ISITEP

D7.5.1 - DEMONSTRATOR PLAN AND REQUIREMENTS

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Programme:	Inter System Interoperability for Tetra-TetraPol Networks
Project Acronym:	ISITEP
Contract Number:	312484
Project Coordinator:	Selex ES
SP Leader:	MOT

Document ID N°:	ISITEP_D7.5.1_20150928_V1.0	**Version:**	V1.0
Deliverable:	D7.5.1	**Date:**	28/09/2015
		Status:	Approved

Document classification	**PUblic**

Approval Status	
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REVISION TABLE

Version	Date	Modified Pages	Modified Sections	Comments
Draft1	31/08/2015			First issue
Draft 2	02/09/2015	All	Mainly abstract and 2.1.	New reading
V1.0	28/09/2015	All	All	Final release

PUBLISHABLE EXTENDED ABSTRACT

This deliverable presents ISITEP WP 7.5 demonstrator plan and requirements related to the scenario describing a VIP protection service during a European summit in Brussels.

From the beginning, the goal assigned to this demo was to have an as realistic as possible environment in order to show on the most vivid way the added value of using international radio communications to support such an international event.

The current demonstrator plan has been established after consultation of the end user organizations and the manufacturers from the ISITEP consortium. French end user organization from the Advisory Board has besides been consulted. The demonstrator plan is the result of these consultations and the output of two working groups (operational and technical) including the Belgian Federal Police and both the Belgian radio system operator and manufacturer.

The document provides information on the demonstrator objectives and concept. Key Performance Indicators and performance targets are proposed for the evaluation.

D7.5.1 will be basis for D7.5.2 Demonstrator design.

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1. DEMONSTRATOR CONCEPT AND TEST PLAN

1.1. Demonstrator objectives

1.1.1. Functional objectives

The WP 7.5 aims to demonstrate the benefits of using the ISITEP mission oriented framework to manage the police aspects of a European summit in Brussels in an as realistic as possible environment.

In such a police operation, a visited country has to manage foreign delegations converging to a venue by different routes.

More specifically, in this case study, most of the delegations come by air towards the airport of Brussels national and then, by road, to the Brussels European area.

This is a typical case of “international visit mission” (see D2.3.2, section 3.1).

The WP 7.5 will therefore demonstrate (please see figure 1 below):

1. The benefit and the efficiency of the radio procedures for visitors coming by border entrance points, namely, following the “International Fleetmap Proof Of Concept” (IFPOC, see D2.3.2, appendix 3):
    a. The usage of the pan-European radio group interconnecting the National Contact Points “CO NCP-P EU”.
    b. The usage of the national (here Belgian) Euro Visit radio group “EV-P Be”.
2. The benefits to build up radio communication between the forces of the hosting country and the close protection services of the visiting VIPs, namely, following the IFPOC, the usage of national (here Belgian) Multi-Purpose radio groups “MP-P Be i”.

Moreover, some delegations coming from neighboring countries also come by road (Nl and Lu).

Therefore WP 7.5 will also demonstrate the benefit and the efficiency of the radio procedures in case of planned cross-border operation between two countries (here Belgium + a bordering country), which involves, following the IFPOC:

1. The use of cross-border coordination groups “CO-P BeXx” that allow foreign control rooms along the border to announce to their Belgian counterparts the imminent arrival of their VIP car escort at the border.
2. The usage of bi-national Multi-Purpose radio groups “MP-P BeXxi” for the forces on the field.

Eventually, the French delegation is coming by train (high speed train “Thalys” Paris-Brussels-Amsterdam). From the radio communication point of view, this case is similar to this of a delegation coming by air: no communication when crossing the border, but possible use of the Euro Visit radio group to announce the visiting team departure and arrival to the destination NCP.

Two reasons for this:

1. A cross-border region is rapidly travelled through when you are on board of a high speed train.

2. Radio communications in trains are sometimes difficult because of the usual poor network coverage in railway coaches.

This last point will be illustrated by the fact that, inside the Thalys, French and Belgian protection services will communicate between them using their own, respectively, TETRAPOL and TETRA terminals in Direct Mode (DMO), in combination with a deployable TETRA-TETRAPOL gateway to ensure the interoperability.

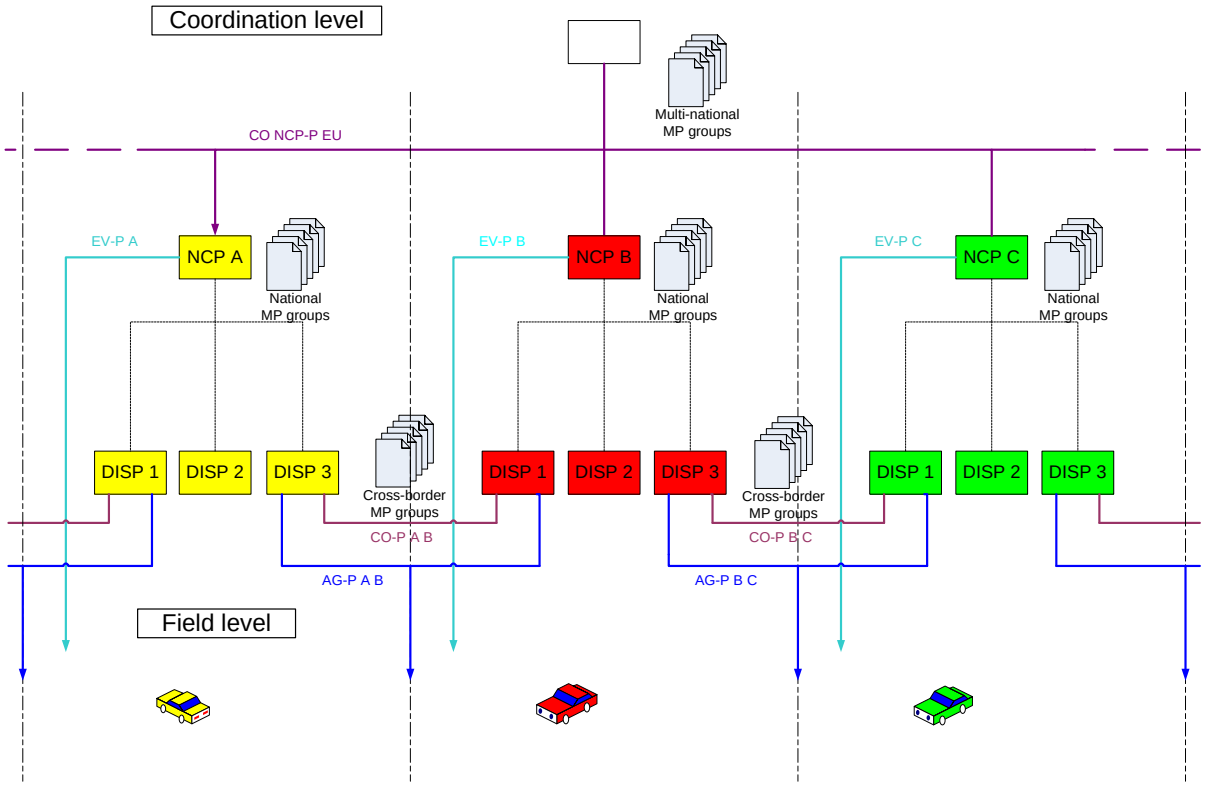

Figure 1: International police fleetmap when no international action is in progress (idle situation):

1. Routine information is exchanged across the borders or between NCPs via CO groups.
2. NCP are ready to respond on EV groups to any visitor coming through a border entrance point
3. Control rooms are ready to respond on AG groups to any unexpected incident coming from units in border regions

Remark: WP 7.5 will not demonstrate:

- The case of an unexpected cross-border intervention, namely, following the IFPOC, the usage of international Alert Groups “AG-P BeXx”.
  The case is handled by WP 7.2.
- Multi-agencies cross-border routine interventions or crisis management, namely, following the IFPOC, the usage of international Multi-Purpose “blue light” cooperation groups “MP-EM XxXx i” or of international Multi-Purpose all responders cooperation groups “MP-ALL XxXx i” groups.
  These cases are handled by WP 7.1 and WP 7.3.
- A “Full international mission” case (see D2.3.2, section 3.1), i.e. an operation which covers a large area of two countries or more, namely the usage of multi-national MP groups.
  This case is not handled as such by an ISITEP demo. The topic is however referred to in WP 7.5 via the incident in the train transporting football supporters from Amsterdam to Paris which will impact the French delegation route to the Brussels European summit.

	Routine Intervention	Planned operation	Unexpected intervention / Crisis	Multi-agency character
Cross-border mission (operation covering a border area)	WP 7.1	WP 7.4 WP 7.5	WP 7.2 WP 7.3	WP 7.1 WP 7.3
International visit mission (country hosting visitors)		WP 7.5		
Full international mission (operation covering large areas of several countries)				

Table 1: ISITEP demos sorted following the international mission types

1.1.2. Technical objectives

Next to the main functional objectives described in section 1.1.1. above, some technical innovative solutions will be demonstrated:

1. An ISI between two existing TETRA Airbus networks.
   The first located in Brussels (test network of the Belgian operator A.S.T.R.I.D. named “TAS”) and the second one in Diegem, near Brussels (test network of Airbus.be named “CTB”)
2. An ISI between a lab TETRA Airbus network in Finland and the TAS.
3. An ISI using an integrated version of the ISITEP E1-IP gateway between a lab TETRA Motorola network in Denmark and the TAS.
4. The ISITEP Enhanced Terminal (IET) as the solution to simulate roaming between a TETRA and a TETRAPOL network, in this case Astrid (Be) and Acropol (Fr).
5. The ISITEP deployable TETRA-TETRAPOL gateway to interconnect TETRA and TETRAPOL terminals working in direct mode (DMO).
6. Subject of the technical validation of the ISI between the TAS and the CTB and of a future agreement between Belgium and Germany, an ISI between the operative Belgian TETRA network Astrid in Brussels and the operative German TETRA network BOSNET in Berlin, both from Airbus.

	TETRA AIR / TETRA MOT	TETRA MOT / TETRA SES	TETRA AIR / TETRA AIR	TETRAPOL / TETRAPOL	TETRA AIR / TETRAPOL	TETRA MOT /TETRAPOL
WP 7.1	×					
WP 7.2	×	×				
WP 7.3				×	×	
WP 7.4						×
WP 7.5	×		×		×	

Table 2: ISITEP demos sorted following the innovative interfaces combinations

Remark:

The existing interim interconnection solutions included in the WP 7.5 setup will not be deeply tested (only their effectiveness) because they are not subject to research and development. They can however be taken as comparison point to assess the performances of the innovative ISITEP solutions.

1.1.3. Other objectives

Verification of the supporting tools “business sustainability” (WP 6.3) and “training and simulation supporting tool” (WP 6.2) on the base of input information coming from the demonstrated case study.

All the information and statements collected at the end of the demo will be analysed and evaluated in the WP 7.5 work progress and in WP 7.6 for further improvement.

1.2. Demonstrator concept

In order to make the functional demonstration as realistic as possible, it will be played, when possible (i.e. when some interim interconnection solutions are already effective), with the existing operative networks and on the real spots, based on a scenario developed by the same people who manage European summits in the real live.

In its maximalist version, the demonstrator will involve 8 networks depicting Belgium and delegations coming from 6 European countries: France, Luxemburg, Germany, the Netherlands, Denmark and Finland.

For security issues (reliability, confidentiality and integrity) the demonstrator’s operational setup and test setup will be technically independent.
Therefore, Brussels (i.e. the area between the airport and the venue) will be covered by both Astrid operative and test networks.

The following operative networks will be used:

1. Belgium (Astrid),
2. France (Acropol),
3. the Netherlands (C2000),
4. Germany (BOSNET).

The following test or lab networks will be used:

1. Astrid test system (TAS) duplicating Astrid in a part of Brussels,
2. Airbus.be test system (CTB) duplicating the network of Luxemburg in a part of Brussels,
3. Lab Motorola network in Copenhagen duplicating the Danish network,
4. Lab Airbus network in Helsinki duplicating the Finnish network.

Both test and operational setups are divided in a core/base part and an extension part, please see table 3 below.

Both extensions depend on the technical validation of the test setup core, namely the ISI between the TAS and the CTB.

ISITEP mission oriented framework Functional demonstration: international radio scheme and related procedures Relies on two independent technical setups	
Test setup	**Operational setup**
Core ISI E1 between **TAS** (Astrid test system) and **CTB** (Airbus.be test system)	Base • B2B and dual provisioning **Astrid**-**C2000** • B2B Astrid-**Acropol** • ISITEP Enhanced Terminal (IET) • ISITEP TETRA-TETRAPOL deployable gateway for **DMO** terminals
Extension • ISITEP ISI E1/IP between TAS and **Lab Motorola** • ISI E1 between TAS and **Lab Airbus.fi**	Extension (optional) ISI E1 between DXT Astrid Bru and DXT **BOSNET** Berlin

Table 3: WP 7.5 demo concept

1.3. Demonstrator test plan

1.3.1. Test setup

The test setup is constituted by 4 TETRA networks (TAS, CTB, Lab MOT and Lab AIR). The TAS, as depicting the Astrid network, has an ISI link with the 3 others. This enables the migration of terminals coming from the 3 other networks to the TAS and conversely.

The CTB as depicting the network of the Great Duchy of Luxemburg has a terrestrial border with the TAS, while Lab MOT and Lab AIR as depicting the networks of, respectively, Denmark and Finland have no overlapping with the TAS (see figure 2).

So, a border crossing will be tested between the TAS and the CTB while only a migration and an authentication will be tested between the Lab MOT and the TAS, and between the Lab AIR and the TAS.

Moreover, a bi-network radio group TAS-CTB and a four-network radio group TAS, CTB, Lab MOT, Lab AIR will be created and tested.

Remark:

In the test setup, the terminals will be upgraded with a new firmware that supports the TETRA-TETRA ISI functionalities.

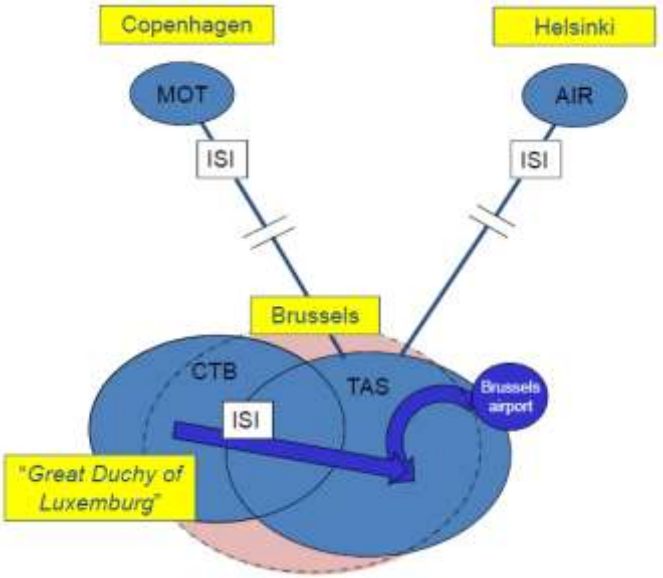

Figure 2 : WP 7.5 test setup

1.3.2. Operational setup

The operational setup is constituted by:

- 4 networks (3 TETRA and 1 TETRAPOL) playing their own role in the scenario.
- A tactical DMO bubble involving TETRA and TETRAPOL terminals on board of the Thalys high-speed train transporting the French VIP from Paris to Brussels.

The simulated ISI between Belgium (Astrid, TETRA Airbus) and the Netherlands (C2000, TETRA Motorola) is up and running for years (please see the chapter 3.2.4 dedicated to the “semi-roaming” in D2.1.2).

The simulated ISI setup between Belgium (Astrid, TETRA Airbus) and France (Acropol, TETRAPOL) will be constituted by:

- 2 gateways (please see D2.1.2, chapter 3.2.3.1), one existing and one added (G4WIF) for the ISITEP WP 7.5 demo, allowing the simulation of 2 binational Be-Fr radio groups.
- 3 ISITEP Enhanced Terminal (IET) allowing a roaming simulation for 3 terminals.
  The functionalities of this innovative terminal will be tested.

The ISI between Belgium and Germany will be limited to the DXT of Berlin (departure point of the German delegation) and this of Brussels extended to the airport zone (destination area).

It is reminded that this part of the setup is optional. It should allow testing on operative networks what will be tested in the test setup

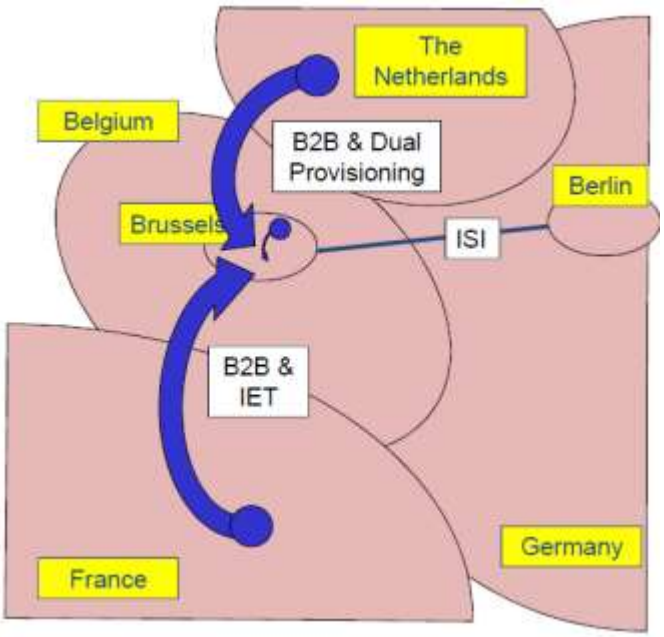

Figure 3 : WP 7.5 operational setup

between the TAS and a Lab network: migration, authentication, group call. Upgraded terminals supporting ISI will be necessary for this.

Besides the optional ISI Berlin-Brussels, an existing gateway (see D2.1.2, chapter 3.6) interconnecting the Astrid-C2000-BOSNET networks will be involved to enable a coordination group between the control rooms along the three-country border section.

Finally, the tactical bubble in the Thalys will be composed by TETRA and TETRAPOL terminals working in DMO and interconnected via an ISITEP TETRA-TETRAPOL deployable gateway which functionalities will be tested.

2. DEFINITION OF KEY PERFORMANCE INDICATORS

As stated above, seeing ISITEP is a R&D project, the existing technical solutions composing the demo setup will not be evaluated. Their role is limited to technically support voice group calls on bi-national radio groups created between the existing radio system of Belgium and this of France and the Netherlands, and on one tri-national radio group between the existing radio systems of Belgium, the Netherlands and Germany.

The WP 7.5 evaluation will focus on the ISITEP mission oriented framework and the innovative technical solutions. Their efficiency will be verified through the four Key Performance Indicators (KPI) described here below.

2.1. Efficiency of the functional radio procedures disregarding the technical limitations

The efficiency of the radio procedures will be checked throughout the execution of the scenario (see "Major Event List", D 2.1.2, annex 8.6.2).

Efficiency criteria:

- Limitation of the terminal manipulations (first responders on the field).
- Easiness of the necessary terminal manipulations (idem).
- Limitation of the work station manipulations (first responders in the control rooms).
- Easiness of the necessary work station manipulations (idem).
- Easy control on the people on the field by the dispatchers.
  Delicate transitions are:
  - When a unit has to select another radio group
  - When the unit passes under the control of another control room.
- Correct radio procedures execution by the first responders.
- Limitation of messages repetitions by the first responders.
- Quality of the radio scheme, meaning the efficiency of how the information fluxes have been translated in radio groups or other communication channels.
- Identified and easy to apply procedure in case of unexpected incident.

Remark:

The non-implementation of end-user requirements can have direct negative impact on the ISITEP functional radio model and the related radio procedures efficiency.

For instance, when an emergency call cannot technically be routed to the most relevant target or when an automatic migration is technically impossible or unpredictable. In the first example, the functional radio model could therefore only envisage what is currently technically possible, like an emergency call in the group selected by the user in danger; in the second example, the functional radio model could simply exclude any automatic migration.

The goal of this KPI is to assess the efficiency of the functional radio procedures considering the technical constraints as facts which are outside the scope of the evaluation.

The technical evaluation of the demonstrator is ensured by the 3 following KPI.

2.2. Effectiveness of the supporting technology (terminal/network)

The effectiveness of the technology will be checked by each execution step of the scenario ("Major Event List").

2.3. Technical-operational end-user requirements

The end-user requirements are listed in the reference table in annex of D2.3.2. This table will be filled in to assess the performance of the innovative setup parts.

Remarks:

1. Some requirements will be tested during the scenario execution (e.g. ISI Group speech call). The other requirements supported by the proposed setup will be tested afterwards (e.g. emergency calls).

   This means that the technology (terminal/network) has to be configured, as far as it is technically possible and as far as all the necessary modules are integrated in the proposed setup, to verify the effectiveness of a maximum of end-user requirements.

2. Some requirements will not be demonstrated because, although the technology is ready, the necessary modules have not been integrated in the setup in order limit the ISITEP demo costs (budgets and delay).

   On the other hand, lot of requirements will not be demonstrated because the technology is not ready yet or the development has not been started/done yet.

   It is therefore important to note in remark why a requirement has not been demonstrated.

2.4. Technical performances of the general key features

The technical performances of both the following general key features:

1. roaming of the terminals,
2. capacity of the terminals to communicate with other terminals beyond the borders,

are so important for the first responders that next to the effectiveness of these, their efficiency has to be verified too.

Therefore the following technical measurements will be performed:

1. Period of time needed to switch manually to another network

2. Degree of difficulty to execute the related manipulation
3. Period of time needed to switch automatically to another network
4. Call interruption time when automatically migrating all receiving a group call
5. Period of time needed for a static user before being able to speak beyond the ISI/gateway
6. Voice quality beyond the ISI/gateway
7. Delay between the sent speech item and its reception beyond the ISI/gateway.
8. Reliability of the ISI/gateway when transmitting a loaded radio group with many call requests coming at the same time from several terminals.

3. DEFINITION OF TARGET PERFORMANCES

3.1. Efficiency of the functional radio procedures disregarding the technical limitations

1. Verification of the added values of each specific concept (NCP, border section, international coordination groups…) developed in the International Fleetmap Proof Of Concept (IFPOC).
2. No suspension of the scenario playing because of a manipulation difficulty.
3. No useless message repetition.

3.2. Effectiveness of the supporting technology (terminal/network)

It is expected that all the communications foreseen in the scenario will technically succeed by the first attempt.

3.3. Technical-operational end-user requirements (terminal/network)

We know that there is a gap between the demonstrator functionalities and the implementation of the end-user requirements (see D2.1.2, annex), therefore 2 priority grades were defined.

A degree of 90% of priority 1 fulfilled could be a good first target performance. This must be separately considered for each of the 3 main technological combinations TETRA-TETRA, TETRAPOL-TETRAPOL, TETRA-TETRAPOL.

When pragmatic solutions are proposed in place of the end-user requirement realisation, the degree of their performance will be based on:

1. their added value,
2. the chance of their implementation on operative networks.

3.4. The technical performances of the general key features

The performances of the technical measurements related to both the key features will be compared with those of the existing interim solutions.

The target is to do as good or better.

4. DEFINITION OF SPECIFIC REQUIREMENTS

In parallel with the demo and without influencing it, the business sustainability tool (WP 6.3) and the training and simulation supporting tool (WP 6.2) will be presented and verified.

They will emphasize the notion of operation interoperability.

4.1. Business sustainability tool

To verify the business sustainability tool, some data related to the cost savings will be communicated to the supporting tool designers:

1. Thanks to an ISI between the private existing TETRA network of the Council of the EU building “Justus-Lipsius”, the current repetitive deployment costs for the mobile TETRA Base Station in order to cover the building upper levels and the deployment costs for the deployable TETRA network in order to cover the building underground car parks would be saved.
2. Some Belgian officers appointed to ensure the radio link with foreign delegations can be saved.
3. Any incident coming from the delegation can be reported rapidly from their own terminal. There is therefore no need any more to foresee and distribute mobile phones in parallel with the radio terminals.
4. …

It is expected from the business sustainability tool that these data, added with replies to standard information requests coming from the tool self, are processed into a final report giving an overview of the cost saved during a European summit in Brussels if ISIs were utilized.

This report should be convincing for decision takers analysing the opportunity to invest in ISIs.

4.2. Training and simulation supporting tool

Operational information will be given to the tool designers:

1. Instructions for using the ISITEP Enhanced Terminal (IET).
2. Extracts of the police operational order description.
3. Operational procedures related to the European summits as programmed in the computer-aided dispatching of the control room of Brussels (CIC BRU).

It is expected from the training and simulation tool that these data, added with replies to information requests coming from the tool self, are processed into:

1. A vivid tool to allow the first responders to get acquainted with the IET usage.
2. A clear presentation for first responders about the general police organisation in Belgium, with a stress on the international joined operations.

3. A training tool to allow the first responders to understand the operational way for managing the European summits in Brussels with a focus on the missions to be fulfilled by the officers accompanying their VIPs.