SPACE FOR CIVIL PROTECTION: THE EUROPEAN CONTEXT

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Outline

- The European institutional context
- The political mandate
- Space for civil protection

The European institutional context

The European Space Agency

- Intergovernmental agency
- Purpose of ESA

  "To provide for and promote, for exclusively peaceful purposes, cooperation among European states in **space research** and **technology** and their **space applications.**"

Article 2 of ESA Convention

- Over 40 years of experience
- 18 Member States, 19 in 2011
- Five establishments in Europe, about 2200 staff
- 4 billion Euro budget (2011)

ESA & EU : two different systems

Bulgaria
Cyprus
Estonia
Latvia
Lithuania
Malta
Slovakia

Austria
Belgium
Czech Republic
Denmark
Finland
France
Germany
Greece
Ireland
Italy
Luxembourg
Netherlands
Portugal
Spain
Sweden
United Kingdom
Romania[3]
Hungary[1]
Poland[1]
Slovenia[1]
EStonia[1]

Norway
Switzerland
Canada[2]

Requires to organise the cooperation

1-ESA European Cooperating States
2-Cooperating State 3-Full Member by end 2011

ESA-EU Cooperation

- Since the late 90ies, ESA and the EU progressively developed a closer relationship

- ESA/EC Framework Agreement (2004)
  - Progressive development of overall European Space Policy by providing a common basis and appropriate operational arrangements for efficient and mutually beneficial ESA/EC cooperation.
  - Creation of Space Council, High-Level Space Policy Group and ESA/EC Joint Secretariat.

- Under the EU/ESA Framework Agreement:
  - 7 Space Council meetings and related resolutions provided directions and guidelines
  - Two flagship programmes: Galileo and GMES
  - The European Space Policy

The political mandate

The European Space Policy

Strategic objectives of space for Europe:

- develop space applications to serve Europe's public policies, enterprises and citizens;
- meet Europe's security and defence needs;
- foster competitive and innovative industries;
- contribute to the knowledge-based society;
- secure access to technologies, systems and capabilities for independence and cooperation.

In May 2007, 29 European countries (17 Member States of ESA and 27 Member States of the EU) adopted a Resolution on the **European Space Policy**, adding a new dimension to European space activities.

Taking Forward the Security Dimension of the European Space Policy

- Creation of Structured Dialogue on Space and Security (EC, EU Council/EEAS, EDA, EUSC and ESA)

- 7th Space Council resolution in November 2010

ACKNOWLEDGES the reinforced EU engagement in security and defence matters embedded in the Lisbon Treaty and the setting-up of the European External Action Service (EEAS) and the significance of crisis management as a key element of the EU and its Member States' actions both in Europe and globally;

therefore INVITES the European Commission, the EU Council, assisted by EDA, together with Member States and ESA, to explore ways to support current and future capability needs for crisis management through cost-effective access to robust, secure and reactive space assets and services (integrating global satellite communications, Earth observation, positioning and timing), taking full advantage of dual-use synergies as appropriate;

- These developments in the space field reflect the more general need to improve the EU crisis response capacity expressed in recent EC communications

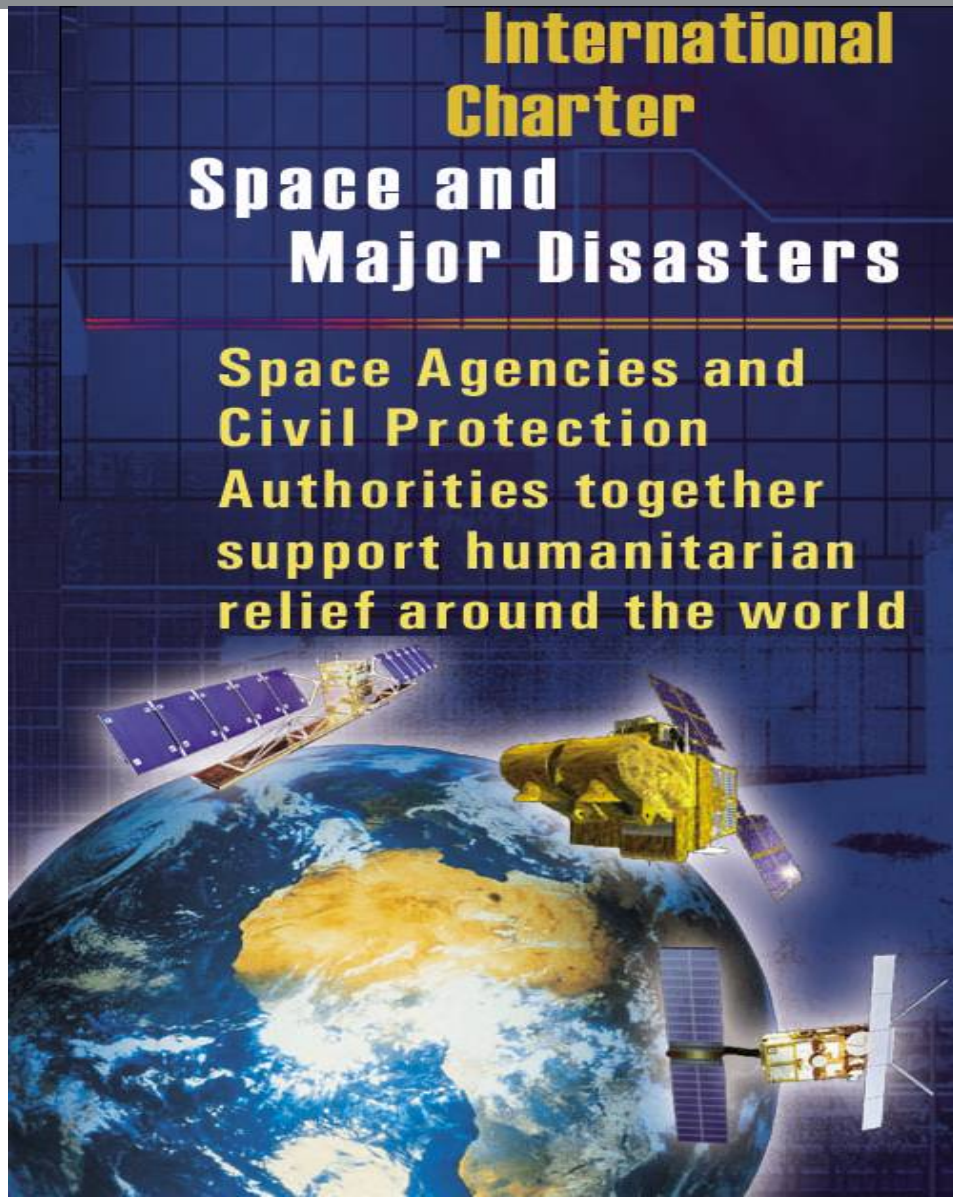
Space for civil protection

Charter on “Space and Major Disasters”

The International Charter aims at providing a unified system of space data acquisition and delivery to those affected by natural or man-made disasters through Authorized Users.

Each member agency has committed resources to support the provisions of the Charter and thus is helping to mitigate the effects of disasters on human life and property.

ESA is a founding member of the Charter, which has been in operation since 2000 and which has been activated more than 200 times.



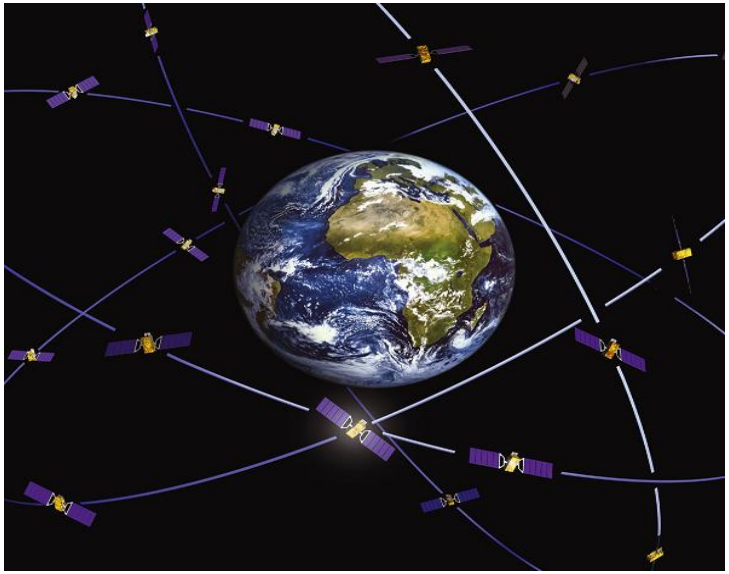
EU Programmes Relevant to Security

Global Monitoring for Environment and Security (GMES)

Independent capability for global monitoring

Vital information on the global environment

Supporting Europe's needs for security (e.g. with the Emergency Response and Security Services)



Galileo

The first joint ESA/EU programme, providing independent capability for positioning, timing, navigation services

Significant strategic importance

Civil programme under civilian control

ESA's initiative on "Space for Crisis Management" (1/2)

- Building on existing activities at European and national levels
- Objective: To address the need for space-based services that are operational, guaranteed, integrated, more reactive and affordable

  "Bringing the right information and services to the right people, when they need it"
- Users
  - Aimed at satisfying primarily civilian needs
  - Potentially interested national institutions include: Civil Protections, Fire Brigades, Police, Customs, Coast Guards, and officers from Ministries of Defence and Foreign Affairs
  - EU institutions, services and agencies active in these domains include: MIC, EEAS, EU Council SitCen, FRONTEX and EMSA (as well as JRC and EUSC as intermediary users)

ESA's initiative on "Space for Crisis Management" (2/2)

- Ongoing internal work supported by security actors and industrial studies

- Two main components:
  1. Scenario-based preliminary analysis of the security actors' needs in case of crisis response
  2. Preliminary architectural design of future space systems for crisis management

- Aims at preparing future European infrastructures and services and the associated future technologies

1. Preliminary analysis of the security actors' needs (1/3)

- Compilation of a comprehensive set of representative crisis response scenarios elaborated by European security actors and the associated emergency procedures.
- The scenarios represent situations which could trigger a European response by European national and/or EU institutions including civil protections in 3 categories: Natural disasters, Technological Accident and Complex man-made emergencies.
- The "most relevant" crises in each category were determined based on an analysis of some historical records and statistical database.

1. Preliminary analysis of the security actors' needs (2/3)

- *Natural disasters:*
  - Northern Winter Storm in Europe
  - Floods in central Europe
  - Forest fire in Southern Europe
  - Earthquake in L'Aquila (Italy)
  - Earthquake in Haiti
  - Tsunami in Indian Ocean
- *Technological Accident:*
  - Fuel oil spill in front of the European shores
  - Cruise vessel accident in the Arctic region
- *Complex man-made emergencies*
  - Counter-piracy operation off the Horn of Africa
  - EUFOR-CHAD mission

1. Preliminary analysis of the security actors' needs (3/3)

- For each scenario:
  - Scenario description
  - Immediate direct and indirect damages
  - Operations timeline
  - Space-based services supporting responders' needs

2. Preliminary architectural design

- Preliminary analysis and architectural design of a European Integrated Space Architectures for Crisis Response

- In parallel of the two ongoing industrial studies, internal assessment of the architectural options (space infrastructure and service provision) in ESA's Concurrent Design Facility (CDF)

The CDF analysis

The assessment was based on a first set of requirements associated with the provision of a limited set of representative services at two time horizons (2015 and 2025)

In the 2nd exercise, the test case scenario considered the simultaneous provision of three sets of crisis response services:

1. Management of the crisis associated with an **major earthquake** (simulation based on the case of Bam's earthquake in 2003)
2. Support to **counter-piracy** (simulation based on a pirate attack in the Strait of Malacca)
3. Management of a **tanker accident in the Arctic region** (in the Spitzberg area)

Summary of services and draft requirements of the 2nd exercise

- **Earthquake in Bam**

  SERVICE 1: Rapid mapping (reference map) of the Bam city with response time < 6 hours

  SERVICE 2: Rapid mapping (buildings damage assessment map) of the Bam city with response time < 24 hours

  SERVICE 3: Deployment of secure telecommunications between the "EU Headquarters" and the operators on the field (for voice and maps data) with a connectivity time < 24 hours

  SERVICE 4: Tracking capacity for individuals in the field set up in less than 24 hours (updated every 10 min)

- **Counter piracy action in the strait of Malacca**

  Situation of alert triggered by information based on SSAS (Ship Security Alert System) or a VTS (Vessel Traffic Service)

  SERVICE 5: Detection, Identification and Monitoring of pirate ships/ hijacked vessels (possible attack detected) in support of the units' deployment:

  - Detection, identification and monitoring of vessels longer than 2 meters in sea states up to 4
  - Information update time < 1 hour
  - Information delivery time < 30 minutes
  - Location accuracy < 500 meters

  SERVICE 6: Complete telecommunications coverage over the region (for voice as well as data transmission - high and low data rate) for the units once deployed with a connectivity time < 24 hours

- **Tanker accident in the Arctic region**

  Situation of alert triggered by the GMDSS (Global Maritime Distress and Safety System)

  SERVICE 7: Complete telecommunications coverage over the region (for voice as well as data transmission – low and high data rate) in support of search and rescue and pollution mitigation operations with a connectivity time < 24 hours

  SERVICE 8: Detection and monitoring of the vessel in distress in support of search and rescue operations

  - Initial information delivery < 1 hour
  - Information update time < 1 hour
  - Information delivery time < 30 minutes
  - Location accuracy < 100 meters

  SERVICE 9: Detection and monitoring of the oil spill in support of pollution mitigation operations

  - Initial information delivery < 12 hours
  - Information update time < 12 hours
  - Information delivery time < 30 minutes
  - Location accuracy < 500 meters

First results of the CDF assessments

- Assessment of different architectures based on potentially available assets at horizon 2015

⇒ The selected services could be partially provided

- Analysis of the performance gap in 2015 and in 2025
- Identification of the complementary systems and technologies needed to provide all services with the desired level of performance
- Identification of key issues to be addressed in parallel with the design of the infrastructure (governance models, data policy, service level agreements, standardisation, etc.)

NEXT STEPS

- The final outcome of this work will be further consolidated with the results of the ongoing industrial studies

- This work and other ongoing ESA activities relevant to civil protections will be presented during the workshop of the Polish Presidency on 19-20 July 2010

- All these activities will contribute to the implementation of the political mandate of the 7th Space Council

Thank You !

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European Space Agency