SIXTH FRAMEWORK PROGRAMME

Research Infrastructure – Communication Network Development

Contract for:

SPECIFIC SUPPORT ACTION

Annex I - "Description of Work"

Project acronym: CYCLOPS
Project full title: CYber-Infrastructure for CiviL protection Operative ProcedureS
Proposal/Contract no.: 031874
Related to other Contract no.: *Not Applicable*

Date of preparation of Annex I: 28th December 2007

Start date of contract: 1st June 2006

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Introduction

The present document is a revision of the original Technical Annex of the CYCLOPS Project Proposal, in response to the EC prescriptions following the First Review.
This version of the TA is an update taking into account several important facts which took place before and during the first year of the project. In particular two new partners joined the Consortium to provide technical support to some Civil Protection Agencies already involved in the project. Basing on a specific Commission recommendations, as described in the first review report, the workplan and budget have been consequently reviewed.
The proposed extension of four months has been considered and it is used for recovering the delay cited in the review, and mainly to strengthen the dissemination activities.

In particular, with reference to the "CYCLOPS First Review Report", the Technical Annex addresses the Recommendations as follows:

- R1: A specific task (T1.6 *To assure collaboration with related projects and initiatives*) has been added in the Project Management WP (WP1);
- R2: The Deliverable (D11 *System Requirements document*) has been postponed to allow a deeper requirement analysis;
- R3:Dissemination tasks are specifically targeted to major events with the participation of the main actors of CP and Grid communitites;
- R4: A specific task (*T1.7 Financial monitoring*) has been added in the Project Management WP (WP1);
- R5: A specific task (*T1.8 Quality Control*) has been added in the Project Management WP (WP1);
- R6: A specific task (*T1.9 Risk Analysis and Contingency Plan*) has been added in the Project Management WP (WP1);
- R7: It is specifically cited that the list of participants in the Working and Expert Groups will be provided in the Quarterly Report.
- R8: It is specifically cited that contribution to standards is considered one expected result and it will be documented in the D19 *Final Plan for using and disseminating knowledge*.

1. Project summary

The Global Monitoring for Environment and Security (GMES) concept was endorsed by the EU Commission in 2001 with the aim of "establishing by 2008 a European capacity for Global Monitoring of Environment and Security" to gather and use all available data and information in support of sustainable development policies. GMES has the potential to stimulate economic growth by creating innovative value-added services. The challenge for GMES is to use these services to enable decision makers to better anticipate or mitigate crisis situations and management issues related to the environment and security. The *Final Report for the GMES Initial Period* recognised the European Civil Protection (CP) as one of the GMES service categories. This report outlines the importance to develop enabling e-infrastructures and virtual organisation services to serve specific GMES applications. Indeed, the EU EGEE (Enabling Grids for E-Science in Europe) project provides a powerful GRID platform to implement services for specific application Communities. However, GRID evolution has mainly focused on technology, while, GMES services have mostly been user-oriented. Thus, there is a need to cross-disseminating the approaches, requirements and visions of the diverse Communities, in order to fully exploit the GRID capabilities for GMES applications. CYCLOPS brings together these two important Communities: GMES and GRID, focusing on the operative sector and needs of European CP. The main objectives of CYCLOPS are:

1) To disseminate EGEE results to the CP Community, assessing EGEE infrastructure for CP applications. A variety of activities will focus on dissemination and outreach, training, workshops, possibly in close relation with EGEE events and on promoting a close collaboration between the two communities.
2) To provide the EGEE Community with knowledge and requirements that characterise the CP services. These requirements will also be used to assess the possibility for the development of an advanced grid platform enabling Real Time and near-Real Time services and implementing a security infrastructure very close to the defence systems standards.
3) To evaluate the possibility to utilise the present EGEE services for CP applications, developing the research strategies to enhance EGEE platform.
4) To develop the research strategies to enhance EGEE platform, especially for Earth sciences resources.

CYCLOPS will contribute to the EU policy developments establishing liaisons and synergies with other existing projects and initiatives dealing with GMES, GRID and complementary sectors, among them: PREVIEW, Risk EOS, RISK-AWARE, BOSS4GMES, EGEE Networking Activities and Application Support, e-IRG and INSPIRE. In fact, Consortium partners are involved in all these projects and initiatives.

2. Project objective(s) and state of the art

The Context and state-of-the-art

The Global Monitoring for Environment and Security (GMES) concept was endorsed by the EU and European Space Agency (ESA) Councils in 2001. In its Communication to the EU Gothenburg Summit (2001) the Commission called for "..establishing by 2008 a European capacity for Global Monitoring of Environment and Security". GMES initiative has now reached a stage of maturity, ready for its development and implementation phase, with service provision for different areas becoming operational in a staged approach. GMES has been selected as one of the "Quick Start" projects in the Commission's Initiative for Growth.

GMES is a highly innovative research initiative, driven by the needs of end users; first steps will concern the full exploitation of currently available data (either archived or provided by ongoing and impending Earth Observation missions) in order to suit needs posed by end-users' applications. Full exploitation of data and resources will necessarily require their mutual sharing, which will impact consistently on economic aspects. GMES must provide a structured framework for data integration and information management (i.e. a European shared information capacity). The following key architectural requirements must drive GMES implementation: interoperability, scalability, dependability, data security, quality of service, ubiquity of access.

This is reckoned in the final document of the implementation plan ("Final Report of GMES Initial Period" (2001-2003). In the same report, the GMES service categories for the period 2004-08 were introduced, Civil Protection is one of them. The importance of Civil Protection, in the European context, was also, reaffirmed by the decision 2001/792/EC - Official Journal L 297 of 15.11.2001, which supplements the Community action programme in the field of civil protection (2000-2004). The aim is to improve the coordination of assistance intervention in the event of natural, technological, radiological, ecological or environmental disasters, including serious marine pollution, occurring inside or outside the Community. On the 10th of November 2005, the European Commission adopted a new Communication on "Global Monitoring for Environment and Security (GMES): From concept to reality". This Communication plans to introduce the first three earth observation services that have been identified for 'Fast Track' treatment: Emergency Response, Land Monitoring and Marine Services. In particular, the Emergency Response service aims to reinforce the European capacity to predict and respond to crises and emergencies

associated with natural and man-made disasters such as: meteorological-driven hazards, e.g. storms, fires, floods; geophysical hazards, e.g. earthquakes, tsunamis, volcanic eruptions, landslides; technological disasters, whether deliberate or accidental, e.g. urban fires, chemical accidents on industrial sites; humanitarian disasters generated by sudden natural, technological and weather driven disasters. In the long run, the proposed service will guarantee that Europe can provide adequate information system capabilities to support early warning, urgent assistance, relief operations, humanitarian aid, reconstruction wherever and whenever they may by required around the world.

Grid paradigm is another technological and economic revolution in high performance distributed computing as the World Wide Web has been since the last ten years for what concerns the meaning and the availability of a global information. Grid-based platforms will allow the implementation of widely distributed computing environment operated as a uniform service.

In 2003, within the FP6 Research Infrastructure program, the EU approved the EGEE (Enabling Grids for E-Science in Europe) project, which aims to integrate current national, regional and thematic Grid efforts, in order to create a seamless European Grid infrastructure for the support of the European Research Area. After less than one year, the EGEE computing Grid is now operating and includes more than 100 sites in 31 countries. This makes it the world's largest international scientific Grid. Such an occasion of progress for the whole European Society must be leveraged by important and strategic sectors like GMES, and in particular Civil Protection operative infrastructures: Civil Protection organization, is a typical example of virtual organization and its system infrastructures need high performance distributed computing environment to share critical data and resources.

Civil Protection, as well as most of GMES services, require a strict integration with research infrastructures providing heterogeneous and distributed resources (e.g. computing, data, services, knowledge, expertise, etc.) useful in the full cycle of emergency situations (i.e. forecasting, warning, management, assessment). Moreover, Civil Protection and GMES activities typically involve many different actors (e.g. Civil Protection systems, public bodies, research centers, etc.) who need to share resources in a coordinated and effective way. In this document, the term “CP community” is used to describe this community as a whole, since Civil protection Agencies *sensus stricto* act as leaders in GMES as well as in this project Grid infrastructures offer useful services to face these needs. Indeed, grid technologies are designed just to allow the coordinated sharing of resources (i.e. computing, storage, communication and sensors) needed by Virtual Organizations (VOs) such as Civil Protection systems. Consequently the adoption of a Grid-based infrastructure to support GMES applications seems a natural choice.

Current Grid platforms were mainly designed to support research and applications requiring intensive processing and data management, thus they offer high computing and storage capabilities. Only in recent times Grid research is facing new problems like sensor interaction and communication quality of service. They need an enhancement to support new kinds of applications such as Civil Protection.

Indeed, Civil Protection applications have specific requirements that are not commonly satisfied by typical research infrastructures.

These requirements (e.g. real-time support, sensor control functionalities, geo-information sharing services, advanced policy and security support) have a strong impact on research strategies (i.e. new data models, algorithms, methodologies need to be investigated) and consequently on the enabling research infrastructures (i.e. new protocols, services and architectures must be designed and experimented).

CYCLOPS Objectives

Taking into account the previously described context, the main goal of the present Specific Support Action is *to bridge the gap between Grid and GMES communities*

making Civil Protection people be aware of the services provided by Grid infrastructures, and, at the same time, letting Grid researcher to be aware of Civil Protection specific requirements and service enhancement needs.

CYCLOPS will bring together these two important Communities: CP and GRID, creating a fruitful interaction between Civil Protections agencies, experts of CP Information Technology requirements and Grid/EGEE community, in order to have an effective synergy guiding the development of future Grid research infrastructures and studying the feasibility of getting them run onto the European Grid Infrastructure.

CYCLOPS will provide a support action to the EGEE and EGEE-2 I3 projects in order to utilize its platform in the Civil Protection community.

The Main Goal represents a really general objective. To carry out effective actions toward it, this main goal is translated in six Project Objectives (PO):

PO_1) *To assure effective project management*
PO_2) *To assure effective technical activities*
PO_3) *To assure quality of the results*
PO_4) *To define CP community requirements for Grid platforms*
PO_5) *To carry out CP and Grid communities inter-dissemination*
PO_6) *To prepare for future innovation and R&D projects*

The Project Objectives define what CYCLOPS will do in the framework of the Main Goal. They are designed in terms of the six key criteria that are considered fundamental for the success of the project:

- Relevance to the Objectives of the Programme
- Potential Impact
- Quality of the Support Action
- Quality of the Management
- Mobilisation of the resources

The first three POs aim to assure the overall quality of the project, while the last three ones aim to define which results the project will carry out in respect of the Main Goal. In particular:

PO_1 (*To assure effective project management*) aims to assure an effective project management to satisfy the Quality of the Management criterion;

PO_2 (*To assure effective technical activities*) aims to satisfy the Mobilisation of resources criterion.The Support Action specific objectives (see PO_4 to PO_6) are carried out mainly through technical activities such as performance of studies and analyses, development of research or innovation strategies, dissemination actions. Thus an action of monitoring and coordination of the human resources (working group) is needed. CYCLOPS defines a specific PO for assuring the human resource effectiveness of the technical activities carried out in the framework of the project.

PO_3 (*To assure quality of the results*) aims to satisfy the Quality of the Support Action criterion. Since CYCLOPS activities are mainly carried out by expert groups, the quality of the support action strictly depends on the expertise and involvement of the expert group members.

PO_4 (*To define CP community requirements for Grid platforms*) aims to satisfy the Relevance to the Objectives of the Programme criterion. Taking into account the Objectives of the Programme (see section 4) the main PO concerning it is the definition of the CP community requirements for Grid Platforms.

PO_5 (*To carry out CP and Grid communities inter-dissemination*) and PO_6 (*To prepare for future innovation and R&D projects*) aim to satisfy the Potential Impact criterion. Being an SSA, CYCLOPS effectiveness and potential impact strongly depend on the inter-dissemination between the CP and Grid communities and on the preparation of exploitation strategies through innovation and R&D projects that CYCLOPS studies could start.

These Project Objectives are translated in Operational Goals (OG) which are reached carrying out specific Tasks. The Operational Goals define the actions and the expected results of CYCLOPS as regards the relative PO.

Fig. 1 depicts a diagram of such decomposition showing the Main Goal, the Project Objectives (highlighting the key criteria they are relative to), the Operational Goals and the Tasks collected in Work Packages (described in the WP forms).

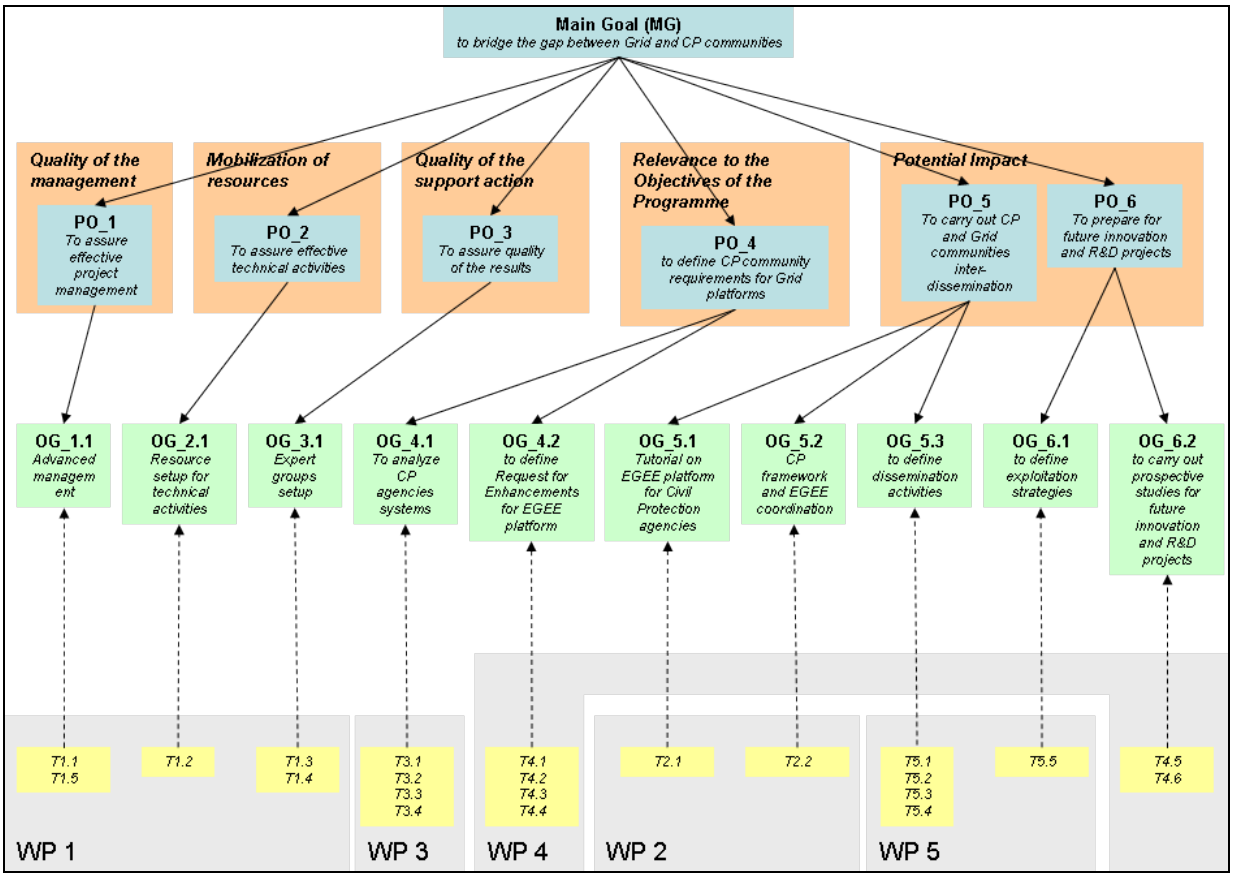


Fig. 1 Project Objectives diagram

Operational Goals description

The Operational Goals define what CYCLOPS will carry out as regards its Project Objectives. In the following forms, each Operational Goal is briefly described showing the means planned to achieve it, how its progress is measured and how its success is estimated.

To monitor the project progress and results, each workpackage will devote some resources to assessment and evaluation activities. The WP leaders will report the results of such activities to the Project Management Board that is responsible of monitoring the overall progress and taking actions to respond to possible deviations and problems.

OG_1.1	***Advanced Management***
Description	An important objective goal for the CYCLOPS success is to set up an advanced project management. Project management aims to plan and organize effort to

	accomplish the expected CYCLOPS results Monitoring progress, tracking deliverables and reporting back to the EC and partners, actions carried out with: • permanent monitoring of the situation with reliable information; • Establish clear visibility in the content of work for any partner; • Nominate package leaders with high responsibility delegated; • Limit the interfaces and simplify links for driving and reporting. The project has been broken down in to 5 workpackage series, allowing clear responsibility distribution and coherence. Project management includes also developing CYCLOPS project plan Another important aspect address the project plan implementation, along with careful controls to stay on the "critical path", that is, to ensure the plan is being managed according to plan.
Means to achieve it	Project plan implementation is carried out through the day-by-day activities required for the project management. In order to facilitate the management, there will set up a collaborative environment: specific tools for enabling collaborative working. These instruments will be set up and managed to facilitate the working group activities. In particular the following services will be made available: - project web site; - mailing lists and discussion forums; - project document repository; - collaborative editing environment; - audio/video conferencing tools.
Measure of progress	PM 1 *D1 Project Presentation* PM 2 *D3 Perspectives on cooperation with existing projects and initiatives* PM 3 *M1.3 Project ready to start support activities*
Measure of success	The timely delivery of CYCLOPS products (i.e. deliverable, Web site, publications, etc.); The effectively organization of CYCLOPS events (e.g. tutorials, workshops, etc.). The success rate for internal conflict resolution.

OG_2.1	***Resources setup for Technical Activities***
Description	In order to assure an effective mobilization of resources, CYCLOPS must setup a successful working group which is in charge of carrying out any support activities concerning the

	project tasks.
Means to achieve it	To establish a high level working group: at least one member of each partner is part of the WG. The WG can be further divided into work teams for accomplish well-defined sub-tasks. The WG consults the expert groups on specific issues.
Measure of progress	*PM 1* *M1.2 Working Groups set up*
Measure of success	The timely accomplishment of CYCLOPS tasks; The success rate for technical conflict resolution; The effectively use of allocated resources.

OG_3.1	***Expert Groups setup***
Description	In order to provide a good quality support action, CYCLOPS must rely on high level competences on present Civil Protection structures and procedures, as well as applied technologies for risks prevention and management.
Means to achieve it	Definition of a Civil Protection Expert Group (CPEG). Typically, one member for each Civil Protection, involved in the project, is part of the CPEG. The CPEG provides knowledge about the typical business processes and internal procedures of the different Civil Protections involved in the project. Definition of a Technical Expert Group (TEG). The TEG is composed of members carrying expertise on information and communication technologies (ICT) applied to the following specific sectors: Environment, Earth Observation and Civil Protection. Actually, the TEG provides the knowledge about technologies and resources available –or needed- for Civil Protection applications.
Measure of progress	*PM 3* *M1.3 Project ready to start support activities*
Measure of success	The timely setup of CPEG; The representativeness of the CPEG experts; The timely setup of TEG; The representativeness of the TEG experts

OG_4.1	***To analyze CP agencies systems***
Description	In order to define the requirements of Civil Protection community for Grid platforms, CYCLOPS will first analyse the heterogeneous European Civil Protection needs and available resources; then, it will provide common use cases and system requirements.
Means to achieve it	Heterogeneous Civil Protection systems, infrastructures, operational structures and procedures will be captured and described. Then, common or visionary use-cases, representative of typical scenarios of Civil Protection, will be achieved. On the top of it, common requirements will be worked out. In particular, the following analyses will be used to achieve this goal: Business Process analysis: a Business Process analysis of the Civil Protections systems active in the partner countries. This analysis should highlight the

	internal processes and the interactions with external entities such as public bodies, research centers, data and knowledge providers. Cross-boundary activities will be particularly considered. Existing Analysis: to collect information about the resources (information systems, communication services, computing resources, etc) commonly used by the different Civil Protection systems involved in the project; Use-cases analysis: to identify and describe a set of significant use-cases that could be ported, improved or even made possible by using Grid technologies. The objective of this study is to help in the definition of the system requirements. System Requirements Analysis: functional and non-functional requirements of a Grid-based infrastructure for enabling Civil Protection applications, based on the previous analyses results. This study is the basis for researches on grid infrastructure addressed by future projects.
Measure of progress	PM 5 - D6 Business Process analysis document released PM 6 - D8 Existing Analysis document released PM 7 - D9 Use-cases document released - M3.1 Civil Protection System description available PM 20 - D11 System Requirements document released - M3.2 System Requirements available
Measure of success	o Number and significance of Civil Protection Agencies and systems surveyed; o Number and significance of Civil Protection Business Processes analysed; o Number of Cross-boundary activities considered. o Number and significance of use cases worked out; o Number and significance of functional and non-functional requirements achieved.

OG_4.2	**to define Request for Enhancements for EGEE platform**
Description	To assure the Relevance to the Objectives of the Programme is the target of the definition of Civil Protection requirements for Grid platforms. In particular this Operational Goal concerns the Requests for Enhancement for EGEE platform to make possible the support of Civil Protection applications on the top of it.
Means to achieve it	This Operational Goal is achieved through several activities. First of all the EGEE middleware is installed at the CP sites for test purposes. Then, basing on the System Requirements analysis a study is performed about the integration of the Civil Protection framework with the EGEE middleware. This is a preliminary

	activity to highlight weaknesses of current EGEE platform in supporting CP applications. After that, basing on the results of T3.1 (Business Process analysis) the EGEE needed extensions are analyzed. Finally, the possible implementation (porting) of existing Civil Protection applications on the enhanced EGEE infrastructure is analyzed.
Measure of progress	*PM 13* *M4.1 EGEE infrastructure deployed* *PM 15* *M4.2 EGEE Integration analyzed* *PM 24* *M4.3 EGEE enhancement analyzed* *D14 "EGEE Request for Enhancement" document released* *PM 24* *M4.4 Application porting analyzing*
Measure of success	o Number of EGEE installations. o Peer-review of deliverables from EGEE members.

OG_5.1	**Tutorial on EGEE platform for Civil Protection agencies**
Description	The first CYCLOPS operational goal to have an effective inter-dissemination between Civil Protection and Grid communities is the presentation of EGEE platform to possible users. This is intended to provide an example of Grid platform to evaluate and test its capabilities in the GMES context considering the Civil Protection applications.
Means to achieve it	One of the member of CYCLOPS consortium is also member of the EGEE consortium (INFN). INFN experts will organize dissemination and training events open to Civil Protection personnel to present the current EGEE architecture and its planned evolution
Measure of progress	PM 7 *First Training Workshop* PM 24 *Second Training Workshop*
Measure of success	o Number of training events. o Number of attenders at training events. o Questionnaire for self-evaluation of training events.

OG_5.2	**Civil Protection framework and EGEE coordination**
Description	A fundamental aspect of GMES and Grid communities inter-dissemination is the knowledge exchange with EGEE, the main Grid project at European level. To enhance the potential impact of CYCLOPS a specific operational goal is the coordination between EGEE project and the development of the framework for

	the applications of Grid technologies to the Civil Protection context. CYCLOPS members developing the Civil Protection Grid framework must be kept continuously updated about new EGEE middleware functionalities implemented by the EGEE project, at the same time need to give feedback to EGEE developers highlighting the weakness encountered in the Grid middleware and suggesting possible improvements for satisfying their requirements.
Means to achieve it	One of the member of CYCLOPS consortium is also member of the EGEE consortium (INFN). INFN experts will provide the needed link between the project. They will present the new EGEE middleware functionalities to the CYCLOPS expert group and will report the Civil Protection requirements to the EGEE developers.
Measure of progress	*PM28* *D17 dissemination and coordination activity final report released*
Measure of success	Number and impact of feedback provided by CYCLOPS to EGEE. Timeliness of information about new EGEE middleware functionalities implemented by the EGEE project. Peer review of deliverables.

OG_5.3	**To define dissemination activities**
Description	Organize the activities to be performed in order to distribute adequate knowledge from the project and promote the exploitation of the results by the widest Civil Protection and GMES community and interest in Europe The actions are expanded towards a wide range of existing public bodies, national and local decision makers, users and scientific society, data and product providers, EC and general RTD sector, industry in order to enhance the potential of the solutions for safety improvement and let them share an interest in the success of this initiative, delivering technical and operational outcomes.
Means to achieve it	Organization of **a project open conference**, **a project final workshop**, **a mid-term project workshop** and a, **two Self Training Workshop** Participation to other relevant conferences There are a great number of events, conferences, seminars, workshops taking place all over Europe focusing Grid technology. The partners have to careful choose those events which seem most appropriate to meet their objectives, for example those organized by the following entities: users (civil protection units), scientific community and researchers, strategic bodies (EC DG, OECD…), disaster reduction initiatives (ISDR), GMES forum, space agencies addressing the space applications development, national institutions (ministries). The content of the CYCLOPS presentations will reflect the goals of the project and its progress. Partners will make contributions to appropriate publications that provide high impact opportunities, like users periodical journals, annual reports, risk assessment

	publications, and research published papers. Civil Protection representatives will facilitate contacts and access to the civil security official publications and newsletters. Results may reach researchers and research groups active in the related areas. These contributions will be coordinated and reviewed by the CYCLOPS management and all published information will include contact details and the web site address from where further information can be obtained. The project will implement and maintain a web site for global information dissemination. The web site plays the important role of being the main communication tool and, providing suitable access restriction, the main repository of information about the project activities as well.
Measure of progress	*PM1* *- D2 Project open conference* *PM3* *- M5.1 Dissemination started* *- D4 Dissemination Plan released* *PM24* *- D12 Mid-term project workshop* *PM 28* *D18 Project results presentation released* *D19 Final Plan for using and disseminating knowledge released* *D20 Report on raising public participation and awareness released* *D21 Project final conference* *PM 28* *M5.2 Project results disseminated*
Measure of success	○ Number of public bodies, national and local decision makers, users and scientific society, data and product providers who will participate to the project open conference and the couple of workshops foreseen. ○ Number and role of people who will attend the project tutorials. ○ Number and appropriateness of national and international conferences to which CYCLOPS will present its activity. ○ Number of accesses to the CYCLOPS Web site. ○ Number of downloads of CYCLOPS documents, published on-line.

OG_6.1	***To define exploitation strategies***
Description	The success of CYCLOPS Project is strongly dependant on the exploitation of its results. Indeed, as a support action, the number and quality of following initiatives is the real measure of its success. Thus, a detailed exploitation plan is considered a

	valuable resource to enhance the impact of the project. The exploitation plan will consider a wide range of initiatives built on the top of CYCLOPS output such as R&D project startup (funded by national or international bodies), cooperative research activities, SMEs and GEs involvement, coordination actions for existing projects (both at European and international level).
Means to achieve it	The exploitation plan will be defined through the activity of a working group made of representative of both Civil Protection and Grid communities. The exploitation plan will take into account the results of the dissemination activities considered useful to build a community made of research centers, public bodies, enterprises and interested in Grid applications for Civil Protection.
Measure of progress	PM28: - *D19 Final Plan for using and disseminating knowledge released*
Measure of success	o Number and impact of proposed R&D activities. o Impact of SMEs and GEs involvement. o Impact of coordination actions for existing projects (both at European and international level). o Peer review of deliverables

OG_6.2	***To carry out perspective studies for future innovation and R&D projects***
Description	CYCLOPS aim to provide studies that could be the base for future R&D projects in the field of Grid technologies applied to the GMES context and for defining the innovation strategies for Civil Protection as regards the Grid technology adoption. In particular, a deliverable called “Research Strategies for the development of a Civil Protection E-Infrastructure” collects the open issues on the application of Grid technologies to the Civil Protection context, providing the directions for targeted projects. These studies could be useful both for EGEE middleware development and for new R&D projects. A deliverable called “Toward a Grid - Guidelines for Innovation Strategies for Civil Protection Systems” collects the requirements for the adoption of Grid technology in the context of Civil Protection agencies taking into account the existing and required resources.
Means to achieve it	The studies are carried out through the activity of expert groups made of members with expertise in Civil Protection management and in Grid and Information & Communication Technologies. In particular the results of an User Requirement Analysis, and the analysis of the problem of porting Civil Protection applications in a Grid platform will be specifically considered. Concerning the innovation strategies, the results of an Existing Analysis and a technical requirements analysis will be considered.
Measure of progress	PM25: - *Operational Goal achieved* *- D15 “Toward a Grid - Guidelines for Innovation Strategies for Civil Protection Systems” report released* *- D16 “Research Strategies for the development of a Civil Protection E-Infrastructure” report released*

	- M4.5 Research and innovation strategies investigated
Measure of success	Number and significance of open issues on the application of Grid technologies to the Civil Protection context provided. Impact of provided directions for targeted projects dealing with application of Grid technologies to the Civil Protection. Number and importance of provided requirements for the adoption of Grid technology in the context of Civil Protection agencies. Peer review of deliverables

3. Participants list

Partic. Role	Partic. No.	Participant name	Partic. short name	Country	Date enter project	Date exit project
CO	1	Dipartimento della Protezione Civile	DPC	IT	1	28
CR	2	Istituto Nazionale di Fisica Nucleare	INFN	IT	1	28
CR	3	Istituto di Metodologie per l'Analisi Ambientale	IMAA	IT	1	28
CR	4	Direction de la Défense et de la Sécurité Civiles	DDSC	FR	1	28
CR	5	Civil Protection of Chania Prefecture	CP-CH	GR	1	28
CR	6	Technological Educational Institute of Crete	TEI-CR	GR	1	28
CR	7	Autoridade Nacional para a Protecção Civil	ANPC	PT	1	28
CR	8	Association pour la Recherche et le Développement des Méthodes et Processus Industriels – Ecole Nationale Supérieure des Techniques Industrielles des Mines d'Alès	ARMINES - LGEI	FR	1	28
CR	9	Universidade do Minho	UMINHO	PT	10	28

*CO = Coordinator
CR = Contractor

4. Relevance to the objectives of the specific programme and/or thematic priority

As stated in the Work Programme 2004-2006 about Structuring the European Research Area, within the Sixth Framework Programme, the objectives of the Communication Network Development (CND) scheme, in support of existing Research Infrastructures, is to create, in conjunction with the priority thematic research area on Information Society Technologies (IST), a denser network between related initiatives, in particular by establishing a high-capacity and high-speed communications network for all researchers in Europe (GÉANT) and specific high performance Grids and test-beds (GRIDs). Broadband communication networks and Grid technologies are keys for the development of the Research e-Infrastructure, enabling collaborative work and resource sharing among researchers spread across Europe. For what concern the GRIDs area of work, the CYCLOPS project aims to address the following general objectives indicated by the CND scheme:

1) ensure that Grid infrastructures exhibit production-level performance capabilities and constitute themselves distributed facilities at gigabit/terabit scales (in terms of computing, storage and communication power) for use by a broad range of different research disciplines;
2) promote complementary work vis-à-vis national Grid-Programmes in Europe in view to add value to national Grid-initiatives and support

the creation of a network of (e.g. National) Grid Support Centres in Europe;

3) emphasise the integration of access facilities and interfaces/portals into core Grid infrastructure environments (e.g. wireless-devices, sensors);

4) address and integrate both supercomputing and distributed computing technology, concepts and resources;

5) foster interoperability across heterogeneous technology domains and interoperability of solutions across different disciplines in an effort to achieve broader scale uptake of Grid technology across numerous user communities;

In particular, within the GRIDs area of the CND scheme, the CYCLOPS project is actually placed in the sub-area of work called eInfrastructure-Consolidating Initiatives, where it will contribute to the following additional specific objectives:

a. the reinforcement of the user communities engagement (e.g. social sciences, humanities and education; astronomy; environment; earth observation, biomedicine etc);

b. the reinforcement and stimulation of eInfrastructure policies for science and engineering, and policy based management actions and tools (e.g. authentication, authorisation, ICT-resource sharing, security, registries/repositories of resources and policies etc).

The CYCLOPS project, in complementing the EGEE I3 project, clearly matches all of the above general objectives, in fact:

1) Civil Protection community will fully exploit the existing EGEE Grid infrastructure, testing the quality of the middleware services, providing continuous feedback to EGEE architects, and helping to find common solutions in order to enhance the production-level capabilities of the e-Infrastructure;

2) the participation of Civil Protection agencies of different European countries to CYCLOPS project will assure the interconnection among their national Grid initiatives;

3) the wide use of sensor networks and data acquisition systems is typical of Civil Protection applications: the CYCLOPS project will provide a valuable set of requirements in order to integrate these new access facilities into the EGEE platform;

4) specially for complex simulation tasks, supercomputers are often needed for the most demanding computations: the CYCLOPS project will deal with the issue of integrating supercomputing and distributed computing technologies, always selecting the best computational solutions for their applications;

5) Actually, Civil Protection applications adopt several different technologies, but need to cooperate to accomplish their tasks: it means that a coordinate way to share their resources by mean of Grid Virtual Organisations is not enough, but also interoperable solutions among heterogeneous technologies are required and will be investigated within the CYCLOPS project.

The more specific objectives relevant for the eInfrastructure-Consolidating Initiatives will be fully addressed by the CYCLOPS project work-plan, for the following reasons:

a. the Civil Protection community, after defining the requirements for a Grid-based infrastructure satisfying their needs, will evaluate and test the EGEE platform, taking advantage from the dissemination activity of the EGEE results planned by the CYCLOPS project. The dissemination activity is usually the first step in the process of engaging new user communities for the eInfrastructure, it provides the general picture and introduces state of the art Grid technologies and services covering a broad range of scientific and technological areas, highlighting the benefits every community can obtain from joining a Grid computing infrastructure. A second step, also planned by the CYCLOPS project, consists in the evaluation and testing of the EGEE platform carried out by experts in Civil Protection applications. This activity will bring the potential users of these communities deep into the technical details, giving them, as a training process, the proper knowledge and the skills to use the Grid computing infrastructure. These pioneer users can act then themselves as further dissemination vectors within their communities. They not only will assess the power of the Grid computing, but also eventually identify critical areas where their specific requirements are not yet fully addressed by the current platform, giving valuable feedback to EGEE community and developing strategies in order to enhance the eInfrastructure and enable it for Civil Protection applications, stimulating an effective synergy between the CYCLOPS and the EGEE projects;

b. among the high priority issues of the Grid computing concerning the overall management of the eInfrastructures certainly are the definition of the Acceptable Use Policy (AUP) for the eInfrastructure, and the definition of a policy for Authorization and Authentication (AA), commonly agreed for accessing and sharing in a controlled way the computing, data storage and networking resources geographically distributed across different administrative domains. Security of course plays a key role in attracting new user communities other that eScience, for example from industry, business, finance and defence, since their activities often require secrecy and privacy. The interaction with military resources typical of Civil Protection systems sets new strict data policies and security requirements on the ICT-resource sharing, putting the CYCLOPS project in the position of stimulating and guiding the reinforcement of the global eIfrastructure policies and policy based management actions and tools, according to the objectives of the CND scheme. Again, it will produce an effective synergy between the CYCLOPS and EGEE projects, which is the goal of the complementary activities supported through the Specific Support Action instrument adopted.

5. Potential Impact

The current EGEE platform is based on the middleware developed by several pioneering projects, most notably DataGrid, where the main focus was put on enabling to Grid computing the data intensive scientific applications in the fields of High Energy Physics, Earth Observations and Genomic Exploration. Their

requirements lead to a platform designed to handle the processing of a large amount of distributed data, ranging in size from 0.1 to 10 PetaBytes/year, exploiting the sharing of computing, storage and network resources in a coordinated way.
Civil Protection applications will certainly benefit from the above design, nevertheless they also have specific requirements not yet or only partly addressed within the EGEE platform. They concern the integration of sensor networks and acquisition systems, the data policy and security support management, the communication quality of service. The impact of the CYCLOPS project in the area of Grid computing research will be then of great value. The project will provide useful inputs to the EGEE community: a set of use-cases representative of typical scenarios of Civil Protection activities will establish the e-Infrastructure functionalities which are suitable to satisfy their requirements. Besides missing needs specific of Civil Protection community will be outlined. The impact will be strong on both sides: data models, algorithms and methodologies typical of Civil Protection applications could be reviewed to better adapt and exploit the Grid functionalities already available through the EGEE platform; new research strategies will be defined to plan an enhancement of the EGEE platform in order to fully support Civil Protection applications.

As far as Grid infrastructures are concerned, other national and international research activities will be taken into account by means of the tight collaboration with EGEE Project which deals with creating a European Grid infrastructure.
As far as similar initiatives in the field of Civil Protection are concerned, Civil Protection agencies involved in CYCLOPS Project will provide the necessary liaisons.

Interoperability solutions and Grid infrastructures represent an important opportunity to expand knowledge in the monitoring and security sectors and to enable new applications (especially in relation to 3D and 4D process modelling using Real-Time and Near-Real-Time data): from this perspective, there exists a direct connection between GÉANT, EGEE and GMES. Therefore, this unique opportunity can be realized only in carrying out the work at a European level (as it is the dimension of GÉANT, EGEE and GMES).

5.1 Contributions to standards

Being a Project mainly concerned with dissemination and outreach activities, CYCLOPS will not directly contribute to develop any standards in grid computing. However, from one side CYCLOPS, trough the INFN, will closely follow the activity of the Global Grid Forum and other standardization activities, such as those of OMII Europe, and, from another side, CYCLOPS will early adopt, test and validate, the middleware re-engineered by EGEE and EGEE-2 in compliance with the current open standards. In this way, CYCLOPS will actively participate in requirements capture and feedback on the middleware, standards and protocols, but also Grid management tools. Via this feedback through EGEE and EGEE-2, CYCLOPS will indirectly contribute to international standards.

Being IMAA an active member of the Open Geospatial Consortium (OGC), Cyclops may profitably contribute to several areas of OGC standardization activity.
OGC is a non-profit, international consortium of more than 270 companies, government agencies and universities, that is leading the development of standards for geospatial and location based services. Through a member-driven consensus programs, OGC works with government, private industry, and academia to create open and publicly available interface specifications so as to promote interoperability of geographic information and "geo-enable" the Web, wireless and location-based services, and mainstream IT.

In particular, some of the anticipated Cyclops results may be proposed as OGC Discussion Paper to germane OGC Working Groups, such as the following:

- Risk and Crisis Management Working Group, set to improve the efficiency and effectiveness of users in each phase of the risk and crisis management life cycle and across the risk and crisis management community through changes and extensions to OGC specifications;
- Sensor Web Enablement Working Group, focused on developing standards to enable the discovery and exchange of sensor observations, as well as the tasking of sensor systems;
- Earth Observation Working Group, particularly involved in the G8-sponsored initiative for the implementation, in the next 10 years, of a Global Earth Observation System of Systems (GEOSS), which will provide the institutional mechanisms for ensuring the necessary level of coordination, strengthening and supplementation of existing global Earth observation systems, and for reinforcing and supporting them in carrying out their mandates.

Moreover, Cyclops results may be contributed to the ongoing activities for setting up the Infrastructure of Spatial Information in Europe (INSPIRE), an initiative that aims to establish a base collection of standard technical rules, policies and institutional arrangements and to facilitate discovery, evaluation, application of (existing digital) geospatial and environmental data for users and providers within all levels of government, the commercial sector, the non-profit sector, and academia and by citizens in general.

Where applicable, the results of CYCLOPS will be proposed as contributions to standards to the proper organizations and consortia.

5.2 Contribution to policy developments

Being a sister Project of EGEE, CYCLOPS will closely follow the international policy developments made in the context of EGEE Network Activity and Application Support and e-IRG.
CYCLOPS will also contribute to policy developments via a number of its internal activities:

- Enhancing collaboration between national protection communities, thus paving the way for educational, scientific and cultural exchanges, initiatives and projects across the borders.
- Stimulating the sharing of the know-how in terms of Grid computing among the partners.
- Facilitating research activities over a number of scientific sectors linked to the national protection, by providing access to the nascent e-Infrastructures to a wide spectrum of applications.
- Encouraging the interaction of research communities and governmental bodies with the aim of gaining long-term support for e-Infrastructures. CYCLOPS aims to trigger these actions by involving the participating countries in latest developments and e-Infrastructure practices in computing and e-Science.

The project is expected to improve the following knowledge-based society indicators along 3 distinct lines: 1) Providing cheaper, faster, secure and immediate access to computing and storage resources; 2) Investing in people and skills; 3) Exploiting the network infrastructures provided by GEANT and GEANT2.

CYCLOPS will contribute to the GMES initiative, with particular attention on Long Term Sustainability issues, as far as the Civil Protection sector is concerned: this action will be pursued by disseminating and reusing CYCLOPS analyses and results at both the National and European level. In fact, the CYCLOPS Civil Protection agencies are fully part of the GMES working groups at the European level and are involved in GMES activities. For example, DPC and IMAA are involved in the Italian steering committee for the GMES programme and are part of European-funded projects on GMES (e.g. BOSS4GMES, OASIS, EURORISK-Preview).

CYCLOPS will contribute to the INSPIRE initiative, as far as the ESDI (European Spatial Data Infrastructure) design and development is concerned. This action will be pursued by disseminating and reusing CYCLOPS analyses and results at both the National and European level in the INSPIRE framework. DPC and IMAA are among the initiator of an INSPIRE SDIC (Spatial Data Interesting Community) which is focused on GMES and INSPIRE technology harmonization, with particular attention on Grid solutions. Experts of such SDIC are experts of the Drafting Teams which have been working on the INSPIRE Implementing Rules.

5.3. Synergies with other relevant projects

Several partners of CYCLOPS Consortium are active in other relevant EC-funded projects in the Civil Protection, GMES and GRID sectors. Whereby, CYCLOPS will establish close relationships and synergies with the following projects: PREVIEW (in the context of DG INFSO and DG RECH), RiskEOS Stage 2 (in the context of Programme ESA GMES Service Element), EGEE/EGEE-2 (in the context of DG INFSO) and RISK-AWARE and AMPHORE (in the context of INTERREG III B). Full description of these projects objectives are included as annexes.

When feasible and opportune, CYCLOPS will plan its workshops and training events in close connection with analogous initiatives promoted by PREVIEW, RiskEOS, EGEE/EGEE-2 and RISK-AWARE.

CYCLOPS is a sister project of EGEE and will closely follow the international policy developments made in the context of EGEE Network Activity and Application Support and e-IRG. New developments and technological decisions taken by EGEE Consortium will be promptly presented to CYCLOPS Technical Management Board by INFN which is part of EGEE. Moreover the INFN, holding the main responsibility for the middleware development within EGEE, will play a key role in triggering the required improvements of the Grid-based
infrastructure for enabling CP applications to run on the Grid environment. CYCLOPS dissemination activity towards GRID Community will be pursued in close synergy with EGEE, e.g. scheduling CYCLOPS activity presentations at the main EGEE events. Furthermore, INFN will pursue the needed steps inside EGEE to allow CP community to be acknowledged as a new EGEE Virtual Organisation.

As far as INTERREG III B projects are concerned (i.e. RISK-AWARE and AMPHORE) they will provide useful support to collect requirements from the operative Civil Protection infrastructures for cross-borders use cases.

PREVIEW and CYCLOPS will share the following common strategic objective: to enlarge as much as possible the list of target users so that these projects can collect their needs, inform them and disseminate projects' results as largely as possible in Europe in the framework of FP6. The aim is to create the demand, in terms of GMES risk information services (e.g. GRID-based ones), and push for deployment of such services at medium to long term. In PREVIEW and CYCLOPS this objective has the

leadership of Civil Protection partners, respectively: the PREVIEW “User Task Force” and the CYCLOPS “Civil Protection Expert Group (CPEG)”.

GMES RiskEOS and CYCLOPS will collaborate on the same strategic objectives, previously described for PREVIEW, but in this case focusing on ESA-GMES community. In GMES RiskEOS this objective has the leadership of the “User Executive Body”.

Therefore, PREVIEW “User Task Force”, GMES Risk-EOS “User Executive Board” and CYCLOPS CPEG will establish a strong synergy and a close relationship for: collecting needs, inform Civil Protection Community and disseminate projects results. Besides, CYCLOPS management will invite representative European Civil Protection experts, who are involved in PREVIEW and Risk-EOS, to join the CPEG.

It is noteworthy that the DDSC acts as: Risk-EOS “User Executive Board” coordinator, PREVIEW “User Task Force” coordinator and CYCLOPS “Civil Protection Systems Analysis” work package leader.

CYCLOPS partners are also involved in other interesting projects of the Space Research and Applications sector, which are still in the negotiation phase, such as: LIMES and BOSS4GMES. In the due course, synergy actions could be planned with these projects, too.

In general, synergies with existing projects from Unit F3 'Research Infrastructures' will be sought at clustering and concertation events organised by the Commission according to the Special Clause 3bis on Clustering and concertation:

> “In order to assure coherence of the work within the specific programme and its relevance in worldwide developments, the contractors will be required to participate in periodic cross-dissemination meetings together with other related projects. When applicable, the contractors of these projects shall collectively discuss common approaches to standardisation activities. The concertation activities related with the project clusters foresee up to four meetings per year with the presence of project representatives. Interest groups clusters will be flexible and will be organised by the Commission services if added-value is demonstrated and if they answer a particular need for action in relation to a clearly identified and targeted theme.” [Decision DL/2003/3004]

6. Project management and exploitation/dissemination plans

6.1 Project management

General description

The CYCLOPS project is designed to link with related initiatives at the National level (an important task of National Civil Protections member of the consortium) and the trans-national EU-funded EGEE project, in particular. Given the close relationship to EGEE project, we propose to manage the CYCLOPS project using a management structure similar to EGEE one. This approach has the main benefit to fully exploit the complementarities of these projects.

The Management of the project is designed to deal with the problem of a number of geographically distributed partners with light project management resources. To meet this challenge the management of individual work-packages has been devolved to experienced work-package managers, appointed by the lead partner in each of the

work-packages. Another important role of CYCLOPS management will be to ensure the effective and enabling availability of the work developed by EGEE and by the useful initiatives at the National level. Eventually, a key task of CYCLOPS management will be the set up of working and expert groups (i.e. civil protection and technical expert groups).

Communication between all participants will be via electronic mail and the use of audio/teleconferencing to reduce time lost through travelling and travel expenses to a minimum. The Project Manager will ensure that digests of communication between partners are transferred to the project's Web site providing easily accessible information on the current activities of all partners. The project will make use of common styles for deliverables etc.
The work package managers and project manager will generate quarterly progress reports. These reports will indicate the progress made in each task and the resources consumed.
Project meetings will be organized every six months. The result of these meetings and the quarterly progress reports will be used as input into the annual EU review of the project.
The project manager will organise project meetings and the annual EU reviews.

Detailed project management structure

The project management will be organized with the following structure:

- A project manager (PM), nominated by the coordinating partner to run the project on a day-to-day basis.
- A Project Management Board (PMB) composed of one management representative of each partner and the PM. The PMB will supervise the project from the political and administrative points of view. PMB will co-ordinate and manage items that affect the contractual terms of the project.
- A Technical Management Board (TMB), comprising of one representative from each Work Package (normally the WP manager), to take decisions on technical issues.
- A leader for each work package: the WP manager.

Project Manager

Implementing decisions taken by the management board, the Project Manager will undertake the following tasks:

- To be in charge of communication between the project and the EU.
- To be in charge of taking decisions between board meetings.
- To be in charge of organizing links with other related or relevant Projects on both sides of the Atlantic and related activities.
- To be in charge of ensuring that Intellectual Property Rights (IPR) and knowledge issues will be properly addressed.
- To be in charge of all administrative management tasks.

The PM will report to the PMB.

Project Management Board

The project management board will address strategic and contractual decisions concerning the project, supervising it from the political and administrative points of view. It will be composed of one management representative from each partner and

chaired by an elected chairperson to be appointed annually. The project manager will act in support of the board. The management board will take decisions affecting the budget and the objectives of the project, changes and dissemination agreements. All partners will have the right to vote.

Technical Management Board

The Technical Board will take day-to-day technical decisions on analysis and methodologies to be used. When necessary, experts (e.g. from application fields or technical expert groups) can participate to Technical Board decisions. Technical Board will report to the management board. In coordination with the project manager, the technical board will be responsible for the overall technical management and execution of the project: fixing the study and analysis strategy, the choice of methodologies and techniques to be used, supervising the monitoring of the results and coordinating the quality assurance function.

The technical board will be responsible for monitoring the quality and timely production of deliverables. It will propose corrective action (to the management board) in the event that partners fail to meet their commitments.

The technical board will be composed of one representative from each Work Package (normally the WP manager), to take decisions on technical issues; The technical management board will nominate a chairperson among its members who will be responsible for reporting to the PMB.

Working Group

The Working Group is made of members from the project partners, who are involved in the project on regular basis. It is in charge of carrying out the specific actions of the CYCLOPS Project (studies, dissemination, etc.). As a Specific Support Action, mainly targeted to studies, analyses, dissemination and research preparation, the setup of an effective Working Group is an important objective and a specific task is dedicated to such an action.

Expert Groups

The two Expert Groups (Technical Expert Group and Civil Protection Expert Group) are made of persons with high expertise in specific domains of interest for CYCLOPS: Information Technologies and Civil Protection. The members are selected both externallyand internally to the Consortium (maximum one member from each relevant partner) and act as consultants for the project on specific issues to assure the quality of the actions. The Expert Groups also play the fundamental role of establishing a liaison with Grid and GMES communities. A specific task is dedicated to the setup of the Expert Groups.

Work Package Manager

Each work package is under the responsibility of a single partner who will designate a Work-package Manager. It will be the responsibility of this person to organize suitable contacts between the partners involved in the work-package and also be responsible for the management of the production of the deliverables.

Conflict resolution

The management board will have both the authority and the responsibility for conflict resolution. Normally it is expected that conflicts will be resolved by voting on a simple majority. The PMB will take remedial action based on advice from the technical board in the event of milestones being missed or deliverables not being available. The project management board will normally conduct its business by email. We expect it to need to meet every six months at the same time as the project meetings.

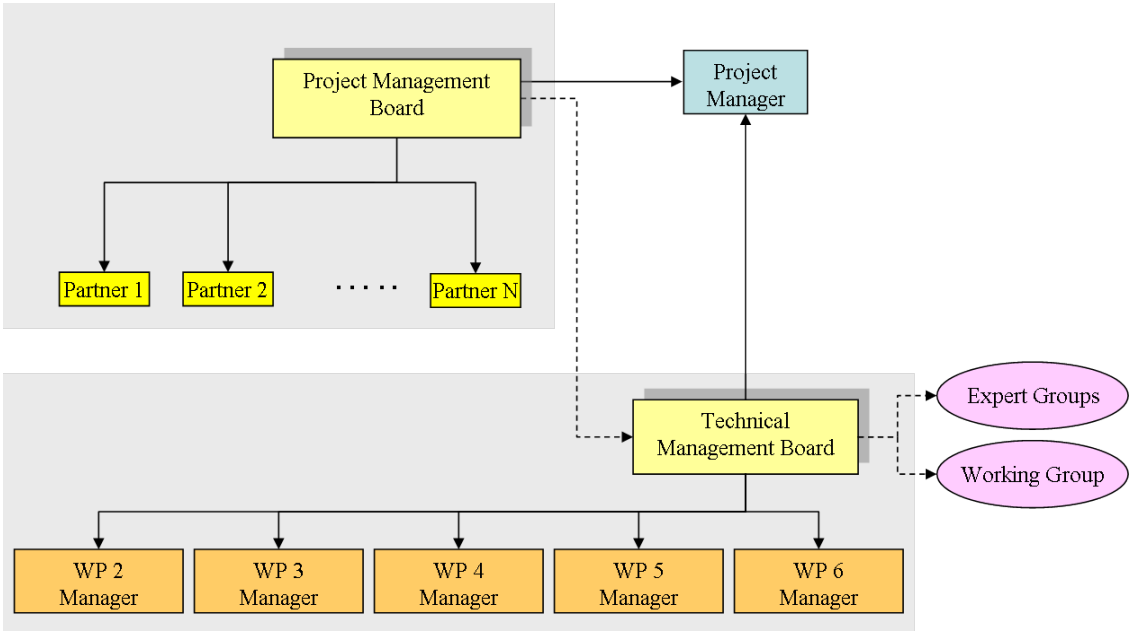
Exceptional meetings can be called by the PM on request from one or more of the partners.

Dissemination, Exploitation and Intellectual property

Dissemination and Exploitation activities are very important activities of the present SSA, tightly coupled to the technical aspects of the project, whereas they are not "embedded" among the management duties. A specific, fully dedicated, Work Package (WP5) will carry out dissemination and exploitation for the entire project extent. The WP5 Manager, in collaboration with the PMB, will be in charge of Dissemination and Exploitation activities; of course, all partners will contribute to such work package. The detailed plan for these activities is discussed in detail in the B.3 section.

In addition to the normal dissemination and exploitation of the work through scientific journal and professional bodies, Civil Protection Community will be specifically targeted for dissemination of the CYCLOPS deliverables and their future exploitation of the results.

WP5 Manager, coordinating its activity with the PMB, will develop a coordinated plan for the full exploitation of the project results. They will actively audit and evaluate project outcomes and make recommendations on Intellectual Property protection and routes to Civil Protection Community. They will maintain target Communities awareness and intelligence to inform the scientific direction of the project and to identify on-going scientific and application opportunities.



Project Management Structure

6.2 Plan for using and disseminating knowledge

A Project WEB site, Management Database, e-Mail, Mailing lists, Templates for Meetings Agendas, Meeting Minutes, Reports and Costs statements are the basic tools that will be put in place for information bookkeeping and flow. Besides, a project website will be settled with security levels, in order to interface persons with the basic tools.

The project activities' meetings are key tools for the running of the project. They will be held either in presence, by phone conference or by videoconference. A calendar with the dates of ordinary meetings will be agreed yearly at the kick-off meeting and at the last meeting of the first year. Specific actions will be undertaken to successfully disseminate project results. These include:

- Establishing close relationship with European Infrastructure projects such as EGEE and EGEE-2 and with Projects involved in the development of Grid infrastructures outside Europe (EELA, EUCHINAGRID, EUMEDGRID, etc.) A CYCLOPS contribution to the EGEE-II project conference and user forum will be assured

- Monitor and follow up European and worldwide standards as they emerge within international bodies like the Global Grid Forum (GGF).

Organization of and participation in conferences, workshops and knowledge dissemination events, so as to disseminate the project results to the potentially interested communities. In particular the Cyclops partners plan the:

- **Organization of a project open conference** (in Italy, Roma – DPC) to be organized during the first year, to meet Grid, Civil Protection and GMES experts broaden the opportunities for dialogue and discuss the EGEE platform for Civil Protection applications also towards other national and transnational organization.

- **Organization of a mid-term** project workshop to present the CYCLOPS objectives and first results.

- **Organization of a project final conference** to present the results to many different communities: scientific and technological, Civil Protection, GMES and Earth Observation.

- Co-ordination of dissemination activities by project partners in the academic and research communities of the participating countries.

The project will facilitate the spread and exchange of technical expertise between all participating countries. The Project will also facilitate the exchange of information between the participating countries and the rest of the world, via close interactions with worldwide Grid efforts and projects. This interaction between the associated participants of the project is envisaged to promote the integration of the research communities of the region to the ERA (European Research Area). In particular INFN will take the lead of the **Organization of two Training Workshop** specially directed to the Civil Protection community which will include theoretical lectures, debates and round tables discussion, case studies, practical exercise, to focus the proper knowledge and the skills to use the GRID computing infrastructures -place: Chania(Greece) and Padova or Bologna(Italy).

Regarding the contribution to standard activities, the project will pursue collaboration with Pan- European efforts namely EGEE and EGEE-2. The specifications will be closely linked so as to achieve the similar policy formats, service definitions, architecture, tools etc. Moreover, WSRF and other Globus/GGF standards will be closely observed and fed back into. The relationship with EGEE and EGEE-2 will be of particular value in this context where these Projects will act as a strong link with international Grid efforts, including the Global Grid Forum (GGF). Again, active participation in quick requirements capture and fast feedback to the EGEE and EGEE-2 middleware developers will indirectly contribute to international standards.

The CYCLOPS Project objectives, activities and results will be presented in the major events involving the interested communities with particular reference to events where the participation of decision-makers is expected.

Great attention will be payed to events and initiatives related to interoperability and inter-community activities, like OGC/OGF collaboration (Open Geospatial Consortium / Open Grid Forum).

6.3 Raising public participation and awareness

Get the operational people aware of CYCLOPS and its future developments is essential, as they can relay information and disseminate such knowledge in their different working environment. Therefore, it is envisaged to generate a module for increasing awareness of the operational community, which could be released during the end users training sessions or included in the instructional material with the support of end user training authorities.

7. Workplan– for whole duration of the project

7.1 Introduction - general description and milestones

The context

Many Civil Protection applications require a strict integration with research infrastructure providing resources (computing, data, services, knowledge, expertise, etc.) useful in the full cycle of emergency management (forecasting, warning, management, assessment). Moreover these activities typically involve many different actors (Civil Protection systems, public bodies, research centers, etc.) that need to share resources in a coordinated and effective way. The recent development in the information and communication science and technology, provide the basis for enabling such applications. In particular, Grid technologies are designed just to allow the coordinated sharing of resources (computing, storage, communication, sensors) needed by such Virtual Organizations (VOs).
Consequently, the adoption of a Grid-based infrastructure seems a natural choice to build a cooperative platform for supporting Civil Protection activities. However Civil Protection applications have specific requirements such as:

- especially during emergency situations, they require to access research infrastructure to run models or search information, but they need real-time (RT) or near-real-time (NRT) responses, privileging time of response instead of accuracy.
- during emergency situations, they gain great benefit from the possibility to control sensors networks and acquisition systems to modify their acquisition strategy and processing chain;
- they require to share geo-spatial information that has specific characteristics. In particular, remote-sensing observation from new satellite sensors produces huge amount of data that are frequently updated;
- Civil Protection systems often need to interact with military resources so they have the strict data policy and security requirements typical of dual systems (civil/military);

- they require knowledge-based systems that starting from data, can provide information suitable by the decision-makers;

These requirements have strong impact on research strategies (new data models, algorithms, methodologies need to be investigated) and consequently on the functional and non-functional requirements of the enabling research infrastructures (new protocols, services and architectures are to be designed and implemented).
Current Grid platforms were mainly designed for researches requiring intensive processing and data management, thus they offer high computing and storage capabilities. Only in recent times Grid research is facing new problems like sensor interaction and communication quality of service. Thus they presumably need an enhancement to support the typical Civil Protection applications that are Real-Time or Near-Real-Time applications requiring data-integration, high-performance computing and a distributed environment for simulations and modelling.

In the Grid technology domain, EGEE Project, which is targeted to the design and development of an enabling Grid platform for e-Science, is a natural choice as starting point for CYCLOPS activities, since it is facing many problems that also CYCLOPS must consider. Nevertheless EGEE platform, and the resulting middleware, is designed for typical research activities aiming to gain knowledge mainly through the processing of great amount of generated or acquired data. Hence, to support Civil Protection applications, research infrastructure should enable the new models, algorithms and services that they require.

This Specific Support Action will elaborate on this and provide commentary and guidance for further research along the EGEE guidelines, in so supporting 6FP, with particular reference to the Communication Development Scheme, GMES, and eventually, contributing to foster innovation in Society.

Overall architecture

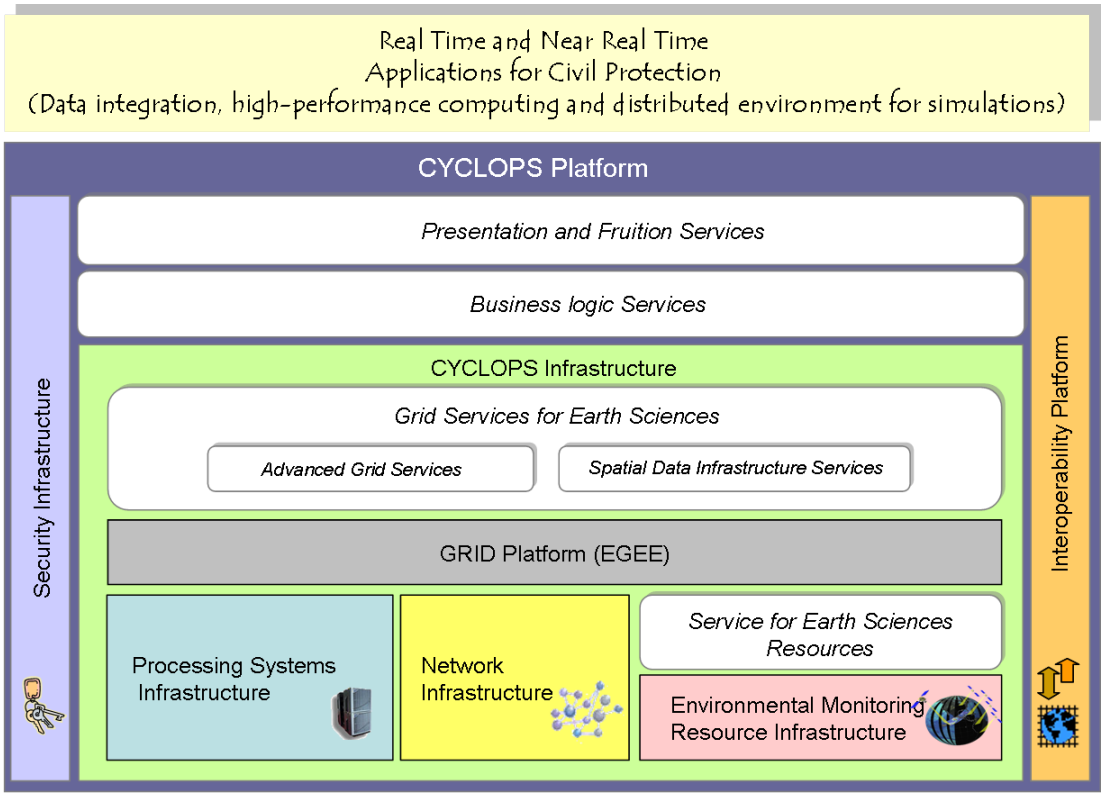


Fig. 1 General CYCLOPS architecture

Fig. 1 depicts the overall architecture that guides the CYCLOPS activities. It is based on preliminary investigations whose results suggest the need of the studies and analysis planned in the present support action. As a Specific Support Action CYCLOPS Project will not develop the infrastructure in itself, anyway a reference framework is essential to guide the studies and analyses that are an important part of the project. They will be summarized in the definition of proper research strategies. Future R&D projects, exploiting CYCLOPS results, can be directed towards the design and implementation of specific parts of an infrastructure based on this architecture.

The figure shows how the existing Grid Platform (EGEE) can provide the coordinated sharing of computing, storage and communication resources of existing and enhanced Processing Infrastructure and Network Infrastructure of Civil Protections and research centers involved in the emergency management procedures. Other specific resources that are part of the Environmental Monitoring Infrastructure (sensors and acquisition systems) need to be grid-enabled through services for Earth Science resources. Such services (sensor discovery, description, access for acquisition and control, etc.) make possible the virtualization of sensor resources in a Grid view.

On top of the Grid platform, providing basic services, specific Grid Services for Earth Science can be implemented to build the infrastructure for Civil Protection applications: the CYCLOPS Infrastructure. These are:

a. advanced Grid services (e.g. Quality of Service management, orchestration services, Knowledge Grid services, etc.);
b. Spatial Data Infrastructure services for geo-spatial data management.

These Grid Services for Earth Science make the CYCLOPS Infrastructure providing domain-specific services suitable to develop Grid-enabled application for Civil Protection applications.

The applications are built using generic Business Logic (e.g. expert systems) and Presentation/ Fruition (e.g. GIS, collaborative work environment) services according to a Service-Oriented Architecture (SOA) approach. Beside these services, an advanced Security Infrastructure provides the Security and Policy services required at each level, for handling the complex data policies typical of the Civil Protection domain. They allow to satisfy the strict requirements of integrity, confidentiality and data/services access control that Civil Protection applications impose to the enabling platform. Moreover, to complete their tasks, many applications should be able to interact with external infrastructure such as existing Grid platforms, security systems, e-Government infrastructures, and Spatial Data Infrastructures. Thus, an interoperability infrastructure completes the platform.
These high-level services and tools make the CYCLOPS platform, a complete Grid-based platform supporting Civil Protection applications.

Basing on this view many problems have to be investigated. For example:

- How is it possible to integrate sensor networks and acquisition systems in the EGEE platform?
- How is it possible to integrate Spatial Data Infrastructures (SDI) in a Grid platform?

- Which advanced services are needed to support Civil Protection applications (knowledge-based services, Quality-of-Service management, etc.)?
- Which Data Policy and Security support is needed for Civil Protection applications?
- Which generic Business Logic or Presentation and Fruition Services are useful to build Civil Protection applications?

To answer to these and other arising questions an extensive research is required. A preliminary study to define the research strategies in the EGEE enhancement is necessary to guide further activities.

Workplan description

The CYCLOPS workplan is aimed to reach the Operational Goals of the project. It is made of two kinds of activities:

a. Support activities, carrying out the work for reaching the Operational Goals;
b. Management activities that aim to coordinate and facilitate the Support activities for the best result of the project;

They are summarized in the following lists:

- *Management activities*
  - Project Management
- *Support activities*
  - Coordination with EGEE activities
  - Civil Protection system analysis
  - Research and Innovation Strategies definition
  - Dissemination and Exploitation

Concerning the Management activities, a specific *Project Management* Work Package (WP1) exists. It is dedicated to the global coordination of the project, and to the project setup. Indeed creating a successful synergy between the Civil Protection and EGEE communities requires great care in the creation of the working group, the specific expert groups and their relationships. In particular two expert groups need to be set up to provide specific knowledge to the working group. The former is made of persons with expertise in the working of Civil Protection systems. The latter is a panel of experts in Information and Communication Technologies (ICT) applied to Civil Protection, the Earth Sciences, environmental monitoring and GMES applications. The working group, possibly divided in teams, carries out the day-to-day activities also using collaborative work tools that allows for the strict collaboration between members in different countries. This activity assures that after an initial setup time the project can go through the support activities without any major problem.
The WP1 is divided in five tasks. A first task T1.1 is devoted to the day-to-day activities, while the other fours are dedicated to preliminary activities for the start of the project. In particular T1.5 aims to create a collaborative work environment and along with T1.1 make possible an advanced management for assuring the quality of the management itself. A specific task (T1.2) is dedicated to the setup of the working group and it is essential to assure a correct mobilisation of the resources that are essentially human resources since CYCLOPS results are mainly studies and reports. The other two tasks aim to create the expert groups which are made of members with high expertise in different domains (CP agencies work and Grid/IC technologies). The

availability of these expert groups aim to assure the quality of the support action results.

CYCLOPS is a project that complements the EGEE I3 project. For a better synergy between them a specific WP is dedicated to their coordination. The *Coordination with EGEE activities* WP aims to keep in touch the EGEE and Civil Protection communities. It transfers knowledge from one project to the other. Initially EGEE results need to be disseminated to the Civil Protection community in order to have a precise view of what EGEE Grid platform can provide. In particular Civil Protection experts need to know what a Grid-platform can provide to them in terms of resources and support, to identify new possible scenarios and applications. ICT experts need to know the EGEE middleware development stage to evaluate the need of future enhancement specific for the Civil Protection domain.
During the project a continuous interaction is useful both for guiding CYCLOPS activities in the EGEE view and to report preliminary results of CYCLOPS to the EGEE designers. At the end of the project the final results of CYCLOPS can be reported to EGEE community.
The WP2 is divided in two tasks. T2.1 is dedicated to the dissemination of EGEE architecture and middleware to CP agencies to inform about the possibility of Grid platforms. T2.2 is a fundamental task dedicated to the coordination between EGEE/EGEE-2 and CYCLOPS. It performs one of the core actions that is the exchange of information between the two projects, providing CYCLOPS members with the information about EGEE middleware evolution, and providing EGEE technical group with the knowledge about the Civil Protection requirements resulting from CYCLOPS activities. T2.1 and T2.2 perform a specific aspect of the Grid and Civil Protection communities cross-dissemination establishing a link between Civil Protection agencies and EGEE members. This is an essential issue to increase the potential impact of CYCLOPS project.

The second support activity is the *Civil Protection systems analysis*. Civil Protection systems are extremely heterogeneous both in operational models and resources. To better support them through a European wide infrastructure, an extensive study about their organization and resources is needed. This is carried out through the expertise of the Expert Groups. The Civil Protection expert panel provides the Business Process analyses, the Existing Analyses, and a set of significant use-cases. The Business Process analysis is an important element to analyze the needs of the different Civil Protections and also to compare them in order to identify common and peculiar processes. The Existing analysis provides a view of the human and technological resources available and used by the Civil Protection systems. This is useful both to identify the required enhancement to support an EGEE-based Grid platform and to analyze the problem related to the homogenization of resources.
The identification of significant use-cases is essential for the correct definition of system requirements. Use-cases should be significant in terms of usage scenario, involvement of organizations (research centers, data providers, etc.), interaction of human and technological resources. They should cover a wide set of possible applications of Grid technologies to Civil Protection applications. Moreover, some of them should be existing scenario that can be enhanced by the use of advanced technologies, while others should be new scenarios made possible by the existence of a Grid infrastructure. Taking into account all these elements, use-cases can drive the study of the research strategies for the design and development of the infrastructure.
Indeed basing on these preliminary analyses, the ICT experts can provide the system requirements for the research infrastructure supporting Civil Protection applications. The Expert Groups will pay particular attention to the problem of data security and policies that has both organizational and technical concerns.
The WP is divided in four tasks dedicated to analysis. T3.1 will provide the Business Process Analysis, T3.2 the Exiting Analysis, T3.3 the Use Cases and T3.4 the

System Requirement Analysis. These analyses are also an input for WP4 and they are important to define Civil Protection community requirement for Grid platforms has high relevance to the Objectives of the Programme.

The WP *Research and Innovation Strategies definition* carries out the core activities of CYCLOPS project. Basing on the Civil Protection system requirements, and the EGEE existing and planned features, it defines the research strategies to enhance EGEE for enabling Civil Protection applications. Initially the EGEE middleware is deployed and configured on partner sites to build a Grid infrastructure. This is useful to test and evaluate the current release of EGEE in a Civil Protection setting. Using this infrastructure a study for the Civil Protection framework integration with the EGEE middleware is performed. This is useful for evaluating which part of the middleware need to be enhanced. Subsequently it is possible to analyze in detail the required enhancement of the platform. Considering the current and planned features of EGEE, the existing research on Grid of new generation, the existing infrastructures for Earth Science systems, like Spatial Data Infrastructures (SDIs), the strategies for future researches are defined.
The resulting strategies are summarized in form of Request for Enhancement (RFE) to EGEE community, reporting the main features that need to be improved and the fields where greatest research effort has to be planned. Moreover innovation strategies are proposed to the Civil Protection communities to guide future acquisition in order to support advanced applications through Grid-based technologies. In short, this WP provide the guidelines for the future convergence of Civil Protection and EGEE communities through research and development projects aiming to the design and implementation of a research infrastructure for Civil Protection, and potentially GMES, applications.
The WP is divided in six tasks. The first four are dedicated to a detailed analysis of using EGEE/EGEE-2 platform in a Civil Protection context. T4.1 is dedicated to the installation of the EGEE platform in the real context of the Civil Protection agencies members of the project. T4.2 is a preliminary activity to highlight weaknesses of current EGEE platform implementation in supporting Civil Protection applications. T4.3 analyzes the EGEE extensions needed to fully support Civil Protection applications. Finally T4.3 is dedicated to analyze the porting of applications in the EGEE platform. All this tasks result in a Request for Enhancement for EGEE document that is an important result for the Relevance to the Objectives of the Programme.
T4.5 and T5.6 are dedicated to the definition of R&D strategies and innovation strategies for Civil Protection agencies, and are important output to increase the potential impact of the project since they prepare two important aspect of future exploitation: the startup of future R&D projects in different contexts and to guide innovation actions for Civil Protection agencies.

The *Dissemination and Exploitation* WP defines the activities aimed to spread the results of CYCLOPS project towards different communities. It is detailed in 6.2 section.

Risk analysis and contingency plans

Threats identification

As any technological project, CYCLOPS must face many possible threats. Some of them have a negligible effect on the project due to their very low probability or to their minimum impact. Others are to be considered, because their probability is high or their effect is heavy.

In particular we identify some possible threats that need to be investigated:

- Human: CYCLOPS, as a study and analysis project, is based on the high expertise of persons active in the expert groups. Consequently the experts are a valuable resource for the project. The absence of some of them, due to illness, other activities, etc. can have a negative impact on the project;
- Procedural: CYCLOPS involves many different organisations. Problems in the procedures of some of them can affect the project (e.g. failures of accountability, internal systems and controls, organisation, etc.). One type of procedural threat, related to changes in the organization, operational models and procedures of Civil Protections during the project extent is particularly important since they are a vital input for the project.
- Project: in the course of the project problems can arise from cost over-runs, jobs taking too long, insufficient product or service quality, etc.
- Technical: CYCLOPS is a technology project. Advances in technology or modifications in the technological context can make it ineffective and reduce the values of the results;

Risk estimation

Concerning the Human threats, the absence of members of the Expert Groups due to other activities must be considered having medium to high probability. The risk is reduced due to the fact that Expert Groups are not full-time involved in the CYCLOPS project and consequently they can coordinate their effort on CYCLOPS and on other projects and activities. Anyway the potential high impact of their missing on the project needs to plan proper risk management actions.

The procedural threats related to the internal functioning of partners are considered with low probability due to the reliability of the organisations involved in the CYCLOPS project. The special threat of possible changes in the organisations, operational models and procedures of Civil Protections requires a risk management plan due to its potential high impact on the project.

Project threats are considered with medium probability as for any project of this kind. Since they directly affect the project results, risk management actions have to be defined.

Technical threats are considered highly probable. CYCLOPS is a project covering some of the most advanced topics in science and technology. Specially the continuous upgrade of environmental monitoring systems and the progresses in the information and communication technologies can modify the context of the project during its time extent. In particular Grid technologies, that are the core technologies in the project, are undergoing a fast evolution that the project must consider.

Risk management

Risk management is worked out through two integrated approaches:

1) Risk counteract, to minimize the risk probability whenever possible;
2) Contingency plan, to minimize the effects of risk occurrence;

Concerning the Human threats, the risk management is based on project management activities. In particular the working group will be redundant with the

participation of more than one member of each organization, allowing to easily compensate for temporary absences. For the Expert Groups that are less continuously involved in the activities but more critical for the project, a strategy to minimize the absence is based on an advance scheduling of meeting and required contributions. Whenever the absence is prolonged, a temporary or permanent substitution of the expert person is required.

The procedural threats due to possible changes in the Civil Protection organizations are faced through the continuous monitoring provided by the Civil Protection Expert Group. Moreover the project results are based on the use-cases and scenario provided by that Expert Group made of members who are aware of future evolutions of their specific systems and presumably of the European and international context.

Project threats are faced by the continuous activity worked out in the Project Management Work Package. The threats identification and management are specific activity of that WP.

Technical threats management is based on their immediate occurrence detection. The presence of Expert Groups about both Civil Protection and ICT sectors provides high confidence about a continuous monitoring of Civil Protection applications and ICT evolution allowing to direct the project efforts towards the future scenarios. In particular, concerning Grid technologies that are at the core of project initiatives, a partner (INFN) is one of the main actors in the European and international scenario, and one specific WP is dedicated to the coordination of CYCLOPS with EGEE, a key project in the European Grid evolution scenario.

7.2 Work planning and timetable

Fig. 2 shows the planned timing of the Project expressed in form of a Gantt chart. reporting the time extent of the Work Packages.

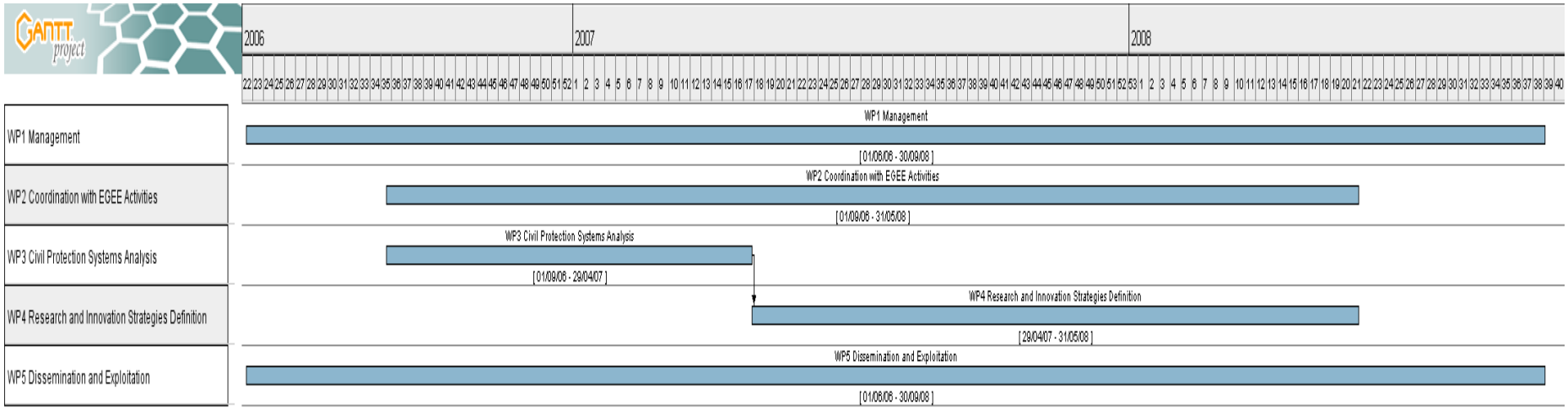
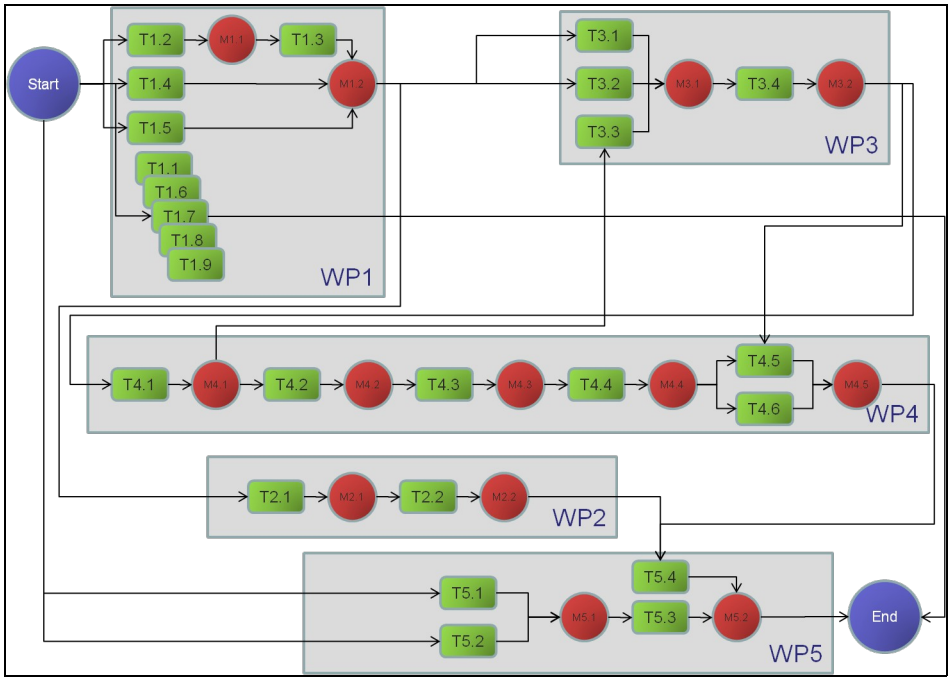


Fig. 2 GANTT chart of the CYCLOPS Project

As the Gantt shows, the Project Management WP covers the entire duration of the project that is 28 months. The Project Setup extends for the first three months. After that, the Civil Protection Systems analysis WP starts, covering eight months. When the Civil Protection systems analysis is concluded, the Research and Innovation Strategies definition WP can begin. It lasts for 13 months. The Coordination with EGEE Project WP covers the 21 months of the previous two core project activities. Finally, the Dissemination and Exploitation WP covers the entire project duration. In particular, the last three months are entirely dedicated to the dissemination of the results.

7.3 Graphical presentation of work packages

In fig.3 the PERT diagram showing the interdependencies between the components (Work Packages, Milestones, Tasks) is depicted.



Tasks	
T1.1	Project Management
T1.2	Definition of the Working Group
T1.3	Definition of Civil Protection Expert Group
T1.4	Definition of Technical Expert Group
T1.5	Setup of the collaborative environment
T1.6	To assure collaboration with related projects and initiatives
T1.7	Financial Monitoring
T1.8	Quality Control
T1.9	Risk Analysis and Contingency Plan
T2.1	Dissemination and tutorial of the EGEE middleware to the GMES community
T2.2	Civil Protection Framework and EGEE middleware evolution coordination
T3.1	Business Process analysis
T3.2	Existing Analysis
T3.3	Use-cases analysis
T3.4	System Requirements Analysis
T4.1	Implementation of a Grid infrastructure for Civil Protection
T4.2	Study of Civil Protection framework integration with EGEE Grid middleware
T4.3	Study for a Civil Protection infrastructure to enhance EGEE middleware
T4.4	Analysis of Civil Protection applications porting
T4.5	Research Strategies definition
T4.6	Innovation Strategies definition
T5.1	Project start dissemination
T5.2	Dissemination planning
T5.3	Project activities dissemination
T5.4	Project results dissemination

Milestones	
START	Start of Project
M1.1	Working Groups set up
M1.2	Project ready to start support activities
M2.1	Dissemination and training plan ready and published
M2.2	EGEE presented to the GMES community
M3.1	Civil Protection System description available
M3.2	System Requirements available
M4.1	EGEE infrastructure deployed
M4.2	EGEE Integration analyzed
M4.3	EGEE enhancement analyzed
M4.4	Application porting analyzed
M4.5	Research and innovation strategies investigated
M5.1	Dissemination started
M5.2	Project results disseminated
END	End of Project

Fig. 3 - PERT chart of CYCLOPS Project

The PERT highlights how in the initial phase some tasks can be performed in parallel, while the final phases are mainly serial. This is an important input for the Project Management since it points out that a major attention is required to monitor WP4 and WP5 to avoid delays blocking following tasks and activities.

7.4 Work package list

Work-package No[1]	Workpackage title	Lead contractor No[2]	Person-months	Start month[3]	End month[4]	Deliv-erable No[5]
1	Management	1 (DPC)	4,50	0	28	D1 D3
2	Coordination with EGEE activities	2 (INFN)	21.85	3	25	D5 D7 D10 D13 D17
3	Civil Protection systems analysis	4 (ARMINES-LGEI)	32.20	3	11	D6 D8 D9 D11
4	Research and Innovation Strategies definition	3 (IMAA)	50.30	11	25	D14 D15 D16
5	Dissemination and Exploitation	7 (ANPC)	18.65	0	28	D2 D4 D12 D18 D19D 20 D21
	TOTAL		**127.50**			

[1] Workpackage number: WP 1 – WP n.
[2] Number of the contractor leading the work in this workpackage.
[3] Relative start date for the work in the specific workpackages, month 0 marking the start of the project, and all other start dates being relative to this start date.
[4] Relative end date, month 0 marking the start of the project, and all ends dates being relative to this start date.
[5] Deliverable number: Number for the deliverable(s)/result(s) mentioned in the workpackage: D1 - Dn.

7.5 Deliverables list

Del. No	Deliverable name	WP No	Lead Participant	Estimated person-months	Nature	Dissemination level	Delivery date
D1	Project Presentation	1	1 (DPC)	0.25	R	PU	PM1
D2	Project open conference	5	7 (ANPC)	0.5	O	PU	PM1
D3	Perspective on cooperation with existing projects and initiatives	1	1 (DPC)	0.25	R	RE[1]	PM2
D4	Dissemination Plan	5	7 (ANPC)	1	R	RE[1]	PM3
D5	Training events plan	2	2 (INFN)	0.5	R	RE[1]	PM3
D6	Business Process analysis document	3	4 (ARMINES-LGEI)	1	R	PU	PM5
D7	“EGEE cookbook: a guide for Civil Protection Grid users” document	2	2 (INFN)	1	R	PU	PM6
D8	Existing Analysis document	3	4 (ARMINES-LGEI)	0,5	R	RE[1]	PM6
D9	Use-cases document	3	4 (ARMINES-LGEI)	1	R	RE[1]	PM7
D10	First Training Workshop	2	2 (INFN)	0.5	O	PU	PM7
D11	System Requirements document	3	4 (ARMINES-LGEI)	1	R	PU	PM20
D12	Mid-term project workshop	5	7 (ANPC)	0.5	O	PU	PM24
D13	Second Training Workshop	2	2 (INFN)	0.5	O	PU	PM24
D14	“EGEE Request for Enhancement” document	4	3 (IMAA)	1	R	PU	PM24
D15	“Toward a Grid - Guidelines for Innovation Strategies for Civil Protection Systems” report	4	3 (IMAA)	1	R	RE[1]	PM25
D16	“Research Strategies for the development of a Civil Protection E-Infrastructure” report	4	3 (IMAA)	1	R	PU	PM25
D17	Dissemination and coordination activity final report	2	2 (INFN)	0.5	R	RE[1]	PM28

D18	Project results presentation	5	7 (ANPC)	0.5	R	PU	PM28
D19	Final Plan for using and disseminating knowledge	5	9 (UMINHO)	1	R	RE[1]	PM28
D20	Report on raising public participation and awareness	5	9 (UMINHO)	0.5	R	RE[1]	PM28
D21	Project final conference	5	9 (UMINHO)	0.5	O	PU	PM28

[1)] The access is public after explicit request. The identification is the only restriction applied since the Consortium does not deny the access to any project deliverable.

7.6 Work package descriptions

WP 1 Management

Workpackage number :	1	**Start date or starting event:**	PM0
Activity Type	Management of the Consortium activities		

Participant id:	1 DPC	2 INFN	3 IMAA	4 DDSC	5 CP-CH	6 TEI-CR	7 ANPC	8 ARMINES -LGEI	9 UMINHO
Person-months per participant	1,50	0,50	0,50	0,50	0,25	0,75	0,30	0,0	0,20

Objectives

- To coordinate the support activities;
- To provide financial and administrative management;
- To provide regular progress reports to the Commission;
- To resolve conflicts;
- To collect reports about related initiatives and consequently to stimulate their consideration in the project evolution;
- To deal with IPR;
- To maintain the project web site up to date;
- To setup expert and working groups;
- To setup the collaborative environment;
- To monitor project progresses and results

Description of work

This Work Package deals with the Management of the project. The main tasks of the work package are: the overall coordination of the project activities, the management of knowledge and intellectual property, the management of collaboration with similar international initiatives, the management of any action arising in the project.

CYCLOPS management activity will cover important project aspects, such as: quality plan, management reports and cost statements.

An effective management and decision making organization is utilized to achieve such tasks; it is fully described in the B5 paragraphs. Such specific structure is designed to deal with the problem of a number of geographically distributed partners with light project management resources. To meet this challenge the management of individual work packages has been devolved to experienced Workpackage Managers, appointed by the lead partner in each of the work packages.

An important role of CYCLOPS management will be to ensure the effective and enabling availability of the work developed by EGEE and related initiatives at the National level.

Eventually, a key task of CYCLOPS management is the set up of working and expert groups (i.e. civil protection and technical expert groups). As a support action complementing the EGEE project toward the creation of a Grid-based infrastructure for Civil Protection applications, the CYCLOPS project involves many different actors with diverse expertise and role. To achieve an effective cooperation between them, we need to properly setup an organization made of human and

technical resources that is able to facilitate the cooperation throughout the duration of the project. In particular this specific management activity aims to the creation of the workgroups and expert groups, and to provide the technical system that assists the collaborative work.

The WP 1 is made of five tasks:

T1.1 Project Management

This task cover the day-by-day activities required for the project management including:

- the co-ordination of the technical activities through the actions of the Technical Management Board;
- the overall legal, contractual, ethical, financial and administrative management, including deliverables collection and timely issue to the Commission and reporting;
- co-ordination of knowledge management and other innovation-related activities;
- maintenance of any consortium agreement;
- resolution of conflicts;
- monitoring of progress and success of the project through the collection of review and assessment internal reports from all WPs (including WP1), their evaluation and planning of response actions to possible problems;

T1.2 Definition of the Working Group (WG)

The Working Group is in charge of carrying out the support activities. The WG works in team using the collaborative environment set up as result of T1.5. It can be further divided in work teams for accomplish well-defined sub-tasks. The WG consults the expert groups on specific issues. This task aims to set up an effective Working Group assuring that the human resources effort is adequate to the project both in quantity (person-months allocated to CYCLOPS) and quality (expertise of single members and of the WG as a whole). At most one person for each partner is member of the WG, while other members will be selected externally to the Consortium. The WG is defined taking into account the proposals of each partner. It is responsibility of the PMB to manage the evolution of the WG during the project extension. The list of participants will be provided in the Quarterly Reports.

T1.3 Definition of Civil Protection Expert Group (CPEG)

The Expert Groups are made of persons with high expertise in a specific domain who are not involved full-time in the Project. The experts act as consultant for the project on specific issues to assure the quality of the actions. In particular the Civil Protection experts provide knowledge about the typical business processes and internal working of the different Civil Protections involved in the project. This task aims to define the CPEG. Typically one member for each Civil Protection involved in the project is part of the CPEG. The list of participants will be provided in the Quarterly Reports.

T1.4 Definition of Technical Expert Group (TEG)

The TEG is composed of members with expertise in information and communication technologies and their applications in the environmental, Earth Observation and Civil Protection sectors. The TEG provides knowledge about the technologies and resource available for Civil Protection and GMES applications. This task aims to define the TEG. The list of participants will be provided in the Quarterly Reports.

T1.5 Setup of the collaborative environment

Since the quality of the project is highly dependant on the possibility to conduct the activities at the European level, the project requires strict cooperation between persons located in different sites, with particular reference to the WG members who are in charge of the day-to-day activities. Although meetings between WG and EG (Experts Group) members will be scheduled during the project extension, the availability of collaborative tools makes easier the cooperation. This task aims to set up a set of tools for collaborative work. In particular the following services will be made available:

- project web site;
- mailing lists and discussion forums;
- project document repository;
- collaborative editing environment;
- audio/video conferencing tools;

T1.6 To assure collaboration with related projects and initiatives

To reach its main objective of bridging the gap between the CP and Grid communities, a collaboration with other related projects is needed. This task aims to initiate and maintain collaborations with other "Communication Network Development" initiatives and with other e-projects, institutions and organizations in Europe and worldwide. As a SSA, CYCLOPS will pay particular attention to projects from the RI Unit.

T1.7 Financial monitoring

This task aims to assure a continuous monitoring of financial expenditure and to implement counter measures if needed.

T1.8 Quality Control

A quality control will be performed on each output of the project. In particular concerning the official deliverables, while the content is approved by the responsible partner, the evaluation of formal issues and the accordance of the content with the expectations is the objective of this Project Management Task.

T1.9 Risk Analysis and Contingency Plan

To reach success the CYCLOPS Project must face a few possible threats, both technical and not. This task aims to assure that the existing risks are analyzed, and proper counter measures proposed. They will be documented in the proper deliverables (e.g. technical deliverables for technical risks, exploitation plan, etc.).

Moreover the WP includes activities aimed to evaluate and assess progresses and results as regards the Operational Goals 1.1, 1.2 and 1.3. The results of these activities will be documented in quarterly internal reports for the Project Management Board.

Deliverables

D1 (PM1) Project Presentation

This deliverable consists of a brief project presentation in English, written in a style which is accessible to the non-specialist. It is designed to be used both for WWW publishing and other media distribution

D3 (PM2) "Perspectives on cooperation with existing projects and initiatives" report

This deliverable outlines how CYCLOPS relates (or plan to relate) to the main existing projects and initiatives in the contexts of Grid technologies, Civil Protection and GMES. It defines the actions required during the project extension to make these relationships effective and fruitful.

Milestones and expected result

M1.1 (PM0) Start of Project

This is the starting point of the project

M1.2 (PM1) Working Groups set up

Persons continuously involved in the project are identified. A team is in charge of setting up the collaborative environment.

M1.3 (PM3) Project ready to start support activities

The tools useful for collaborative work (mailing list manager, web site, document repository) are active. The experts of Civil Protection systems and the expert of ICT for Civil Protection and GMES applications are identified.

Justification of financing requested

A total amount of 3 PM will be dedicated to specific project management activities. Travel costs.

During the first three months 1 PM will be deployed for setting up expert groups, working group and the collaborative work environment. Collaborative work equipment and software.

WP 2 Coordination with EGEE activities

Workpackage number :	2	**Start date or starting event:**	PM3
Activity Type	Activities specific for the Support Action		

Participant id:	1 DPC	2 INFN	3 IMAA	4 DDSC	5 CP-CH	6 TEI-CR	7 ANPC	8 ARMINES -LGEI	9 UMINHO
Person-months per participant	1,25	11,75	3,25	0,0	0,00	1,75	0,0	2,10	1,75

Objectives

- to disseminate the Grid concepts and the EGEE middleware into the Civil Protection community

- to establish a two way communication channel between CYCLOPS and EGEE projects, in order to keep updated the Civil Protection community about EGEE middleware news and evolution, and to allow GMES community to provide feedback to EGEE community

Description of work

T2.1 Dissemination and tutorial of the EGEE middleware to the Civil Protection community

This activity aims to organise, in cooperation whenever possible with the EGEE project corresponding activity, dissemination and training events where the current architecture of the EGEE middleware and its planned evolution will be presented to the Civil Protection community in order to establish the starting point for future design of a Civil Protection -and potentially GMES- Grid infrastructure.

T2.2 Civil Protection *Framework and EGEE middleware evolution coordination*

The GMES framework enabling on a Grid infrastructure requires the coordination with the EGEE activities in order to reach a valuable synergy between the projects. CYCLOPS members developing the GMES Grid framework must be kept continuously updated about new EGEE middleware functionalities implemented by the EGEE project, at the same time need to give feedback to EGEE developers highlighting the weakness encountered in the Grid middleware and suggesting possible improvements for satisfying their requirements.

Moreover the WP includes activities aimed to evaluate and assess progresses and results as regards the Operational Goals 5.1 and 5.2. The results of these activities will be documented in quarterly internal reports for the Project Management Board.

Deliverables

D5 (PM3): Training events plan

This deliverable describes the scheduling (date, duration), organization issues (sites, equipments to be used), content and attendants' profiles for the planned training events.

D7 (PM6): EGEE cookbook: a guide for Civil Protection *Grid users*

This deliverable is a guide to the use of EGEE platform for Civil Protection users. It introduces the Grid technologies, their possible applications for Civil Protection, and describes EGEE platform. It will be prepared taking into account the target audience using a style accessible to non-specialists for the sections which are not addressed to technicians.

D10 (PM7) First training workshop

This deliverable consists of a workshop directed to the Civil Protection community which will include theoretical lectures, debates and round tables discussion, case studies, practical exercise, to focus the proper knowledge and the skills to use the GRID computing infrastructures. The material of the workshop will be made available through the project website.

D13 (PM24) Second training workshop

This deliverable consists of a workshop directed to the Civil Protection community. It is analogous in structure to the previous workshop but its content will be different according to the Training Events Plan. The material of the workshop will be made available through the project website.

D17 (PM28): dissemination and coordination activity final report

This deliverable is a document reporting the results of the dissemination of EGEE towards the Civil protection community, and about the coordination between the EGEE and CYCLOPS activities.

Milestones[1] and expected result

M2.1 (PM3): dissemination and training plan ready and published

The required activities to disseminate EGEE in the Civil Protection community are established and clear.

M2.2 (PM6): EGEE explained to the Civil Protection *community*

At this stage Civil Protection community is aware of the potentiality of EGEE platform. It is ready for its evaluation in the context of Civil Protection applications and for providing useful contribution to its evolution.

Justification of financing requested

0.5 FTE will be deployed for this activity by INFN for planning the dissemination and training events and producing the corresponding material and documentation; a total effort of about 0.5 FTE will be deployed by other partners, to contribute to the activities; travel costs for participating in dissemination and training events; events organisation.

[1] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

WP 3 Civil Protection systems analysis

Workpackage number :	3	**Start date or starting event:**	PM3
Activity Type	Activities specific for the Support Action		

Participant id:	1 DPC	2 INFN	3 IMAA	4 DDSC	5 CP-CH	6 TEI-CR	7 ANPC	8 ARMINES -LGEI	9 UMINHO
Person-months per participant	9,75	1,50	3,25	0,0	1,25	3,25	2,75	8,20	2,25

Objectives

- Business process analysis of the Civil Protection systems involved in the project
- Existing Analysis for each Civil Protection systems involved in the project
- Use-cases definition
- System requirements analysis

Description of work

This Work Package aims to the description of the requirements of a grid-based infrastructure for Civil Protection applications. This study requires some preliminary steps to fully understand the working of the diverse Civil Protection systems, their technological resources and infrastructures, the main use-cases and scenarios.

This WP is made of the following tasks:

T3.1 Business Process analysis

EU countries adopt very different Civil Protection systems. They have different responsibilities, and they are based on diverse models. This task carries out a Business Process analysis of the Civil Protections systems active in the partner countries. This analysis should highlight the internal processes and the interactions with external entities such as public bodies, research centers, data and knowledge providers. The study should pay particular attention to the cross-boundary activities, since they could gain the greatest advantage by a shared infrastructure. The objective of the study is the identification of common and particular characteristics that could affect functional and non-functional requirements.

T3.2 Existing Analysis

EU Civil Protection systems use different scientific and technological infrastructures and services. In a European-wide view, this infrastructures need to be integrated and enhanced. This task aims to collect information about the resources (information systems, communication services, computing resources, etc) commonly used by the different Civil Protection systems involved in the project. The work will be carried out also preparing a form to be filled by technical reference persons of the Civil Protection agencies involved in the project. The results allow to evaluate the available resources in quantity and quality as regards grid technology adoption.

T3.3 Use-cases analysis

This task aims to identify and describe a set of significant use-cases that could be ported, improved

or even made possible by using Grid technologies. This common or visionary use-cases should be representative of typical scenarios of Civil Protection. This task is performed through the strict cooperation of the Expert Groups whose overall expertise (in CP agencies work and Grid/Information&Communication technologies) assures the identification of use-cases relevant for the objective of the project. Since the objective of this study is to help in the definition of the system requirements, the selected set of use cases should consider, for example, one or more of the following issues: high computing and storage requirements (that could be provided by grid technologies), cross-border applications (for interoperability problems), spatial data management, real-time and near-real-time requirements, data policy and security, etc.

T3.4 System Requirements Analysis

Basing on the T3.1, T3.2 and T3.3 results, this task provides the functional and non-functional requirements of a Grid-based infrastructure for enabling Civil Protection applications. This study is the basis for researches on grid infrastructure addressed by future projects. Examples of functional requirements to be considered are: the support to control sensors networks and acquisition systems, the sharing of geo-spatial information; the support of strict data policy and security; the implementation of knowledge-based services. Examples of non-functional requirements to be considered are: time of response (especially for RT and NRT services); service level agreement (example for time-of-response/accuracy negotiation); quality of service (resource prioritization and reservation).

Moreover the WP includes activities aimed to evaluate and assess progresses and results as regards the Operational Goal 4.1. The results of these activities will be documented in quarterly internal reports for the Project Management Board.

Deliverables

D6 (PM5) Business Process analysis document

This deliverable describes the Civil Protection agencies involved in the project. In particular it explains their responsabilities in the national context, the internal working model, the relationships with other national and international bodies, the organizational structure and so on.

D8 (PM6) Existing Analysis document

This document describes the technical resources (both equipment such as computing, storage, communication, etc. and technical staff) available at each Civil Protection agency involved in the project, in the perspective of Grid technology adoption.

D9 (PM7) Use-cases document

This document details a set of significant use-cases that could be ported, improved or even made possible by using Grid technologies. It is based on the *Business Process analysis document* and it is a fundamental input for the definition of the User Requirements.

D11 (PM20) System Requirements document

This document describes the functional (what the system should do, i.e. data sharing, distributed processing, etc.) and non-functional (how the system should provide services, i.e. response time, throughput, etc.) requirements of a Grid-based infrastructure for enabling Civil Protection applications.

Milestones and expected result

M3.1 (PM7) Civil Protection System description available

A complete description of different Civil Protection Systems and typical use-cases are available.

M3.2 (PM10) System Requirements available

The system requirements for a Grid-based infrastructure supporting Civil Protection applications are available for the definition of research strategies.

Justification of financing requested

An effort of 3.5 FTE will be deployed for this activity. Scientific partners contribute to system requirement analysis. Travel costs.

WP 4 Research and Innovation strategies definition

Workpackage number :	4	**Start date or starting event:**	PM11
Activity Type	Activities specific for the Support Action		

Participant id:	1 DPC	2 INFN	3 IMAA	4 DDSC	5 CP-CH	6 TEI-CR	7 ANPC	8 ARMINES -LGEI	9 UMINHO
Person-months per participant	6,25	5,50	11,00	4,0	0,00	6,50	0,50	10,55	6,00

Objectives

To define the research and innovation guidelines toward the definition of a e-Infrastructure for Civil Protection applications.

Description of work

The previous WPs provide the requirements for a Grid infrastructure supporting Civil Protection applications and the EGEE platform current and foreseen capabilities. Starting from this point it is possible to define the research strategies to plan an enhancement of EGEE in order to support Civil Protection applications.

T4.1 Making of a Grid infrastructure for Civil Protection

The EGEE middleware is installed and configured at the Civil Protections sites for test purposes. A minimal set of Grid elements needs to be deployed to form a dedicated Grid test-bed: 1 UI (User Interface), 1 RB/BDII (Resource Broker/Berkeley Database Information Index), 1 VO (Virtual Organisation) server, 1 RLS (Replica Location Server), 2 CEs (Computing Elements), 2 SEs (Storage Elements), 2 WNs (Worker Nodes). After setup, the test-bed must be maintained in operation, and continuously kept updated with the most recent EGEE releases, which might introduce new middleware functionalities.

T4.2 Study of Civil Protection *framework integration with EGEE Grid middleware*

Basing on the System Requirements analysis, this activity carries out a study about the possible integration of the Civil Protection framework with the EGEE middleware. This is a preliminary activity to highlight weaknesses of current EGEE platform implementation in supporting Civil Protection applications. It is dedicated to define which issues should be addressed by future researches aimed to the enhancement of EGEE architecture and implementation.

T4.3 Study for a Civil Protection *infrastructure to enhance EGEE middleware*

Basing on the results of T3.1, this activity analyze the EGEE extensions needed to fully support Civil Protection applications. In particular some topics need to be addressed:

- Real-time and Near-Real-Time support;
- Spatial Data Infrastructures and Grid integration;
- Security and Data Policies enabling;
- Sensor networks and acquisition systems control;

- Knowledge-based Grid services;
- Interoperability with other existing or planned infrastructures (SDIs, security, eGov, etc.);

Other topics could (and probably will) arise from the analysis performed in the previous WPs.

The study provides information about generic Grid technologies and more specific hints about the EGEE middleware components evolution.

T4.4 Analysis of Civil Protection *applications porting on the top of the new infrastructure*

This activity performs the analysis of the possible implementation of existing Civil Protection applications, or new applications derived by the defined use-cases, on the new infrastructure. This study highlights possible problems deriving from the integration of legacy resources (applications, data, etc.).

T4.5 Research Strategies definition

This activities aims to define the research strategies that will allow the design and implementation of the Grid infrastructure for Civil Protection. The results of this activities could be useful both for:

a) EGEE project, to guide the future middleware development in order to support Civil Protection and possibly other GMES sectors applications;

b) Specific projects aiming to the design and development of the e-Infrastructure for Civil protection applications;

This strategic task takes the results of WP3 and T4.1-T4.4 to define which are the issues requiring R&D efforts toward the implementation of a Grid infrastructure for Civil Protection applications. After the definition of a general framework, for each specific domain where weaknesses are emerged, possible R&D activities are proposed estimating the effort, possible problems, and the context in which the activities could be started (existing projects and activities in the sector).

T4.6 Innovation Strategies definition

The possible future existence of a Grid for Civil Protection applications will affect Civil Protection infrastructures design and development. This activity aims to provide guidelines for the innovation strategies of Civil Protection systems in order to prepare the adoption of Grid-based platform (namely EGEE and its evolution). These guidelines provide the general framework for the adoption of an EGEE/EGEE-2 based grid infrastructure and specific requirements for the hardware, software and human resources to be allocated. This study will allow to Civil Protection agencies to take their planned innovation actions taking into account a future evolution toward Grid-based platform, increasing the re-use of hw/sw resources.

Moreover the WP includes activities aimed to evaluate and assess progresses and results as regards the Operational Goals 4.2 and 6.2. The results of these activities will be documented in quarterly internal reports for the Project Management Board.

Deliverables

D14 (PM24) "EGEE Request for Enhancement" document

This document details which enhancements would be required to EGEE platform to fully support Civil Protection applications. It is designed as a fundamental input for EGEE (and future EGEE-II) project evolution.

D15 (PM25) "Toward a Grid - Guidelines for Innovation Strategies for Civil Protection Systems"

document

This deliverable describes how the planned adoption of Grid technologies can affect the innovation strategies of Civil Protection agencies. It is designed as an instrument for guiding future equipment acquisition, and technical staff enhancement in the view of Grid technology adoption.

D16 (PM25) "Research Strategies for the development of a Civil Protection E-Infrastructure" document"

This document describes the research strategies to be followed for the design and implementation of a complete Civil Protection E-Infrastructure. It reports the results of the analysis and studies carried out by CYCLOPS project highlighting the open issues where more R&D activities are required to implement services and tools for Civil Protection applications on the top of a Grid-infrastructure.

Milestones and expected result

M4.1 (PM13) EGEE infrastructure deployed

The EGEE infrastructure is deployed for test and evaluation purposes

M4.2 (PM15) EGEE Integration analyzed

The possibility to adapt EGEE platform for supporting Civil Protection applications is evaluated.

M4.3 (PM 24) EGEE enhancement analyzed

Possible weaknesses of EGEE for supporting Civil Protection applications are investigated.

M4.4 (PM24) Application porting analyzing

Problems related to the porting of old applications is analyzed

M4.5 (PM25) Research and innovation strategies investigated

Research and Innovation strategies for EGEE and Civil protection systems enhancement are made clear.

Justification of financing requested

An effort of 3.5 FTE is estimated; travel costs

WP 5 Dissemination and Exploitation

Workpackage number :	5	**Start date or starting event:**	PM0
Activity Type	Activities specific for the Support Action		

Participant id:	1 DPC	2 INFN	3 IMAA	4 DDSC	5 CP-CH	6 TEI-CR	7 ANPC	8 ARMINES -LGEI	9 UMINHO
Person-months per participant	4,25	2,25	2,25	0,0	2,25	2,25	1,40	1,15	2,85

Objectives

To make the project existence and main results widely available to communities concerned with GRID and Civil Protection world in Europe. Objectives are to have a large community informed about the CYCLOPS concept and aware of the potential benefits, and to build the future development on an extended basis of users. The promotion/dissemination will support EC in program decision for FP6 rationale and long term plan.

Description of work

T5.1 Project start dissemination

Promotion activity and disseminating knowledge about the initiative and promoting the research, studies in order to progressively enhance the users base.
Organization of a project open conference will present the project objectives to a large community including the relevant user groups, scientific bodies, EC authorities, national and European decision makers, and potential selected non-EU representatives.

This activity aims to promote the concept of the project in order to raise awareness, create interest and encourage participation / follow-up actions.

T5.2 Dissemination planning

This task is dedicated to draw a dissemination plan, to identify target audiences, to detail actions, timing, procedures and actions for the dissemination activities, the expected benefits, and describe which methods of dissemination will be used by the partners.

This plan is for the project regular information and exploitation of the results. It will also be used by all partners as a tool to record events and activities that take place during the life of the project. The key elements structuring the plan are:

- ✓ ***Users*****:** a consideration of who would benefit from learning about the findings, leading to define scope and characteristics of the potential users of the dissemination activities;
- ✓ ***Content*****:** type of messages to be released;
- ✓ ***Source*****:** information source and adaptation;
- ✓ ***Medium*****:** capabilities and resources that will be required to deliver the information in the most effective conditions and access rules;
- ✓ ***Availability*****:** information quality and update.

The plan will be endorsed by the partners and submitted to the European Commission for approval.

T5.3 Project activities dissemination

This activity is targeted to inform constantly about the progress of the project for its full duration and provide feedback to the project.

- Elaborate a promotion/dissemination plan
- Manage the specification, development and maintenance of a project Web site, structured for wide communication, including restricted access when needed.
- Elaborate adequate messages and communication materials with respect to targeted people and envisaged event
- Write a newsletter about the project situation and significant results, at least every 6 months (with additional special issues if needed)
- Assist in the preparation of the annual CYCLOPS workshop
- Interface with the external bodies and find ways to integrate CYCLOPS presentation and information in existing official publications, seminars, workshops
- Maintain the agenda of conferences, workshops in relation with the CYCLOPS activities
- Develop and maintain a knowledge data base of the project

T5.4 Project results dissemination

This activity aims to disseminate the results of the project to proper target audiences (Civil Protections, research centres, SMEs,etc.)

The partners are committed to maximize the project impact. Dissemination will be continuous throughout the project time frame, and requires the development of a dissemination strategy, shared by the EC and the project manager board, giving clear responsibility to one partner in implementing this strategy. One of the most significant aspects of this strategy is to generate dissemination material in different format and for different media to reach the intended target audiences.

This is a list of documents that will be produced for general communication support actions:

- Brochure, summary paper: 3 to 4 illustrated pages describing the objectives of the project ;
- Poster: a large sized and visually impressive poster will be produced for display at exhibitions, workshops and conferences;
- Newsletter distributed on a regular basis (6 months): a sort of logbook summarizing the activities and significant outcomes from the project, including meetings agenda, events and communication actions;
- Description sheet of the case study: this is a very concentrated technical and operational information form about the studies, functions, input/output, operations, performances;
- Logo: identity created for the project to facilitate clear and consistent communications. The logo will be used on all documentation, promotional/publicity literature, exhibition boards, CD-ROM, and on the project web site.

T5.5 Exploitation

This activity aims to define the plan for the exploitation of CYCLOPS results.

The CYCLOPS E-Infrastructure are dedicated to risk management actors (Civil Protection services, land planning and risks prevention services, etc...) at various territorial levels (European, National, Regional) and in different countries with different organisations and needs and will have to be flexible and adapted to the needs of this community.

In particular, the exploitation is ensured by a network of operators “distributed” in the different European countries or regions. This scheme will be necessary adapting to the specificities of each country, region and bodies, implementing the research and the studies.

Moreover the WP includes activities aimed to evaluate and assess progresses and results as regards the Operational Goals 5.3 and 6.1. The results of these activities will be documented in quarterly internal reports for the Project Management Board.

Deliverables

D2 (PM1) Project open conference

This deliverable consists of a conference planned to meet Grid, Civil Protection and GMES experts broaden the opportunities for dialogue and discuss the EGEE platform for Civil Protection applications also towards other national and transnational organization.

D4 (PM3) Dissemination Plan

The Dissemination Plan describes the actions to be taken for an effective dissemination of CYCLOPS during the entire project extension. It defines the scheduling of dissemination for each phase (raise of awareness, project activities dissemination, project results dissemination) taking into account a typical set of key factors (namely Users, Content, Source, Medium, Availability).

D12 (PM24) Mid-term project conference

This deliverable consists of a workshop planned to disseminate CYCLOPS activity and first results. It will be held in conjunction with the 2nd IBERIAN INFRASTRUCTURE FOR DISTRIBUTED COMPUTING CONFERENCE, Porto, May 2008, a major event conference, already involving major interested communities to allow a wider participation and audience.

D18 (PM28) Project results presentation

This document is a report collecting the CYCLOPS project results for dissemination towards different interested audience such as Grid communities, other Civil protection agencies, but also national and international initiative and projects, SMEs, etc. It includes training activities reporting and results .

D19 (PM28) Final Plan for using and disseminating knowledge

The Final Plan for using and disseminating knowledge will describe the participants’ actual achievements in dissemination and their plans at that time for the exploitation of their results - for the consortium as a whole, or for individual participants or groups of participants. It includes planned and achieved contributions to standards. The Plan for using and disseminating knowledge is maintained through the lifetime of the project.

D20 (PM28) Report on raising public participation and awareness

This deliverable is a document reporting the extent to which actors beyond the research community have been involved to help spread awareness and to explore the wider societal implications of the proposed work. It includes the content provided in the training sections It includes training activities reporting and results .

D21 (PM28) Project final conference

This deliverable consists of a conference planned to present the CYCLOPS results to many different communities: scientific and technological, Civil Protection, GMES and Earth Observation.

Milestones[1] and expected result

M5.1 (PM3) Dissemination started

The dissemination plan is clear: the what, when, how, by whom and to whom (target audiences) of dissemination activities are decided. It will be decided which dissemination activities will be part of the proposed action and which will follow only after the end of the project.

The project start and objectives are disseminated through several ways (web site, newsletter, etc.)

M5.2 (PM28) Project results disseminated

The results of CYCLOPS project are disseminated to different targets, and initiatives for the full exploitation through future specific R&D projects are undertaken.

Justification of financing requested

An effort of about 0.5 FTE is estimated; travels; costs for events organizations, publications, conference participations

[1] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

8. Project resources and budget overview

8.1 Efforts for the project

The Project effort is summarized in the Project Effort Form. It shows that management activities count for about 3.6% of the total budget and they do not exceed 7% of each participant budget. The core activities (WP3 and WP4) require the 65% of the budget (about 25% and 40% respectively for WP3 and WP4), while the coordination and dissemination activities count for the remaining percentage (15% each for WP2 and WP5).

Concerning the amount of required financing, it should be considered that the work is mainly made of study and analysis activities. This implies that the most part of resources are human resources involved in working and expert groups. Their effort can be measured in man-months (MM) of FTE (Full-Time-Employers) units. An average cost around 7,000 €/MM (20% overheads included) is considered for estimation. This should be considered made of: a weighted average of two different personnel cost categories such as engineers (for working group) and researchers/scientists (for working and expert groups); travel costs; other minor costs (publications, conference fees, equipment).

On a global view, the core activities (WP3 and WP4) and the coordination activity (WP2) require a total effort of about 80 MM in 21 months (see Gantt chart above). This is estimated considering a working group of 8 persons involved part-time in the project.

Concerning the participants budgets, the form shows that, generally, Civil Protection agencies are mainly involved in the WP3 (Civil Protection systems analysis) and scientific partners are mainly involved in WP4. It is important to note that the CP-CH budget is substantially lesser than other Civil Protections authorities. This is due to the fact that many activities related to the Greek Civil Protection system are performed by the scientific partner (TEI-CR). On the contrary, DDSC and ANPC directly contribute to research and innovation strategies definition. These choices depends on the organization and internal resources of the different Civil Protections authorities. DDSC and ANPC are national agencies, while CP-CH is the Civil Protection Unit of a local public body.
Finally, INFN is obviously involved in the coordination activity to complement EGEE project, but it also provides contribution to WP4.

SSA Project Effort Form
(expressed in person-months)

	DPC	INFN	IMAA	DDSC	ARMINES-LGEI	CP-CH	TEI-CR	ANPC	UMINHO	TOTAL ACTIVITIES
Activities specific for the Support Action										
WP 2 - Coordination with EGEE activities	1,25	11,75	3,25	0	2,10	0,00	1,75	0	1,75	21.85
WP 3 - Civil Protection systems analysis	9,75	1,50	3,25	0	8,20	1,25	3,25	2,75	2,25	32.20
WP 4 - Research and Innovation Strategies definition	6,25	5,50	11,00	4	10,55	0,00	6,50	0,5	6,00	50.30
WP 5 - Dissemination and Exploitation	4,25	2,25	2,25	0	1,15	2,25	2,25	1,40	2,85	18.65
Total'specific activities '	21,50	21,00	19,75	4	22,00	3,50	13,75	4,65	12,85	123
Consortium management activities										
WP 1 - Management	1,50	0,50	0,50	0,50	0,00	0,25	0,75	0,30	0,20	4,50
Total management	1,50	0,50	0,50	0,50	0,00	0,25	0,75	0,30	0,20	4,50
TOTAL per PARTICIPANT	**23,00**	**21,50**	**20,25**	**4.50**	**22,00**	**3,75**	**14,50**	**4,95**	**13,05**	
Overall TOTAL EFFORTS										**127,50**

SSA Project Effort Form

(expected budget in € for activities in which participants are involved)

	DPC	INFN	IMAA	DDSC	ARMINES-LGEI	CP-CH	TEI-CR	ANPC	UMINHO	TOTAL PARTICIPANT
Support activities										
WP 2 - Coordination with EGEE activities	8.000,00	82.000,00	22.000,00	0	12.860,00	0,00	12.000,00	0	12.000,00	148.860,00
WP 3 - Civil Protection systems analysis	68.000,00	11.000,00	23.000,00	0	33.774,00	8.000,00	23.000,00	19.250,00	15.750,00	201.774,00
WP 4 - Research and Innovation Strategies definition	44.000,00	39.000,00	77.000,00	0	50.985,00	0,00	45.000,00	3.500,00	41.500,00	300.985,00
WP 5 - Dissemination and Exploitation	30.000,00	15.000,00	15.000,00	15.000,00	7.579,00	15.000,00	15.000,00	10.000,00	20.000,00	142.579,00
Total support activities	150.000,00	147.000,00	137.000,00	15.000,00	105.198,00	23.000,00	95.000,00	32.750,00	89.250,00	794.198,00
Management activities										
WP 1 - Management	10.000,00	3.000,00	3.000,00	3.000,00	1.802,00	2.000,00	5.000,00	1.800,00	1.200,00	30.802,00
Total management	10.000,00	3.000,00	3.000,00	3.000,00	1.802,00	2.000,00	5.000,00	1.800,00	1.200,00	30.802,00
TOTAL ACTIVITIES	**160.000,00**	**150.000,00**	**140.000,00**	**18.000,00**	107.000,00	**25.000,00**	**100.000,00**	**34.550,00**	**90.450,00**	**825.000,00**

8.2 Overall budget for the project (Forms A3.1 & A3.2 from CPFs)

The spreadsheet below reflects the CPF A3.1 form

Nr	Partner	Cost model		SA (€ x 1.000)	Management (€ x 1.000)	TOTAL (€ x 1.000)
			Direct cost	130.833	10.000	140.833
			of which Subcontracting	35.000		35.000
			Indirect cost	19.167		19.167
			TOTAL elegible cost	150.000	10.000	160.000
1	DPC	AC	**EC CONTRIBUTION**	**150.000**	**10.000**	**160.000**
			Direct cost	122.500	3.000	125.500
			of which Subcontracting			
			Indirect cost	24.500		24.500
			TOTAL elegible cost	147.000	3.000	150.000
2	INFN	AC	**EC CONTRIBUTION**	**147.000**	**3.000**	**150.000**
			Direct cost	114.167	3.000	117.167
			of which Subcontracting			
			Indirect cost	22.833		22.833
			TOTAL elegible cost	137.000	3.000	140.000
3	CNR-IMAA	FC	**EC CONTRIBUTION**	**137.000**	**3.000**	**140.000**
			Direct cost	12.500	3.000	8.000
			of which Subcontracting	0.000		0.000
			Indirect cost	2.500		10.000
			TOTAL elegible cost	15.000	3.000	18.000
4	DDSC	AC	**EC CONTRIBUTION**	**15.000**	**3.000**	**18.000**
			Direct cost	19.167	2.000	21.167
			of which Subcontracting			
			Indirect cost	3.833		3.833
			TOTAL elegible cost	23.000	2.000	25.000
5	CP-CH	AC	**EC CONTRIBUTION**	**23.000**	**2.000**	**25.000**
			Direct cost	79.167	5.000	84.167
			of which Subcontracting			
			Indirect cost	15.833		15.833
			TOTAL elegible cost	95.000	5.000	100.000
6	TEI-CR	AC	**EC CONTRIBUTION**	**95.000**	**5.000**	**100.000**
			Direct cost	27292	1.800	29.092
			of which Subcontracting			
			Indirect cost	5458		5.458
			TOTAL elegible cost	32.750	1.800	34550
7	ANPC	FCF	**EC CONTRIBUTION**	**32.750**	**1800**	**34.550**
			Direct cost	87.665	1.802	89.467
			of which Subcontracting		1.802	1.802
			Indirect cost	17.533	0	17.533
	ARMINES-		TOTAL elegible cost	105.198	1.802	107.000
8	LGEI	FC	**EC CONTRIBUTION**	**105.198**	**1.802**	**107.000**
			Direct cost	78.095	1200	79.294
			Of which subcontracting	22.313		22.213
			Indirect cost	11.156		11.156

			TOTAL eligible cost	89.250	1200	90.450
9	UMINHO	AC	**EC CONTRIBUTION**	**89.250**	**1.200**	**90.450**
	TOTAL elegible cost			794.198	30.802	825.000
	EC CONTRIBUTION			**794.198**	**30.802**	**825.000**

Since even the co-ordinator will receive less than 150.000 for the first reporting period, all partners must produce audit certificates only at the end of the project as stated by the Special Clause 39:

> "Notwithstanding the provisions of Article 7.2 of this contract, contractors requesting a Community financial contribution for one or more reporting periods of less than €150,000, need not submit an audit certificate, until the cumulative request for Community financial contribution is equal to or exceeds €150,000 for the reporting periods for which an audit certificate has not yet been submitted. In all cases an audit certificate shall be submitted at the latest 45 days after the final reporting period. This final audit certificate shall cover all period/s for which an audit certificate has not been previously submitted. [Decision DL/2005/1150]

The spreadsheet below reflects CPF A3.2 estimated breakdown per reporting period

WP	Leader partner number	PERIOD 1 (1 - 12 months) 1 YEAR	PERIOD 2 (13 - 28 months) 1 YEAR	Totale Project
WP 1	1 (DPC)	9.500	21.302	30.802
WP 2	2 (INFN)	42.000	106.860	148.860
WP 3	8 (ARMINES-LGEI)	47.400	154.374	201.774
WP 4	3 (CNR-IMAA)	28.500	272.485	300.985
WP 5	7 (ANPC)	32.600	109.979	142.579
	Totale	**160.000**	**665.000**	**825.000**

8.3 Management level description of resources and budget

Financial Information whole duration of the project

	management activities	Co-ordination or support activities	Total

Prt. N°	Cost Model	Costs (€)	Requested grant to the budget (€)	Costs (€)	Requested grant to the budget (€)	Costs (€)	Requested grant to the budget (€)
1	AC	10.000	10.000	150.000	150.000	160.000	160.000
2	AC	3.000	3.000	147.000	147.000	150.000	150.000
3	FC	3.000	3.000	137.000	137.000	140.000	140.000
4	AC	3.000	3.000	15.000	15.000	18.000	18.000
5	AC	2.000	2.000	23.000	23.000	25.000	25.000
6	AC	5.000	5.000	95.000	95.000	100.000	100.000
7	FCF	1.800	1.800	32.750	32.750	34.550	34.550
8	FC	1.802	1.802	105.198	105.198	107.000	107.000
9	AC	1.200	1.200	89.250	89.250	90.450	90.450
Total		**30.802**	**30.802**	**794.198**	**794.198**	**825.000**	**825.000**

9. Other issues

Gender issues

There are no particular gender issues arising from this initiative apart from those that have been affecting the European research community from the beginning. Indeed, female representation in Information Technology (engineering, mathematics and computer science) is far behind other academic activities, such as arts, literature and even medical/biological studies.
Gender issues are therefore not related specifically to the CYCLOPS Project activities but are dramatically inherent to Information Technology communities.
CYCLOPS will support parity through its different activities by promoting gender equality to Human Resources Management decision makers.

The following tables state that no sensitive ethical question are raised by the proposed project:

Ethical issues checklist

Does your proposed research raise sensitive ethical questions related to:	**YES**	**NO**
Human beings		✓
Human biological samples		✓
Personal data (whether identified by name or not)		✓
Genetic information		✓
Animals		✓

Table B. Proposers are requested to confirm that the proposed research does not involve:

- Research activity aimed at human cloning for reproductive purposes,
- Research activity intended to modify the genetic heritage of human beings which could make such changes heritable[1]
- Research activity intended to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer.

	YES	NO
Confirmation : the proposed research involves none of the issues listed in Table B	✓	

[1] Research relating to cancer treatment of the gonads can be financed

Appendix A - Consortium description

A.1 Participants and consortium

Participant roles

The CYCLOPS Consortium consists of nine partners from four EU member countries:

1. Dipartimento di Protezione Civile (DPC) [Italy];
2. Istituto Nazionale di Fisica Nucleare (INFN) [Italy];
3. Istituto di Metodologie per l'Analisi Ambientale (IMAA) [Italy];
4. Direction de la Défense et de la Sécurité Civiles (DDSC) [France];
5. Prefecture of Chania (CP-CH) [Greece];
6. Technological Educational Institute of Crete (TEI-CR) [Greece]
7. Autoridade Nacional para a Protecção Civil (ANPC) [Portugal]
8. Association pour la Recherche et le Développement des Méthodes et Processus Industriels – Ecole Nationale Supérieure des Techniques Industrielles des Mines d'Alès (ARMINES - LGEI) [France]
9. Universidade do Minho (UMINHO) [Portugal]

Four of them (DPC, CP-CH, DDSC and ANPC) are national or regional authorities in charge of Civil Protection activities, four of them (IMAA, TEI-CR, ARMINES – LGEI, UMINHO) are scientific partners active in GMES and Earth Observation research activities and/or in ICT applications for those sectors. The last one (INFN) is the scientific partner for Grid technologies research and applications.

The Civil Protection agencies provide the description of the Civil Protection systems, the definition of typical use-cases both for: a) testing the EGEE infrastructure in GMES applications and b) investigating possible and required enhancements. They play also an important role in the dissemination activities toward other national organizations and institutions involved in GMES activities and toward their counterparts in other countries. DPC, as the project coordinator, is also responsible of management activities; DDSC is responsible of the specific Work Package dedicated to Civil Protection analysis and ANPC is responsible of project setup phase.

The scientific partners provide the expertise and knowledge in the scientific and technological domains interested by CYCLOPS: GMES and related sectors, and Grid technologies.
They have an important experience in the use of Information and Communication Technologies (ICT) for advanced environmental applications. Thus they are the partners committed to relate the Grid expert partner, INFN, and the users (Civil Protection agencies). Their main contributions regard the definition of the system requirements of the Grid platform for GMES applications, and the test and study activities for the definition of the research and innovation strategies. They are also in charge of the dissemination of CYCLOPS in their scientific community.

INFN is member of EGEE Project with great expertise in Grid technology applications to the e-Sciences. It plays the key role of coordinating the CYCLOPS efforts with the EGEE activities. This internal dissemination and coordination activity is fundamental for CYCLOPS success. Moreover INFN gives an important contribution to the system requirements analysis, and to the study for research and innovation strategies definition.

As the Partner Description Forms below show, the Consortium is made of partners with complementary expertise and characteristics.
The four Civil Protections authorities are chosen considering their internal organization, geographical position and existing relationships. In particular, the Italian, French and Portuguese Civil Protection authorities are examples of national agencies, while the Greek partner is a local agency (Greek prefectures are public bodies with a specific Civil Protection Unit in charge of making decisions on Civil Protection measures and co-ordinating Civil Protection authorities and competent services in case of local disasters). This allows to consider two different organization models, with different scenarios that could affect the enabling infrastructure. Indeed a relevant aspect is held by the role of the different European civil protection structures involved as participants in the framework of the project, mainly concerning with the general heterogeneity existing among both operative structures and infrastructures employed to support the decisional system. Based on such item, further interesting contribution, emerging from the expected results, refers to the opportunity to reinforce the European civil protection system by ensuring data and information exchange in real time as well as the increasing in the computational features of the forecasting models providing a direct support from the research and institutional subjects not strictly involved in the procedures but capable to enable a suitable data-flow. The opportunity to identify uniform procedures in the pre-operative and operative controlling chain allows in creating a common knowledge and behaviour of the civil protection systems in order to define an optimized communicational network that is extremely needed to manage risks and disasters. Moreover, the presence of agencies from neighbour countries (France and Italy) with strong relationships between them, allows to investigate cross-borders issues examining transnational Civil Protection scenarios.

The scientific partners have a great expertise both in the environmental monitoring, Earth Observation and GMES sectors and in the application of advanced ICT to these sectors. Moreover, the existing relationships, both mutual and with Civil Protections authorities involved in the project, greatly simplify the CYCLOPS planned activities.

INFN is an important partner chosen for its great experience in the implementation and widespread use of large-scale Grid platforms specially in the e-Science sector. It is suited to establish a liaison between the scientific GMES community and the Grid technology community.

The following table summarize the participants roles. It shows the main contributions to WPs for each participant.

Participant main contributions for Work-Packages

Particip. No.	Participant Acronym	WP 1 Management	WP 2 Coordination with EGEE activities	WP 3 Civil Protection systems analysis	WP 4 Research and Innovation Strategies definition	WP 5 Dissemination and Exploitation
1	DPC	Project Management/ WP leader	Contribution in the EGEE dissemination	Major contribution for Business Process Analysis, Existing Analysis, Use Cases Definition	Contribution for testing EGEE infrastructure and porting of Civil Protection applications	Major contribution to the deliverables;dissemination towards Civil Protection communities
2	INFN	Contribution	WP leader	Contribution for System Requirements definition	Main contribution for the definition of the EGEE Requests for Enhancements	Dissemination towards Grid communities
3	IMAA	Contribution	Major contribution for reporting required middleware enhancements	Contribution for the Use-Cases and System Requirements definition	WP leader, main contribution for studying a Civil Protection Grid infrastructure and R&D strategies definition	Dissemination towards Earth Science community
4	DDSC	Contribution	Contribution in the EGEE dissemination	WP leader, contribution for Business Process Analysis, Existing Analysis, Use Cases definition	Contribution for testing EGEE infrastructure and porting of Civil Protection applications	Major contribution to the deliverables; dissemination towards the Civil Protection communities
5	CP-CH	Contribution	None	Contribution for Business Process Analysis, Existing Analysis, Use Cases definition	None	Dissemination towards Civil Protection communities
6	TEI-CR	Contribution	Contribution in the EGEE dissemination	Contribution for Business Process Analysis, Existing Analysis, Use Cases and System Requirements definition	Contribution for R&D strategies definition	Dissemination towards Civil Protection communities
7	ANPC	Contribution		Contribution for Business Process Analysis, Existing Analysis, Use Cases definition	Contribution for testing EGEE infrastructure and porting of Civil Protection applications	WP leader, dissemination towards Civil Protection communities
9	UMINHO	Contribution	Contribution in the EGEE dissemination	Contribution for Business Process Analysis, Existing Analysis, Use Cases definition	Contribution for testing EGEE infrastructure and porting of Civil Protection applications	dissemination towards Civil Protection communities

Participants description

Dipartimento della Protezione Civile (DPC)

Description

The Dipartimento della Protezione Civile (Department of Civil Protection) is a division of the Italian Presidenza del Consiglio dei Ministri, and represents the national authority in charge of civil protection activity. Its fields of interest are planning, prevention and management of every type of risk all over the national territory. It plays the role of coordination of all the forces operating on Italian territory such as Italian Army, Navy, Air force, National Fire Department, Police authority, regional and local authorities, in order to warranty the safety for human life. Further, the new asset of the civil protection is approaching to an operative and functional model mainly based on the concept of "real time risk prevention and management", assumed as the time needed to actuate urgent actions for the safeguard of people and goods, as well as to replace the life condition pre-existing to the natural or human disaster. Then, the main target is to develop a "prevention system", thought in the wide sense of forecasting, monitoring, overseeing, active contrast and early management of emergency, through the integration of surveying and modelling tools as well as shared informational system in real time, among all the "actors" involved in civil protection activities. The Italian Department of Civil Protection (DPC) was involved in many different European projects such as Formidable, Egeris, European, INTERREG IIC, Platform of New Technologies for Civil Protection. Currently, the DPC is involved in CARPE DIEM and RISK-AWARE project. Moreover, DPC is also involved within VI Aerospace GMES "Eurorisk-Preview" both for fire and volcanic risks topics and within the research projects SPREAD, ERAS and FIRESTAR on forest fire detection and prevention. Finally, DPC is represented as a Forest Fire Research project Evaluator within the European Commission General Research Directorate on Natural Disasters.

Resources deployed

The Italian Government establishes The National Alert System for Risks Management (NASRM) and states that such an early warning system has to be provided by the National Department of Civil Protection (NDCP) and by the Regional Civil Protection Authorities (RCPA) through a national network of Centres for Forecasting and Surveillance of Effects (CFSE) which may act along with the support of Centres for Technological and Scientific Services (CTSS). CFSEs are the operative units able to collect, processing and exchange every type of meteo, geo, hydro, hydro-geo, marine, volcanic, seismic, etc. data and information, gathered from modelling outputs and monitoring systems and shared within the national civil protection network supporting the NDCP and RCPA decisions. Such CFSE, and the operative personnel working in, are the main resources to be involved in the project for co-ordinating activities and to define the requirements for the GRID system as well as to validate the output products to be inserted in the pre-operational and operation chain.

Principal Investigator

Dr. Bernardo De Bernardinis is General Director of the Risk Planning, Assessment and Prevention Office at the Italian National Department of Civil Protection. He is Professor at University of Basilicata, Roma "Tor Vergata" and Cagliari in Fluid Mechanics and Hydraulics, Member of the Environmental Impact Assessment National Committee (Italian Ministry of Environment); Member of the Technical Committee for the Italian national programmes for "Potenziamento delle reti di monitoraggio meteo-idropluviometrico" and "Rete nazionale dei radar-meteorologici";

Member of the GMES Steering Committee. He is author of about 70 papers concerning fluid mechanics, hydraulics, river hydraulics, environmental planning and management, natural hazards and risk management. He is advisor in several national and international research activities as well as he is scientific responsible in projects involving the Department of Civil Protection, universities, research centers, public and private land management enterprises.

Istituto Nazionale di Fisica Nucleare (INFN)

Description

The INFN - the National Institute of Nuclear Physics - is an organization dedicated to the study of the fundamental constituents of matter, and conducts theoretical and experimental research in the fields of subnuclear, nuclear, and astroparticle physics. It was founded in 1952, and owns 4 National Laboratories and 19 Divisions (Sezioni) operating in strong synergy with the Physics Departments at all major Italian Universities. The INFN workforce includes about 2000 of its own employees, and almost 2000 university employees involved in research conducted by the Institute. INFN has a long tradition of dissemination and training, dedicated both to the scientific community and to the general public. INFN has a long pioneering experience in the implementation and widespread use of large-scale Grid platforms. Since the year 2000 INFN is involved in many national and international Grid projects. It played a main role in DataGrid, DataTAG, LCG, Coregrid, GridCC and EGEE projects, with responsibilities in the Grid workload management services, interoperability between European and US Grids, and Grid resource access services. INFN runs a Production Grid for Scientific Application (http://grid-it.cnaf.infn.it/) based on the EGEE middleware, composed of more than 800 CPUs and 100 TB of storage resources distributed in more than 20 sites in Italy. INFN Grid is part of the wider EGEE Grid which collects about 130 sites spread around Europe.
INFN is partner of some new project approved by Th 6th Framework Program, like EUMEDGRID, EUCHINAGRID, BIONFOGRID and ETICS. Some INFN GRID new Projects have been approved and will be founded by the Italian Ministry for Research. INFN in coordinating a Consortium initiative for the Open Middleware Enabling Grid applications in Italy (c-OMEGA).

Resources deployed

The project implementation requires the deployment of a small pilot dedicated Grid test-bed where to install and test the GMES applications in the Grid environment. Such a test-bed will be based on the up to date existing EGEE middleware, no middleware developments are planned within the scope of the CYCLOPS project. The Grid dedicated test-bed will consist of a minimal set of Grid elements:
1 UI (User Interface), 1 RB/BDII (Resource Broker/Berkeley Database Information Index), 1 VO (Virtual Organisation) server, 1 RLS (Replica Location Server), 2 CEs (Computing Elements), 2 SEs (Storage Elements), 2 WNs (Worker Nodes), for a total of 10 bi-processor PCs.
Human resources are required in order to carry out:

- the dissemination activity to explain the EGEE Grid middleware to GMES community and application experts
- the setup, the management and the operation control of the Grid dedicated test-bed;
- the study, joint with the GMES application experts, on how to interface the GMES applications to the EGEE middleware;

Principal Investigators

Dr. Mirco Mazzucato is Director of INFN-CNAF (Centro Nazionale per la Ricerca e Sviluppo nelle Tecnologie Informatiche e Telematiche). He is involved in many initiatives on Grid technologies at national and international level. Currently, he is member of the Grid Deployment Board (GDB) and INFN representative in the CERN LHC Computing Grid project; member of the Management Board and of the Executive Committee of the FP6 Grid infrastructure project EGEE; Head of the Research Unit 4 of the FIRB MIUR Grid.it project; Italian Delegate at the European IST Committee and of the e-Infrastructure Reflection Group (e-IRG); Member of the International Grid EU-US coordination group. He was Member of the Management Boards of the FP5 European Projects DataGrid and DataTAG; INFN national coordinator of many HEP experiments based at CERN: NA16, NA27 and DELPHI; Head of the Team who set up in 1988 the DELPHI INFN Farm for the offline productions, one of the world pioneering examples of CPU clusters based on commodity components (Digital workstations connected via Ethernet); Member of the DELPHI Management Board from1993 to 2000 as coordinator of the offline computing activity; Chairman of the CERN LHC Computing Board from 1996 to 2000; Chairman of the CNTC the Committee which has fostered the introduction of the new computing technologies in INFN from 1998; President of the INFN Computing Committee from 1998 to 2001; General Chair of the Computing in High Energy Physics (CHEP) Conference 2000 ; Member of CHEP Advisory Board in 2001 and 2003 and Chair of the Grid Computing session in 2001; Member of the SC2002 program committee. He is author of more that 250 publications.

Istituto di Metodologie per l'Analisi Ambientale (IMAA)

Description

IMAA-CNR is an Operational Center of the Civil Protection, and is a member of OGCE. Its research focuses on information and communications technologies (e.g. Spatial Data Infrastructures) to harmonize, manage and share Earth Sciences data and information in the framework of Information Society applications. Besides, IMAA has complete chains to receive, archive and process NOAA-HRPT and MSG-HRIT data; there exists a long-term historical AVHRR archive consisting of more than 8 years of co-located imagery, soon available on-line via Web. IMAA gained specific knowledge and experience on international tools and standard related to Earth Sciences data access and interoperability, such as: OPeNDAP, THREDDS, netCDF, ncML., ESML and GML. As a matter of fact, IMAA has contributed to several middleware specifications, such as: UNIDATA THREDDS, ncML and ncML-GML. IMAA participates in several international projects, like the 6FP projects: GRIDCC "Grid-enabled Remote Instrumentation with Distributed Control and Computation", EUORORISK/PREVIEW, the NoE GMOSS (Global Monitoring for Security and Stability) and the IP NEEDS ("New Energy Externalities Developments for Sustainability"), and THREDDS/DLESE funded by the American NSF. IMAA is one of the initiator (along with UCAR, NASA and George Mason University) of the OGC Interoperability Experiment GALEON (Geo-interface to Atmosphere, Land, Earth, Ocean netCDF), which aims ad experimenting the OGC WCS to implement Earth Sciences and GIS communities interoperability. Jointly with the Italian Dept. of Civil Protection and the Ministry of Environment, IMAA is in charge of the INSPIRE SDIC, called INTERO (Italian National earTh & Environment Research cOmmunity) in order to provide requirements and suggestions on Earth Sciences Real Time data and services for INSPIRE. IMAA is a consultant of the Italian Ministry of Environment to design and implement the National Cartographic System. IMAA is heavily involved in the GMES (Global Monitoring of Environment and Security) initiative at the National and International level.

Resources deployed

IMAA is equipped with advanced resources for Earth Sciences applications. In particular the following material resources will be made available to CYCLOPS Project:

- Infrastructure for storage, sharing and processing of Earth Observation Data:
    - Storage area network (9 TB on-line);
    - 5 Network Attached Storage (800 GB each);
    - Cluster HPC LINUX 16+2 nodes;
    - Tape Library LTO, 30 TB;
    - Communication facilities (1-10 Gb/s);
- Web-based publishing system for data products;
- NOAA/HPRT receiving station;
- MSG/HRIT receiving station;
- AVHRR images historical archive;

IMAA will also provide human resources with expertise in the ICT application to GMES and Earth Sciences in order to contribute to:

- system requirement analysis;
- the definition of research and innovation strategies, and related work package management;
- dissemination activities;

Principal investigators

Dr Stefano Nativi He is in charge of the Operative Unit of CNIT (the Italian National Interuniversity Consortium for Telecommunications) at IMAA-CNR and member of its Scientific Council. He is professor (with no-track position) at the University of Florence ("Web Services management" for the degree in Information Engineering) and at the University of Padua ("Land Management Systems" for the degree in Informatics). He is member of the Italian Scientific and Technological Committee for GMES (CTSG). He is the representative person of IMAA–CNR, in the Open Geospatial Consortium (ex OpenGIS). He represents Italy –as an expert- in the standardization work of the CEN Technical Committee 287 for establishing a European Spatial Data Infrastructure. He is part of the Metadata Core Drafting Team for the European INSPIRE initiative (his role is: *link with GMES+ Grid*). He is the CNR representative in the INTERO (Italian National earTh & Environment Research cOmmunity) SDIC (Spatial Data Infrastructure Community) for INSPIRE. He has been Distinguish Visitor at the l'NCAR/UCAR/ UNIDATA working on the subject: "Interoperable Data Systems" in the field of geospatial information and Earth sciences. He has been PI and co-PI of numerous projects funded by the Italian Space Agency (ASI) and the EC. His scientific interests include the multi-disciplinary sector of ICT for Earth Sciences applications.

Prof. Vincenzo Cuomo Since 1987 he has been a full professor of Physics at the University of Basilicata's Faculty of Engineering. He is the director of the new Institute of Methodologies for Environmental Analysis (IMAA) and is the chairman of the Potenza (Italy) Research Area of the Italian National Research Council (CNR). He is member of GMES Italy "Steering Committee" and he has been Italian member of

GMES “Data Policy” Working Group during GMES initial period (2001-2003). He is member of the “Commissione Grandi Rischi da Incendi Boschivi” – Protezione Civile (Risk Committee for Forest Fires of Civil Protection). He is Italian member of AIE agreement “Energy and Tecnology System Assessment Project”. He is PI for the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) within the framework of the development of the IASI high resolution satellite interferometer which will be launched with the METOP mission. He is responsible of the stream “Energy systems modelling and internalisation strategies, including scenarios building” in the IP NEEDS (“New Energy Externalities Developments for Sustainability”) and is involved in many European Project as: Eurorisk Preview, GRIDCC, GMOSS, Earlinet Network, etc. He is member of the “Fondazione IDIS” that is performing the project “Città della Scienza” in Naples. He is the promoting the Industrial Research Project “Development of industrial district of Earth Observation” (PON 200-2006). He is responsible of the University of Basilicata section in the National Inter-University Atmospheric and Hydrospheric Physics Center (CINFAI). He is member of the National Inter-University Telecommunications Consortium (CNIT) Scientific Council. He has been member of the Scientific Committee of Italian Space Agency (ASI) and he is or has been chair of many projects in the framework of ASI activities. He has been responsible of many projects in the framework of U.E., ESA, EUMETSAT and IEA activities.

Selected publications of the IMAA staff:

S. Nativi, J. Caron, E. Davis and B. Domenico, “Design and implementation of netCDF Markup Language (NcML) and its GML-based extension (NcML-GML)”, in printing on the Computers & Geosciences Journal, Elsevier Publication.

S. Nativi, L. Bigagli, P. Mazzetti, V. Cuomo, 2004, “Applying SOA to Earth Observation: the COS(OT) experience”, Proceedings of ICTTA’04, Damascus (Syria), April 2004, IEEE Press, ISBN 0-7803-8482-2/04, 2004.

B.Domenico, J.Caron, E.Davis, R.Kambic and S.Nativi, May 2002, "Thematic Real-time Environmental Distributed Data Services (THREDDS): Incorporating Interactive Analysis Tools into NSDL", Journal of Digital Information, Vol.2 Issue 4, May 2002.

Direction de la Défense et de la Sécurité Civiles (DDSC)

Description

The Direction de la Défense et de la Sécurité Civiles (Directorate of Civil Defence and Safety) belongs to the Ministry of Interior and it is the French Civil Protection. The Director of Civil Defence and Civil Protection manages and coordinates the services responsible of:

- Planning, coordination and implementation of civil defence measures, protection of civilian population, prevention of civilian hazards of any kind, planning of civil defence and civil protection endeavours;
- Rescue actions oriented towards safeguard of persons and goods, during peace as well as in crisis times;
- Intervention forces of Civil Protection ;
- Assistance to local rescue and fire fighting services;
- Promotion of civil protection training and professional education of fire fighter commissioned officers.

Civil protection is a mission led by the DDSC and following the territorial organisation and involving several actors such as medical services, police, flood alert centres etc.

The International Relations Department liaises with the European commission and its sister organisations in Europe, and supervises usage of new technologies for civil protection.

Resources deployed

The DDSC will take part to the Project Board with a high-rank professional fire-fighter officer. A commissioned professional officer shall take part to the Civil protection expert group whereas a geomatics engineer shall take part of the technical expert group. This latter task may be subcontracted to a Research and Development entity already conversant with GRID technology and e.g. hydrology. Such staff have experience in previous projects funded under national scheme such as the PACTES co-operative work for flood management or the PAREFEU fire management application. Furthermore the DDSC may provide a series of cases studies and would be interested in a demonstrator. DDSC would liaise with other institutions such as meteorological or flood alert services, scientific laboratories in hydrology or seismology and volcano observatories as needed, using the relationship set in the context of the EURORISK activity.

Principal Investigator

Colonel Philippe Nardin is the head of the International relations department of DDSC. He has a thorough knowledge of France and European civil protection systems. He supervised the study “platform of new technologies for civil protection” and he is the chairman of the steering committee of the EURORISK PREVIEW and RISKEOS projects relating to GMES.

P. Nardin and J. Béquignon. “*La plate-forme des nouvelles technologies pour les protections civiles européennes*” , proc. Euro Mediterranean Seminar on New technologies and civil protection, Madrid, 6_8 October 2003

Civil Protection of Chania Prefecture (CP-CH)

Institute description

Within the competence of CP-CH lies the regional planning and organization of state services aiming to the protection of citizen's life, health and property from natural hazards, technological accidents and other disasters, causing emergency situations during peace period and to the protection of cultural heritage, historical buildings and monuments, the resources and the infrastructure. On May 2002, a new Law (N. 3013) upgraded the role of Civil Protection in Greece, emphasizing the importance of citizen protection and assigning roles to local authorities. The national CP authorities cooperate with the CP directorates in the 13 regions, the CP departments in the 54 prefectures and the CP offices in the municipalities of the country. All competent authorities at prefecture level are parts of the CP system. Among them, Fire Brigade, Coast Guard, Police, Emergency Medical Care Service, Armed Forces, Earthquake Planning and Protection Organization, Network Services and Meteorological Service are included. Finally, CP-CH cooperates with CP General Secretariat for the development of the National System for Volunteer Organizations in the field of Civil Protection due to the fact that volunteers and Volunteer organizations have a significant role in emergencies.

Resources deployed

CP-CH's staff and infrastructure will be involved in the frame of the proposed project in order to gear, at all stages of the development of GRID system its main activities:

Readiness of the personnel and means of civil protection. Elaboration of available scientific information for the mobilization of resources in case of emergencies. Coordination of emergency planning, response and recovery actions in emergencies at prefecture level. Implementation of the Annual National Planning at prefecture level in cooperation with competent authorities. Preparation of special reports for every major disaster (revisions, amendment and improvement of existing proposals are included). Assess information on weather forecasting and other precursory phenomena related with natural hazards, for the early notification and warning of the competent authorities and the general public. Public information and awareness at prefecture level. Organization and promotion of volunteer organizations work in the field of CP. Cooperation with the competent authorities towards preparing plans and regulations in the field of prevention at prefecture level. Programming of the necessary annual provisions of means and human resources in cooperation with competent authorities at prefecture level. Support and promotion (coordination, planning) of the research, education and training in the field of CP. Participation to the Civil Protection Emergency Operation Center, a unit functioning on a 24/24h basis, equipped with communication systems (including mobile units that can be transported by C-130 aircraft) and directly connected with the competent services all over the country.

Principal Investigator

Mr. George Agorastakis (born on 1952) is Vice-Prefect of Prefecture of Chania in Crete. He holds B.Eng. in Mechanical Engineering and has for many years professional service and experience in industrial management, electromechanical constructions and installations and public works. Last years is mainly devoted, as coordinator, in the development planning and the submission and execution of many development programs and projects (especially for energy resources, environmental planning, management and protection) for Chania Prefecture.

Technological Educational Institute of Crete (TEI-CR)

Description

The Geophysics and Seismology Laboratory of the Technological Educational Institute of Crete (TEI-CR-GSL) has been ceaselessly contributing to the advancements made the past 10 year in the field of Geophysics and Seismology in Crete. In the course of its activities over the years, a better understanding of the seismicity and the seismic risk of various areas of South Aegean were accomplished. At the same time a large number of microzonation studies contributing in seismic hazard mitigation were performed and many local seismic station networks for monitoring and determining the seismotectonic regime of the certain areas- were deployed. Certain applications of theoretical aspects of seismology to Greek data resulted in revised and/or local seismic intensity and seismic energy attenuation laws and in the determination of seismic source parameters for a large number of events. In recent years, major advances were made ín the field of Geophysics, due mainly to the application of dynamic, seismic, electromagnetic and magnetotelluric methods. Emphasis was imposed on the application and of modern methodologies, e.g. seismic and geoelectric tomography, high resolution seismic reflection. TEI-CR-GSL is concerned both with the understanding the cause and mechanism of earthquakes and with determining the structure of the earth's interior, using seismic waves and other geophysical methods. The group includes seismologists, geophysicists and rock physicists. The mission of TEI-CR-GSL is to: Operate a network of seismic stations in the Crete region; Analyze the data obtained with the Crete seismic network; Compile data on historic and current earthquake activity in and around the region of Crete, exchange of information on earthquake activity in S. Aegean with other Research Institutes and Universities; Provide for education of the public in

matters related to seismicity and earthquake risk in the Crete region; Carry out grant- and contract- supported research on earthquake problems.
Geophysics and Seismology both theoretical and applied are major areas of expertise, in which TEI-CR-GSL has accumulated years of experience. TEI-CR-GSL employs the most advanced technology available in Seismology and Geophysics. As a multidisciplinary quantitative research field, the new advances in electronics and computer technology are immediately adapted into the projects being carried out. Our greatest research strengths are in network seismology, tectonics, earthquake source physics, earthquake hazard research, exploration seismology, and theoretical seismic wave propagation, Seismicity and Aftershock Studies, Engineering Seismology, Earthquake Site Effect Evaluation, Earthquake Risk and Seismic Hazard Evaluation, Mapping of Earthquake Faults by Remote Sensing & GIS Applications, Seismic Data Processing, Modelling and Inversion. TEI-CR-GSL maintains a seismological network over the entire region of Crete and S. Aegean (frontal part of the Hellenic Arc). Its research staff also has extensive experience with rapid deployment, maintenance and analysis of temporary networks for seismological and engineering studies. Such expertise has been expanded through participation in national and international research programmes. TEI-CR-GSL is able to offer its services in: Seismic Risk investigations in rural and/or urban areas and at sites of major infrastructures; Microzonation studies for seismic hazard mitigation in cities or other populated areas; Studies of seismic precursors tracing in areas of high or low seismic activity; Seismic source and strong ground motion research for designing major infrastructures; Seismotectonic studies for the location of active faults; Structure vulnerability due to potential seismic load in conjunction with soil category; Designing emergency response scenarios to potential earthquake disaster in specific regions; Seminars, lectures and publications aimed to inform the public on earthquakes and on the means of protection and hazard mitigation; Geophysical research; Problem solving in engineering seismology and geology i.e. identification of the depth and topography of the base rock for the foundation of major bridges, dams and port infrastructures; Seismic tomography studies, Geoelectric tomography studies, Cross-hole, Seismic refraction and Seismic reflection studies.
The development of the research in Geophysics and Seismology to high and exemplary standards is a scientific target and a strategic objective of the research group in TEI-CR-GSL. The Laboratory has an extensive and indigenous experience in the design, construction and maintenance of geophysical instrumentation and telemetric networks for surveys in seismic and volcanic areas and the continuous monitoring of geophysical fields. TEI-CR-GSLs research team to be involved in this project comprises an effective blend of highly qualified scientists in the research topics of seismology-geophysics, geophysical instrumentation and geo-informatics. The accumulated experience of the members of the Greek research team is a consequence of their extensive involvement in large number of national & international research programs, in co-operation with European and Japanese Universities and Research Institutes. Over the last five years the researchers of TEI-CR-GSL group have participated in the following research projects:

1) Study of the ULF electromagnetic phenomena related to earthquakes (INTAS99);
2) Contribution to seismic hazards using seismic and electromagnetic observations Greek-Russian R&T collaboration, General Secreteriat of Research & Technology;
3) An expert system for the environmental monitoring and management in Crete , Region of Crete, MARMARA Earthquake Rehabilitation Project, MEDA-EU;
4) Seismic Hazard in the frontal part of the Hellenic Arc. A contribution to Seismic protection of the old Venecian city in Chania-Crete" (Archemedes Project- Greek Ministry of Education);

5) Non-linear mathematical problems in Geophysics and wave propagation, (Archemedes Project- Greek Ministry of Education);
6) Study of the active tectonics in the Hellenic Arc using geophysical methods (Pythagoras Project- Greek Ministry of Education);
7) Seismotectonics and Geodynamics of the South part of the Hellenic arc (Pythagoras Project- Greek Ministry of Education).

Resources deployed

TEI-CR-GSL is equipped with state-of-the-art hardware and highly sophisticated data analysis software. The hardware comprises integrated complete systems for geophysical prospection with electric, electromagnetic and seismic methods; networked seismological stations; ULF/ELF/VLF-electromagnetic monitoring stations; numerous data processing workstations and a cluster of 16 networked personal computers supervised by a Sun Blade server for solving complex mathematical problems in parallel processing and configured in such a way to be ready to participate in forthcoming "Global Grid". TEI-CR-GSL makes use of a suite of GIS, GPS, Remote Sensing, and database management system software packages and tools for geospatial data collection, information analysis and modelling, GIS development, implementation, and processing; also there are available in TEI-CR-GSL advanced analysis and 2D and 3D modelling software for electric and electromagnetic data, as well signal processing packages. In order to solve the problems and address the issues related to the proposed project implementation, TEI-CR-GSL will provide its multidisciplinary scientific personnel with expertise in the fields of Geophysics, Seismology, GIS, Remote Sensing, Land-Use and Land–Management, Natural Disasters Management, Physical Geography, Geo-environment and Natural Resources Monitoring, Data Management Systems and Electronic Engineering.

Principal Investigator

Dr. Filippos Vallianatos (born on 1963) is Professor of Geophysics & Natural Hazards in the Technological Educational Institute of Crete with expertise in the fields of Physics of the Earth's Interior, Geo-Seismo-Electromagnetism and Earthquake Prediction Research. He is the author or co-author of more than 70 papers in international journals and conference proceedings, guest Editor in Physics & Chemistry of the Earth and Annali di Geofisica and has served as reviewer in numerous scientific magazines.

A.Tzanis and F.Vallianatos, 2003. "*On the nature, scaling and spectral properties of pre-seismic ULF signals*", Natural Hazards and Earth Systems Sciences, vol. 3.

F.Vallianatos, V.Lapenna, V.Troyan, N.Smirnova, Y Kopytenko, V.Korepanov and T.Matiashvili, 2002. "*Study of the ULF electromagnetic phenomena related to earthquakes: Strategy of the SUPRE project*", in Seismo Electromagnetics (Lithosphere-Atmosphere-Ionosphere Coupling) monograph (Ed. M. Hayakawa), published by Terra Scientific Pub, Tokyo.

L.Telesca, V.Cuomo, V.Lapenna and F.Vallianatos, 2000. "*Self-similarity properties of seismicity in the Southern Aegean area*", Tectonophysics.

Autoridade Nacional para a Protecção Civil (ANPC)

Description

The existing Portuguese Service for Fire & Civil Protection – ANPC - is the result from the merge in 2003 of 3 others services: National Service for Civil Protection, National Service for Fire and Fire-fighters, National Commission for Forest Fires. The mission of ANPC is:

- To prevent and mitigate the risks associated with severe accidents and disasters and attenuate the effects resulting from this situations
- To coordinate and supervise all the operational activities carried on by the Portuguese fire-fighters
- To assess and give accordance to studies, projects and plans in respect with safety against fire in all kind of facilities and buildings and verify and inspect in loco their observance
- To give direction and coordinated the activities of emergency response at national and district level

Resources deployed

4 seniors technicians and respective structure; office, communications and computing equipment.

Principal Investigator

Dr. José Norberto Fernandes graduated in 1985 in Geography and Regional Planning, with a specialization in Geographic Information Systems (GIS). All professional activity centred on Information Technologies, being consultant in GIS area on different levels technical, academic and political.

SNBPC, "*Civil Protection at Home*", prevention user's manual.
SNBPC, "*Fire prevention for all*", user's manual.

Universidade do Minho (UMinho)

Description

The University of Minho (UMinho), founded in 1973, began its academic activity in 1975/76. UMinho is renowned for the quality of its teaching, the quality of its students, the public recognition given to its Alumni and for its intervention and strong links with the local community and the surrounding region. It has a student population of 16.000; out of which 1.900 are postgraduate students. The University has 1.200 teaching staff, of who 850 hold a PhD, and 600 administrative and technical staff.
Throughout the years the University has achieved a high reputation as an institution of learning and leadership, combining strategic vision with a capacity to innovate, and rigorous scientific, academic, administrative and financial management.
Research and other specialized services in their respective field of scientific knowledge, is strategically planned with the surrounding socio-economic environment in mind. Research programs are organised in Research Centres, Institutes and Groups, and the University is committed to several projects in purely national programs – POCTI, POSI, AGRO, PRIME, etc - and to many projects supported by international frameworks, namely the European Union's.

UMinho is participating of the National Grid Initiative being one of institutions that establish the Portuguese Community for Grid and Advanced Computing as a Joint Research Unit (JRU). It has several clusters, and efforts have been made to have some of these resources integrated in a grid infrastructure.

CCTC - Computer Science and Technology Centre - is a Research Centre that bundles the research activities of the Informatics Department of the University of Minho, which cover a wide range of fundamental and applied research topics. Detailed information on CCTC's members, projects, and publications can be found at http://cctc.di.uminho.pt/.
Its production infra-structure already supports the activity of its research community in several areas, but it is committed to the consolidation and expansion to new scientific areas to bring to the grid new researchers communities and applications. In this context it already joined EGEE-II Southwest federation.

CCTC, large experience on parallel and distributed computing, supports its involvement in the setting-up of a joint "International Collaboratory for Emerging Technologies", with poles in Portugal and in Austin, Texas that strength transatlantic cooperation in research and development on several areas which includes applications: namely in science, engineering, economics, civil protection and risk management;

CCTC-UMinho integrates the Portuguese participation in Project EELA2 - E-infrastructure shared between Europe and Latin America- sharing responsibilities in the NA4 activities related to e-Education and BIOMEDICINE, the training human resources for grid operation and utilization at the NA3 activities, also participating of dissemination activities NA2 and installation and deployment of grid software.

Presently its researchers lead and participate in several national Grid funded projects, such as:

- Cross-Fire, (Collaborative Resources Online to Support Simulations on Forest Fires) which pursue several objectives: 1) to develop and deploy in a grid environment, a decision (Civil Protection) support system to control forest fires, following EU guidelines to assure its integration in European CP and EGEE communities; 2) to improve the functionality and accuracy of a current forest fire simulation tools; 3) to foster the CP community into the grid environment, through cooperation links between CP agencies and research bodies.

- AspectGrid (Pluggable Grid Aspects for Scientific Applications) aims to design and implement a new concept of Grid middleware where Grid aspects are (un)plugged into scientific applications. The focus is on softening the migration of scientific applications to Grid environments by means of 1) design and implementation of a new Grid middleware and support tools, without intrusive code modifications; 2) migrate a small set of scientific applications, requiring a large amount of computing resources and from multiple application domains, to Grid environments; 3) promote collaborations among researchers with expertise in Grid and parallel computing and scientists with scientific codes that require computing resources not currently available in a small cluster system.

Principal Investigators:

António Manuel Silva Pina is a lecturer at the Department of Informatics of University of Minho, and a researcher member of CCTC.
He supervised several MsC and PhD students and is author of a significant number of papers on the areas of parallel computing modelling and programming and high-performance computing and communication.

As an active researcher, presently he assumes a special role in areas of Advanced and grid computing being the key researcher in charge of development and deployment issues related to cluster and grids platforms.
He was a member of the Scientific Committee of the 1st Iberian Infrastructure for Distributed Computing Conference, Santiago de Compostela, May 2007, and he will also participate in Scientific Committee of the 2nd issue, to be held in Porto, May 2008.

Joaquim Melo Henriques Macedo is a lecturer at the Department of Informatics of University of Minho, and a researcher member of CCTC.
He supervises several MsC and PHd students and is author of several
papers centred on the areas of information retrieval and computer networks. He is particular interested on sensor data networks and Internet of Things. He is particularly active in Portuguese Networking Community, with a large experience on computer networks and services R&D projects management.
He participated on the working group for the establishment of IP infrastructure for the Portuguese Academic Network. He was also the technical leader of X.500 Directory Services pilot, integrated on EU Paradise project for X.500 Directo

A.2 Sub-contracting

CYCLOPS will make use of subcontracting services for specific studies and for dissemination and learning activities. In particular DDSC would liaise with other institutions such as meteorological or flood alert services, scientific laboratories in hydrology or seismology and volcano observatories as needed in the study activities of the project. DPC will consider subcontracts to a Research and Development entity already conversant with GRID technology working on multidiscliplinary sectors (e.g. hydrology) and also for promoting CYCLOPS dissemination and learning.

A.3 Third parties

The Consortium does not consider third parties activities.

A.4 Funding of third country participants

The Consortium does not consider funding of third country participants.

Appendix B - Glossary

This glossary reports a brief description of the main concepts related to the present document.

Term	Acronym	Description
Global Monitoring for Environment and Security	GMES	The "Global Monitoring for Environment and Security" (GMES) is a joint initiative of European Commission and European Space Agency. It represents in simple terms a concerted effort to bring data and information providers together with users, so they can better understand each other and agree on how to make environmental and security-related information available to the people who need it. A challenge for GMES is to gather relevant data and provide innovative, cost-effective, sustainable and user-friendly services, which will enable decision-makers to better anticipate or integrate crisis situations issues relating to the management of the environment and security. [www.gmes.info]
Spatial data Infrastructure	SDI	The term "Spatial Data Infrastructure" (SDI) is often used to denote the relevant base collection of technologies, policies and institutional arrangements that facilitate the availability of and access to spatial data. The SDI provides a basis for spatial data discovery, evaluation, and application for users and providers within all levels of government, the commercial sector, the non-profit sector, academia and by citizens in general.The word infrastructure is used to promote the concept of a reliable, supporting environment, analogous to a road or telecommunications network, that, in this case, facilitates the access to geographically-related information using a minimum set of standard practices, protocols, and specifications. The applications that run "on" such an infrastructure are not specified in detail in this document. But, like roads and wires, an SDI facilitates the conveyance of virtually unlimited packages of geographic information. [GSDI, “Developing Spatial Data Infrastructures: The SDI Cookbook”]
INfrastructure for SPatial InfoRmation in Europe	INSPIRE	INSPIRE is a European Commission initiative which intends to trigger the creation of a European spatial information infrastructure that delivers to the users integrated spatial information services. These services should allow the users to identify and access spatial or geographical information from a wide range of sources, from the local level to the global level, in an inter-operable way for a variety of uses. The target users of INSPIRE include policy-makers, planners and managers at European, national and local level and the citizens and their organisations. Possible services are the visualisation of information layers, overlay of information from different sources, spatial and temporal analysis, etc. [inspire.jrc.it]
Real	RT/NR	According to IEEE a real-time system is “a system whose

Time/Near-Real-Time	T	correctness includes its response time as well as its functional correctness." This means that the system doesn't just perform its task; it needs to do it in a timely manner. The required response time depends on the application supported by the system. Near-Real-Time refers to looser requirements about the system time response.
Grid		The term Grid refers to technologies that allow "coordinated resource sharing and problem solving in dynamic, multi-institutional virtual organizations". In particular, according to a modern view, a Grid is a system that: a) coordinates resources that are not subject to centralized control b) using standard, open, general-purpose protocols and interfaces c) to deliver nontrivial qualities of service. [I. Foster, "What is the Grid? A Three Point Checklist", GridToday]
Service Oriented Architecture	SOA	The term SOA refers to an application architecture within which all functions are defined as independent services with well-defined invokable interfaces which can be called in defined sequences to form complex processes. In a modern view SOA is typically implemented using Web Services Technologies (XML, SOAP, WSDL,etc.)

Appendix C – EGEE Support Letter

ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE
EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

Laboratoire Européen pour la Physique des Particules
European Laboratory for Particle Physics

GENEVE, SUISSE
GENEVA, SWITZERLAND

Enabling Grids for E-sciencE

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Votre référence/Your reference:
Notre référence/Our reference:LoS CYCLOPS

Dr Bernardo Bernardinis
Dipartimento della protezione civile della presidenza del Consiglio
Department: Previsione e prevenzione dei rischi Via Vitorchiano 3
00188 Roma
Italy

Geneva, February 3, 2006

Dear Dr Prof Bernardinis,

This is a letter to show my support for the **CYCLOPS** project. On behalf of the EGEE consortium, I wish to confirm our willingness to work with this project extending the EGEE infrastructure and opening up new possibilities on how to use the Grid of the benefit for new communities.

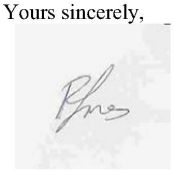
EGEE (Enabling Grids for E-SciencE) is integrating national, regional and thematic computing and data Grids to create a global Grid-empowered infrastructure for the support of the many scientific applications, exploiting unique expertise generated by previous EU projects (DataGrid, CrossGrid, DataTAG, etc) and national Grid initiatives (UK e-Science, INFN Grid, Nordugrid, US Trillium, etc).

The EGEE consortium involves 70 leading institutions in 27 countries, federated in regional Grids, with a current combined capacity of over 10'000 CPUs, the largest international Grid infrastructure ever assembled.

The EGEE vision is to provide distributed research communities with a common market of computing, offering round-the-clock access to major computing resources, independent of geographic location, building on the EU Research Network Geant and National Research and Education Networks (NRENs). EGEE hosts applications from two pilot scientific domains: particle physics and biomedicine while working with new scientific disciplines to exploit grid technologies. As such it matches the scope and goals of the CYCLOPS project, aiming at building on the EGEE applications expertise, while supporting other regional applications and promoting new ones.

My colleagues and I look forward to the opportunity of a fruitful collaboration.

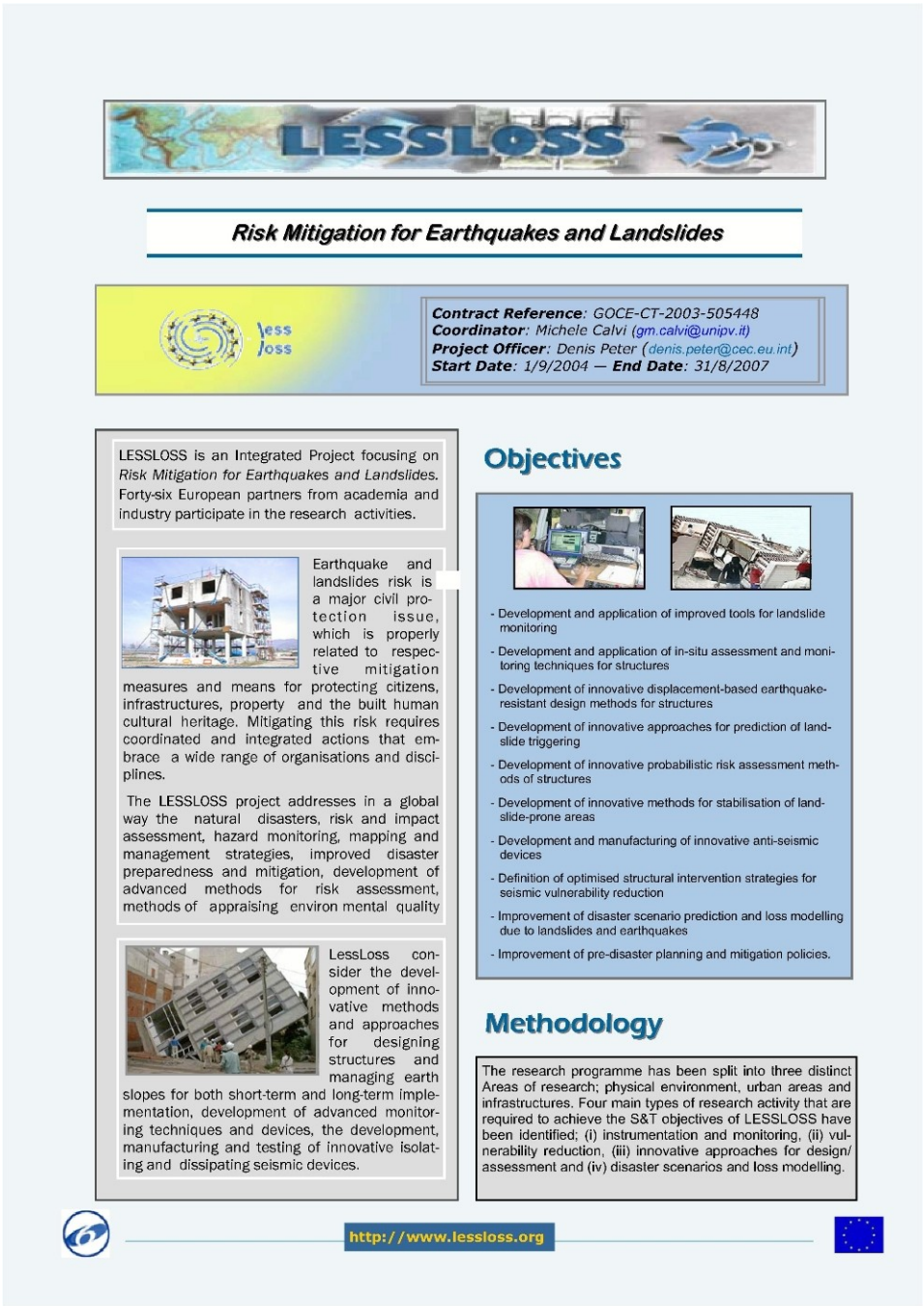
Yours sincerely,



Dr. Bob Jones
EGEE Project Director

Appendix D – Description of Relevant Projects

D.1 Project LessLoss



http://fp6.cordis.lu/fp6/home.cfm

LessLoss is an R&D project supported by the DG Research of the EC, in the context of FP6. The project belongs to a group of projects which aim at integrating and homogenizing data and techniques for managing multiple natural disaster risks. This approach has been prioritized in the context of the Euro-Mediterranean Disaster Information Network (EU-MEDIN) initiative of the EC.

Visit the European Network of Research in Natural Disasters

EU-MEDIN:http//www.eu-medin.org

Expected results

The results of LessLoss will include among others:

- Landslides: Mapping, Monitoring, Modelling and Stabilization
- European in-situ Assessment Manual for Existing Structures
- Innovative Anti-Seismic Systems Users Manual
- Guidelines for Seismic Upgrading of Buildings and Infrastructures
- Guidelines for Displacement-based Design of Buildings and Bridges
- Guidelines for the Application of Probabilistic Methods to Seismic Assessment of Existing Structures
- Disaster Scenarios Predictions and Loss Modelling for Urban Areas
- Prediction of Ground Motion and Loss Scenarios for Selected Infrastructure Systems in European Urban Environments

LessLoss: Research areas and activities

	Research area 1 Physical environment	Research area 2 Urban areas	Research area 3 Infrastructures
Research activity 1 Instrumentation and monitoring	*Research component 1.1* Landslide monitoring and warning system	*Research component 2.1* In-situ assessment, monitoring and typification: Buildings; Bridges, Lifelines	
Research activity 2 Vulnerability reduction	*Research component 1.2* Landslide zonation, hazard and vulnerability assessment	*Research component 2.2a* Development and manufacturing of energy dissipation devices and seismic isolators: Buildings; Bridges, Viaducts *Research component 2.2b* Techniques and methods for vulnerability reduction: Buildings; Bridges, Underground	
Research activity 3 Innovative approaches for design/assessment	*Research component 1.3* Innovative approaches for landslide assessment	*Research component 2.3a* Displacement-based design methodologies: Buildings; Bridges, Lifelines *Research component 2.3b* Probabilistic risk assessment: methods and applications: Buildings; Bridges, Lifelines	
Research activity 4 Disaster scenarios predictions and loss modelling	*Research component 1.4* Landslide disaster scenarios predictions and loss modelling	*Research component 2.4a* Earthquake disaster scenarios predictions and loss modelling for urban areas	*Research component 2.4b* Earthquake disaster scenarios predictions and loss modelling for infrastructures

Coordinator: **Michele Calvi** (gm.calvi@unipv.it) Deputy Coordinator: **Rui Pinho** (r.pinho@unipv.it)

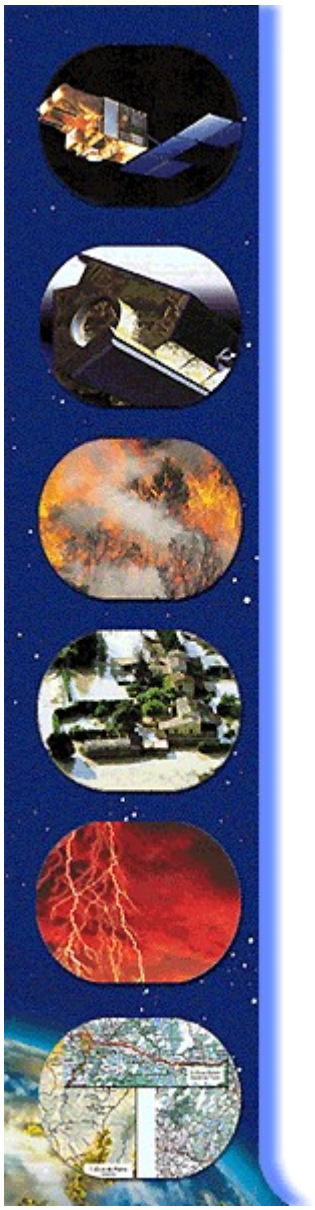
Project Manager: **Giorgio Franchioni** (franchioni@cesi.it) Dissemination Manager: **George Eftichidis** (geftihid@algosystems.gr)

D.2 Project RiskEOS

SDIC Title GSE RiskEOS for Flood and Fire Risk Information Services

Acronym RiskEOS SDIC

EURORISK is a European-wide approach for the development, deployment and operation of new information services for risk management. EURORISK is a consortium of 60 partners across 15 nations, steered by EumetNet, comprising national civil defence organisations, EADS Astrium and other users, manufacturers, operators and scientists. Its purpose is to harmonize the tools used in order to obtain better forecasts and more efficient risk management.



Mission and Objectives

RiskEOS project and consortium have the ambition to build up a long term co-operation for the development of flood and fire information services, fully accepted by the user communities at European and global level.
The stage 2 of the GSE RiskEOS shall allow to achieve:

- Scaling-up the Risk-EOS services (fire and flood risk information services through the use of EO techniques), delivering those Services to the benefits of Users
- Establishing a durable open distributed GMES Service Network
- Establishing standards and working practices for the GMES Services

Main Activities

Fire and flood risk information service development and provision to the users like:

- 4 services dedicated to fires management:
  - **(FSP) Forest Structural Parameters Mapping**: yearly mapping at HR to update parameters to fire-fighting and fire prevention such as vegetation types, fuel loads, etc…
  - **(FRM) Dynamic Fire Risk Monitoring**: daily fire risk indexes at resolution 8 km, based on EFFRFS approach combined with existing service suite for soil &vegetation moisture estimation, to be made fully operational over Europe by EUMETNET.

- **(RFM) Near-real-time Fire Monitoring**: near-real time monitoring of large fires (2 maps per day) using Middle-Resolution satellites (MODIS, FENG YUN..) to provide a "global view" of on-goin large fires in support to trans-regional and trans-national cooperation of fire fighting services; based on REMFIRESAT results.
- **(BSM) Burnt Scars Monitoring**: seasonal mpping of burnt areas and damage assessment, based on ITALSCAR, further deployed and qualified during the consolidation phase, and then to be further deployed in Europe.

- 2 services dedicated to floods risks management:
  - **(FRA) Flood Risk Analysis**: an on-demand service based on simulation and use of flood extent maps acquired during the event (Charta / RM service below), to deliver added-value products for flood risks analysis on a given basin; being deployed and qualified during the consolidation phase, to be improved and deployed widely on Europe- starting with large basins.
  - **(FFA) Flash Flood Awareness / Early Warning**: real-time service for flash flood anticipation; based on the AIGA approach, being deployed and qualified during the consolidation phase, to be improved and deployed widely on Southern Europe.

- 2 services common to floods and fire risks management:
  - **(RM) Rapid (Flood & Fire Event) Mapping**: systematic, rapid mapping of flood and fire events, to provide information support to crisis and immediate post-crisis (damage assessment) and to capitalize information for further use (risk estimation, models improvement,…). This service is close to the Charta but targeted to a wider scope of application (systematic capitalisation of flood events; rapid mapping of large fire events (>50 ha) as requested by users).
  - **(AM) Assets Mapping**: yearly monitoring of areas subject to natural hazards, to provide up-to-date information on human settlements, infrastructures, etc…at high and very high resolutions (land cover, urban growth, enhanced cartography, isolated habitat,…). Aimed to provide a better (more up-to-date) information to CP services (rescue plans, real-time operations) and prevention services (risk prevention plans maintenance).
  -

Comments

The RiskEOS project aims to the meeting of technical standards (whether they existing and emerging) in the working procedures of the consortium partners, both at process and product level. The standards generated by ISO/TC 211 Geographic information/ Geomatics Committee will be considered as a baseline for geoinformation services. Special attention will also be devoted to the development of the INSPIRE initiative, by participating to the various initiatives that will emerge from the work program, as requested by ESA. Also in the perspective of a long term development of service, the consortium intends to implement an open and decentralized structure of service generation. This structure has to be open also to new development and technical solution that may be brought by new partners or partners already participating to the consortium, provided that due standards are met by the solutions. So, there is a need to identify, within the working procedures, the way how these solutions will be incorporated.
Two lines will be followed:

- Meeting of technical standards adopted by the consortium
- Validation of the product and services possibly by using the same data set of already validated services, in order to make comparison and verify the performance of the new services.

All partners and Promotion action

INFOTERRA	• RISK-EOS presentation in the frame of the national Risk Day (Gefahrentag 2004), which is organized jointly by the German Committee for Disaster Reduction (DKKV). • Active participation in the upcoming UNOOSA Disaster Management events in particular in SE Europe. • Extension of user base by cross-linking with SAGE activities on service extension to Poland and Czech Republic.
INSA	• RISK-EOS presentation in CLIF (Spanish fire committee) meeting, joining DGCN and representatives of regional Spanish services • TBD meeting(s) to get SLA for: (in priority) BSM extension to full Spain in 2005 + pilot use I Spanish (if possible, other than Castilla y Leon) for the new 2008 services (NRT fires monitoring, forest struvct params,…)
METEO FRANCE	• (with DRSTPRP) briefing session in Piemonte • Continuation of presentation to the French flood steering committee • TBD opportunity(ies) to present RISK_EOS to other NMSs & associate them to further deployments (2005+)
MET OFFICE	• At least one briefing session, allowing to enhance the awareness of RISK_EOS services and initiative in UK, and possibly to the extension of the users base from 2005 (new pilot users for the services)
SRSA	• At least one briefing session targeting Swedish end-users (flood + fire, or separately) which could be a presentation (at an occasion – to be defined by SRSA – assembling local Swedish user) of the service results achieved and of the overall RISK-EOS service prospectus
TELESPAZIO	• Identification of regional user for the promotion of BSM service in Italy with the support National Core user

	• Meeting with selected national/regional user for BSM service presentation in order to expand service in Italy, in accordance with National Core User • Distribution of promotion material in National conferences and congress • Preparation of Service Level Agreement for BSM expansion in Italy
ASTRIUM – (INFOTERRA)	• Briefing session in the frame of GEO-EVENEMENT2004 • Briefing session upon users event organized by ENTENTE at Valabre • Meeting with COZ Sud-Ovest • Meeting TBD with National CP authorities to prepare 2005+further deployments.
CIVIPOL	• Contribute to services promotion, especially towards National-level Civil Protection services responsibles, by supporting contact-making and meeting set-up.

D.3 Project PREVIEW

INTEGRATED PROJECT

SIXTH FRAMEWORK PROGRAMME
PRIORITY 4 AERONAUTICS & SPACE – SPACE 2004

Project acronym: PREVIEW

Project full title: PREVENTION, INFORMATION and EARLY WARNING pre-operational services to support the management of risks

Proposal/Contract no.: 516172
Start date of contract : 1/4/2005

Project summary

In the frame of the AERONAUTICS & SPACE, FP6-2003-SPACE-1, GMES-Risk Management, PREVIEW addresses the first axe: "improvement of the services content", the second one being in the area of the DG INFSO FP6 projects.

PREVIEW proposes to develop, at the European scale, new or enhanced information services for risk management in support of European Civil Protection Units and local or regional authorities, making the best use of the most advanced research and technology outcomes in Earth Observation. Services will be validated under pre-operational conditions.

There is no European region that can be considered as perfectly secured from natural or man-made risks, either originating at national or trans-national level. The risks may result from the direct impact of atmospheric events (windstorms, heavy precipitations, snowfalls, thunderstorms…), from their hydrological consequences (plain floods, flash floods) or from geophysical events (earthquakes, subsidence, landslides…) and in some cases be worsened or directly caused by industrial activities.

Wherever they live, the citizens rightfully expect to get the best available information on the risks that can endanger their life and property, be warned in due time when facing a forthcoming event and be assisted with proper effectiveness during and after the unavoidable crisis.

The challenging issue is to enhance risk mitigation through better prevention and preparedness, better anticipation and more accurate assessment at various time and spatial scales of situations at risk, improved timely dissemination of meaningful and adapted early warning information, perfectly fitted to the societal needs and to the concepts of operations of rescue forces. This has to be done in a joint effort of all actors to develop risk awareness and culture.

Two main axes of progress will lead to enhanced capabilities for key actors (Civil Protections and Rescue bodies, Environmental Agencies, Planning offices, anticipation services operators, EU institutions…):

1. **Improvement of services content**: increasing quality and harmonisation of the information supporting decision-making at operational level; improving information collection, aggregation and intelligence methodologies; developing synergies, cooperative work and inter-operability capacities among operators to widespread best solutions at national, regional, and European levels (considering also portability to regions outside Europe).
2. **Improvement of services infrastructures**: improvement and standardisation of the information processing infrastructures for better, faster, safer, field operations, paying specific attention to Command Support Systems, secured Telecommunication Means, Geographical Information Systems, for stationary command posts as well as for on-field deployable configurations.

The European GMES initiative offers a significant opportunity to progress in responding to these expectations, making in particular the best possible use of the Space techniques and solutions. To reach that goal a European team of the major actors of the Risk Management domain has been set up (EURORISK consortium), merging all the required technical skills (from the sciences, from the operators and from the industry) and the main end-users bodies. This team has identified the most promising achievements that can be reached through new operational services, at an evidently increased cost benefits ratio. This will result in a definite step in the European capacity building that will be a driving force for future developments and implementation.

The proposed approach, ran from end-to-end **in close cooperation with all the bodies involved in the risk chain**, will enable them to benefit from the most relevant, tailored and performing services supporting the management of risks.

Project objective(s)

PREVIEW will follow thus a three-fold objective:

- First make an intensive use of the available or planned space based services in risk management such as those provided through the CHARTER or the RISK-EOS new space based services
- Second complement the development of available space basic services, by developing new ones, typically on plain floods, storms, landslides, earthquakes, industrial risks
- Third validate that such final and added value services can be easily integrated at users premises and can benefit of the effort of the synergy with the solution conveyed by new projects such as ORCHESTRA and OASIS.

PREVIEW will further propose a plan for the operational deployment and exploitation of the services which have been successfully through the user validation process. This plan will project the possible best scenario to install and operate these service in all the European Regions taking into account the risks they usually encounter, their present practices and their operational budget. This will contribute to the enlargement of the market for the resulting services.

PREVIEW will as well examine what are the conditions (sensors, data distribution ground infrastructures, …) to be met to guarantee the services adequate performances and their sustainability for the next decade.

State of the art

Scientific state of the art and emerging actions

Contribution of science in risk management has a two fold objective:

- Better understand the risk phenomenon (origin, occurrence, behaviour, effect) so as to predict it or simulate scenarios, assessing whenever possible the uncertainties.
- Identify the needs in improvement of quality or of collection process for the raw data and the parameters that are used to generate information to support the risk management.

The science contribution is very rich since decades but remains spread over countries, focused on very specific and partial issues related to the knowledge of the risk comprehensive phenomenology, usually insufficiently validated or mature to fully benefit to operational purposes.

The scientific community is also very diverse as the typologies of risks and inherent problematic are diverse: hydrology, meteorology, seismology, vulcanology, geology, geophysics, chemistry, space science, Information technology, …
Cross-cutting issues have to be addressed to standardize and structure the data processing chains or modelling techniques and ensure modularity and inter-operability of systems: optimally coupling or assembling land surface schemes, atmospheric and hydrologic forecast systems or forest fire risk estimates; deriving and understanding the final actual skill and uncertainties of the hydrological forecasts resulting from a deterministic or probabilistic forecasts of precipitations.

Many RTD projects are available both at national or European level, being funded by FP4, FP5, ESA, FP6, OMM, EumetNet and scientific bodies. Recent emerging projects have been identified either to federate European integrated research or to go through the development of pre-operational solutions integrating the best and the most mature results of science. These projects are presented in section 6.2 for each main thematic domain of PREVIEW. Lessons learned will be conveyed to the consortium through participating partners and by establishing direct contacts with leading organisations.

Relevance of PREVIEW with the GMES 2nd Call for Risk Management

PREVIEW addresses the development of Value Added information services to support the decision making process of risk management. *In the context of DG INFSO and DG RECH FP6 calls for projects, the objective of PREVIEW is to develop and deliver information content services, based on best results*

from thematic research projects, information services to be ingested in the decisional systems of the operators and users.

The proposed information services are to be used by mainly: the civil protections, the environmental agencies, forecasting services, emergency services, local authorities, DG Relex/Echo,… The end-users are at the core of the PREVIEW project both for the priority selection of services to be processed, for the validation at their premises under pre-operational conditions, for the dissemination and transfer of ownership, for the preparation of the operational deployment and exploitation plans.

In PREVIEW, atmospheric risks, geophysical risks, risk related to industrial and man-made accidents will be addressed. It is proposed to proceed with successive batches of risks to be tackled pending on their impact at European level, on the maturity of new research results, on the priority given by the users, and on the capacity to make it in the project programmatic envelop.
All the phases of the risk management cycle (prevention, preparedness, response and recovery) will be covered in a consistent and harmonised approach, allowing the exchange of harmonised information between the different operators and actors intervening in the different phases.
The services are built integrating space data, in-situ measurements, exogenous data, new modelling and most recent research and technologies results… The promotion of space data in the information production chain is one of the key objectives of PREVIEW. To guarantee it, the consortium includes best European savoir-faire and skills from the satellite remote sensing techniques and solutions and from EO geo information service providers.
The service are scalable at regional/local and global/European scale. They will be first exercised on the Europe scene but always with the concern of portability worldwide for those services of interest to support abroad interventions and relevant authorities in case of risk occurring outside Europe.

The proposed information services proposed are:

- new services *(eg: European flood awareness, very short range flash floods forecasts, European windstorm awareness, high resolution fire indice…)*
- existing services improved in terms of performances *(eg: CHARTER services, improved short range plain flood forecast…)*
- existing services improved in terms of application field and operation – enlarged applicability from a country to another, European deployment, better harmonisation, cross-border interoperability *(i.e. European flood awareness, European earthquake damage estimates, European accidental chemical pollutant dispersion and deposit)*.

User driven

PREVIEW is **designed and organised to fulfil the users own strategies (basically civil protection, environmental bodies, local authorities, and European DGs) both at local level and European level such as:**

- The “New mechanism” instrument of the Civil Protections “Community action programme”
- The EUROMED and EUROBALTIC strategies.
- The INSPIRE initiative promoting improvement paths in access and share of geo-spatial data sources
- The DG-Env EU-Risk concept supporting means and better practices for risk mastery and mitigation

PREVIEW proposes improved GMES information services to instrument part of these policies, applicable and acceptable first at local level and then at European level when harmonized practices and solutions will be possible and recommended.
Major users are active members being present on the field to deeply analyze the users needs, the service specification and validate at their premise the services exploited pre-operationally.
To ensure the user driven approach the project has set up as instrument a User Task Force. It represents an enlarged user community available to review the service portfolio, validate the interest of precursor services at an enlarged scale and validate the interest of PREVIEW European services to be used outside Europe (supporting international missions from EC members).

Addressing all cross-cutting issues to build a credible deployment scenario

The project encompasses all activities that will be necessary to set up risk information services that can be deployed during or after the 3 years period of PREVIEW.
Based on the service level agreement (users approval for transfer to full operations), the following tasks are assigned to the project and built in concurrent engineering:

- Definition of an operational concept and associated procedures so that services can be installed and exploited locally to provide services to local users in regions
- Definition of the adequate functional and system architecture to implement the service production chains and to ensure that the services, being compliant of local existing assets and forthcoming FP6 achievements (OASIS, ORCHESTRA, …)
- Identification and solving of all critical cross-cutting issues: sustainable access to data, delivery mechanisms, establishment of regulations and directives to fasten the market and service use, standardisation of processes and policies.
- Alternate organisations to exploit the services at local and European level, negotiation of the service partnership protocol between candidate service providers
- Engineering of the of the deployment and operational exploitation of the services.

A part from defining the right services for the right needs and users, central activities are driven on an incremental basis, being delivered to the decision makers per cycle of 24 and 18 months.

Better use of space

Research has made the demonstration that space resources used alone or combined with other sources of data were of prime interest for risk management. In combination with other data, the available space and techniques and data have shown to be mature enough to permit to build new valuable services.
Numerous pilot projects have demonstrated the operational or potential benefit of remote sensing information, in conjunction with other data and models, to improve the management of risks across all phases:

- In prevention: regular monitoring of the areas at risk allows to maintain an up-to-date information on the areas at risk, in particular:
    - the potential impact of natural hazards (*land cover, land use, assets mapping*),
    - the *structural parameters* (DTM, basin hydrological properties relevant to floods, vegetation and forest information, soils erosion…) that condition the natural hazards are required for risks analyses
- During the alert phase:

- EO satellites allow to monitor dynamic properties (soil moisture, vegetation status) which, once assimilated into end-to-end forecasting models, shall allow to better anticipate the occurrence of natural hazards
- Similarly, SAR-based techniques for monitoring of ground surface deformations shall allow a better anticipation of geophysical risks like landslides or volcanic eruptions.

- During the crisis and recovery phases:
  - EO satellites, thanks to global coverage and increasing revisit capability and optimum combination of different sensors, shall also (as already demonstrated by CHARTER) to provide event mapping information in support to the crisis management actors, and – as importantly – to capitalise the information about the occurred events, for a better prevention and management of future events.

High-resolution space data and products will be at the core of the building of PREVIEW new services. These data and products, combined when needed with in-situ measurements,will basically allow:

- To monitor, plan and prepare for disasters and emergencies
- To prepare response efforts for natural and unintentional events
- To analyse information and provide relevance
- To provide for preventative action and timely response resulting in reduced consequences
- To evaluate critical infrastructures
- To monitor networks and transportation activities in case of emergencies
- To actively support first responders, related civil protections organizations, citizens and non-government organizations
- To support efficiency and options for recovery.

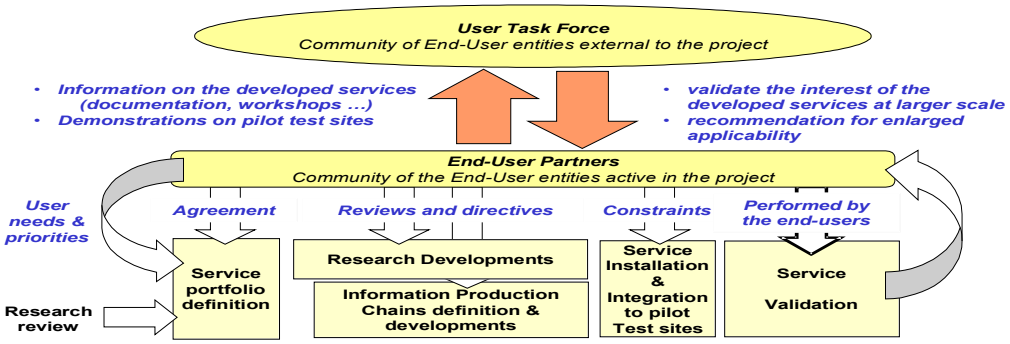
The question of sustainability of the new information services that PREVIEW will deliver is a key issue for the end-users. Indeed the end-users will go for an operational equipment and exploitation of the new PREVIEW services if and only if, as first condition, beyond the demonstration of the service own added value, the continuity of the data sources mandatory for running these services is well demonstrated, at least for a decade. This will apply, not only but in particular, to the space sensor resources where the guarantee of continuity of data delivery service will be key.
The PREVIEW team will analyse this major aspect and make appropriate recommendations to guarantee the required level of information service continuity starting with existing operational remote sensing missions (SPOT5, ENVISAT,…), with forthcoming ones (PLEIADES, COSMO, TERRASAR-X), with future possible or recommended ones.
As such PREVIEW will:

- Contribute to further rationalise the current utilisation of existing satellite missions
- Consolidate the transfer and improvement of the services onto the forthcoming missions
- Contribute to the requirements definition of future missions in terms of characteristics and performances (resolution, revisit time,..).

In complement, the way the basic remote sensing data will be accessible from the information services is another point to be well analysed and where improvements will have to be recommended. Objective there is to make sure that the remote sensing data flowing from missions ground segments to the services exploitation environment does not constitute any bottleneck or performance reducer. The PREVIEW team will analyse these aspects and propose appropriate recommendations and candidate solutions both for the GMES development period from 2003 to 2006 and for the operational deployment and exploitation period from 2007-onwards.

A strategic objective of the project is to enlarge as much as possible the list of target users so that we can inform them and disseminate the results of the project as largely as possible in Europe to create the demand in terms of GMES risk information services and push for deployment of such services at medium to long term. This enlargement is desirable both in terms of countries and of user communities.

Dedicated activities are planned and organised in PREVIEW under the leadership of end-user partners: the "**User Task Force**".



Core Partners of PREVIEW

The core team of PREVIEW consortium is composed of partners from **6 European countries**, namely, in alphabetic order, **France, Germany, Italy, Spain, Sweden and United Kingdom**, together with **European organisations**.

Type of organisation	Name	Country
Large firm	EADS Astrium SAS (ASTRIUM)	F
	TELESPAZIO spa (TPZ)	I
	Ingeniería y Servicios Aeroespaciales, S.A. (INSA)	E
	INFOTERRA GmbH (ITD)	D
End-User Services	Swedish Rescue Services Agency (SRSA)	S
	Direction de la Défense et de la Sécurité Civile (DDSC)	F
	Dipartimento della Protezione Civile (DPC)	I

Research Institutes & Service Operators	European Centre for Medium range Weather Forecasts (ECMWF)	EU
	Joint Research Centre (JRC)	EU
	Météo France (MF)	F
	Instituto Nazionale di Geofisica e Vulcanologia (INGV)	I
	Università di Firenze- Dipartemento di Scienze della Terra (UNIFI)	I
	Instituto di Ricerca per la Protezione Idrogeologica (IRPI-CNR)	I
	Swedish Meteorological and Hydrological Institute (SMHI)	S
	Met Office (METO)	UK
	Bundesanstalt für Gewässerkunde (BfG)	D
	Finnish Meteorological Institute (FMI)	Fi
	SERTIT - Service Régional de Traitement d'Image et de Télédétection - Université louis pasteur	Fr
Agency	Centre National d4etudes Spatiales (CNES)	Fr

Table: The 19 Core partners of PREVIEW CHECK Table number

The all EUMETNET community is represented at core team level through Meteo-France, MetOffice and SMHI

The distribution of the responsibilities in PREVIEW, illustrated in , was done according to the recognised expertises and national specificities:

- **ASTRIUM**, from France, is the **project coordinator** and drives the **central engineering**. In consistency with its technical expertise, ASTRIUM is also the **coordinator of the Atmospheric risk cluster**. Based on internal skills and own products, it also contributes to the development of services in the Flash Flood platform and coordinates the development of Assets Mapping services. This scheme of responsibilities and of contributions is fully in line with the current position of ASTRIUM in the on-going RISK-EOS project.
- **TELESPAZIO**, from Italy, is **coordinator of the Geophysical risk cluster**, and contributes to the central engineering. TELESPAZIO will also lead directly the developments of services supporting the management of Landslides and of Winter Fires, both of which being of particular interest for Italy.
- **SRSA**, from Sweden, is **coordinator of the Man-made risk cluster**. The Swedish central government administration in the field of Civil Protection will bring its long experience in the development and implementation of practices for the management of risk in general and industrial accidents in particular. The agency will also provide connection with related European initiatives such as the Ensemble or projects linked to the Seveso directive.
- The **French DDSC**, the **Italian DPC** and the **Swedish SRSA** are the **core members of the User Task Force and of the steering committee**. They have a key role in the project as being the most active end-user partners in the project, defining their operational needs and their national specificities, reviewing the proposed services all along the project and contributing largely to the operational validation of these services. They will be also facilitators in the interconnection and interface with all the other European civil protections involved in the User Task Force. Their role in the dissemination of the PREVIEW results to this community will be essential.

Internet address
www.preview-risk.com

D.4 Project RISK-AWARE

"RISK-AWARE" application ref. 3B064 (Extension call – 02.11.2004)

Community Initiative INTERREG III B (2000-2006) CADSES Priority 4 Measure 4.2

General objectives of RISK-AWARE are:

- Development and assessment of methodologies addressed to reduce the impact of geohydrological natural disaster at regional, national and trans-national level forced by meteorological situation
- Prevention of geo-hydrological natural disaster at regional, national and trans-national level forced by meteorological situation
- Design and implementation of regional, national and trans-national programmes for geo-hydrological hazards assessment and risk management

Objectives

Meteorological hazards affect all Europe and, among all natural hazards, international floods cause the greatest loss of human lives. The goal of the project is to enlarge the spectrum and quality of meteorological information up to short range (0-24 hours) to support users interested by severe meteorological, flood events and other hydro-geological hazards evolving on a very short time scale. The scientific understanding of the processes that cause hydro-geological hazards has made great progress in the last decades. This concerns meteorological conditions as well as geo-hydrologic processes in relation to catchments, estuary, coastal hydraulics and slope response and also includes the engineering of infrastructures for flood protection. A new paradigm has emerged, giving rise to the concept of geo-hydrological risk analysis and management.

Despite progress in research and practice, however, significant gaps still remain at operational level in optimisation the exploitation of data and information available from different sources. In this respect RISK-AWARE aims to cover the "last mile" between meteorological forecasting and the agencies that are in charge of ground defence. The major strength of RISK AWARE comes from the co-operation among meteorologists, hydrologists, geologists (who represent the data providers) and risk managers (as end users). RISK AWARE activities cover a quite wide geographical extension, from Central Europe to Mediterranean region. These different areas have different level of exposure to natural hazards. In regions with a lower level of risk, more attention will be devoted to increase the awareness of population and local authorities. Following the above considerations two different pilot actions will be carried out over two target areas.

Even in the past the Italian territory was interested by floods but, in the last decades, floods have become more frequent and sudden and the amount of damages they cause is increased a lot. Therefore, in 1998, after the flood in Sarno (on 5th May 1998 in Campania Region – Italy), a decree (n.180/1998) has been approved to implement a national programme aiming to enforce the hydro-meteorological monitoring network in every Italian region and to coordinate the monitoring activities. In the framework of this program Regional Centri Funzionali have been established to support the Civil Protection structures in the emission of alert messages addressed to public administrators to prevent, as far as possible, damages to people and properties. The improvement of the exploitation of the weather forecasting results to better determne ground effects - the goal of RISK AWARE project - is essential to increase the quality of risk-management practices and, consequently, to reduce losses in lives and properties by prevention.

Under the European Commission's (EC) Fourth and Fifth Frameworks considerable research effort has been funded on the reduction of natural hazards, bringing scientific advances in several areas where the hazard is triggered by meteorological events. The RTD projects included applications of remote sensing from satellites and weather radar, meteorological and rainfall forecast models, real time flood monitoring, modelling and

forecasting, landslide identification, modelling and hazards assessment. These topics are covered by the 5th Framework shared-cost research projects: CARPE DIEM, EFFS, EURAINSAT, MANTISSA, MUSIC, FLOODREIEF and FLOODMAN within the Clustering arrangement CLUFF, TESLEC, NEWTECH, DAMOCLES and others. RISK AWARE is designed to draw additional benefit from these and other related researches within the CADSES area.

Territory concerned: location of project activities (NUTS II) :

RISK-AWARE activities cover a large geographical region, from Central Europe to the Mediterranean region. The study areas exhibit different level of exposure to geo-hydrological natural hazards. Where risk exposure is lower, care will be taken to increase the awareness of the population and the local Authorities to geo-hydrological hazards and the associated risk. Geo-hydrological hazards in the CADSES area, which will be considered in RISK- AWARE, are chiefly connected to intense and localised rainy events. As a consequence particular consideration will be given to define all the necessary information, to design the telecommunications system and to implement all the risk management tools suitable for the short to very short range (up to 1-2 days).

In detail, the project activities will be carried out in:

1. The Italian, Austrian and Croatian Alpine regions, which are frequently affected by intense, often very localised, rainfall events, that produce severe geo-hydrological hazards with associated risks.
2. The Northern and Central Italian Apennines, and the Dynaric Alps, where intense and prolonged rainfall events have repeatedly proved to be capable of widespread and destructive geo-hydrological events.
3. Urban and other densely populated areas, where the impacts of geo-hydrological hazards triggered by severe meteorological conditions can be severe, including the loss of human life and economic damage.

Two target areas (TA) have been identified, one to the north and one to the south of the Alps:

1. **TA1** encompasses the territory between the Lake of Constance, to the west, and the city of Vienna, to the east; and from the main alpine divide, to the south, and the city of Nuremberg, to the north.

   This area is routinely affected by severe weather phenomena, including, wind storms predominantly in the winter, wide spread rainfall with associated flooding events in the spring and summer, convective t hunderstorms with associated flash floods and landslides in the summer and autumn.

   Most of the severe weather types in TA1 are influenced or triggered by the local orographical setting, especially the convective types whose preferred regions of origin and tracks are clearly linked to orographic features.

   A prominent example of this occurred in mid-August 2002 when parts of Austria, Bavaria, the Czech Republic, and Eastern Germany have been flooded by torrential rain. Water gauge levels of rivers in that areas reached the highest peaks since more than 100 years, e.g. peak levels of the Danube at Straubing were reported the highest since 1883. In winter and spring the UDC area is frequently crossed by cold fronts connected to cyclones, sometimes accompanied with gust fronts and thunderstorms. Along the north-alpine ridge these fronts can produce orographic jets with strong low level winds.
2. **TA2** The second pilot action is focused on the set-up, test and operational verification and tuning of the whole RISK-AWARE system. This pilot action cover, therefore, an area that is well representative of the geo-hydrological problems tackles in the project. The second target area encompasses the Northern part of the Adriatic sea (hereinafter referred as High Adriatic Area, HAA). This area cover the eastern Italian regions, bounded by the Apennines chain on the west and the sea on the east flank, the eastern Italian alpine regions, which are contiguous with the northern target area, and the territory of Balcanic Countries, like Slovenia, that in the spirit of CADSES program are involved to improve transnational collaboration and harmonisation. In the HAA target area the prototype will be tested with a degree of information to support risk management that will be scaled in accordance with the level of basic products available from the local/regional authorities.

LIST OF PARTNERS

	Institution	EU Member State	Country
Leader Partner	Regional Environmental Agency in Emilia-Romagna Hydrometeorological service	Y	IT
Partner n° 2	University of L'Aquila CETEMPS	Y	IT
Partner n° 3	Regione Marche Civil protection and Local Security	Y	IT
Partner n° 4	ARPA FRIULI VENEZIA GIULIA OSMER	Y	IT
Partner n° 5	Regione Emilia-Romagna Servizio geologico, sismico e dei Suoli	Y	IT
Partner n° 6	CONSIGLIO NAZIONALE delle RICERCHE - ISAC	Y	IT
Partner n° 7	CONSIGLIO NAZIONALE delle Ricerche Istituto di Ricerca Per la protezione idrogeologica	Y	IT
Partner n° 8	Dipartimento di Protezione Civile Centro Funzionale	Y	IT
Partner n° 9	Deutsches Zentrum für Luft- und Raumfahrt Institut für Physik der Atmosphäre	Y	DE
Partner n° 10	Joanneum Research GmbH Institute of Applied Systems Technology	Y	AT
Partner n° 11	Universität Wien Institut für Meteorologie und Geophysik	Y	AT
Partner n° 12	Institute of Meteorology and Water Management	N	PL
Partner n° 13	Meteorological and Hydrological Service	N	HR

Internet address
http://www.smr.arpa.emr.it/riskaware

D.5 Project AMPHORE

AMPHORE

"APPLICATION DES METHODOLOGIES DE PREVISIONS HYDROMETEOROLOGIQUES ORIENTEES AUX RISQUES ENVIRONNEMENTAUX"

Community Initiative INTERREG III B (2000-2006) MEDOCC AXE 4 – MESURE 4.3

Objectives

1. *Apporter des contributions techniques au procès en cours de redéfinition des règles et des procédures de responsabilité par rapport à l'alerte pour le risque hydrologique, visant à répondre aux exigences de clarté propres de la part du système destinée aux actions de contraste et émergence*
2. *Amélioration de la prévision hydrométéorologique en fonction de la prévision et de la prévention des risques naturels, en particulier en ce qui concerne les situations alluviales, les inondations, les instabilités du sol liées aux effets de précipitations intenses, ainsi que les actions de protection civile*
3. *Expérimentation relative à l'utilisation opérationnelle jointe aux outils opérationnels de prévision, parmi lesquels modèles innovateurs de type météorologique et hydrologique, à des fins de prévision quantitative et à haute résolution des précipitations dans des zones bien définies*
4. *Poursuite dans le temps des activités d'optimisation des méthodologies et des outils réalisés durant le programme opérationnel précédent (mesure 1 et action 1 de la mesure 2 du Programme opérationnel INTERREG II C "Gestion du territoire et prévention des inondations") et extension à la collectivité nationale et internationale.*
5. *Utilisation intégrée des données de surveillance du milieu ambiant obtenues aussi suite à des investissements dans le domaine du programme opérationnel Interreg IIC.*
6. *Création de synergies, optimisation des efforts et expérimentation de méthodes de travail communes*

Le projet se place dans le contexte de la prévention et de la gestion des risques naturels et en particulier dans le domaine du risque météohydrologique, avec les objectifs spécifiques suivants :

1. *mettre au point des méthodologies partagées pour fournir aux autorités, aux sujets institutionnels et aux organismes territoriaux qui s'occupent de la gestion des émergences les informations relatives à la source et à l'évolution du risque hydrogéologique et hydraulique, liées à la manifestation d'événements météorologiques particulièrement intenses, tels qui engendrent des situations de déséquilibre pour le territoire et de danger pour la population;*

2. *approfondir les connaissances relatives aux phénomènes hydro-météorologiques qui sont à la source de situations de risque, leur interdépendance et les caractéristiques spécifiques de vulnérabilité du territoire concerné par le projet;*

3. *améliorer la précision quantitative des précipitations, au fin de prévoir le risque hydrogéologique par des techniques multi-scénario ;*

4. *continuer le parcours commencé pour intégrer des domaines de connaissance au secteur de la météorologie et de l'hydrologie, à partir du langage jusqu'aux outils technologiques utilisés, en constituant un moment de rencontre entre différentes communautés scientifiques et les utilisateurs de l'information, à des fins de prises de décisions;*

5. *créer des opportunités de travail, de formation « sur le tas » et de formation structurée pour les jeunes par l'organisation d'une école estive (59% coûts du personnel sur les coûts totaux, 3 nouvelles bourses d'étude et 6 nouveaux contrats) ;*

6. *minimiser, avec la prévision, le préavis et la surveillance, les effets du risque naturel en termes de défense de l'intégrité de la vie humaine et des biens exposés;*

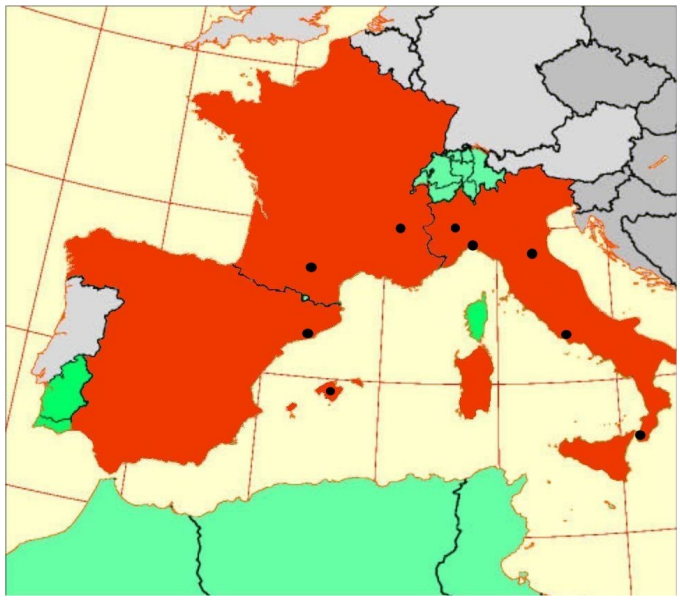
7. *situer et adresser les efforts de la communauté scientifique par rapport aux exigences des administrateurs locaux.*

Territory concerned: location of project activities:

Le régime pluviométrique dans les régions méditerranéennes, espagnoles, sud alpines françaises et italiennes est dominé par des systèmes pluvieux intenses occasionnant régulièrement des crues catastrophiques. La surveillance et la prévision de ces systèmes pluvieux est un important enjeu de protection civile, en particulier pour les territoires fortement urbanisées. L'arc méditerranéen septentrional constitue en effet une bande de côtes riche en infrastructures et en zones résidentielles ; à cause de la proximité des zones montagneuses à la mer, les centres urbains se sont développés principalement le long d'une étroite bande de côtes et dans la partie basse des vallées alluviales, en occupant les zones

d'expansion des fleuves et des torrents et en accroissant ainsi la vulnérabilité du territoire. L'ensemble de cette zone est soumise à l'influence du bassin méditerranéen, qui, tout en ayant une fonction de facteur d'adoucissement du climat, constitue un remarquable réservoir d'énergie et d'humidité, qui alimente les perturbations atmosphériques et favorise le développement de systèmes de précipitations intenses, événements qui peuvent produire en un seul jour plus que la moitié de la moyenne des précipitations annuelles et en une seule heure plus que la quantité de pluie moyenne d'un mois. Le territoire concerné par les activités du projet représente bien la zone Medocc, soit du point de vue administratif, soit morphologique. En effet il comprend des régions alpines, caractérisées par une vulnérabilité du territoire élevée, également à cause du réseau hydrographique complexe et de la forte présence anthropique des zones situées dans le fond des vallées, mais qui au même temps favorisent l'amorce des phénomènes de précipitation ou en augmentent l'intensité. Il comprend les régions situées le long des Apennins et les régions du sud de l'Italie, avec des événements intenses, essentiellement localisés, mais avec un fort impact sur la stabilité des versants, ainsi qu'une incertitude accrue relative aux effets de l'interaction entre la mer et les versants de la chaîne des Apennins; les zones insulaires, où les événements intenses sont plus rares, sans pour autant être moins nuisibles et où il se peut qu'une oeuvre de sensibilisation de la population et de l'administration publique soit plus difficile; les zones des côtes, où les effets d'événements intenses sont particulièrement rapides et difficiles à prévoir, où une bonne capacité de localisation des structures liées aux précipitations joue un rôle fondamental; les zones des côtes du nord-est de l'Espagne, où les événements intenses sont plus rares mais où des conditions d'aridité supérieure du terrain font en sorte que leurs effets sur le sol soient macroscopiques; et enfin la France, qui est la première à percevoir l'influence des perturbations atlantiques et où le contraste entre la masse d'air chaud-humide du sud-ouest et les intrusions d'air froid intensifie souvent les phénomènes.

Les zones comprises dans le projet ont aussi en commun une forte sensibilité des structures techniques et de gestion du territoire qui depuis beaucoup d'années, même par les fonds structuraux du Programme Interreg, coopèrent sur les problématiques des risques naturels.
Les cas examinés, sur lesquels activer les projets pilotes qui seront distribués sur le territoire concerné par le projet (activité 1.4 du tableau 2.2.3.2) seront sélectionnés durant la première phase du travail). La variété d'organismes impliqués, dont chacun sera associé à son propre partenariat local, permettra d'étendre les expérimentations à des zones encore plus vastes.



Présentation synthétique du contenu du projet :

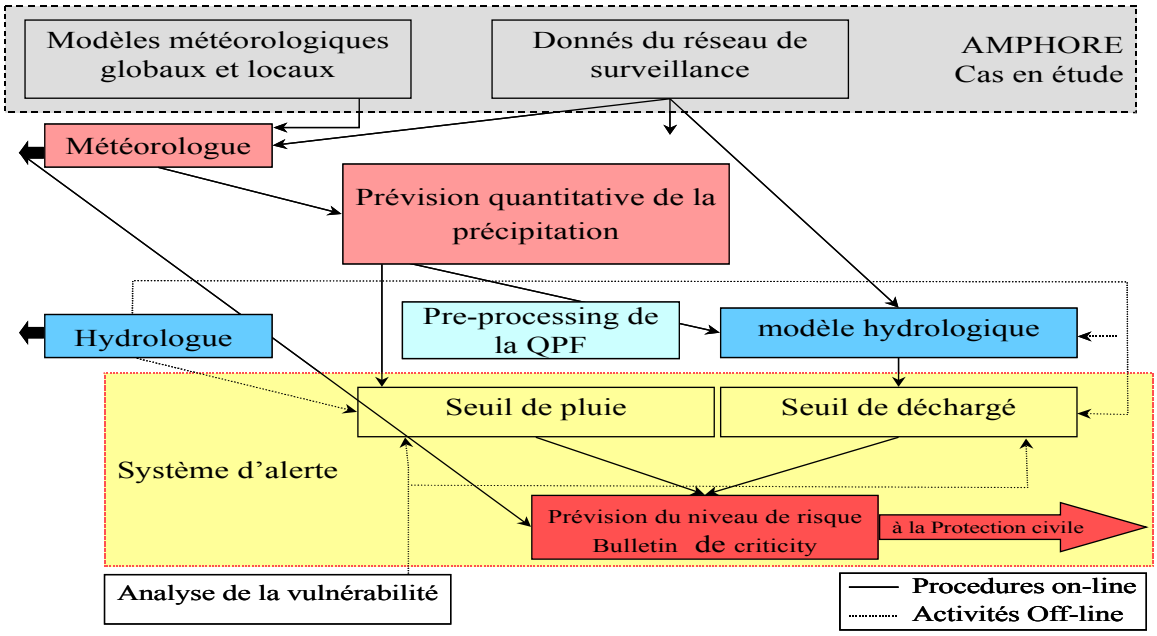
Dans ce projet on veut expérimenter l'utilisation conjointe des différents scénarios, considérés tels que différentes représentations du même phénomène naturel, par le moyen de méthodologies objectives, pour améliorer la QPF pour l'application de système d'alerte pour les risques naturels engendrés ou favorisés par les précipitations intenses.

L'objectif principal est en fait celui de l'optimisation de ces systèmes d'alerte, à partir de l'analyse et de la comparaison de l'existant au niveau du bassin du Méditerranéen Occidental, uniment à l'objectif d'étendre le territoire d'application, fournissant aux Organismes chargés, expertises et méthodologies consolidées.

Le nombreux partenariat participant permet de disposer d'une multiplicité de scénarios de précipitation prévue, par le moyen du modélisme adopté par chaque partenaire, et d'expérimenter des différentes méthodologies de production, compte ténu des différents scénarios prévisionnels. L'application de la QPF obtenue de cette façon relativement à l'entier cycle de prévision hydrométéorologique, et in particulier son utilisation dans les systèmes d'alerte, permet une vérification finalisée de la fiabilité et de l'efficacité de la méthode utilisée.

De plus, les résultats du projet permettent d'adresser la recherche scientifique vers une approche de type probabiliste ou de toute façon multi scénario, plus orienté à l'usager final, si comparé à une approche purement déterministe, qui présume la possibilité de réaliser une prévision de précipitation à élevée définition espace temporelle univoque et parfaite. C'est-à-dire, passer à la réduction de la complexité à la reconnaissance et à la gestion d'elle-même.

Dans le schéma logique ici-dessous on résume les activités et les produits qui permettent de déterminer le niveau de risque attendu.


Modèles météorologiques globaux et locaux
Donnés du réseau de surveillance
AMPHORE
Cas en étude
Météorologue
Prévision quantitative de la précipitation
Hydrologue
Pre-processing de la QPF
modèle hydrologique
Seuil de pluie
Seuil de déchargé
Système d'alerte
Prévision du niveau de risque
Bulletin de criticity
à la Protection civile
Analyse de la vulnérabilité
Procedures on-line
Activités Off-line

PARTNERS

	Institution	EU Member State	Country
Leader Partner	**ARPA Piemonte – Area Previsione e Monitoraggio Ambientale**	Y	IT
Partner n° 2	**Université Joseph Fourier**	Y	FR
Partner n° 3	**METEO-France/CNRM**	Y	FR
Partner n° 4	**Universitat de les Illes Balears (UIB)**	Y	ES
Partner n° 5	**Fundació Bosch i Gimpera (UB)**	Y	ES
Partner n° 6	**ARPAL (Agenzia Regionale per la Protezione dell'Ambiente Ligure)**	Y	IT
Partner n° 7	**CIMA (Centro Interuniversitario di Monitoraggio Ambientale)**	Y	IT
Partner n° 8	**Agenzia Regionale per la Protezione dell'Ambiente della Calabria (ARPACAL)**	Y	IT
Partner n° 9	**Regione Emilia-Romagna Agenzia regionale prevenzione e ambiente (ARPA-SIM)**	Y	IT
Partner n° 10	**Presidenza del Consiglio dei Ministri Dipartimento della Protezione Civile (DPC)**	Y	IT

Internet address
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