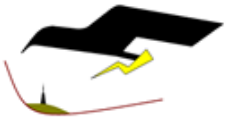

UPC - HIRO


ESEIAAT

# UAV platform study for research on atmospheric electricity

## Zeus UAV platform

### Deliverable 1
### Project Charter

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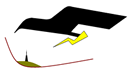
**Group:** G3-PM-P2018

**Delivery date:** 16-03-2018

# Contents



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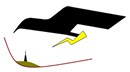


# 1 | DEMO CODES

## 1.1 Lists

- Create a specific data logging device for the given Electro Field Meter (EFM).
- Provide the required power supply to the field mill on-board the UAV.
- Integrate the EFM to the payloads bay.

**Ground stations** The most common procedure is to attract the lightnings to a tall tower fully monitored. When a thunderstorm is unchained near the tower, there are strong chances of lightnings hits, which can be studied. The main drawback is that the tower must be placed on a usually thunderstorms zone where attract lightnings don't represent a risk to humans lives. Used all-round the world.

**Rocket triggering** A rocket is launch with an electric wire attached to its bottom, when the atmosphere conditions are favourable for a lightning discharge. When te conductor hit the charged cloud a lightning falls along the wire. Then is measured by the sensors on the ground. Rocket triggering method is currently used by the *Lightning Research Group of Florida University* with great results.

## 1.2 Short Tables

| Feature | Description |
|---|---|
| 3 | UAV platform must be **fail-safe**.<br>If it lose controlling signal coverage, must be able to **perform predefined manoeuvres** and **auto-land**.<br>If a major controlling electronics failure happens, UAV, needs to have a **safe landing mechanism** such as a parachute. |
| 4 | UAV platform must be able to carry **250g** of payload at least. |
| 5 | All payloads **sensor data** should be at least **stored** on board. |

Table 1.2.1: Project Requirements

## 1.3 Images

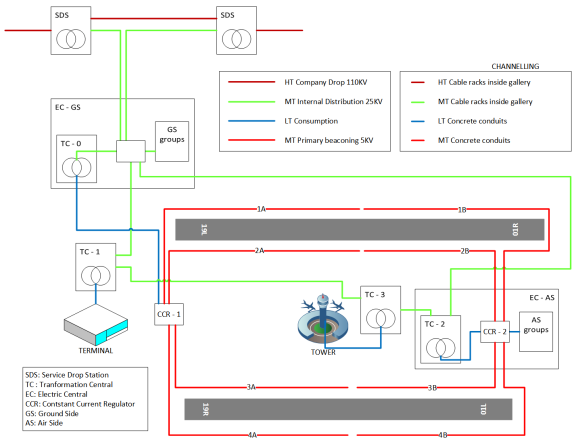
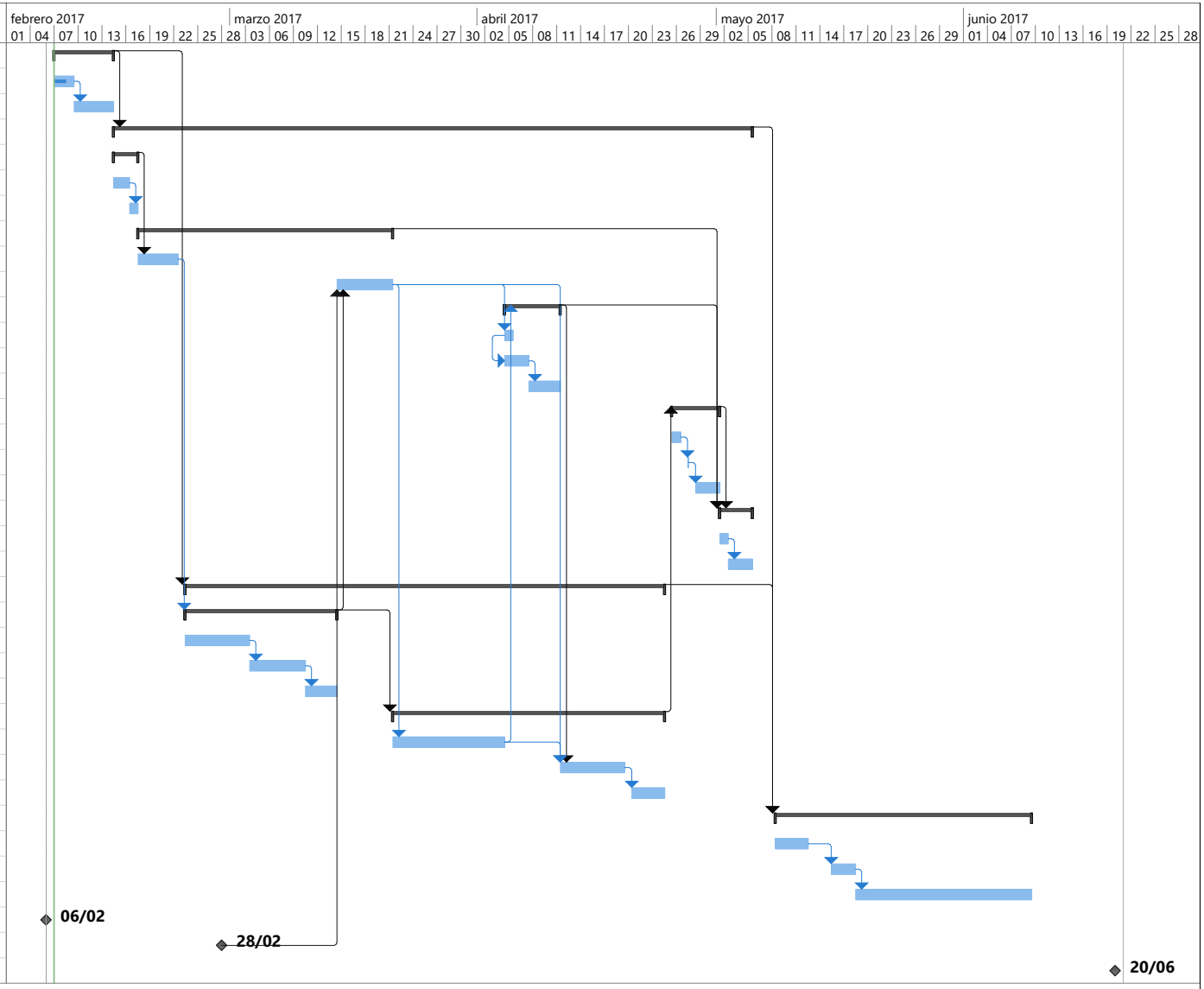



Figure 1.3.1: General electric system scheme

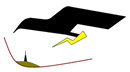
## 1.4 PDF HORITZONTAL

| Id | EDT | Nombre de tarea | Duración | Comienzo | Fin |
|---|---|---|---|---|---|
| 1 | **1** | **PRELIMINARY REVIEW** | **16 horas** | **mar 07/02/17** | **mar 14/02/17** |
| 2 | 1.1 | Earth-Ionosphere | 9 horas | mar 07/02/17 | jue 09/02/17 |
| 3 | 1.2 | Previous research | 8 horas | jue 09/02/17 | mar 14/02/17 |
| 4 | **2** | **PLANE DEVELOPMENT** | **176 horas** | **mar 14/02/17** | **vie 05/05/17** |
| 5 | **2.1** | **Conceptual design** | **10 horas** | **mar 14/02/17** | **vie 17/02/17** |
| 6 | 2.1.1 | Flight conditions | 6 horas | mar 14/02/17 | jue 16/02/17 |
| 7 | 2.1.2 | Functional specifications | 4 horas | jue 16/02/17 | vie 17/02/17 |
| 8 | **2.2** | **Hardware** | **65 horas** | **vie 17/02/17** | **mar 21/03/17** |
| 9 | 2.2.1 | Components | 10 horas | vie 17/02/17 | mié 22/02/17 |
| 10 | 2.2.2 | Assembly | 15 horas | mar 14/03/17 | mar 21/03/17 |
| 11 | **2.3** | **Software** | **15 horas** | **mar 04/04/17** | **mar 11/04/17** |
| 12 | 2.3.1 | Configuration | 5 horas | mar 04/04/17 | mié 05/04/17 |
| 13 | 2.3.2 | Automatization | 10 horas | mar 04/04/17 | vie 07/04/17 |
| 14 | 2.3.3 | Custom modes | 5 horas | vie 07/04/17 | mar 11/04/17 |
| 15 | **2.4** | **Launching platform** | **13 horas** | **mar 25/04/17** | **lun 01/05/17** |
| 16 | 2.4.1 | Design | 6 horas | mar 25/04/17 | mié 26/04/17 |
| 17 | 2.4.2 | Components | 3 horas | jue 27/04/17 | jue 27/04/17 |
| 18 | 2.4.3 | Assembly | 4 horas | vie 28/04/17 | lun 01/05/17 |
| 19 | **2.5** | **Testing** | **14 horas** | **lun 01/05/17** | **vie 05/05/17** |
| 20 | 2.5.1 | Subsystems test | 4 horas | lun 01/05/17 | mar 02/05/17 |
| 21 | 2.5.2 | Preliminary flights | 10 horas | mar 02/05/17 | vie 05/05/17 |
| 22 | **3** | **PAYLOAD** | **129 horas** | **jue 23/02/17** | **lun 24/04/17** |
| 23 | **3.1** | **Field Mill** | **40 horas** | **jue 23/02/17** | **mar 14/03/17** |
| 24 | 3.1.1 | Data logger | 20 horas | jue 23/02/17 | vie 03/03/17 |
| 25 | 3.1.2 | Integration | 15 horas | vie 03/03/17 | vie 10/03/17 |
| 26 | 3.1.3 | Test | 5 horas | vie 10/03/17 | mar 14/03/17 |
| 27 | **3.2** | **Wire Launcher** | **74 horas** | **mar 21/03/17** | **lun 24/04/17** |
| 28 | 3.2.1 | Design | 30 horas | mar 21/03/17 | mar 04/04/17 |
| 29 | 3.2.2 | Construction | 20 horas | mar 11/04/17 | mié 19/04/17 |
| 30 | 3.2.3 | Test | 9 horas | jue 20/04/17 | lun 24/04/17 |
| 31 | **4** | **TESTING** | **75 horas** | **lun 08/05/17** | **vie 09/06/17** |
| 32 | 4.1 | Sensing flights | 15 horas | lun 08/05/17 | vie 12/05/17 |
| 33 | 4.2 | Experimental flights | 10 horas | lun 15/05/17 | jue 18/05/17 |
| 34 | 4.3 | Optimization | 50 horas | jue 18/05/17 | vie 09/06/17 |
| 35 | 5 | START | 0 horas | lun 06/02/17 | lun 06/02/17 |
| 36 | 6 | Components arrival | 0 horas | mar 28/02/17 | mar 28/02/17 |
| 37 | 7 | END | 0 horas | mar 20/06/17 | mar 20/06/17 |




Proyecto: Zeus UAV platform
Fecha: mar 07/02/17

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tarea | Resumen del proyecto | Tarea manual | solo el comienzo | Fecha límite |
| División | Tarea inactiva | solo duración | solo fin | Progreso |
| Hito | Hito inactivo | Informe de resumen manual | Tareas externas | Progreso manual |
| Resumen | Resumen inactivo | Resumen manual | Hito externo | |



# 2 | Project Charter

## 2.1 Project Purpose and Justification

The aim of this project is to improve the existing EO technologies for remote sensing focusing on the sustainable developement of cities.

The acomplishment of this project will demonstrate significant enhancements concerning efficiency, functionality and accuracy of the current sensing technologies.Hence, the obtained data will be more reliable and have higher resolution. This will contribute to cities monitoring by acquiring exhaustive information such as air composition and terrain surveillance.

Moreover, the environmental awareness is increasing at global scale. This motivates the creation of initiatives from world-wide and local organisations that will benefit from frequent data updates to carry out social and green actions. Furthermore the project will contribute the integration of space in economy and society.

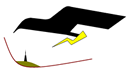
### 2.1.1 Vision

We are committed to achieving substantial improvements in state-of-the-art EO technologies such as radar and optical systems leading to a strengthening of Europe's position and competitiveness in this field.

### 2.1.2 Objectives

The key OBJECTIVES for this project are:

1. Improve EO sensor's technologies in terms of size, efficiency, functionality and accuracy.
2. Manufacture a technology demonstrator prototype.



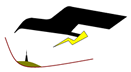
3. Simulate, test and validate the demonstrator prototype manufactored in relevant environtment.
4. Develop machine learning processing algorithms to enable automatic remote sensing base on the final application. ???
5. Develop a web based server for data sharing. ???
6. Provide a technology whose benefits help urban sustainable development.

### 2.1.3 Scope

The SCOPE for this project is:

**Engineering**

- Research and analysis of the current space applications and requirements of the following optical and radar systems:
  - LIDAR
  - Radar
  - Super-spectral
  - Hyperspectral
  - Limb sounders
  - Gravimetry
  - High quantum efficiency photodectectos
  - High precisition optical beam scanning and pointing
  - Advanced infrared technologies
- Research of the contributions of current space technologies to urban development.
- Selection of the most promising systems to profit Earth Observation to air composition and terrain analysis.
- Development of sensor's preliminary design defining the minimum performance parameters in order to improve the existing technologies.
- ¿¿¿Interaction platform ???
- Development of a mock-up by following the preliminary design.
- Testing and validation of the prototype in a space simulated environment.



- Design closure and development of the product.

**Business planning and exploitation of results**

- Market analysis and of the potential suppliers and selection of these.
- Market analysis of the potential costumers.
- Elaboration of a business plan.

**Quality** *esto no acaba de parecer apropiado en el scope*

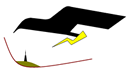
- Every document goes through four stages to be approved:
  - - Guidelines preparation
  - - Document revision
  - - Document rectification
  - - Document approval
- Elaboration of periodic reports in order to have continuous control over the development of the project.

**Communication and dissemination strategies** *esto no acaba de parecer apropiado en el scope*

- Implementation of a dissemination plan to announce the product combining online and offline dissemination.
- Development of a website.
- Use of social media marketing power.
- Conduct several conferences.
- Let to know the product improvements through technology demonstrators.

## 2.2 Project Description

As stated earlier, the main objective of the project is to enhance the performance of the EO systems so as to use the information derived from data to build a greener future. More



specifically, the focus is on the improvement of both optical and radar systems and how can they contribute to the sustainable development of cities.

To begin with, a research on the current technologies is carried out. This study makes it possible to determine which systems are more susceptible to further improvement. In order to demonstrate the advances in the aforementioned systems a prototype has to be manufactured and tested.

¿¿Moreover, the project develops machine learning processing algorithms to enable automatic remote sensing based on the final application and a web-based server for data sharing.??

The project is grounded in initiatives such as the Copernicus programme. The Copernicus services aim at delivering nearly real-time data on a global level. This information allows us to better understand the planet we live in and secure a sustainable management of the environment.

Among other, Copernicus obtains data thanks to a set of dedicated satellites carrying the name of Sentinel. The idea is to take them a further step forward by equipping them with better remote sensing technologies.

## 2.3 High-Level Requirements

INTRO

EXPLICACIÓN Y TABLA

CALL FOR PROPOSALS REQUIREMENTS

TECHNICAL REQUIREMENTS

BUSINESS REQUIREMENTS

### 2.3.1 Call for proposals requirements

### 2.3.2 Technical requirements

| Item | Description | Priority |
|---|---|---|
| T1 | | |
| T2 | | |
| T3 | | |
| T4 | | |

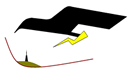


Table 2.3.1: My caption

| Item | |
|---|---|
| C1 | Contribute to the integration of space in society and economy |
| C2 | Improvement of state-of-the-art technologies in key areas such as optical and radar systems, radio occu |
| C3 | Enhancement of the facilities with respect to existing Earth observation missions, opening new possibil |
| C4 | Allow the synergic use of heterogeneous Earth Observation constellations. |
| C5 | Extending Europe's position in industrial competitiveness in technologies for Earth observation payload |
| C6 | Greater industrial cooperation, including SMEs, in research actions. |
| C7 | Promoting networking between academia and industry, accelerating and broadening technology transfe |

### 2.3.3 Business requirements

| Item | Description | Priority |
|---|---|---|
| B1 | | |
| B2 | | |
| B3 | | |
| B4 | | |

## 2.4 Acceptance Criteria

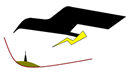
## 2.5 High-Level Risks

Risks allow us to measure the probability of not accomplishing a defined goal and its consequences for the project. Their identification is crucial in order to know in advance the factors that could make the project go wrong.

The determination of the risks is an iterative process because, when the different activities progresses through the specified time, new risks or uncertainties can appear. The main structures and departments of the team has to participate in this task in order to spot as many risks as possible. Even stakeholders has to provide additional information and points of view.

The factors that are used in the identification process are: enterprise environmental factors, organizational process assets, the project scope statement and the project management plan.

After analysing those points, risks have been classified into two groups: the External risks, which are the ones that our team cannot control, so they are inevitable, and the Internal risks, which can be detected in advance and be addressed properly by our own members.



The main identified risks are shown below.

**External risks**

- **Competitors appearance:** The emergence of other companies that could offer the same product. This could modify the benefits of our company.
- **Delays in external deliverables:** If the products that the company order do not arrive at the predicted time all the processes can experience a delay, incrementing costs.
- **Economical market issues:** During the period of time that the project is executed, there could be large-scale economic crisis.
- **Exit of a member of the corporation:** For different reasons, a member that had committed with the project could leave it before than expected.
- **Components and row materials quality:** The ordered equipment or materials could not be in a good condition, delaying processes and increasing costs.

**Internal risks**

- **Delays in deliverables:** The deliverables are not completed at the time of their corresponding deadlines, leading to an increase of costs and a delay of all the schedule of the project.
- **Cost forecasts are inaccurate:** The financial predictions could be wrong or different issues may occur increasing the total cost of the project.
- **Lack of communication:** The absence of a proper communication method or channel might affect at the quality of the product, at the fulfilment of the deadlines or a good coordination between members and departments.
- **Lack of technology improvement:** The main goal of the project is to innovate but it could happen that the company did not find the way to improve enough the different technologies.
- **Lack of information:** Discovering new technologies imply working with leading-edge science. It could occur that the team does not have access to the last improvements or patents.
- **Low team motivation:** The team does not have motivation and the project takes more time and costs to be completed.
- **Unsuccessful quality control:** The quality of some component, product or deliverable is not as was expected and established in the acceptance criteria.

- **Lack of responsibilities:** The responsibilities which were taken by the members of the team or the stakeholders could not be accomplished as expected.
- **Conflicts between members:** There is a disagreement over the project issues between executive members.
- **Infeasible design:** The design turns out to be excessively costly or is not possible to build.
- **Technology components have security vulnerabilities:** Security vulnerabilities are unwanted in high-tech projects if some government will use the technology.
- **Organization issues:** The project is not well organized in terms of timing, activities, etc. and the schedule is always changing.
- **Stakeholders desertion:** The abandonment of a Stakeholder could occur for several reasons, leaving the project without its contribution.
- **Stakeholders conflict:** Different executives of the Stakeholders have a disagreement over the project at an executive level.

When managing risks, both the probability and the consequence of them have to be considered. During the project, each event will be classified into different types of risks. In a general level, they can be classified into low, moderate and high risks. The following figure represents the classification depending on the probability and the magnitude of impact.

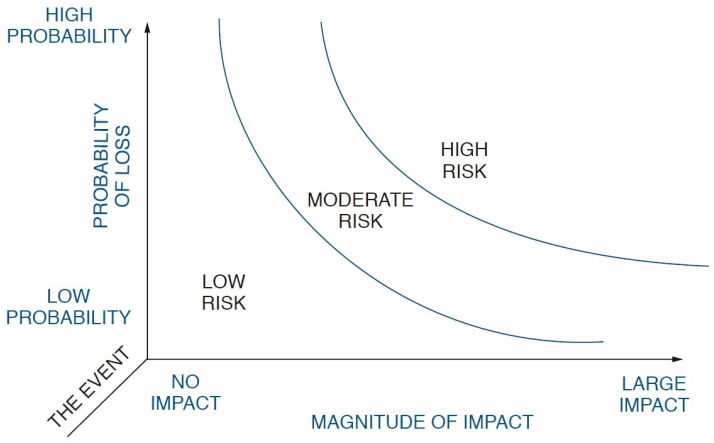



Figure 2.5.1: Overall risk is a function of its components [].

During the following stages of the project, each risk will be assessed with the Probability and Impact Matrix. It is a tool which allows you to rate risks on their probability and impact for the project. This gives you a quick and clear view of which one is more important to control.

**Probability and Impact Matrix**

| Probability | Threats | | | | | Opportunities | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **0.90** | 0.05 | 0.09 | 0.18 | 0.36 | 0.72 | 0.72 | 0.36 | 0.18 | 0.09 | 0.05 |
| **0.70** | 0.04 | 0.07 | 0.14 | 0.28 | 0.56 | 0.56 | 0.28 | 0.14 | 0.07 | 0.04 |
| **0.50** | 0.03 | 0.05 | 0.10 | 0.20 | 0.40 | 0.40 | 0.20 | 0.10 | 0.05 | 0.03 |
| **0.30** | 0.02 | 0.03 | 0.06 | 0.12 | 0.24 | 0.24 | 0.12 | 0.06 | 0.03 | 0.02 |
| **0.10** | 0.01 | 0.01 | 0.02 | 0.04 | 0.08 | 0.08 | 0.04 | 0.02 | 0.01 | 0.01 |
| | 0.05 | 0.10 | 0.20 | 0.40 | 0.80 | 0.80 | 0.40 | 0.20 | 0.10 | 0.05 |

Impact (ratio scale) on an objective (e.g., cost, time, scope or quality)

Each risk is rated on its probability of occurring and impact on an objective if it does occur. The organization's thresholds for low, moderate or high risks are shown in the matrix and determine whether the risk is scored as high, moderate or low for that objective.

Figure 2.5.2: Probability and Impact Matrix [].

## 2.6 Project deliverables

| Deliverable Name | Description | Estimated due date |
|---|---|---|
| Project management plan | Document with detailed explanation of the project management strategies, including the Project Charter, stakeholder register, risk, quality and financial plans. | $t_0 + 1$ month |
| Business plan | Document detailing the market approach, including the selected suppliers, the identified costumers and the exploitation strategy. | $t_0 + 1$ month |
| Communication plan | Document containing all the planned dissemination strategies, such as the online communication (including website development and social media management), the offline communication (participation in meetings and conferences) and the dissemination materials (technology demonstrators). | $t_0 + 1$ month |

| | | |
|---|---|---|
| Research report | Report detailing the current state of the art and the study of requirements for each system of the project. | $t_0 + 4$ month |
| Preliminary design report | Report determining the preliminary performance parameters of each sensor, as well as the technology necessary for the overall system. | $t_0 + 16$ month |
| Mid-term project report | Document used to check the current state of the project, in order to inform all the participants, including the stakeholders, of the progress. | $t_0 + 17$ month |
| Final design report | Report detailing the final design and technical specifications of each sensor developed, the software of the system and the interaction platform. | $t_0 + 29$ month |
| Validation report | Report gathering the results obtained from the fabrication and testing of all the payload sensors, the modular system and the interaction platform, as well as the full system testing. | $t_0 + 41$ month |
| Final report | Final document delivered, that includes all the development done through the execution of the project. | $t_0 + 44$ month |

Table 2.6.1: Project Deliverables

## 2.7 Project milestones

| Milestones Name | Description | Estimated due date |
|---|---|---|
| Kick-Off Meeting | First meeting of the project, formation of the development team and first contact with the stakeholders. | $t_0$ month |
| Project management plan | Specification of the objectives and scope of the project, the organization of the team and the distribution of tasks, a stakeholders register and a financial, quality and risk plans. | $t_0 + 1$ month |

| | | |
|---|---|---|
| Business plan | Obtaining a potential suppliers list, and negotiating procurement conditions with them, as well as identifying and communicating with potential customers. | $t_0 + 1$ month |
| Communication plan | Development of a website and a social media strategy, as well as looking into participation in meetings and conferences. | $t_0 + 1$ month |
| Research report | Definition of requirements for the system based on the current state of the art space applications of the payload sensors. | $t_0 + 4$ month |
| Payload preliminary design | First phase of the design, an optimization of each sensor is done in order to define the preliminary minimum performance parameters. | $t_0 + 10$ month |
| Modular system preliminary design | Development of the initial parameters of the modular system, as well as the software that will be in charge of the fusion of the sensors' data. | $t_0 + 13$ month |
| Interaction platform preliminary design | Preliminary implementation of the functionalities of the interaction platform, such as the machine learning algorithms. | $t_0 + 16$ month |
| Mid-term project report | Mid-term report to evaluate and validate by all the stakeholders the status of the project. | $t_0 + 17$ month |
| Payload final design | Final design of the entire payload (sensors), including the specifications and estimated performance in operation of each sensor. | $t_0 + 23$ month |
| Modular system final design | Final design of the modular system and the software that will process and register the information received by the payload. | $t_0 + 26$ month |
| Interaction platform final design | Final design of the interaction platform according to the guidelines stablished on the preliminary design. | $t_0 + 29$ month |
| Prototype manufacturing | Manufacturing of the prototype according to the final designs, in order to test its function in the next steps. | $t_0 + 34$ month |

| | | |
|---|---|---|
| Individual systems testing | Performance analysis of each module (payload, modular system and interaction platform) of the overall system under operational conditions. | $t_0 + 37$ month |

Table 2.7.1: Project Milestones

## 2.8 Project Objectives

TABLE MISSING

## 2.9 Estimated Budget

The expenses originated during the development of the project are going to be covered with the contribution from the EU as a source of income.

The estimated budget of the project is 4,000,250.00€. The budget is calculated taking into account the required amount of money that each stakeholder needs to fulfil its part in the project. In the next table it can be seen the expenses required for each stakeholder.

Table 2.9.1: Breakdown of the project budget.

| Organization | Expenses |
|---|---|
| HIRO | 200,250.00€ |
| Airbus Defence and Space GmbH | 400,000.00€ |
| BHO Legal Rechtsanwälte Partnership | 100,000.00€ |
| Deimos Space S.L.U. | 1,100,000.00€ |
| ICUBE-SERTIT | 500,000.00€ |
| ReSAC | 100,000.00€ |
| Thales Alenia Space SAS | 1,400,000.00€ |
| VITO nv. | 200,000.00€ |
| **Total** | 4,000,250.00€ |

The breakdown of the expenses for each organization is shown in more detail in the following tables. It has been considered six departments for each organization: management, engineering, marketing, partnership and Networks, contingencies and manufacturing. However, not all the organizations have all the departments defined before since each organization has a speciality, and therefore some of the departments will have zero expenses.

Table 2.9.2: Breakdown of the required budget of HIRO.

| Concept | Expenses |
|---|---|
| Management | 117,812.50€ |
| Engineering | 51,037.50€ |
| Marketing | 6,187.50€ |
| Partnership and Networks | 19,512.50€ |
| Contingencies | 5,700.00€ |
| Manufacturing | 0.00€ |
| **Total** | 200,250.00€ |

Table 2.9.3: Breakdown of the required budget of Airbus Defence and Space GmBH.

| Concept | Expenses |
|---|---|
| Management | 97,500.00€ |
| Engineering | 127,500.00€ |
| Marketing | 9,375.00€ |
| Partnership and Networks | 17,500.00€ |
| Contingencies | 8,125.00€ |
| Manufacturing | 140,000.00€ |
| **Total** | 400,000.00€ |

Table 2.9.4: Breakdown of the required budget of BHO Legal Rechtsanwlte Partnership.

| Concept | Expenses |
|---|---|
| Management | 59,375.00€ |
| Engineering | 0.00€ |
| Marketing | 0.00€ |
| Partnership and Networks | 20,625.00€ |
| Contingencies | 20,000.00€ |
| Manufacturing | 0.00€ |
| **Total** | 100,000.00€ |

Table 2.9.5: Breakdown of the required budget of Deimos Space S.L.U.

| Concept | Expenses |
|---|---|
| Management | 159,843.75€ |
| Engineering | 343,750.00€ |
| Marketing | 27,500.00€ |
| Partnership and Networks | 79,062.50€ |
| Contingencies | 146,093.75€ |
| Manufacturing | 343,750.00€ |
| **Total** | 1,100,000.00€ |

Table 2.9.6: Breakdown of the required budget of ICUBE-SERTIT.

| Concept | Expenses |
|---|---|
| Management | 95,625.00€ |
| Engineering | 225,000.00€ |
| Marketing | 64,375.00€ |
| Partnership and Networks | 87,812.50€ |
| Contingencies | 27,187.50€ |
| Manufacturing | 0.00€ |
| **Total** | 500,000.00€ |

Table 2.9.7: Breakdown of the required budget of ReSAC.

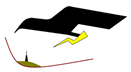
| Concept | Expenses |
|---|---|
| Management | 19,375.00€ |
| Engineering | 40,312.50€ |
| Marketing | 15,156.25€ |
| Partnership and Networks | 23,750.00€ |
| Contingencies | 1,406.25€ |
| Manufacturing | 0.00€ |
| **Total** | 100,000.00€ |

Table 2.9.8: Breakdown of the required budget of Thales Alenia Space SAS.

| Concept | Expenses |
|---|---|
| Management | 245,000.00€ |
| Engineering | 507,500.00€ |
| Marketing | 192,500.00€ |
| Partnership and Networks | 192,500.00€ |
| Contingencies | 63,000.00€ |
| Manufacturing | 199,500.00€ |
| **Total** | 1,400,000.00€ |

Table 2.9.9: Breakdown of the required budget of VITO nv.

| Concept | Expenses |
|---|---|
| Management | 87,187.50€ |
| Engineering | 49,687.50€ |
| Marketing | 24,375.00€ |
| Partnership and Networks | 28,750.00€ |
| Contingencies | 10,000.00€ |
| Manufacturing | 0.00€ |
| **Total** | 200,000.00€ |



## 2.10 Project organization

### 2.10.1 Customers

The following customers are defined for this project.

Table 2.10.1: Customers

| Customer group | Customer representative |
|---|---|
| CGG: NPA Satellite Mapping Ltd | Jean-Georges Malcor – Chief Executive officer |
| CloudEO AG | Dr. Manfred Krischke – Co-Founder and CEO |
| Esri BeLux | Frederik Waûnters - Manager |
| European Space Agency (ESA) | Lionel Hernandez - Station manager in Spain |
| Eurosense | André Jadot – CEO |
| GEOMATRIX UAB | Gedas Vaitkus – Company Manager |
| Harris | Ed Zoiss – Electronic Systems |
| Insar | Martin Leško – Cartography expert |
| Noveltis | Jeff Vinuesa -Business Unit Manager |
| SpaceBel | Bernard Plano – International business development |
| Walphot | Yves Reginster – Account manager |

### 2.10.2 Stakeholders

The following groups and organizations are the key stakeholders in this project:

| **Stakeholder Name** | **Roles/Responsibilities** |
|---|---|
| ACRI-ST SAS | Interested |
| Agroapps PCC | Interested |
| Air and Space Evidence | Interested |
| Airborne technologies | Competitor |
| Airbus Defence and Space GmbH | Consortium member |
| AnsuR Technologoes | Competitor |
| Assimila | Interested |
| Balam Ingeniería de Sistemas | Competitor |
| BHO Legal Rechtsanwälte Partnership | Consortium member |
| CGG: NPA Satellite Mapping Ldt | Customer |
| CloudEO AG | Customer |
| Deimos Space S.L.U. | Consortium member |

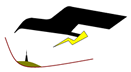
| | |
|---|---|
| DHI-GRAS | Potential customer |
| Esri BeLux | Customer |
| European Association of Remote Sensing Companies (EARSC) | Interested |
| European Comission | Main investor and customer |
| European Council | Regulation |
| European Space Agency (ESA) | Customer |
| Eurosense | Customer |
| Exelis | Customer |
| Flyby | Competitor |
| GAF AG | Competitor |
| GEOMATRIX UAB | Customer |
| GEOSYSTEMS | Interested |
| GISAT | Competitor |
| Harris | Customer |
| High Innovative Remote Observation (HIRO) | Consortium member |
| ICUBE-SERTIT | Consortium member |
| Insar | Customer |
| Non-european space agencies | Competitors |
| Noveltis | Customer |
| Remote Sensing Application Center (ReSAC) | Consortium member |
| Space applications services NV/SA | Interested |
| SpaceBel | Customer |
| Telspazio | Interested |
| Thales Alenia Space SAS | Consortium member |
| VITO nv | Consortium member |
| Walphot | Customer |

Table 2.10.2: List of stakeholders, roles and responsibilities

### 2.10.3 Roles and responsibilities

The following key roles have been defined for this project:

| Role | Resource Name | Organization | Responsabilities |
|---|---|---|---|
| Project Sponsor | Luís Manuel Pérez Llera | European Commission | Supervise the project. |
| Project Manager | Pol Fontanes Molina | HIRO | Manage the project. |



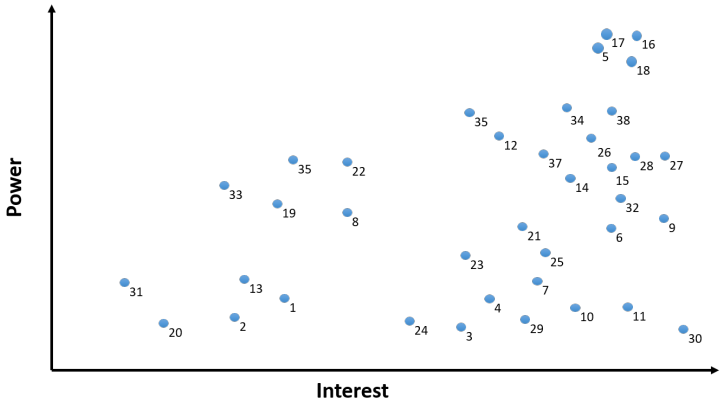
| Role | Resource Name | Organization | Responsabilities |
|---|---|---|---|
| Project Secretary | Sílvia González García | HIRO | Administrate the internal documents and information of the group to ensure communication between the members. |
| Financial Manager | - | HIRO | Estimate and control the costs of the project. |
| Procurement Manager | - | HIRO | Plan, conduct and control the procurements of the project. |
| Scope & Time Manager | - | HIRO | Define and control the scope of the project. |
| Stakeholders Manager | - | HIRO | Identify the stakeholders of the project and control their engagement. |
| Risk Manager | - | HIRO | Identify and manage the possible risks of the project. |
| Quality Manager | - | HIRO | Control the quality requirements of the project. |
| Technical Managers | - | HIRO | Identify, analyse and control the technical aspects of the project. |
| Marketing Manager | - | HIRO | Promote the project and its final product. Search for possible customers. |
| Research & Development assessor | - | Airbus Defence and Space GmbH | Collaboration in the research and production of satellite sensors. |
| Legal & Business Assessor | - | BHO Legal Rechtsanwälte Partnership | Business and legal advice. |
| Research & Development Assessor | - | Deimos Space S.L.U. | Design and development of satellite sensors and systems. |
| Application collaborator | - | ICUBE-SERTIT | Assessment in the application of data provided by EO satellites such as Sentinel. |

| Role | Resource Name | Organization | Responsabilities |
|---|---|---|---|
| Application collaborator | - | Remote Sensing Application Center (ReSAC) | Assessment in the application of remote sensing and geographic information systems products for land cover/land use, urban planning, infrastructure, etc. |
| Development & Testing collaborator | - | Thales Alenia Space SAS | Design, development, integration and testing of space systems. |
| Development & Application collaborator | - | VITO nv | Assesment in the possible use of remote sensing for land use. Development of new remote sensing systems, sensors and platforms. |

Table 2.10.3: Roles and responsibilities

# 3 Stakeholder identification

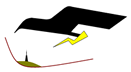
## 3.1 Stakeholder analysis graphic



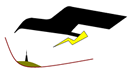

1 ACRI-ST SAS
2 Agroapps PCC
3 Air and Space Evidence
4 Airborne technologies
5 Airbus Defence and Space
6 AnsuR Technologies
7 Assimila
8 Balam Ingeniería de Sistemas
9 BHO Legal Rechtsanwälte Parnership
10 CGG: NPA Satellite Mapping Ldt
11 CloudEO AG
12 Deimos Space SLU
13 DHI-GRAS
14 EARSC
15 Esri BeLux
16 European Comission
17 European Council
18 ESA
19 Eurosense
20 Exelis
21 Flyby
22 GAF AG
23 GEOMATRIX UAB
24 GEOSYSTEMS
25 GISAT
26 Harris
27 HIRO
28 ICUBE-SERTIT
29 Insar
30 Non-european space agencies
31 Noveltis
32 ReSAC
33 Space applications svs
34 SpaceBel
35 Telespazio
36 Thales Alenia Space
37 VITO nv
38 Walphot

Figure 3.1.1: Stakeholder analysis graphic

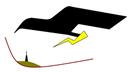
## 3.2 Stakeholder register



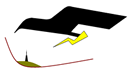
| Name | Role | Contact Information | Requirements | Expectations | Influence | Classification |
|---|---|---|---|---|---|---|
| ACRI-ST SAS | Interested | *+33 492967500*<br><br>*information@acri-st.fr* | Dissemination of the project | Get interesting information about project updates | Keep informed | External/ Neutral |
| Agroapps PCC | Interested | *+30 2310253810*<br><br>*info@agroapps.gr* | Dissemination of the project | Get interesting information about project updates | Keep informed | External/ Neutral |
| Air and Space Evidence | Interested | *+44 7860473172* | Dissemination of the project | Get interesting information about project updates | Keep informed | External/ Neutral |
| Airborne technologies | Competitor | *+43 262234718200*<br><br>*office@airbornetechnologies.at* | To see our product as a potential competition | Obatin information | Monitor | External/ Reluctant |
| Airbus Defence and Space GmbH | Consortium member | *+33 562194040* | Innovation in optical sensors and the development of their technology | Provide new knowledge in optical sensors and in the technology to develop them | Manage closely | Internal/ Supporter |
| AnsuR Technologoes | Competitor | *+47 64009456*<br><br>*contact@ansur.no* | To see our product as a potential competition | Obtain information | Monitor | External/ Reluctant |



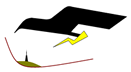
| Name | Role | Contact Information | Requirements | Expectations | Influence | Classification |
|---|---|---|---|---|---|---|
| Assimila | Interested | *info@assimila.eu* | Dissemination of the project | Get interesting information about project updates | Keep informed | External/ Neutral |
| Balam Ingeniería de Sistemas | Competitor | *info@balamis.com* | To see our product as a potential competition | Obatin information | Monitor | External/ Reluctant |
| BHO Legal Rechtsanwälte Partnership | Consortium member | *+49 2212709560*<br>*cologne@bho-legal.com* | Wide legal knowledge | Legal issues management | Manage closely | Internal/ Supporter |
| CGG: NPA Satellite Mapping Ldt | Potential customer | *www.cgg.com/en/What-We-Do/GeoConsulting/NPA* | To be interested in our product | Obtain useful information | Keep informed | External/ Influencer |
| CloudEO AG | Potential customer | *+49 89206021166*<br>*info@cloudeo-ag.com* | To be interested in our product | Obtain useful information | Keep informed | External/ Influencer |
| Deimos Space S.L.U. | Consortium member | *+34 918063450*<br>*info@elecnor-deimos.com* | Innovation in EO technology | Provide new technology for EO | Manage closely | Internal/ Supporter |
| DHI-GRAS | Potential customer | *+45 45169100*<br>*gras@dhigroup.com* | To be interested in our product | Obtain useful information | Keep informed | External/ Influencer |



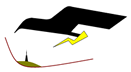
| Name | Role | Contact Information | Requirements | Expectations | Influence | Classification |
|---|---|---|---|---|---|---|
| Esri BeLux | Customer | *+32 24607480*<br><br>*info@esribelux.com* | To be interested in our product | Obtain useful information | Keep satisfied | External/ Influencer |
| European Association of Remote Sensing Companies (EARSC) | Interested | *info@earsc.org* | Dissemination of the project | Get interesting information about project updates | Keep informed | External/ Influencer |
| European Comission | Main investor and customer | *+32 22999696* | Provide funding for the project | Evaluate the viability of the project | Manage closely | Internal/ Supporter |
| European Council | Regulation | *+32 22816111* | Provide the legal environment for the development of the project | Fulfil the regulations and laws | Keep informed | External/ Influencer |
| European Space Agency (ESA) | Customer | *+33 153697654* | To be interested in our product | Obtain useful information | Keep satisfied | External/ Influencer |
| Eurosense | Potential customer | *+32 24607000*<br><br>*info@eurosense.com* | To be interested in our product | Obtain useful information | Keep informed | External/ Influencer |
| Flyby | Competitor | *+39 0586505016*<br><br>*info@flyby.it* | To see our product as a potential competition | Obtain information | Monitor | External/ Reluctant |



| Name | Role | Contact Information | Requirements | Expectations | Influence | Classification |
|---|---|---|---|---|---|---|
| GAF AG | Competitor | *+49 891215280*<br>*info@gaf.de* | To see our product as a potential competition | Obtain information | Monitor | External/ Reluctant |
| GEOMATRIX UAB | Potential customer | *www.geomatrix.lt/cms/index.php* | To be interested in our product | Obtain useful information | Keep informed | External/ Influencer |
| GEOSYSTEMS | Interested | *+48 228511166*<br>*office@geosystems.pl* | Dissemination of the project | Get interesting information about project updates | Keep informed | External/ Neutral |
| GISAT | Competitor | *+42 271741935*<br>*gisat@gisat.cz* | To see our product as a potential competition | Obtain information | Monitor | External/ Reluctant |
| Harris | Customer | *1-855-477-4272* | To be interested in our product | Obtain useful information | Keep satisfied | External/ Influencer |
| High Innovative Remote Observation (HIRO) | Consortium member | *+34 677261221* | Integration of new EO technologies into the Copernicus Programme | Develop the project | Manage closely | Internal/ Main participant |
| ICUBE-SERTIT | Consortium member | *+33 368854645*<br>*sertit@icube.unistra.fr* | Innovation in urban planning | Provide new solutions for urban planning using EO | Manage closely | Internal/ Supporter |
| Insar | Potential customer | *+421 233006847*<br>*matusbakon@insar.sk* | To be interested in our product | Obtain useful information | Keep informed | External/ Influencer |

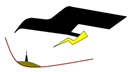


| Name | Role | Contact Information | Requirements | Expectations | Influence | Classification |
|---|---|---|---|---|---|---|
| Non-European space agencies | Competitors | | To see our product as a potential competition | Obtain information | Monitor | External/ Reluctant |
| Noveltis | Potential customer | *+33 0562881111*<br>*contact@noveltis.fr* | To be interested in our product | Obtain useful information | Keep informed | External/ Influencer |
| Remote Sensing Application Center (ReSAC) | Consortium member | *+359 29800731*<br>*resac@techno-link.com* | Innovation in urban planning | Provide new solutions for urban planning using EO | Manage closely | Internal/ Supporter |
| Space applications services NV/SA | Interested | *+32 27215484*<br>*info@spaceapplications.com* | Dissemination of the project | Get interesting information about project updates | Keep informed | External/ Neutral |
| SpaceBel | Customer | *+32 43618111* | To be interested in our product | Obtain useful information | Keep satisfied | External/ Influencer |
| Telspazio | Interested | *+39 08353751*<br>*info@e-geos.it* | Dissemination of the project | Get interesting information about project updates | Keep informed | External/ Neutral |
| Thales Alenia Space SAS | Consortium member | *+33 157778000* | Innovation in EO technology | Provide new technology for EO | Manage closely | Internal/ Supporter |



| Name | Role | Contact Information | Requirements | Expectations | Influence | Classification |
|---|---|---|---|---|---|---|
| VITO nv | Consortium member | *+32 14335511* | Innovation in optical sensors and their possible uses | Provide new knowledge in optical sensors and new uses for urban planning | Manage closely | Internal/ Supporter |
| Walphot | Customer | *+32 81302401*<br><br>*info@walphot.com* | To be interested in our product | Obtain useful information | Keep satisfied | External/ Influencer |

Table 3.2.1: Stakeholder register



# 4 Bibliography