

ESA Short Term Plan for Civil Protection

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- **After two years of meetings & activities, with the active involvement of major European CPs, the Short Term Action Plan prepared in the frame of the IAP preparatory programme has reached clear conclusions;**
- **The process has involved four Advisory Boards, two major surveys of CP agencies, four field and research projects, creation of a cooperative working tool (the ESA/CP website <http://iap.esa.int/c/cpboard>) and a series of documents culminating in the proposal for a next step programme;**
- **This process has defined what CPs require from satellite based systems and what needs to be done to meet those requirements.**

- Improving interoperability between different terrestrial telecoms systems used by national CPs during deployments abroad (the “satellite adapter”);
- Definition of CP requirements for existing and future satellite systems;
- Best practice for implementing IP over satellite;
- Many CPs share a long term vision of a satellite system dedicated to their needs;
- Most see the benefits of **federating** their demand for satellite services.

- There are clear benefits to CPs from increasing their use of satellite services, especially for backup and improved interoperability between existing terrestrial telecoms systems during multi-national CP deployments;
- There are also some important new services that could be delivered via satellite, to complement existing or future CP systems (e.g. broadband, video, population alerting, asset management, disaster monitoring);
- However, the **availability** of satellite telecoms systems is often inadequate during crises and they are widely perceived as too **expensive**;
- These and other shortcomings can only be resolved by attuning both existing and future satellite systems to CP requirements (e.g. for ease-of-use, security and QoS).

- The **fragmented** nature of both demand and supply has led to a lack of standardisation and high costs;
- Very limited penetration of institutional satellite service that can fully satisfy the availability, security and QoS needs of CP, especially during deployments outside Europe;
- Resolution of these issues requires **coordinated**, European-wide action, to achieve economies of scale, increase bargaining power and improve interoperability;
- CPs have clearly articulated that:
 - the current short term programme was useful but has achieved as much as it can;
 - further progress is necessary.

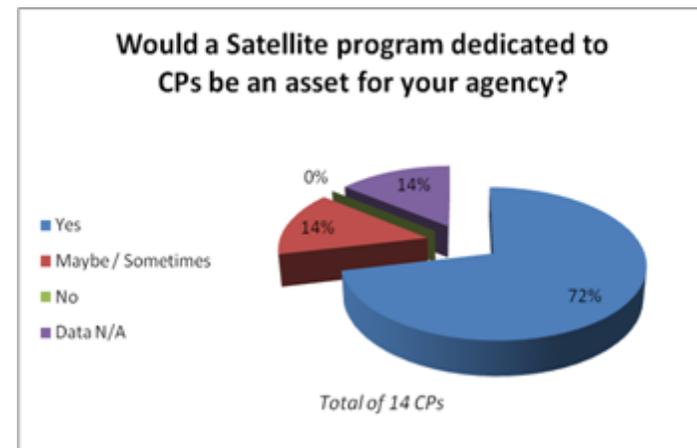
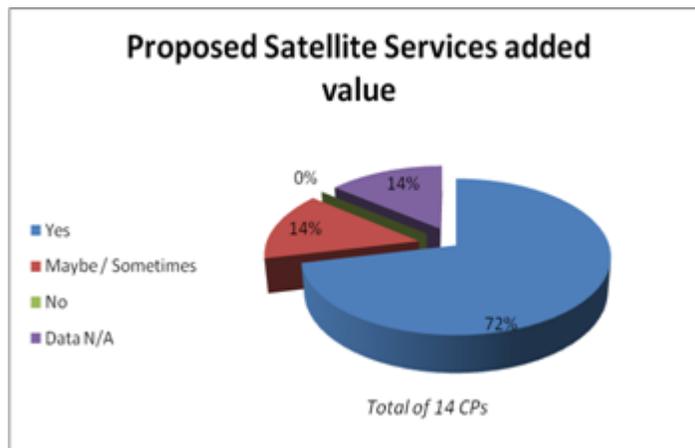
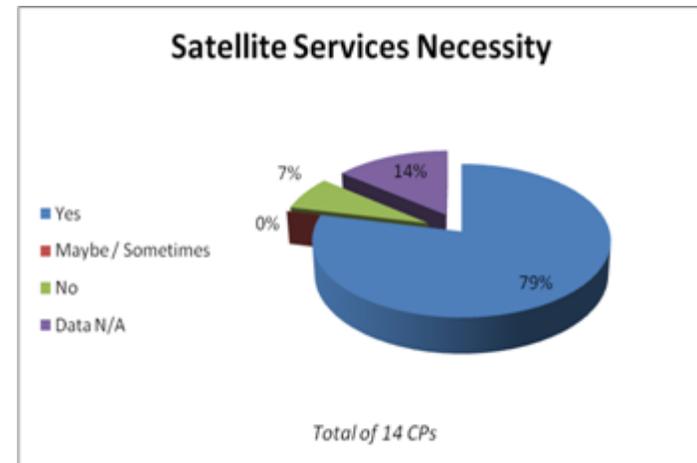
Two surveys involving a large portion of the European Civil Protections were carried out.

The first survey aimed to assess current use of satellite services and identify main shortcomings;

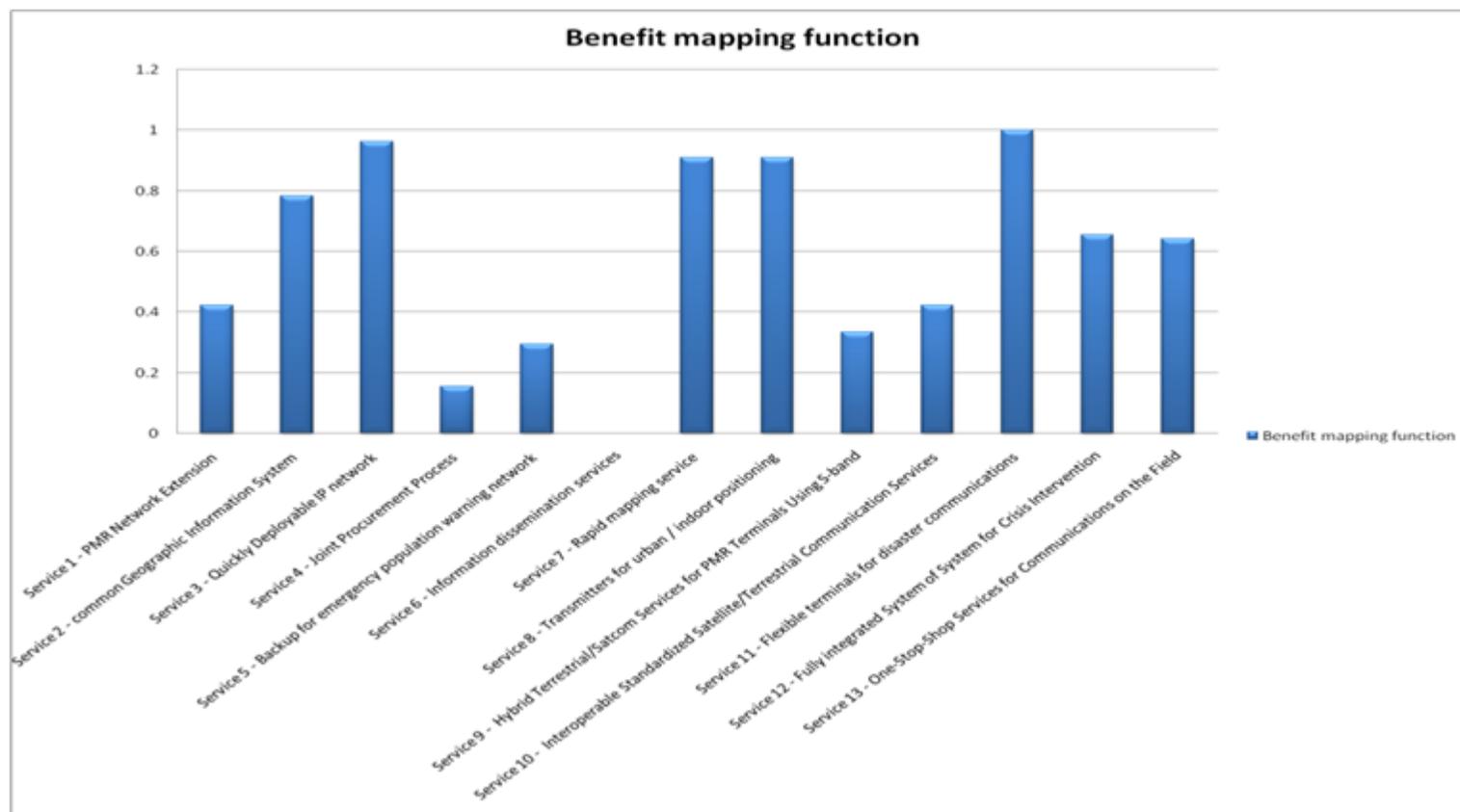
The second survey aimed to select the satellite services to be developed among the proposed ones and to collect a general evaluation on the actual need of a joint program.

The following charts show the feedback collected from the European Civil Protections concerning:

- The **necessity** of Satellite Services
- The **added value** of the proposed satellite-based services
- The **actual need of a dedicated program**.



During the second survey, a list of 13 services was proposed to the CPs. On the basis of the answers collected, a single Benefit Metrics was defined to elaborate an effective ranking and select the most successful Services. The results are shown in the following figure.



Period (1970 -2008)

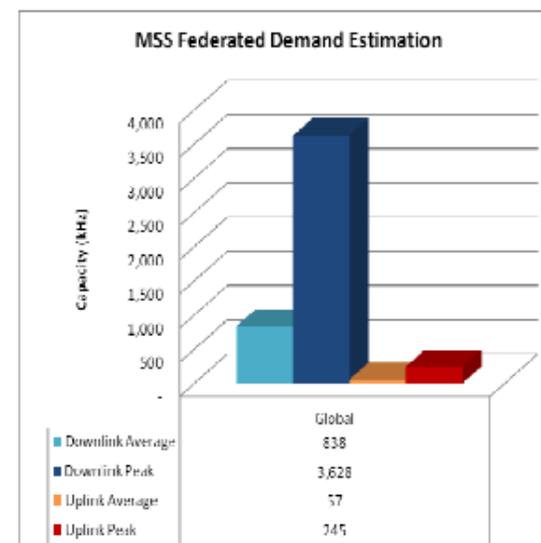
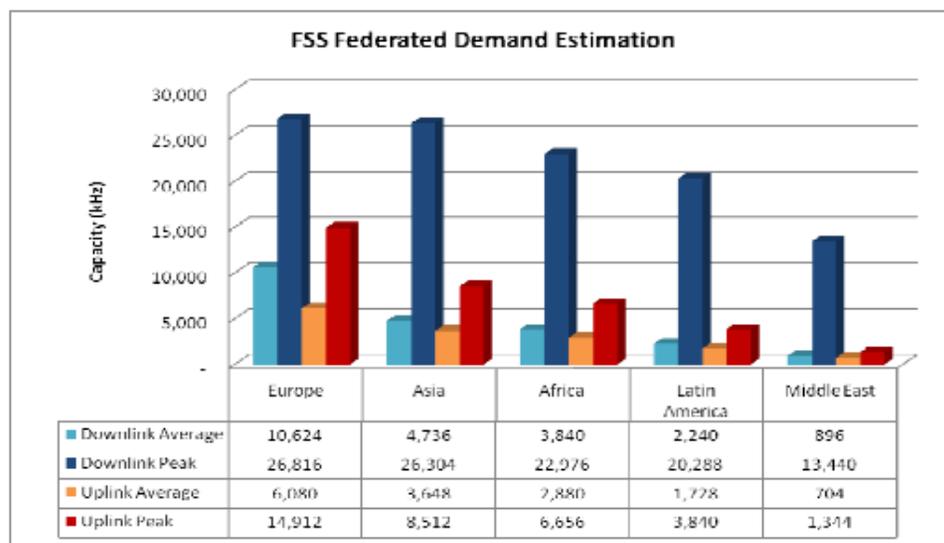
On average, each year in Europe alone:

- *900,000 people are affected by disasters*
- *3,400 people die as a result*
- *6 Billion € of damage is caused*

Disaster Type	No. Disasters	No. Deaths	Total No. Affected	Damage in €(,000)
Drought	36	2	10,482,969	15,724,247
Earthquake (seismic activity)	93	10,032	2,436,083	32,822,461
Epidemic	46	475	189,730	0
Extreme temperature	138	82,405	840,426	12,523,800
Flood	396	3,528	11,193,866	72,041,234
Industrial Accident	154	2,977	333,893	10,338,486
Insect infestation	1	0	0	0
Mass movement dry	5	124	1,802	2,080
Mass movement wet	47	1,232	30,129	2,132,711
Miscellaneous accident	151	4,028	31,681	795,840
Storm	365	1,969	8,411,303	62,161,476
Transport Accident	407	16,609	12,149	6,160
Volcano	7	9	12,224	35,440
Wildfire	87	420	1,286,760	8,723,049
Total	1,933	123,810	35,263,015	217,306,984

A detailed federated demand estimation was carried out assessing the *expected demand for satellite capacity in 2010 if optimized satellite services will be adopted*. This analysis was carried out considering current usage (derived from the 1° survey, worldwide disasters statistics, technical characteristics of the proposed services).

The following figures show the results of this analysis for Fixed Satellite Services and Mobile Satellite Services per region for the European CPs utilisation.



- Lack of **Providers** who can give affordable and ready-to-deploy solutions
Commercial solutions target mass-market
- Lack of **Coverage** (global/regional) for some available solutions
Currently offered solutions might not be available in all crisis areas
- Lack of **Synergy** or **interoperable** tools amongst different organizations
Proprietary standards limit the interoperability
- Lack of **Robust** solutions/tools suitable for crisis environment
Commercial tools not always suitable for crisis

- Nowadays the delay between request and actual allocation of satellite bandwidth is **unacceptable** for CPs (or more in general for first responders) that have to intervene on site within the first hours of an emergency alert. Furthermore, capacity requests by Media in case of major crisis often drain the capacity market.
- For first responders, a **federated approach** would improve flexibility, responsiveness and cost effectiveness compared to the current procurement process.
- From an organizational point of view, this solution would have economical benefits as it would decrease the cost of the satellite resource for each relevant actors thanks to better negotiation power. The **common procurement** of satellite bandwidth would lead to a reduction of the cost by 10 to 20%. A further step would be a joint procurement of a shared satellite capacity, which would decrease the cost by up to 50% for each actors in comparison with the current costs.
- This federated approach would led to several benefits such as **cost reduction, improved availability, improved interoperability**.

- Unlike the EO sector, where a charter and associated operational structure already exists, the satcoms sector has only individual, ad-hoc arrangements in place for the use of space assets in response to disaster and emergency situations.
- The ITU has been moving towards international organisation of this area. They have set up new standards (ITU-R S.1001-2 for the range of frequencies that can be used by FSS for emergency and disaster relief operations; and ITU-R.M.1854 for MSS to enable various functions e.g. voice and data communications, field reporting, data collection, position information and image transmission).
- The ITU has set up an online database (www.itu.int/ITU-R/space/res647) containing the frequencies provided by administrations that are available for use by satcoms in emergency situations.
- In addition, the ITU Sec-Gen has appointed a High-Level Panel for Emergency Telecoms, which has become a platform for bilateral partnership agreements to ensure rapid rehabilitation of communications in the event of a disaster(ITU Framework for Co-operation in Emergencies).

- Several MSS operators have responded to this by providing user terminal equipment and airtime in response to specific disasters. Examples include Inmarsat & its distributor Vizada donating 70 BGAN terminals to the ITU. Vizada will also offer preferential airtime rates and technical support. Inmarsat has a long history of this kind of activity, which sometimes has included the provision of technical support or training to aid agency personnel.
- Iridium has also frequently provided handheld satphones for disaster relief, notably following the Haitian and Chilean earthquakes. These have typically been provided to agencies such as the Red Cross, Medicines Sans Frontiers and USAID.
- On the FSS side as example Spacenet and EchoStar provided satcoms service and equipment to the American Red Cross in Haiti. This involved broadband equipment and VSATs. Other similar arrangements have been provided by key European operators.
- In general, more has been done on the provision of satcoms equipment than on the side of free or discounted airtime and often the arrangements for making capacity available have been ad-hoc and case-by-case.

- Any proposal for a mechanism on the use of satcoms for disaster and emergency situations should be global, not just European.
- The sector needs standardisation and simplification, rather than the plethora of individual arrangements currently in place.
- More work is needed in the area of **satellite capacity availability** than in that of satellite equipment.
- **Rapid response is crucial**: being able to obtain a definite amount of capacity immediately, either free or at a reduced rate, is essential to ensure that relief efforts are maximised in the first hours and days following the event. **This means that the availability and/or the price of capacity must be pre-arranged.**
- FSS is easier than MSS for arranging dedicated capacity. Some MSS systems lack a means of allocating frequencies to specific users.
- Thus an operational system must include both a mechanism for allocating capacity and a mechanism for guaranteeing pre-arranged tariffs (or their waiver). This might well take the form of a total monetary value, allocated annually and topped up at the operators' discretion. It would also probably entail a series of bilateral agreements with individual aid agencies, so that they know how much capacity they can afford to use at any given time.

- ESA intend to conduct a survey of all MSS and FSS operators (and major distributors), to establish both their current arrangements in this area and their willingness to participate in an operational mechanism and to contribute to a Capacity 'Bank'. This could include an examination of various possible mechanisms for implementing the availability of **free and/or discounted satellite capacity**;
- The ESA Integrated Application Programme will be instrumental to support such endeavour.

Ideally, such a study should address how to tie together all of the following:

- Availability of FSS capacity, including management of the same, tariff discounts and bilateral agreements with aid agencies;
- Availability of MSS capacity, including management of the same, tariff discounts and bilateral agreements with aid agencies;
- Availability of user terminal equipment and management of the same;
- Regulatory clearance for rapid import & use of terminal equipment;
- Training of aid agency staff in use of satcoms equipment and services;
- Technical support to aid agencies and their staff.

The overall objective should be to determine how to increase the availability of satcoms in disaster and emergency situations in every sense, i.e. including speed of deployment, affordability, QoS and user competence.

**ESA intends to promote through the IAP
programme mechanisms to facilitate the
user's involvement**
(<http://iap.esa.int>)

