



Tools of ISITEP to increase interoperability

ISITEP Airplane disaster in Geneva border demonstration

*Geneva, Switzerland,
29-30 June 2016*

Net Technologies



- ISITEP intends to provide a solution to achieve interoperability on technical, operational and users level.
- Operational and user interoperability is mandatory for joint operations and joint forces.
- ISITEP Interoperability Tools will support the users and decision makers for fast and reliable actions in case of emergency situations.
- ISITEP Interoperable Tools may also act as proactive tools for identification and simulation of different scenarios in order to assist for the development of common action strategies for different crisis situations.

The following tools are targets of ISITEP Project

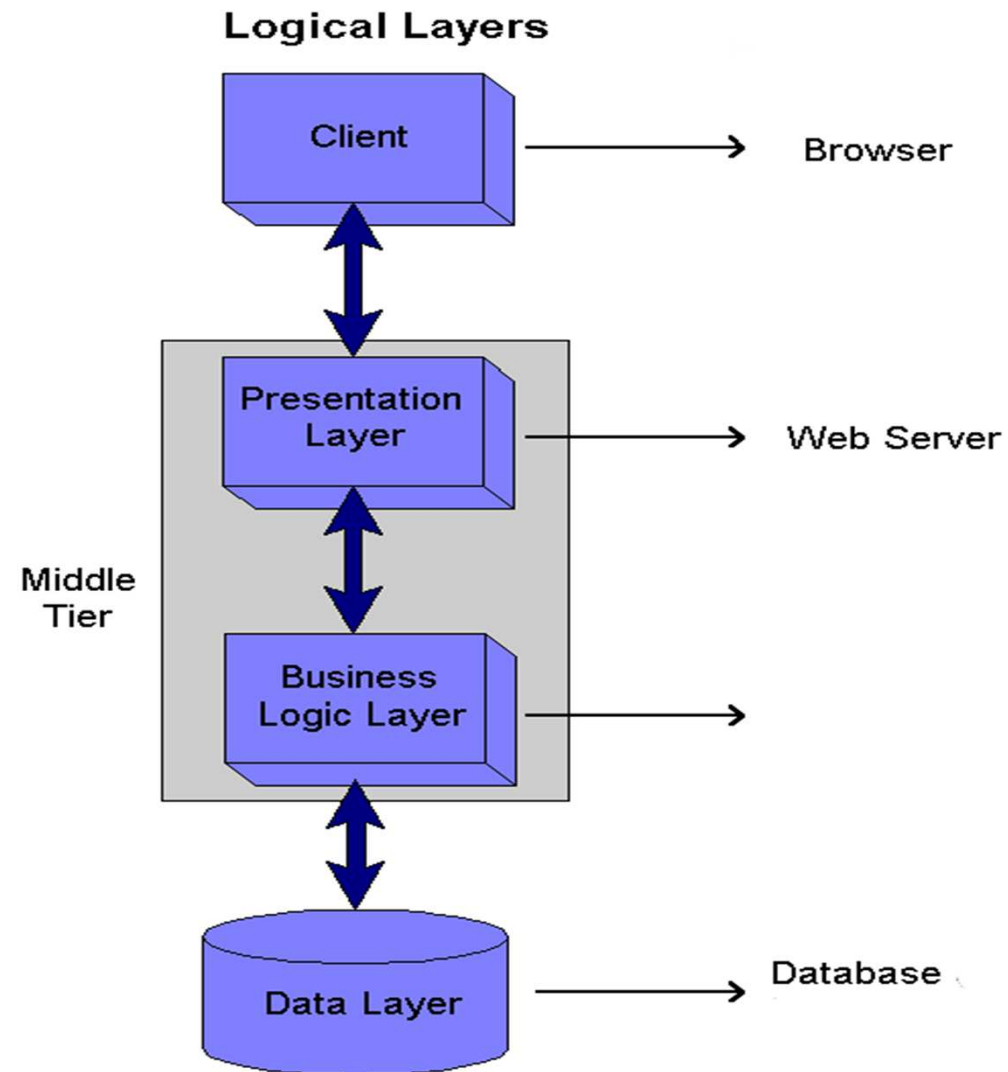
- Infrastructure Dimensioning Tool
- Terminal Training Tool
- Operations Training Tool
- Operations Cost Estimations Tool
- And the development of a European Business Model for roaming implementation

- Microsoft ASP.NET MVC (.NET 4.5) tool developed with C# Programming Language.
- Database: SQL Server Express 2012
- PHP

Front End:

- Javascript/ JQuery
- Google Maps API, Google Maps elevation API
- Bootstrap UI Library
- Mobile friendly interface

High Level system architecture diagram



Infrastructures Dimensioning Tool (IDT)

Description:

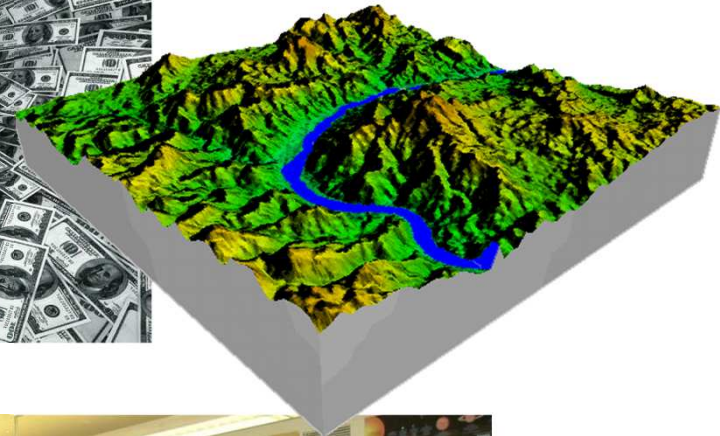
- The tool will estimate all network elements required for covering the communication needs of multinational PPDR forces operating in the same area.
- The tool will allow the validation and verification of the designed ISI interconnection solution and their respective infrastructure and radio resources required for the specific demonstration scenarios.
- The dimensioning takes into account input for the “disaster area”, such as type of first responder forces, existing infrastructure in the area (BS, nodes, types and configuration), traffic resources, bandwidth requirements etc;

- IDT is a dimensioning Tool for:
 - Assisting Engineering efforts towards Wireless Networks Design.
 - Assisting Engineering efforts in preliminary radio network design calculations.
 - Providing reliable input to decision makers for cost control handling.
 - Using existing TETRA/TETRAPOL equipment with provision for future developments
 - Takes into account the networks in proximity
 - Providing in a time-efficient manner, accurate network dimensioning estimations for complex wireless network deployments.

Infrastructure Dimensioning Tool

All of the other existing tools require.....

- Expensive licences
- Physical Classroom
- DEM or DTM Models
- Trainers
- Administration Support
- Time



In real life, the situation is

A member or a force that needs to be deployed to an unknown terrain

- ✓ Does not have time
 - ✓ Does not have calm to study
 - ✓ Does not have patience to setup and deal with fancy graphics
 - ✓ Does not have the luxury of «running» a complex software
 - ✓ Does not have the luxury to ask an expert
-
- He needs live and easy setup tools that will be able to provide him help
 - In any place
 - He needs to decide fast
 - He needs to understand procedure
 - He needs to be able to take decision

Basic Design

Web Based
Applications

That will use
open source
Data

Containing
encapsulated
information

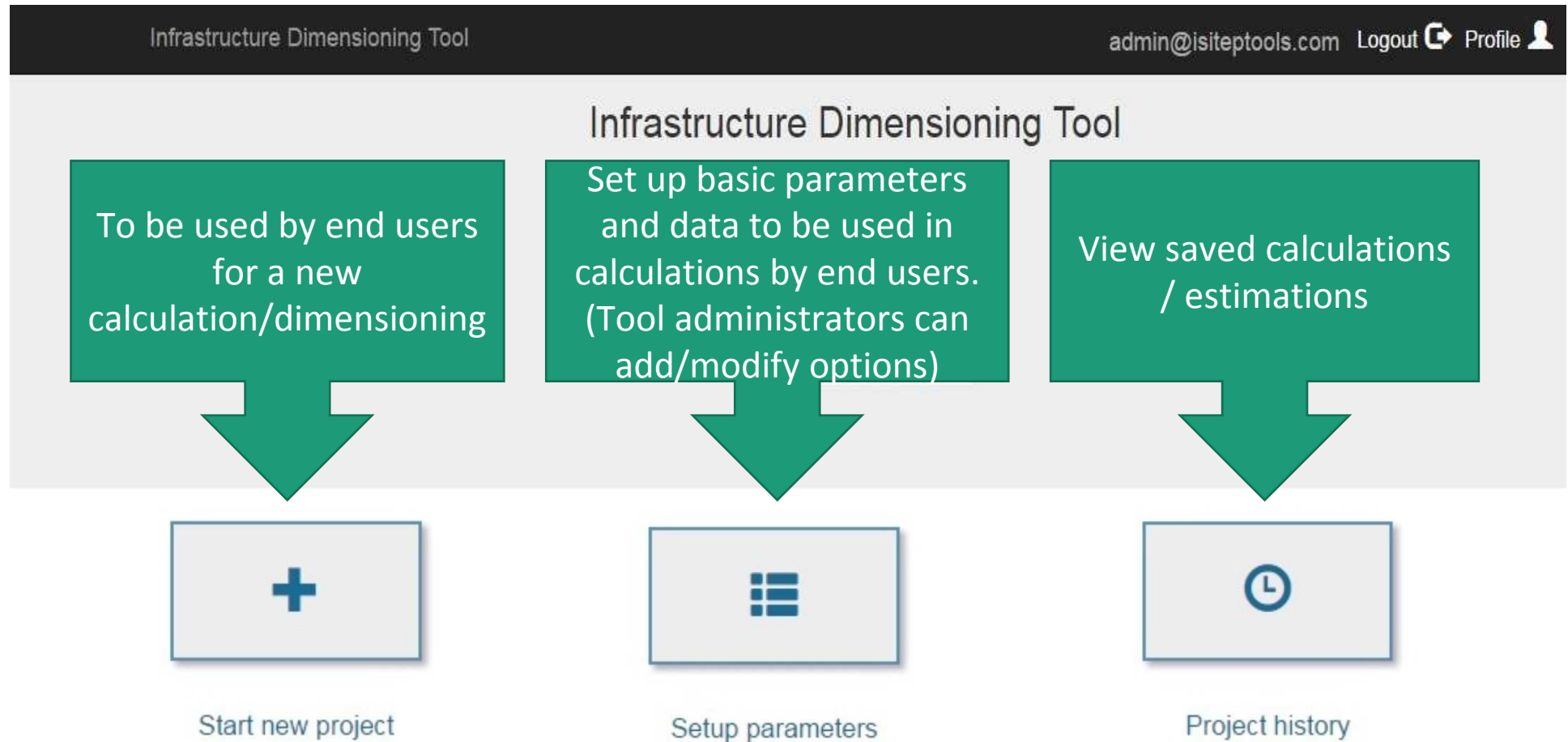
Easy to use
and access

Will be
expandable

Functional Description – Sub Tools

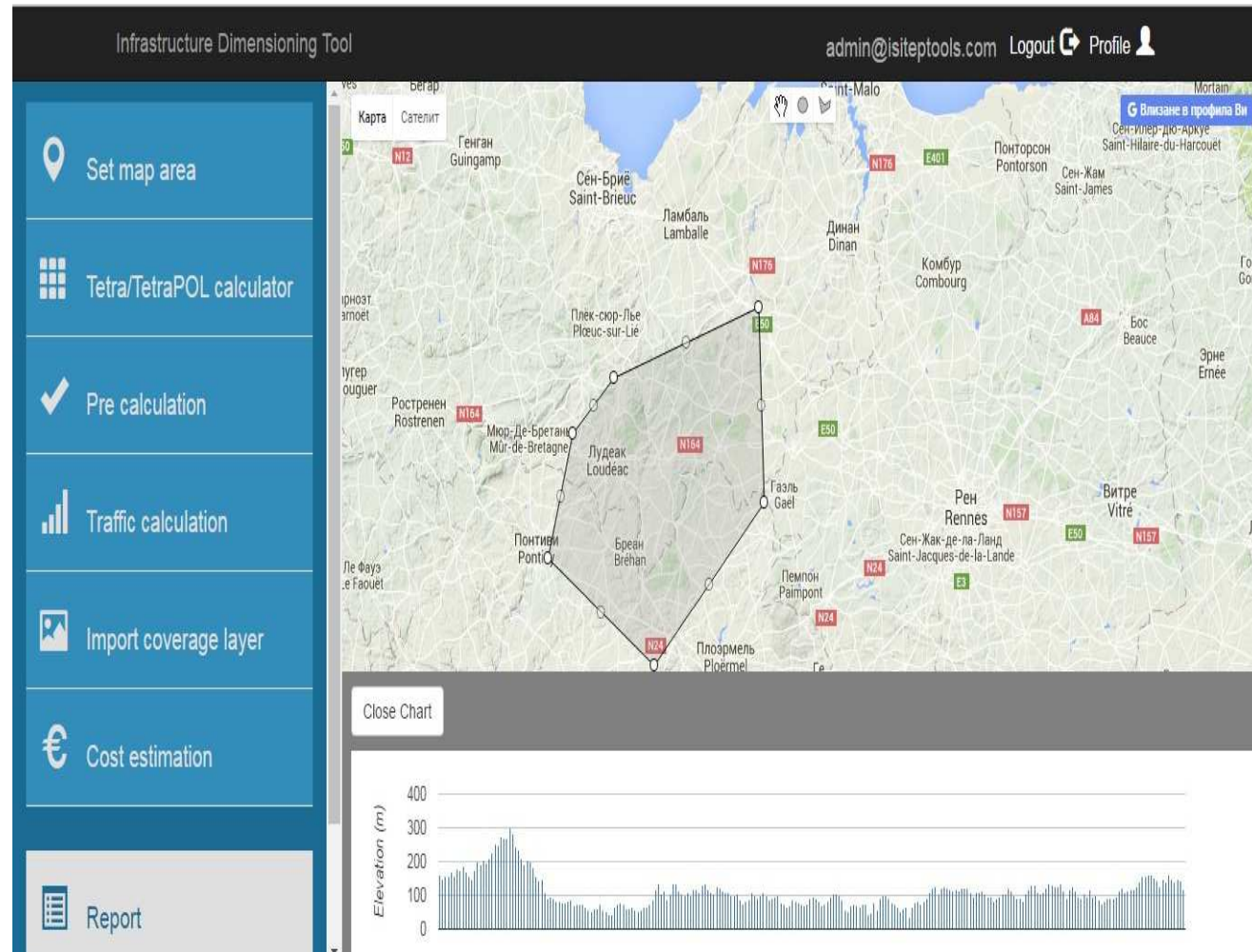
- Different functions are organized into several Sub-Tools :
 - EIRP Calculator: Equivalent isotropically radiated power (EIRP) calculations for both UpLink (UL) and DownLink (DL) directions
 - Path Loss Calculator: Calculations of Path Loss as a function of various parameters (e.g. Distance, Mobile Station height and type, Base Station height and type, etc)
 - Link Balance Calculator: Quick and reliable link balance estimations and proper selection of equipment in both BS and MS sides
 - Cell Range Calculator: Calculations of BS cell range taking into account numerous BS, MS and related technical parameters.
 - Traffic Calculator: Performs different types of traffic calculations according to the selected technology giving the number of BS and TRXs as an output.
 - Infrastructure Dimensioning Tool: Provides reliable estimates of the number of network elements requisite to fulfil both coverage and traffic requirements.

Main/Home Screen:



Target Area

Coverage Area is defined either manually or using markers above the area of interest. Google earth maps are used



Infrastructure Dimensioning Tool	Results Urban area	Mobile Station	Handheld device
	EIRP (dbm)	Path Loss	Path Loss
	Base Station EIRP	DL - Static	DL - Static
	45	148.8	145.8
	Mobile Station (VMR EIRP)	DL - Dynamic	DL - Dynamic
	42.8	139.8	136.8
	Handheld (HPR EIRP)	UL - Static	UL - Static
	29.8	151.8	138.8
	Downlink - Uplink (dBm)	UL - Dynamic	UL - Dynamic
	Downlink (BS to HPR)	142.8	129.8
	35.8		
	Uplink (HPR to BS)		
	25.8		
	Downlink (BS to VMR)		
	38.8		
	Uplink (VMR to BS)		
	38.8		
		Range (Km)	Range (Km)
		Static	Static
		12.1455437076712	9.8673341107026
		Dynamic	Dynamic
		6.51276756603673	5.29113023724435
		UL - Static	UL - Static
		14.9497554557263	6.07705550653096
		UL - Dynamic	UL - Dynamic
		8.01646141133554	3.25868079293493

Traffic Calculations

Infrastructure Dimensioning Tool

admin@isitentools.com Logout Profile

Traffic Calculation

User Profile	Number of users
Moderate User (20 mErl)	45 - 186
Get Results	
Number of TRXs	Number of Base Stations
2	1

Set map area

Tetra/TetraPO

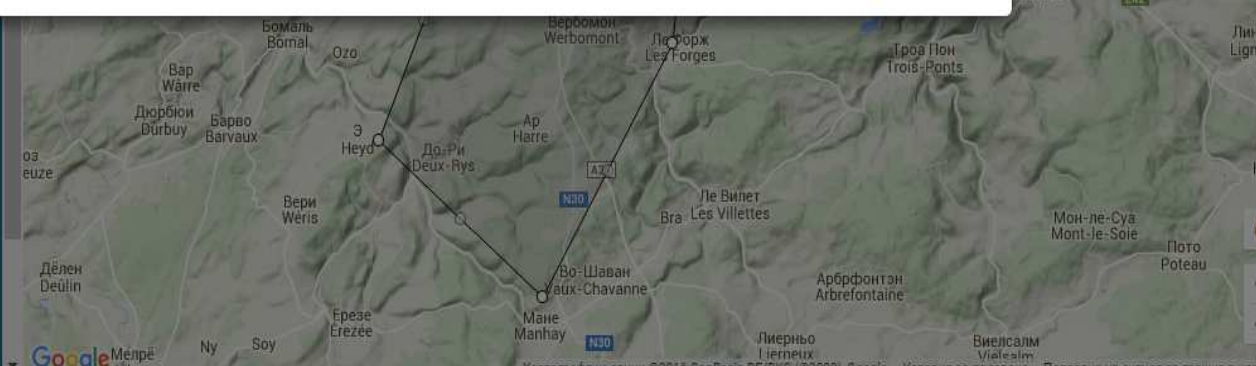
Pre calculation

Traffic calcula

Import coverage layer

Cost estimation

Report



Cost Estimation

← Cost Estimation

Demo_N1

×

Core Network

×

SBS Multisite System (Site Base Stations)

×

Terminals

×

Transmission

Transmission

Main Trasmission Unit

Add

Main Trasmission Unit

Alcatel-Lucent Sw Licences

Add

×

Basic Unit

1660SM SUBRACK WITH INTEGRAT

Add

×

×

TR3

1660SM SUBRACK WITH INTEGRATED FAN SHELF

1

50

Items 9 Total Cost 400 €

Outputs Overview

- EIRP UL/DL
- Path Loss
- Received Isotropic Power
- Maximum Allowable Path Loss for UL/DL
- Link Balance
- Cell Range
- Grade of Service (GoS)
- BS Traffic Capacity

- Minimum Number of BS required for a certain area
- Minimum Number of Transceivers required for a certain area
- Indicative BS locations visualization
- Preliminary Equipment Cost estimate

ISITEP Terminal Training Tool

- A tool to train TETRA/TETRAPOL users to different terminals that they will use when operating in other country with different terminals than those they use in their own organizations
- A tool which allows to add new terminal equipment in order to train the users and show them the common operations and functionalities.
- A web-based application that emulates the terminals used by all different security forces
- Translation capabilities, which allow users to have their own language
- Improves transnational common operations

Advantages

- Decrease the reaction time and organization initiatives.
- Can be used anytime and anywhere due to web-access capabilities.
- Can incorporate new prototype terminals such as ISITEP Enhanced Terminal.
- Can be used for training the users periodically and keeping them up-to-date with the new functionalities of different equipments.
- Will eliminate the congestions of the TETRA/TETRAPOLE networks due to unexpected behaviour originated by the users which are testing the new terminals connected to the operational networks.
- Modular architecture which allows to check specific functionality without going through the whole training session.
- Support different languages due to incorporation of Semantic Syntactic Translator.

Main features:

- Web based application for easy access from everywhere.
- Modular architecture in order to be able to host more devices in the future.
- Architecture that will allow to simulate theoretically unlimited functions and unlimited devices.
- Hint/Help on every screen in order to guide and train users.
- Menu that will allow the user to jump to the functions that he/she wants to see/learn for a specific device.

🏠 ✕ **sepura STP9000**

Switch On **RADIO**

Briefing:
The radio is switched on by momentarily pressing and releasing the Mode Key.

ACTIONS
Find and Click the Mode Key



🏠 ✕ **sepura STP9000**

Select Group for Call

Briefing:
To attach or change a talkgroup, the Mode key should be pressed once. This selects Talkgroup Selection Mode and displays the Talkgroup Selection Box. Use the Left, Right, Up and Down Navigation keys to select the talkgroup folder and turn the Navi-knob or press the +/- Navi-keys to select the desired talkgroup. The PTT key should be pressed once to confirm selection.

ACTIONS
Click the Mode Key, the right key, the Navi-knob, the PPT key



Benefits

- Friendly Graphical User Interface (GUI)
- Web-access
- No preliminary adjustments are needed.
- Simple operational procedures.
- Semantic on line translation to overcome language barriers.
- Step-by-step guidelines and instructions.
- Accessible from different devices (PC and Tablets)

Brief Description

- The Operations Training Tool will provide common environment for various training documents organized for different user groups and training paths.
- A web-based platform which is accessible from different devices (PC and Tablets) anytime and anywhere.
- Provide the users with various educational and training documents for cross-border situations and activities.
- It will store procedure materials that can be assigned for different user groups in relation with their departments and responsibilities.
- A tool which should contain mutual coordination action plans, recovery plans, medical evacuation procedures, execution orders, support and supply instructions, communication details etc.
- It has integrated a live chat functionality which offers exchange of instant short messages with other users.

Functionalities

- Developed with different access levels in relation with user permission rights.
- Offering a friendly working environment for modifications and adjustments of the content.
- Search functionality developed with filtering capabilities – by Country, Language, PPDR Group and Information Type.
- Keep statistics and for system modifications, user activities and uploaded documentations.
- Live chat functionality for support and instruction initiatives.

Operations Training Tool

Personal Area (0 Items)

Logout Profile Add Content Manage Content Manage Training Paths Manage Users Manage Groups Administration Collaboration Contact

Search Term

Select Country Select Language Select PPTN Groups Select Information Type Find

Basic Guidelines and Information

Topics	Country
General Operations	
List of emergency, security agencies with contact details	Sweden Finland...
Communication Guidelines	Sweden Finland...
Emergency incident reported by citizen - Actions/Steps	Sweden Finland...
Emergency incident reported by first responder - Actions/Steps	
Patrol procedures / techniques	
Literature, personal skills	

Benefits and Advantages

- Friendly graphical User Interface (GUI).
- Easy to navigate and create unique user's training view.
- Web-based access allowing to be used on the move.
- Synchronous collaboration between different organization which will decrease the reaction time and overall operations.
- Multinational information system for improving the European cross-border activities.
- A common platform for mutual exchange of procedures and training materials.

Thank you very much for your attendance

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