principle is as follows: the more units with different tasks on the field, the more specific talk groups will be started in Belgium.

Direct radio contact with another country is also possible due to a common international talkgroup, when both countries have the same basic network (eg Tetra based network between Belgium and the Netherlands) or by a physical connection of two radios when there are different basic networks that must be connected (Tetra~Tetrapol Belgium-France).

#### b. Best Practices

Same as above, because the protocols are majorly written on daily practices.

*«Are there, currently, any steady state operations (on-going) (e.g. common fire patrols...)?»*

*If yes, is there any resource sharing (Net , equipment , other resources, Med)?»*

a. Formal guidelines

In Belgium, we have some combined police patrol with France (e.g. in the case of the cross-border crime). Once a month, there are several police joint actions between Belgium and the Netherlands concerning anti-theft actions and drugs-related offences.

Also, there are, in the dry period, common fire patrols in northern Belgium and southern Holland to prevent meadow and forest fires.

b. Best Practices

Mostly there is enough coverage of the own network so the units are connected with their own network. And if not, there is still the possibility of combining the international talkgroups or the use of cellphones.

*“Who is planned to manage foreign resources?”*

a. Formal guidelines

Each country is responsible for its own network. In Belgium, it is a semi-private organization.

b. Best Practices

none

*“Lately we became witnesses of an incident in the US which took place at some state borders, where police force of one state arrested fire dept force of another state due to their refusal to move their vehicles during a MEDEVAC( Medical Evacuation).”*

*Who is in charge in a case where national forces of different branches (Police, Fire brigade etc) operate on the same scene?”*

a. Formal guidelines

That depends on what kind of operation it is. However, in most cases, it will be the highest ranked officer of the fire brigade, unless it is purely police business (eg. a hostage), and then it will be a specially trained police officer.

Everything is written down in guidelines and protocols. Each branch (fire department, medical, police, logistics) has its representative in a central commanding post.

b. Best Practices

We have national guidelines and protocols where the leadership of an operation is defined. Those guidelines are also based on ‘daily’ practices, their evaluations and different exercises.

However, depending on the specific case, it is not always necessary to unroll the whole guideline but also that is published in the guidelines.

*“Who is in charge of a cross-border operation where forces from different states (nations) operate on the field?”*

a. Formal guidelines

Always the local authorities due to legal agreements and national laws. Therefore, there will always be a change of command when crossing a border (eg. with a hot pursuit).

The ‘visiting’ state has only a supporting role.

b. Best Practices

In case of unforeseen incidents a contact must be made as soon as possible with the foreign country. If not, no legal actions can be made.

For planned events: the visiting units have a more ‘welcome function’ for their own residents who are visiting our country. For identifications or background information of some people and/or vehicles, are the visiting units of course a great added value.

*“During cross-border operation, where do the forces report and who is the decision maker?”*

a. Formal guidelines

It is the local leading officer who is in charge and makes the decisions.

In the case of police actions in another country, the Belgian police officers always have to make an official report for their own authorities when they have a cross-border intervention.

Each unit always makes an internal report of their contribution.

The Schengen Agreement and some bilateral agreements are the major guidelines for the legal conditions of a cross-border action.

b. Best Practices

See above.

*“What is the approach in the case of different SOP?”*

a. Formal guidelines

Each Belgian SOP has been written in consultation with all authorities and there is a strict line of global command for each event.

b. Best Practices

Non applicable.

*“Is there a centralized command post or a launched command post?”*

*\* Who is responsible to deploy men and operate that post?*

a. Formal guidelines

Depending on the nature of the event (police, medical, chemical, disaster) it takes only a few minutes to install a first centralized command post in the dispatching room. In a second phase, there will be cops on the field after the leading officer has decided to install one.

Again referring to the existing protocols, there is a checklist for deployment of people and means. It is the emergency room that will rollout that checklist. As soon as the leader of the cp-ops is installed, he or she is responsible for the further deployment.

The cp-ops is manned by the different disciplines and each representative is responsible for the rollout of its own discipline.

b. Best Practices

As above for the same reason: the protocols and rollouts are based on daily practices.

*“Is there a cost estimation table for cross-border forces deployment?”*

a. Formal guidelines

No, it is based on the good neighbourhood between the involved countries.

When there are costs, these will be carried by the own authorities.

b. Best Practices Non Applicable

Good hospitality is very important

*“Is there communication interoperability between different branches of national forces (Border police - Fire fighters/brigade - Med)?”*

a. Formal guidelines

Yes, the so-called ‘multi disciplinary talkgroups’ and ‘multi police talkgroups’ and also some talkgroups for semi-private companies.

Every service that participates in the civil security or public order and uses Tetra-technology has the same structure and name of the maps for the interoperability.

b. Best Practices

Non Applicable

*“According to previous experience & knowledge (if any)*

*\* What is the reaction time to various operational scenarios (cases that you have already encountered)?”*

a. Formal guidelines Non Applicable

Because we use Computer Aided Dispatching, in which a lot of scenarios and protocols are programmed, and we have well-trained call takers and dispatchers, the reaction time is very low; sometimes it takes only the time to switch the talkgroup.

The installation of a cp-ops in unforeseen circumstances is maximum 45 minutes after the decision to install one.

Almost for each emergency event there is a deadline for employment. Of course, it is variable due to the necessary usage of means and people. But first response means are always in standby.

b. Best Practices

The first reaction time is almost immediate but the further rollout depends of course on the nature and the impact of the event.

*« What is the estimation of establishing cross-border communication and how will it be implemented (flow diagram if possible)? »*

a. Formal guidelines

Non Applicable

b. Best Practices

There are permanent installed communication lines between the neighbouring countries which are daily tested by the emergency rooms.

So it can be established in a few seconds because the international talkgroups are monitored 24/7.

*“Currently, during border operations, do you use a common or different Operational (OPS) and Service Supply (OSS) communication network?”*

a. Formal guidelines

Each country (the Netherlands, Germany, Luxemburg, France) uses its own network. When necessary, there is a possibility to combine the two networks. Sometimes, the coverage of the own network is good enough in the foreign country to receive the home-dispatching.

These solutions have been written in protocols between the countries and have their foundation in the Schengen Agreement.

b. Best Practices

The combining between the different countries is established in the home-dispatchings and each first responder stays at his/her own talkgroup frequency. When there is a loss of signal, the mobile phones take over.

Sometimes (but rarely) there is also use of the DMO-function. The fire department, however, regularly uses the DMO-mode for operational/tactical reasons.

### 3.3 Organizational Aspects Analysis

Cross-border collaboration heavily depends on the organization of the various organizations (police, rescue services etc.).

For example, based on the Norwegian response on the Survey Questionnaire in Norway, it is the police who lead the effort at the site. This is true whether it is just a pure police operation or if it is a joint operation with personnel from fire and health as well.

In Sweden, the police lead as long as it is a sheer police operation, but if there is effort from several agencies, the rescue service is the leader.

There are three main emergency service functions:

Police — providing community safety and acting to reduce crime against people and property

Fire department (fire and rescue service) — providing firefighters to deal with fire and rescue operations, and may also deal with some secondary emergency service duties

Emergency medical services (EMS) — providing ambulances and staff to deal with medical emergencies

In some countries, such as the UK, these three functions are performed by three separate organizations in a given area. However, there are also many countries where fire, rescue and ambulance functions are all performed by a single organization.

Other services can be provided by one of the core services or by a separate government or private body.

Military — to provide special services, such as bomb disposal or to supplement emergency services at times of major disaster, civil dispute or high demand

Coastguard — to provide coastal patrols with security function at sea, as well as involvement in search and rescue operations

Lifeboat — dedicated providers of rescue lifeboat services, usually at sea (such as the RNLI in the United Kingdom).

Mountain rescue — to provide search and rescue in mountainous areas, and sometimes in other wilderness environments.

Cave rescue — to rescue injured, trapped, or lost people during caving explorations.

Mine rescue — specially trained and equipped to rescue miners trapped by fires, explosions, cave-ins, toxic gas, flooding, etc.

Technical rescue — other types of technical or heavy rescue, but usually specific to a discipline (such as swift water)

Search and rescue — can be discipline-specific, such as urban, wild land, maritime, etc.

Wildland fire suppression — to suppress, detect and control fires in forests and other wildland areas

Bomb disposal — to render safe hazardous explosive ordnance, such as terrorist devices or unexploded wartime bombs

Blood/organ transplant supply — to provide organs or blood on an emergency basis, such as the National Blood Service of the United Kingdom

Emergency management — to provide and coordinate resources during large-scale emergencies

Amateur radio emergency communications — to provide communications support to other emergency services, such as RAYNET in the UK

Hazmat — removal of hazardous materials

Air search – to provide aerial spotting for the emergency services, such as that conducted by the Civil Air Patrol in the US, or Sky Watch in the UK

### 3.3.1 Organization of Emergency Services in EU Countries

#### Norwegian Police

The National Police Directorate, located in Downtown Oslo, is the central administration for the Norwegian Police Service. It conducts management and supervision of the specialist agencies and police districts, including organizational development and support activities. The directorate is led by the National Police Commissioner, who, since 2012, has been Odd Reidar Humlegård. The National Criminal Investigation Service is a national unit which works with organized and serious crime. It both works as an assistant unit for police districts, with special focus on technical and tactical investigation, in addition to being responsible on its own for organized crime. It acts as the center for international police cooperation, including participation in Interpol and Europol. The National Authority for Investigation and Prosecution of Economic and Environmental Crime is responsible for complex cases of economic crime and acts as a public prosecutor for those cases. The National Police Immigration Service registers and identifies asylum seekers and returns those which have their applications rejected. The National Mobile Police Service is based in Stavanger and operates throughout the country. Their primary role is as highway patrol and manages the police reserves, although they also assist police districts in extraordinary events where extra manpower is needed or where they are in the vicinity.

The Norwegian Border Commissioner is located in Kirkenes and is responsible for managing the Norway–Russia border and upholding the border agreement. Special consideration is needed as it is the only non-Schengen Area land border of Norway. Border controls are the responsibility of the respective police district. The National Police Computing and Material Service is responsible for managing the police's information and communications technology, procurement, security and real estate. Norway has two joint rescue coordination centers, one for Northern Norway located in Bodø and one for Southern Norway located in Sola. Their jurisdiction border goes at the 65th parallel north (Nord-Trøndelag–Nordland border). Organizationally, they are directly subordinate to the Ministry of Justice and the Police, although their operations are subordinate to the chiefs of police in Salten and Rogaland, respectively. The Police Security Service is Norway's security agency; although considered a law enforcement agency, it is not either subordinate to the National Police Directorate nor part of the Norwegian Police Service.

Metropolitan Norway is divided into 27 police districts. Each district is further subdivided into local police stations and rural police districts, the latter led by a sheriff. Each police district is headquartered at a main police station and is led by a chief of police. Police districts hold a common pool of resources and personnel and have common administration and budget. Each district has a joint operations center which also acts as an emergency call center for 112. Many of the larger districts have their own execution and enforcement authority, while this is integrated in the smaller districts. The size of the police districts varies, from Oslo with 2,500 employees and covering a population of 570,000 to Eastern Finnmark which has 160 employees and 30,000 residents.

Each district has specially-trained mobile units for armed and other challenging missions, and dog units for narcotics and search and rescue missions. The police districts also have police boats for coastal waters and selected lakes, with focus on driving under the influence, speeding and environmental monitoring. In Troms and Finnmark, the Reindeer Police are responsible for monitoring and supervising reindeer husbandry and environmental supervision. As of 2009 there were 301 rural police districts, 68 local police stations and 10 execution and enforcement authorities.

Oslo Police District has a series of special divisions and task forces which provide aid to all other police districts when necessary. It is responsible for the two police helicopters, which are mostly, used for traffic motoring, search and rescue and apprehension. The Emergency Response Unit is a

deployment unit for terrorism, sabotage and hostage incidents, which is separate from the crisis and hostage negotiation service. Oslo's dog patrol service includes the national bomb squad. The departments have a mobile deployment squad against demonstrations and riots, a Police Negotiation Unit for use against barricades and kidnapping, a mounted police, and the responsibility for protecting high-ranking government and royal officials.

Svalbard is not part of the regular police district; instead its law enforcement is handled by the Governor of Svalbard. He holds the responsibility as both country governor and chief of police, as well as holding other authority granted from the executive branch. Duties include environmental policy, family law, law enforcement, search and rescue, tourism management, information services, contact with foreign settlements, and adjudication in some areas of maritime inquiries and judicial examinations.

## Swedish Police

Swedish government authorities enjoy a high degree of independence. Under the 1974 Instrument of Government, neither the Government nor individual ministers have the right to influence how an agency decides on a particular case or on the application of legislation. This also applies to the Swedish police, who instead is governed by general policy instruments, such as laws passed by the Riksdag and by the appointment of executives. The Swedish Police Authority is led by a National Police Commissioner, who is appointed by the Government and has the sole responsibility for all activities of the police. The Commissioner holds regular meetings with a non-executive Public Council to satisfy the need for transparency, and is assisted by the Commissioner's Office, tasked with managerial support and performance management. The agency is organized into seven police regions and eight national departments. Six of the eight national departments are responsible for various support processes needed for day-to-day operations (e.g. communications, finance and human resources). The other two are the National Forensics Centre and National Operations Department. Furthermore, there is an internal auditing unit, reporting directly to the Commissioner, and the Special Investigations Division. The internal auditing unit reviews and proposes changes to the internal control and governance of the agency, while the Special Investigations Division deals with professional misconduct. In 2014, the Swedish Police Authority had 28,689 employees, 8,638 of whom were civilian employees, making it one of the largest government agencies in Sweden. The number of employees has increased approximately 18 per cent since 2004. The biggest union is the Swedish Police Union with about 20,500 active members.

## 3.4 Operational Aspects Analysis

### 3.4.1 Organization of Emergency Services in EU Countries

#### Norwegian Police

Norway has a unified police, which means that there is a single police organization and that police power and prosecutor power is not granted to other agencies within Norway. The sole exception is the military police, albeit it only has jurisdiction over military personnel and on military installations, except during martial law. The police are decentralized and generalized to allow a more flexible resource allocation, while remaining under political control. This entails that police officers have no geographical or sector limitations to their powers. The Police Act and several special laws regulate the agencies and the officer's powers and responsibilities. The police are required to assist other public institutions, including the healthcare authorities, and can be asked by other agencies to assist

when it is necessary to enact a decision by force. Conversely, the police can ask for assistance from the Coast Guard when necessary. The police are responsible for all responses against terrorism and sabotage unless Norway is under armed attack.

Responsibilities and functions related to security includes patrolling, continual emergency availability, highway patrolling, sea patrolling, coordination of search and rescue activities, embassy security and a bodyguard service for members of the government, the royal family and other in need. The crime fighting responsibility is split between preventative measures, such as information, observation and controls, and consequential measures, such as investigation and prosecution. The police further have duties related to civilian court cases, such as writ of execution, evaluation of natural damage, assisting the courts after bankruptcies and functioning as a notary public.

The police have a series of functions related to public management, such as the issuing of passports, firearms licenses, police certificates, permissions for lotteries and withdrawal of driving licenses, approval of security guard companies and bouncers, recommendations to municipal councils for issuing alcohol sales licenses, approval of second-hand shops and arrangements which are otherwise unlawful, dealing with unowned dogs and animals in the care of people sentenced unsuitable to hold animals.

The police also have the responsibility for prisoner transport during detention, including transport to and from court. The police serve as border guards for the outer border of the Schengen Area. The busiest are Oslo Airport, Gardermoen, which has 130 man-years tied to it, Storskog on the Russian border and Sandefjord Airport, Torp. These are the only borders with designated border employees—all the others are manned with regular officers. The police are not responsible for customs, which is the responsibility of the Norwegian Customs and Excise Authorities. Norway participates in a series of international police cooperation, such as Interpol, Europol, the Schengen Information System, Frontex, and the Baltic Sea Task Force on Organized Crime. Norway also has a close cooperation with the other Nordic police forces. The Norwegian Police Service occasionally participates in international operations.

In 2011, the police force had 746,464 assignments, the most common with 180,000 assignments being investigation cases, such as reported deaths, controls and reports of motor vehicle theft. This was followed by traffic assignments, public disturbance of peace, animal cases, theft, private disturbance of peace, and sickness and psychiatry. Seventy-five percent of assignments is solved with a single patrol, while ninety percent is solved with one and two. In armed situations only twenty percent is solved with a single patrol. In 2010, the Norwegian Police Service had 13 billion Norwegian kroner in costs, seventy percent of which was used on wages. It employed 13,493 man-years, or 1.6 man-years per 1000 residents. There were 394,137 reported offenses, or 81.1 per 1000 people, 46 percent of which were solved. There were 5,399 debt settlements, 226,491 applications for writ of execution, 195,345 immigration cases and 4,615 forced returns.

## Swedish Police

The National Operations Department (Swedish: Nationella operativaavdelningen) is tasked with assisting the local police regions and is in charge of international police cooperation and all national operations. The head of the department, currently Mats Löfving, serves as the Deputy Director of the Swedish Police Authority. The department has the power to allocate extra resources, if needed, and has a mandate to initiate nationwide operations and activities. It is also responsible for investigating crimes as prescribed by law to be conducted at the national level, such as corruption and war crimes. Furthermore, it handles all contacts with the Swedish Security Service, Armed Forces and the National Defense Radio Establishment, and manages sensitive information about terrorism and signals intelligence. The department acts as a secretariat for the Swedish Economic Crime Authority

and also supervises the National Task Force along with: police aviation, witness protection, undercover operations, border control operations, complex computer crimes, the bomb disposal units and some criminal intelligence operations (regarding e.g. serious organized crime).

The agency is organized into seven police regions, based on the geographical boundaries of several counties, where each region has an overall responsibility for the police work in their geographical area. The work is organized under a regional secretariat, operations unit, an investigations unit and intelligence unit—all led by a Regional Police Chief. Police regions generally investigate crime without a strong local connection and less common crimes, requiring specialized knowledge or the use of special surveillance methods or technologies not typically available at lower levels in the agency. There are also 27 police districts—organized under the regions—tasked with leading, coordinating, monitoring and analysing the operational activities in their geographical area, which is typically based on the boundaries of a county. The work is organized under a secretariat, an investigations unit and intelligence unit, plus a unit for the local police areas—all led by a District Police Chief, who in turn answers to a Regional Police Chief. The districts are responsible for inter alia, serious crime or more complex criminal investigations (e.g. murder) and other cases where it may be inappropriate for the local police to handle investigations, for example sex crimes or cases involving domestic violence. At the bottom of the organizational ladder there are 85-90 local police areas, forming the bulk of the police. Local police areas are based on the boundaries of one or more municipalities, or in the case of larger metropolitan areas, several boroughs. The local police are responsible for the majority of all police interventions, general crime prevention, the traffic police, as well as basic criminal investigation duties. There are between 50-180 employees in a typical local police area, or at least one local police officer per 5,000 inhabitants in disadvantaged areas. In 2014, a government report expected that the local police would account for about 50 per cent of all police interventions, post-reorganization.

### 3.4.2 Germany, United Kingdom, Spain

#### Germany

The Federal Ministry of Interior (BMI) controls the Federal Office of Civil Protection and Disaster Assistance (BBK-Bundesamt für Bevölkerungsschutz und Katastrophenhilfe) in Germany. This organization was established in May, 2004 as a governmental response to new threats such as 9/11 and the 2002 Elbe flood because of the immediate need for a central organizational element in charge of civil safety.

The BBK provides information about emergency management not only with the federal government agency (BMI) but it also works in coordination with the federal states (Land). The organization is established for:

- fulfilling the tasks of the Federal government with regard to civil protection and coordination of international cooperation
- preparing national and area risk analyses, hazard cadasters and emergency planning, and providing coordination of the civil-military-police cooperation
- providing conceptual planning and interdisciplinary coordination of the protection of critical infrastructures
- ensuring national information, communication and resource management in case of damage
- providing coordination of technical-scientific research with regard to civil protection and protection against weapons of mass destruction

- ensuring threat-adequate civil protection training of executives at high and highest administrative levels
- providing national coordination of the European integration process in the area of preventive civil safety
- providing disaster medicine

BBK has other federal bureaus to accomplish those tasks. The organization also has a training institution: Academy of Crisis Management, Emergency Planning and Civil Protection (AKNZ) which serves with 80 employees and 32 lecturers about emergency management issues in Germany. BBK is the main coordination center for different agencies, such as German disaster relief (Katastrophenschutz) and civil defense (Zivilschutz) programs. Other federal organizations, such as the German fire department and the Technisches Hilfswerk (Federal Agency for Technical Relief, THW), also take part in immediate response. BBK is responsible for calling related federal ministries and other organizations, such as telecommunications companies, financial organizations and transportation institutions, for help. The German Armed Forces (Bundeswehr) can also be deployed for disaster relief operations by the suggestion of BBK crisis committee. Other international organizations, such as EU Disease Control, IFRC and other border country help, are also coordinated by BBK in Germany.

Besides governmental institutions and authorities, non-governmental organizations (e.g. German Red Cross, the Workers' Samaritan Federation Germany, the Deutsche Lebens-Rettungs-Gesellschaft (German Life Saving Federation), the Johanniter Emergency Service and Malteser Germany) are integrated into the CM system as well as the fire brigades (run by the municipalities), rescue services and the Federal Agency for Technical Relief.

## United Kingdom

Like those of other European countries, the UK's emergency management policies were dependent on the Second World War plans and strategies.

These strategies aimed to decrease the civilian casualties during the Cold War by establishing a civil protection clause. These policies, however, remained local and the UK Government wanted the local authorities to manage emergencies and do the disaster preparedness and evaluation by themselves. As a response to the need of a central governmental agency, the Civil Contingencies Secretariat (CCS) in the Cabinet Office was established in July 2001.

The increasing number of terrorist incidents throughout the world beginning with 9/11 brought questions about the sufficiency of CCS. For that reason, the Civil Contingencies Act was passed in 2004. The aim of the act was to provide collaboration to a range of organizations to assess the UK's potential man-made or natural emergencies.

CCA explains the local and governmental agencies' responsibilities of the stakeholders of the emergency planning system in depth (O'Brien and Read, 2005). The CCA policies went into another change after the London Bombings in July 2005. The civil protection term was changed into resilience which is used for organisms that adapt themselves to the environment in a pro-active way to prevent damages and hazards that will be sourced from the outside. The CCS defines the resilience as "The ability at every level to detect, prevent and if necessary handle disruptive challenges" (Wood-Heath and Annis, 2004). UK Resilience is provided by CCS and the other regional emergency organizations, such as police, fire brigades and health institutions. Emergencies are classified in CCA as terrorist contingencies and non-terrorist contingencies. The head of any non-terrorist contingency responders in the UK is Civil Contingencies Committee formed by the related ministries in the cabinet organized by CCS. This committee is supposed to coordinate the emergency response by the UK Government during a non-terrorist emergency, such as a flood or an earthquake etc. In the terrorist contingencies,

a committee headed by the Prime Minister gathers in Cabinet Office Briefing Rooms (COBR) in the Cabinet Office.

Although the cast changes due to the attribute of the incident, the other members of the COBR are generally the fire service minister, junior ministers from the Ministry of Defense, officials from the Department of Transport and the Home Office, the representatives from the UK security services and civil servants from other relevant departments. CCS also does the co-ordination of volunteers. The greatest volunteer group is the Disasters Emergency Committee (DEC) which includes most of the other NGO Emergency Organizations, such as ActionAid, British Red Cross, CAFOD, Care International, Christian Aid, Concern Help the Aged, Islamic Relief, Merlin, Oxfam, Save the Children, Tearfund, and, finally, World Vision. DEC organizes many rescue and disaster preparedness studies worldwide. It is funded by public donations. Among other international aid organizations, DEC is supported by the UK Government as well.

The CCS trains the volunteers and other officials via the Emergency Planning College. The college provides fora and lectures for “representatives of local and Central Government, the emergency services, the private sector and volunteer groups to network and share good practice”.

## Spain

The Ministry of Interior is the main responsible for national emergencies in Spain like in the other European countries we examined. Highly decentralized autonomous regions are responsible for the first response, coordination of the rescue efforts, evaluation and preparedness works if the case is not a national emergency. General Directorate for Civil Protection and Emergency (Dirección General de Protección Civil y Emergencias, DGPCE) is the national center for emergency management studies under the Ministry of Interior. DGPCE is responsible for:

- Preparation of national civil protection plans
- Simulation of those plans nationally or regionally, implementing risk analyses, building risk structures and planning, training of citizens and volunteers against disasters, building and suggesting necessary infrastructure for mitigation and preparedness efforts
- Coordinating, requesting help of international emergency management organizations and/or Military Units in Spain if necessary. Spanish Catastrophic Emergency Plan defines the action boundaries for the emergency managers. There are three levels for response to an emergency. The first level is for one municipality. Only the related municipality responds to the incident in Level One. The Level Two Alarm is for a regional activity among more municipalities. The highest level for an emergency is Level Three. This is the national level and DGPCE takes responsibility of the emergency efforts in this cross-regional or national level. After ETA attacks began, the government enacted a number of emergency laws that shared the responsibility among the regional and national agencies. The local and national police, fire brigades, the task forces and volunteers were officially assigned to handle the emergencies especially after Madrid 2004 bombings. DGPCE also trains volunteers and others assigned to the emergency efforts. The name of the education center is National School of Civil Protection (la Escuela Nacional de Protección Civil, ENPC) and it is directed by DGPCE. ENPC is responsible for making national disaster plans, training the local and national emergency forces and volunteers. ENPC is connected to other education centers in Europe and thus shares experience with the other colleagues in other countries via conferences and seminars worldwide.

## 4 INVESTIGATION OF RESOURCE SHARING OVER COUNTRY BORDERS (HUMAN RESOURCES, EQUIPMENT, FINCAIL AID)

Resource sharing over country borders is essential since European security shall be improved through an increased Member States' cooperation. This is a main priority for cross border operations as stated in Schengen Agreements. A stronger support to achieve operational field interoperability is given by the article 222 of the Treaty of Lisbon. Under this clause, also called "mutual solidarity", the Union shall mobilize Member States resources to assist other Member States in case of terrorist attacks or in case of natural/man-made disasters. Below we will examine the major legal/agreements status and the resources sharing in terms of human resources, equipment and financial aid.

### 4.1 International Disaster Response Guidelines

Basic Guideline Provided by the IDRL Guidelines of the International Federation of Red Cross and Red Crescent Societies.[1]

Based on the IDR Guidelines, affected States have the primary responsibility to ensure disaster risk reduction, relief and recovery assistance in their territory. If an affected State determines that a disaster situation exceeds national coping capacities, it should seek international and/or regional assistance to address the needs of affected people. Affected States have the sovereign right to coordinate, regulate and monitor disaster relief and recovery assistance provided by assisting actors on their territory consistent with international law.

Assisting actors and their personnel should abide by the laws of the affected State and applicable international law, coordinate with domestic authorities and respect the human dignity of disaster-affected people at all times. States and assisting humanitarian organizations should cooperate to prevent unlawful diversion, misappropriation, or fraud concerning disaster relief or initial recovery goods, equipment or resources and initiate proceedings as appropriate.

Affected States should use funds and relief goods donated to them, and which they have accepted in relation to a disaster, in a manner consistent with the expressed intent with which they were given.

### 4.2 The European Framework for Disaster Recovery

The main frameworks are provided by the European civil protection mechanism, cooperation based on a bilateral or multilateral agreement and, finally, cross border cooperation. [2]

#### The main Authorities and Agreements

- Civil protection is first and foremost the responsibility of the State.
- The European civil protection mechanism is the main Community mechanism used to provide disaster relief.
- Reciprocal assistance agreements. [2]

### **Assistance may include [2]**

- Loan of radio terminals
- Mobile phones
- Gateways
- Semi-roaming
- Direct mode
- Transportable base stations or networks

### **Special Agreements [2]**

- Sweden-Norwegian, Sweden-Finland, Sweden-Denmark co-operation
- Norway-Sweden ISI under development
- Belgian-Netherlands co-operation
- German-Netherlands co-operation
- German-Belgian-Netherlands co-operation

## 5 ESTIMATION OF REACTION TIME IN VARIOUS OPERATIONAL SCENARIOS UNDER EXISTING FRAMEWORK

### 5.1 Examination of Historical Events

- Maundy Thursday cross border partying [2]
- The Hercules accident
- (B/NL) Eneco speed cycling race (V&J)

#### 5.1.1 Findings on the historical Events

- Reaction times are acceptable when there is preparation before a possible emergency event (known event).
- Even in known events, under existing frameworks, there may be delays in mobilizing resources other than what was initially planned.
- Communications is a key aspect that distinguishes a cross border, international operation from a national operation in terms of reaction times.
- The reaction time is one of the most critical factors for a successful outcome.

#### 5.1.2 Operation Estimation Time Specific Example: Hot pursuit Germany-Belgium-Netherlands

15 minutes to Position suspects, making jointly operational approach

Different technologies: Mobile radio C2000 National, Telephone – Schengen [2]

#### 5.1.3 Effects on Reaction Time because of Communications in a Simple Case

Assuming a ground rescue team has to be moved in a location outside country borders. The team should be able to communicate with:

- The home base
- The operations centre
- Other teams in the field

Under the existing framework, the team should be:

- Provided with proper devices with set up that will work in the new location. EST: 1Hour
- Trained on the new dialing procedure. EST: 2 hours
- Understand the legislation of radio communications in the new location. EST:1 Hour
- Able to maintain two communication channels with home and abroad operations during the operation: Continued Delays

This is an optimistic estimation since it assumes that tools and training materials are available immediately in a manner that can be useful to the remote team.

## 6 ESTIMATION OF REACTION TIME IN VARIOUS OPERATIONAL SCENARIOS BY DIRECTLY ESTABLISHED CROSS BORDER COMMUNICATION INTEROPERABILITY

The ISITEP proposed solution is de facto near a semi-roaming solution, which currently only exists in the TETRA-TETRA intersystem combination (please see D2.1.2, section 3.2.4).

Concerning the TETRAPOL-TETRAPOL interoperability, the innovative objective of ISITEP is precisely to implement a semi-roaming solution. This implies:

The possibility for a TETRAPOL terminal (one box) to migrate from a TETRAPOL network A to a TETRAPOL network B.

The possibility for the terminal user to choose between a manual migration and an automatic migration, via an easy way to change terminal setting.

To be able to perform dual provisioning, meaning to program the same subscriber and group numbers in the DB of two different TETRAPOL networks.

To interconnect the TETRAPOL networks A and B with a gateway transmitting both voice and SDS.

The visited TETRA network has to pre-provision terminal numbers belonging to its visiting TETRAPOL network(s). These numbers will be these of the TETRA modem of the visiting enhanced terminals. The corresponding approach is also applicable for the visited TETRAPOL network.

In this case, the innovative objective of ISITEP centres on the development of the enhanced terminal. This should offer the following highlights:

- The possibility for the terminal user to choose between a manual migration and an automatic migration, via an easy way to change terminal setting.
- A straightforward and easy way to use unique control panel displaying the active group, the active network and the selected folder; and supplying the following commands: on/off, PTT, volume, manual/automatic migration, group selection, emergency button.
- Menus should notably enable to access a more “technical” display (signal strength received at both modem levels) and to the SDS management.
- Seeing national networks typically overlap and seeing the enhanced terminal has two modems, a seamless automatic migration should be quite easily implemented, e.g. by developing location awareness at smartphone level.
- Emergency call target should be also quite easily determined in function of the terminal GPS position.
- SDS exchange between TETRA and TETRAPOL users (from their enhanced or plain mono-technology terminals) should be possible.

### 6.1 Scenarios that highlight the importance of proper communication mechanisms

**Scenario 1.** An ambulance is approaching a border crossing while responding to a mutual aid request in the other country. The ambulance cannot communicate with the border crossing personnel by radio to alert them that they are approaching. Upon reaching the border, the EMS personnel must be checked and cleared before they are allowed to proceed. The ambulance is not able to communicate with the agency which has requested their assistance. They arrive at the scene of the emergency and

are not able to communicate with their dispatch center or the physician at the hospital in their home country. 3 In another scenario, a fire truck is approaching the border while responding to a request for emergency assistance. Like the example above, the fire truck may be delayed at the border crossing before receiving clearance to proceed. The firefighters are not able to communicate with the incident commander or fire trucks already on the scene of the emergency. The incident commander at the scene of the house fire cannot tell the incoming fire truck to stop and connect to a designated hydrant.

**Scenario 2.** When a large wild land fire occurs near the border, local, state/provincial, and federal fire agencies all respond. Dozens of emergency vehicles will be operating on both sides of the border in an attempt to control the fire. It is essential that all personnel be able to communicate directly with each other, regardless of their country of origin. The fire does not respect the international border and emergency personnel must frequently cross the boundary to coordinate their activities. In all of these cases, emergency vehicles must cross the border to provide public safety services. Delays have been reported for a variety of reasons, including confusion at the border crossing when an emergency vehicle arrives unexpectedly. A fire engine was detained at the border crossing while firefighters were trying to respond into the call to assist at the scene of a house fire. Lack of direct radio communications between the incident commander at the scene of the fire and the fire trunk contributed to the delay, as did lack of direct communications between the fire trucks and the border crossing station.

**Scenario 3.** In other instances, the radio network of one country typically does not extend into the other country creating problems for emergency units who need to communicate with their home agency dispatcher.

At the core of all of these scenarios is the problem of ineffective cross border mission critical voice communications. This issue is impacted by existing spectrum management policy, technology, and governance.

Cross border emergency response is complicated because of the various types of emergencies that occur near the border and the variety of public safety agencies who need to respond. Most public safety agencies operating along the international border have experience in responding to the other country and have implemented local solutions with varying degrees of success. However, first responder agencies that are more distant from the border may be requested for high severity emergencies. These agencies typically do not have experience with border crossing procedures and are less likely to have appropriate cross border communications equipment and documentation. It should also be noted that secondary responders are often called to assist with major emergencies. These include transportation, utilities, and other critical infrastructure entities. A comprehensive cross border emergency plan must account for all of these responder organizations. It is also possible that an emergency event will impact the border crossing itself

Many public safety agency executives report that they do not have a clear understanding of their agency's legal status upon crossing the border. For example, once paramedic across into the other country can they still legally perform medical procedures and administer drugs? Is their ambulance legally considered an emergency vehicle and authorized to use lights and siren in the other country? Are they carrying narcotics and other drugs legally? The answer to these questions may depend on state and provincial regulations that are not consistent across the border region. There is not a standardized bi-national solution.

Based on data of Italian municipalities from 2000 to 2012, it is shown that an increase by a standard deviation of distance to the nearest hospital (5 km or 4minutes) increases the fatality rate by 13.84% on the sample average. This equates to a 0.92 additional death per every 100 accidents.

The following table demonstrates the probability of mortality as a function of response time. [3]

TABLE 3. Interval Response Times with Observed and Expected Deaths

Response Time	% Dead	95% CI*	Total Dead	n	Expected Deaths†
0–0.9 Min	0	(0, 7.55)	0	47	0.62
1–1.9 Min	0	(0, 5.13)	0	70	0.92
2–2.9 Min	0.57	(0.01, 3.12)	1	176	2.30
3–3.9 Min	0.48	(0.06, 1.71)	2	419	5.48
4–4.9 Min	0.60	(0.16, 1.52)	4	669	8.76
5–5.9 Min	1.82	(1.04, 2.94)	16	879	11.51
6–6.9 Min	1.52	(0.83, 2.54)	14	921	12.06
7–7.9 Min	1.57	(0.79, 2.79)	11	701	9.18
8–8.9 Min	1.92	(0.92, 3.49)	10	522	6.83
9–9.9 Min	2.02	(0.81, 4.11)	7	347	4.54
10–10.9 Min	1.34	(0.28, 3.86)	3	224	2.93
11–11.9 Min	2.16	(0.45, 6.18)	3	139	1.82
12+ Min	0	(0, 1.18)	0	310	4.06
TOTAL	1.31	(1.02, 1.65)	71	5,424	

\*For observed proportions of zero, one-sided, 97.5% confidence intervals (CIs) are reported.

†Expected stratum-specific death counts based on the overall rate of 1.31%.

Table 1. Internal Response Time with Observed and Expected Deaths

The following diagram shows when resources are needed in case of a state emergency. [4]



Figure 1. Needs for resource availability in relation with emergency event time

## 6.2 Estimation of effects on Reaction Time because of Communications in a Simple Case with communication interoperability

Assuming:

Developments in Policy, Process or Procurement, Technology

Mission oriented procedures, functional models and legal agreements

-A European network solution integrating all types of European national PPDR networks through a novel Inter System Interface (ISI) over IP protocol encompassing:

- ETSI standardized ISI among TETRA national networks
- ISI over IP gateways among national TETRAPOL networks
- ISI over IP gateways among TETRAPOL - TETRA networks
- Bi-technology terminals based on smartphones/tablets with PPDR applications
- Supporting tools to assess business sustainability, technology needs and improve training

A ground rescue team has to be moved to a location outside country borders. The team should be able to communicate with

- The home base
- The operations centre in the other country
- Other teams in the field

Under the proposed framework, the team should be:

- Provided with proper devices with set up that will work in the new location. EST: Not Applicable
- Trained on the new dialing procedure. EST: 30 Minutes
- Understand the legislation of radio communications in the new location. EST: 30 Minutes
- Able to maintain two communication channels with home and abroad operations during the operation: Not Applicable

Tools and training materials are available immediately in a manner that can be useful to the remote team.

## 7 CONCLUSIONS

This deliverable is the first deliverable issued by WP6.3. It provides analysis of End-user Organizational and Operational aspects associated to cross-border incidents, investigation of resource sharing over country borders (human resources, equipment, and financial aid) and estimation of reaction time in various operational scenarios. Below we will summarize the findings and the observations for the topics under examination.

### 7.1 End-user Organizational and Operational aspects associated to cross-border incidents communication

Different end-user groups define different needs and issues with the existing frameworks as well as new opportunities within a new friendlier, interoperable communications framework for border incidents.

The main end-user groups that have been identified are:

#### End user/First responder organisations

- a. Radio terminal users migrating and communicating cross border, including leaders in the field
- b. Control room personnel – leaders and operators
- c. End user support services - responsible for radio terminal programming and other support related to the end users' network usage.

#### - Network owner/operators

- a. National body responsible for network security, capacity, coverage and robustness. Responsible for implementing ISI in the network and for developing procedures for allowing foreign radio terminals to migrate to and from the national network.
- b. Operation centers for 24/7 monitoring and maintenance of the network.

#### - Network suppliers/manufacturers

Network suppliers/manufacturers sell and develop PPDR network technology and develop new functionalities to be implemented in the networks, such as ISI – cross network communication gateways.

For End user/First responder organisations the main needs are:

- A single Channel of communication with home and offshore operation centers
- Familiarity with the structure and organization with the authorities of the offshore location
- Familiarity with the legislation for radio communications in different countries (possible a common framework)
- Familiarity with the tools and equipment that will have to use in a crossborder incident in order to collaborate with teams and services from different countries
- Identification of common terminology, language and methods of communication.

Intervention teams on the field.

-Ability to monitor and communicate fast and accurately with teams of different services and even different countries.

The End user/First responder organisations include their leader(s) on the field (integrated in intervention teams or in mobile command rooms) or in control rooms.

For Network owner/operators the main needs are:

-Clear legislation and technology framework that will enable the technical-operational conception, design and implementation of the radio communication system.

-The data bases provisioning, the technical-operational parameters adjustments and the technical maintenance.

The same needs apply for Network suppliers/manufacturers.

## 7.2 Estimation of reaction time

Reaction times may be improved by 75% in terms of communication readiness with the new framework and almost eliminate delays during the operation since the first responders will not have to maintain two or more communication channels with home and abroad operation centers and teams.

This is very important as for most emergency cases the reaction time can be the single most critical factor of success. Data coming from various sources point out how critical the reaction time is for life saving and crime prevention operations.

Also it is of great importance how confident the first responders and the control and coordination teams are regard the ability to communicate and co-operate offshore.

The proposed framework by establishing common rules, methods and technology with training tools will make possible to reduce communication establishment times and avoid confusion and false communication during the operation.

## 7.3 Cross border co-operation

-Regarding cross border co-operation. The cooperation method depends on whether the operation is pre-planned or if it is the occurrence of an emergency event. Pre-planned cooperation is planned at supervisory level. Upon acute events there is a direct cooperation between the involved police districts.

-Some districts which have a border with neighboring countries have plans for handling assignments related to the border and assistance to neighboring countries. Currently there are not any steady state operations (on-going) (e.g. Common fire patrols) and no resource sharing (Net, equipment, other resources, Med) for most of EU countries.

-In Norway, the police supersede all shared resources where there are efforts from different agencies. This also applies to forces / crews coming from neighboring countries. In Sweden, it is the rescue service which leads joint efforts. The differences in structure and organization in EU countries makes a common framework of cooperation necessary.

-In some cases a Tetra and GSM / Satellite phone are used for communication. Currently, there is a "Pandora Solution" (a back-to-back solution) that works in the border area (very limited area). This is

used when if possible. Outside this area Tetra DMO talk groups are used locally. Other communication takes place using commercial GSM / Satellite phone.

-Regarding the free movement of people within the European Union based on Title III of the EC Treaty, European citizens are authorized to move freely between the various Member States. Chapter 1 concerns the right of workers to move freely within the Union without being subject to discrimination. Free movement of labour was granted through regulation 1612/68/EEC.

-At the moment, many requests for crossborder cooperation have an informal nature. This can be seen as the granting of legal means in the customs domain.

## 8 REFERENCES

- [1] Introduction to the Guidelines for the domestic facilitation and regulation of international disaster relief and initial recovery assistance, International Federation of Red Cross and Red Crescent Societies, 2011
- [2] ISITEP D2.1.2 Usage Candidate Scenarios v1.0, November 2014
- [3] Response Time Effectiveness: Comparison of Response Time and Survival in an Urban Emergency Medical Services System, THOMAS H. BLACKWELL, JAY S. KAUFMAN, 2002
- [4] Emergency Preparedness & Response Plan, Pacific Humanitarian Team, 2013



## APPENDIX A

### Survey questionnaire

SP6 : Supporting tools

WP 6.3 Business Sustainability

Task 6.3.1 European cross Border collaboration survey

Document Title: Survey questionnaire

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Net Technologies

### IEPWP 6.3.1 European cross-border collaboration survey V 1.0

**Scope:** This survey will be conducted within WP 6.3.1, in order to create a draft deliverable regarding the identification of the End-user Organizational and Operational aspects associated to cross-border Incidents, resource sharing over country borders and estimation of reaction time in various operational scenarios.

Every piece of information provided will be managed as confidential and will be used only for the mentioned scope within our organization. What we want is formal directives, if any, from EU authorities or other Body.

Please note that we mainly want formal guidelines or results of previous cases your organization faced.

We are trying to get information from other sources as well.

### Survey Questions

\* Describe the process of an initialization of a cross-border Operation (flow diagram if possible)

**a. Formal guidelines** .....

**b. Best Practices** .....



\*Is there any standard Operating Procedure (SOP) to control such cross-border operation?

**a. Formal guidelines** .....

**b. Best Practices** .....

\* Are there, currently, any steady state operations (on-going) (e.g. Common fire patrols...)?

\* If yes, is there any resource sharing (Net ,equipment , other resources, Med) ?

**a. Formal guidelines** .....

**b. Best Practices** .....

\* Who is planned to manage foreign resources?

**a. Formal guidelines** .....

**b. Best Practices** .....

“Lately we became witnesses of an incident in the US which took place at some state borders, where police force of one state arrested fire dpt. force of another state due to their refusal to move their vehicles during a MEDEVAC( Medical Evacuation).

Who is in charge in a case where national forces of different branches (Police, Fire brigade etc.) operate on the same scene?”

\* Who is in charge at a case where national forces of different branches (Police ,Fire brigade etc.) operate on the same scene ?

**a. Formal guidelines** .....

**b. Best Practices** .....

“Who is in charge of a cross-border operation where forces from different states (nations) operate on the field?”

**a. Formal guidelines** .....

**b. Best Practices** .....

“During cross-border operation, where do the forces report and who is the decision maker?” **a. Formal guidelines** .....

**b. Best Practices** .....

\* What is the approach at the case of different SOP

**a. Formal guidelines** .....



**b. Best Practices** .....

“Is there a centralized command post or a launched command post?”

\* Who is responsible to deploy men and operate that post?

**a. Formal guidelines** .....

**b. Best Practices** .....

“Is there a cost estimation table for cross-border forces deployment?”

**a. Formal guidelines** .....

**b. Best Practices Non Applicable**.....

“Is there communication interoperability between different branches of national forces (Border police - Fire fighters/brigade - Med)?”

**a. Formal guidelines** .....

**b. Best Practices Non Applicable**.....

\* According to previous experience & knowledge (if any)

\* What is the reaction time to various operational scenarios (cases that you have already encountered)?

**a. Formal guidelines Non Applicable** .....

**b. Best Practices** .....

\* What is the estimation of establish a cross border communication and how that will be implemented (Flow diagram if possible) ?

**a. Formal guidelines Non Applicable** .....

**b. Best Practices** .....

\* Currently, during border operations ,do you use a common or different Operational (OPS) and Service Supply( OSS ) communication network?

**a. Formal guidelines** .....

**b. Best Practices** .....

**Useful clarifications / Statement of Confidentiality**

The above mentioned term “**Formal guidelines**” describes EU guidelines among agreements of the member states, the guidelines of each particular country/state, or NCOs & any other international recognized body.

The “**best practices**” term describes what member countries usually do as a course of

practice, or the field decisions that have been taken by OIC (Officers in Charge)

Provide non classified information.

Every piece of information provided will be managed as confidential and will be used only for the mentioned scope within our organization.

The current survey is evolutionary and other versions may be released in the future according to the outcomes.

V 1.0 Created& Launched By NETFI

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