Welcome to the World of Standards

ETSI
World Class Standards

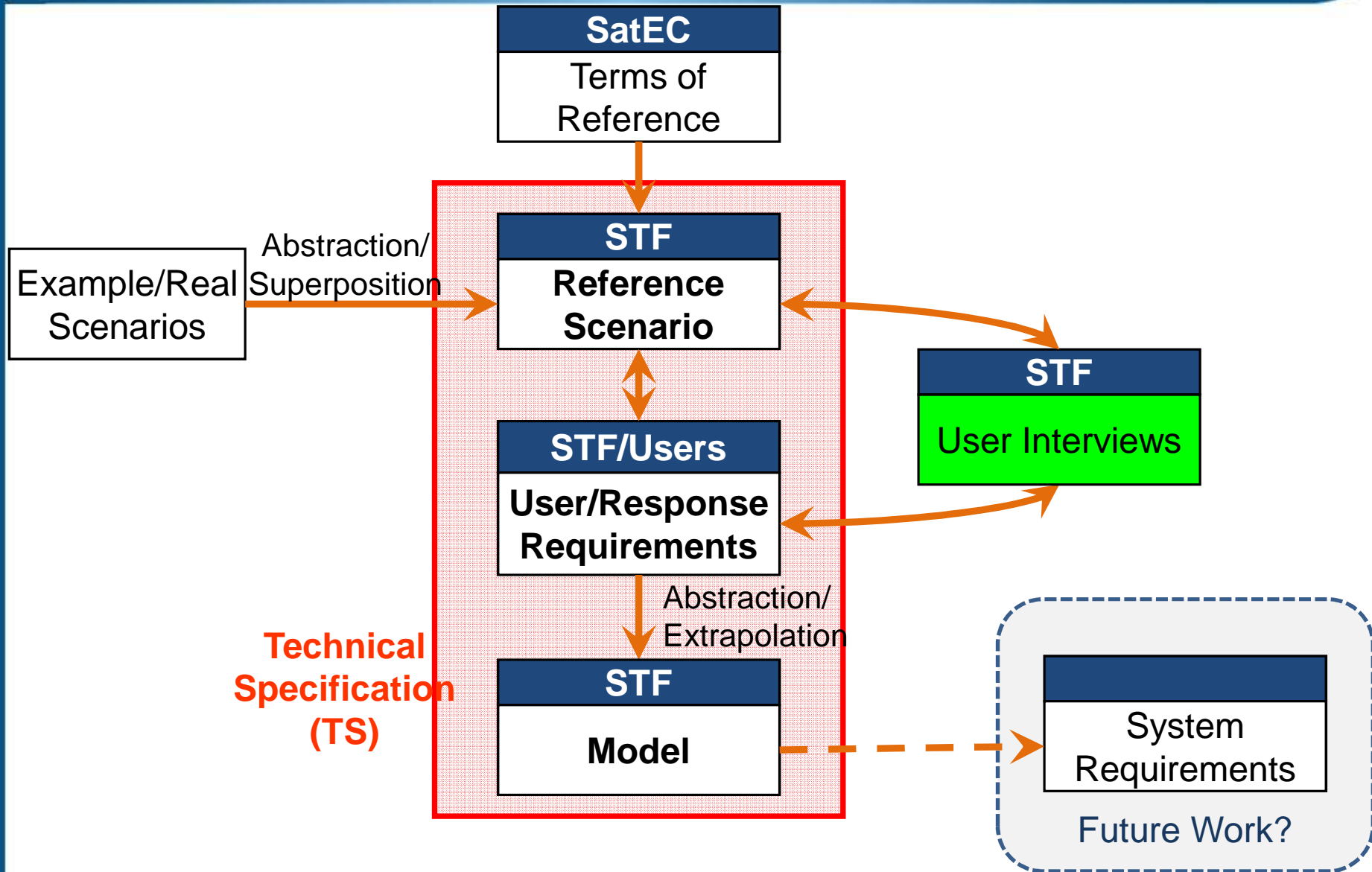**ETSI WG SatEC (Satellite Emergency Communications)**

Emergency Satellite-Assisted Telecommunication Services in major disasters

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ETSI Special Task Force STF 472

SatEC WG Objectives

Activities are currently focused on 3 topics

- Definition of reference concepts for the use of satellite in disaster situations
- Use of satellite communications for public warning systems
- **Use of satellite communications for restoring/establishing communication capabilities in a disaster area (STF 472)**

1. Define Scenarios for:

   - **Major earthquake** in an urban environment
   - **Mass public transportation accident** in countryside

2. Define set of emergency responses to scenarios

3. Dimensioning of a satellite-based telecommunication network for use by first responders (in charge of search & rescue operations, emergency shelter…..)

STF 472 Approach

SatEC
Terms of Reference

STF
Reference Scenario

Example/Real Scenarios

Abstraction/Superposition

STF/Users
User/Response Requirements

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User Interviews

Abstraction/Extrapolation

Technical Specification (TS)

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Model

System Requirements

Future Work?

- **Major challenge is to integrate**
  1. specifics of a scenario with
  2. the operating modes of responders
- **Validate with data from real users**
- **Derive technology-agnostic network models**
  - In a later stage these models, when mapped to technologies, should lead to network architecture definitions or network dimensioning

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Reference Scenario Definitions

Have to be:

- **Sufficiently realistic and complex (e.g., weather conditions, access, available rescue forces…)**

- **Representative in terms of telecoms needs of a number of likely alternative situations**

- **Take account of predicted (near) future communications needs**

Regional/National/Civil Protection Authorities

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- **Example authorities**
  - Civil protection authorities
  - Crisis management groups
  - Government, police, armed forces
- **Example tasks**
  - Call center for relatives
  - Organization infrastructure (shelter, water, food, transport)
  - Coordination of supra-regional help

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PART 1: EARTHQUAKE

1) Earthquake

- **Responders likely to be distributed over a large area**
- **Responses likely to be diverse (fire-fighting, search and rescue, first aid, emergency sheltering…….)**
- **Cross-discipline information exchange required**
- **Satcoms likely to replace temporarily disabled infrastructures**

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- **Major Earthquakes in Europe are rare and centred on a few countries – experience is varied and limited**
  - **Experience from outside Europe may be needed**
- **Other major disasters are more common e.g., flash-floods**
  - **Extrapolate/abstract from these events?**
- **Earthquake as superposition of several "minor" incidents having influence on each other**

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Entities involved in the handling of a major earthquake

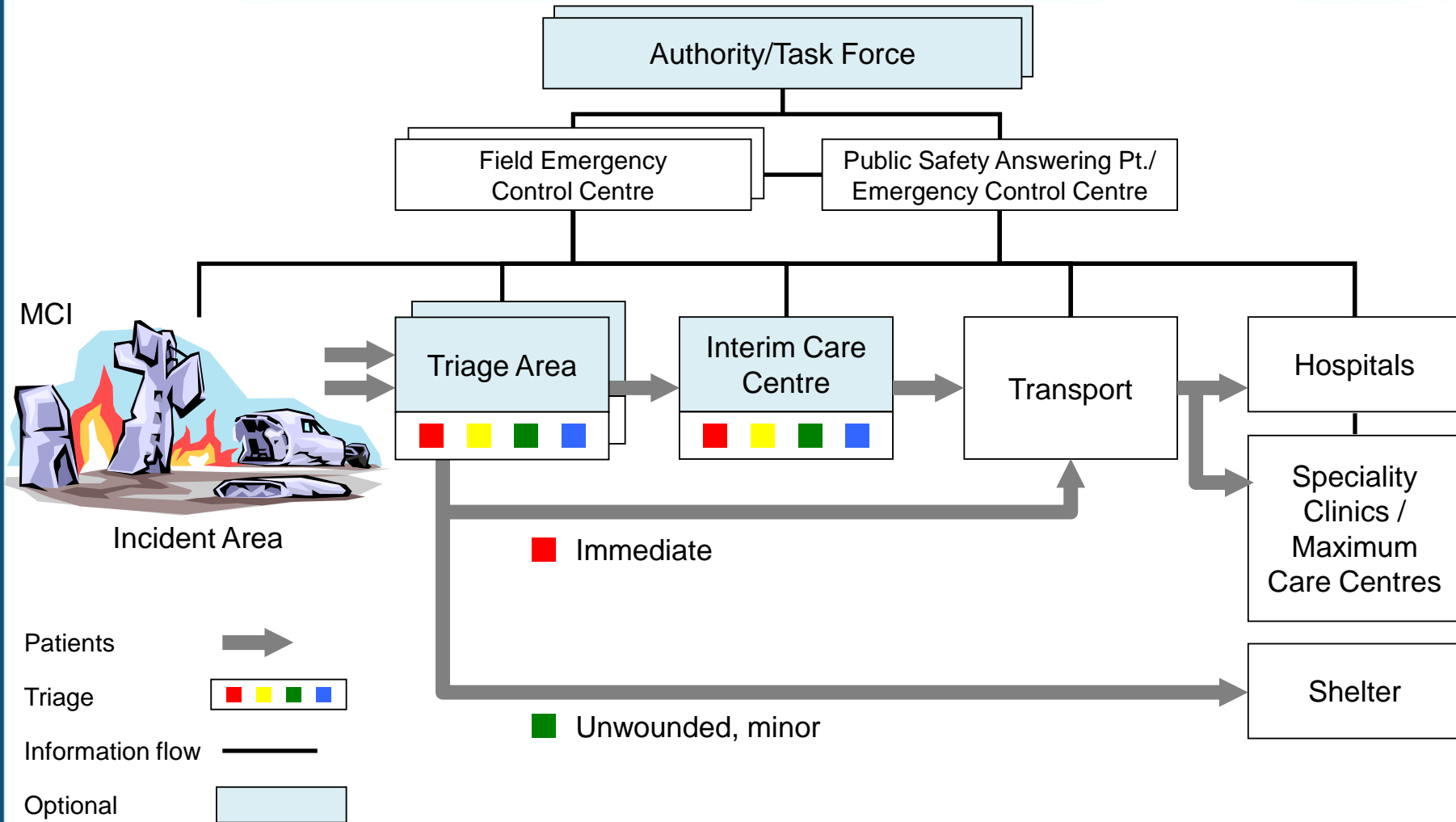| Task	Sit. Assesm.	SAR	Triage	First Aid	Fire Fight.	Chemical Inc	Logistics	Med. Evac	N.Med Ev.	Em. Shelter	Information
On Scene											
Members of public	x			x							x
Site manager	x						x				x
Police	x	x									
Fire/rescue	x	x	x		x	x					
Health	x		x	x		x		x			
Civil Protection	x	x	x	x			x		x	x	
NGOs		x	x	x	x	x		x	x		
Defence	x	x	x	x	x	x	x	x	x	x	x
Local Authorities	x						x			x	x
MNOs							x				
Utilities							x				
Transport companies								x	x		
Off Scene											
PSAP	x										x
ECC	x	x	x	x	x	x	x	x	x	x	x
Hospital	x			x				x			
Civil Protection	x	x	x		x	x			x	x	x
ATC		x						x	x		
NGO	x						x				
Local Auth.	x						x		x	x	x
Central Auth.							x				x

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PART 2: MASS CASUALTY INCIDENT (MCI) IN PUBLIC TRANSPORTATION

- **Examples: railway accident, bus accident, motorway pileup, plane crash**

- **Responders more concentrated over a small area**

- **Responses more restricted to a few specialities (search and rescue, first aid)**

- **Satcoms provide communication hub to amend/compensate for lack of existing infrastructure**

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Information flow in the MCI example

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Authority/Task Force

Field Emergency Control Centre

Public Safety Answering Pt./ Emergency Control Centre

MCI

Triage Area

Interim Care Centre

Transport

Hospitals

Incident Area

Speciality Clinics / Maximum Care Centres

■ Immediate

Shelter

Patients →

■ Unwounded, minor

Triage ■ ■ ■ ■

Information flow ──

Optional

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Overview of institutional entities involved in MCI responses

Role/ rescue discipline	Situation assessment	SAR	Registration & triage	First aid	Command & control structures	Interim care centre	Transport	Emergency shelter	Information
Citizens, affected persons	x			x				x	
Police	x	x			(x)				x
Technical rescue	x	x	(x)	x	x				
Medical rescue	x	x	x	x	x	x	x		
Care					x		x	x	
PSAP	x								
ECC	x				x		x	x	
Authority									x
Hospitals	x								
Infrastructure provider							x	x	

Example Communication Roles

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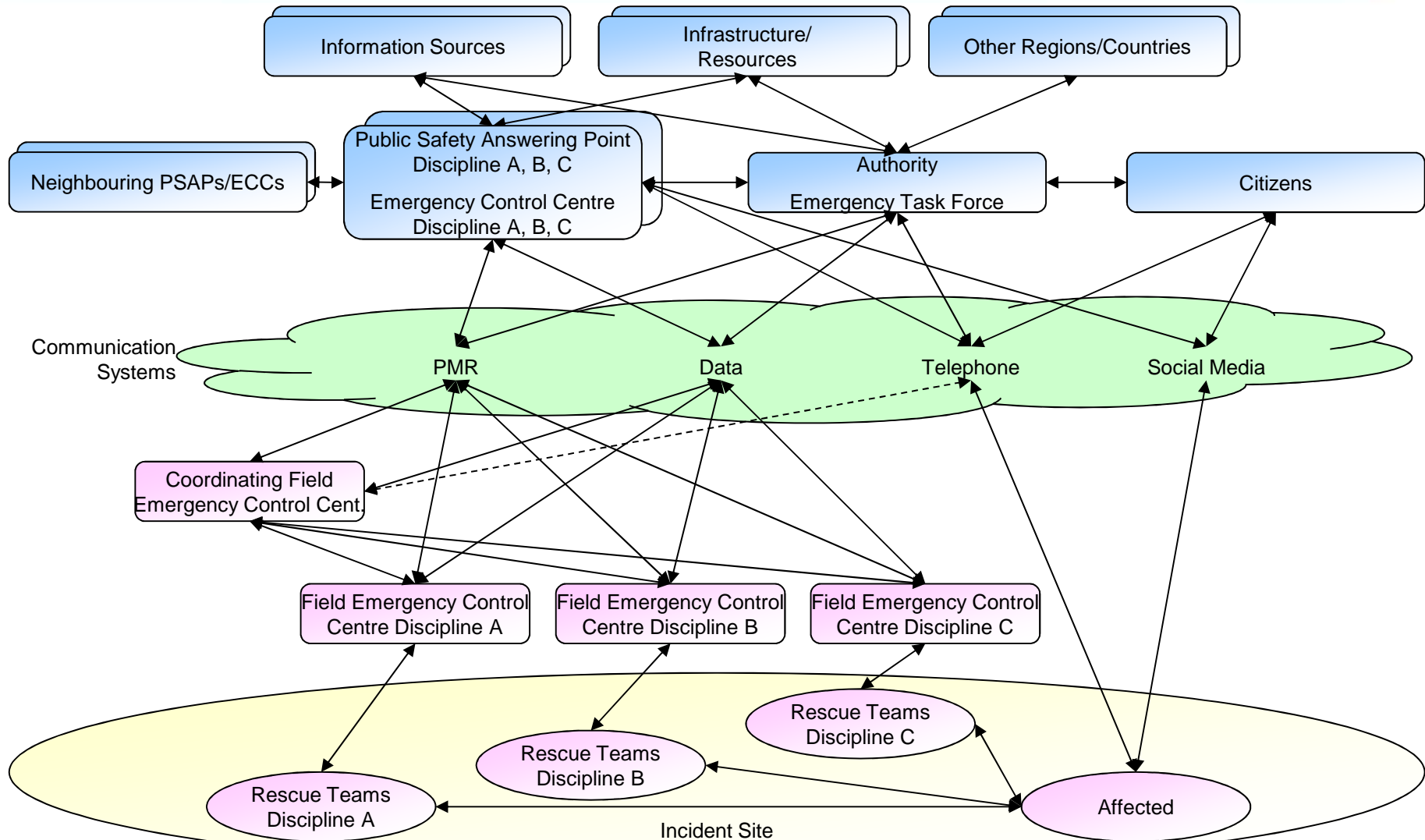
Example satellite/terrestrial communication requirements (MONET Project)

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PUBLIC SAFETY AGENCY	SERVICE IN USE	USERS	SAT MANET/SAT	COMM. FLOW	REQUIREMENT LEVEL	OCCURRENCE
FIRE AND RESCUE TEAM IN OPERATION AREA	PTT Voice Call	120	MANET/SAT	Fire Brigade CP from/to fire-fighters in hot area	Mandatory	926,4 PTT/15 minutes during busiest hours 463,2 PTT/15 minutes during regular hours
	Personnel monitoring	120	MANET/SAT	Fire-fighters in hot area to CP	Required	Nominal each 5s while moving.
	Location services	120	MANET/SAT	Fire Brigade units (pedestrian) to CP	Mandatory	Nominal each 1,5 minutes while moving. Each 5 mins if stopped.
	Real Time Video	20	20 Fire-fighters to CP	20 Fire-fighters in hot area to CP	Desirable	20 transmitting continuously during all disaster
FIRE AND RESCUE FIELD EMERGENCY CONTROL	P2P Voice Calls	1CP	SAT	Fire Brigade CP to BO and other CPs	Mandatory	12 P2P/h
	PTT Voice Call	40	MANET/SAT	Fire Brigade CP from/to fire-fighters in warm area	Mandatory	308,8 PTT/15 minutes during busiest hours
	Location services	40+20	MANET/SAT	Fire Brigade units (pedestrian and vehicles) to CP	Mandatory	
	Real Time Video	1CP	SAT	Fire Brigade CP to BO	Desirable	
POLICE DEPARTMENT	P2P Voice Call	1	SAT	Police CP from/to BO and to other CPs	Mandatory	
	PTT Voice Calls	10	MANET/SAT	Police CP from/to policemen	Mandatory	77,2 PTT/15 minutes during busiest hour
	Location services	10+5	MANET/SAT	Police units (pedestrian and vehicles) to CP	Mandatory	
MEDICAL SERVICES	P2P Voice Call	1CP	SAT	Police CP from/to BO and to other CPs Medical CP to hospitals	Mandatory	
	PTT Voice Calls	30	MANET/SAT	Medical CP from/to doctors/nurses	Mandatory	231,6 PTT/15 minutes during busiest hour
	Location services	30+10	MANET/SAT	Medical units (pedestrian and vehicles) to CP	Mandatory	

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Comments, inputs are welcome.

Contacts with interested Responders/Organisers are invited.

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Session questions

- **How can we make satellite communications as a default part of emergency communication networks.**

- **Any suggestions for obtaining realistic requirements for satellite/terrestrial communications.**

- **Is generic communications model possible ? Or each individual case has its own specific requirements.**

- **How do we get realistic estimates of data, voice and video requirements for each incident?**

- **Does social media has a role in emergency monitoring and alerting ? Can satellite communication help here ?**

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