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Full Proposal Template for Space and 5G Convergence: Transport and Logistics Demonstration Projects

Part 3 of Appendix 1 to AO/1-10428/20/UK/ND

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# INTRODUCTION

This *Full Proposal Template* is a tool to help the tenderer to prepare a comprehensive Full Proposal responding to the Space and 5G Convergence: Transport and Logistics AO for a Demonstration Project.

Please note that, in consideration to the fact that the preparation of the Full Proposal can be started only upon confirmation by ESA that the corresponding Outline Proposal has been accepted, for the purpose of this template it is assumed that several parts of the Full Proposal will be based on information, possibly expanded whenever required, that have been already provided in the Outline Proposal.

Concerning the use of this template, please note the following styles and the related instructions:

* Material presented in this plain style is either suggested content for a Full Proposal, or describes the content to be inserted in the corresponding paragraph, as relevant. This is intended to be an example of a response to the related Agency requirements, which the Tenderer needs to properly complement by activity-specific information. The suggested material may be adopted as is, or modified at the Tenderer’s discretion. It remains the responsibility of the Tenderer to ensure that all of the Agency’s requirements of the present Call for Proposals are properly addressed.
* Parts highlighted in yellow may or may not need to be filled in, depending on the scope of the proposal (please refer to the related explanatory notes to determine if they apply or not).
* This style is used to identify information that must be modified and/or completed by the Tenderer for the proposed activity. This supplementary information shall presented in plain typeface (i.e. not red) in the final version of the Full Proposal.
* This style is used for explanatory notes and guidance to help you to develop the Full Proposal content (e.g. to indicate a selection between mutually-exclusive options). This information should be removed from the final version of the Full Proposal.

Use of this Full Proposal Template is mandatory. The Tenderer shall not change the structure of this Full Proposal Template (i.e. the table of contents must remain unchanged) with the exception of Section I for which inclusion depends on the scope of the activity.

Please note that the Full Proposal is the only document that will be considered by the ESA Tender Evaluation Board, which will not have access to the Outline Proposal. Therefore, the Full Proposal shall be considered as a full self-contained document, and the contributions coming from the Outline Proposal shall be explicitly appearing in the Full Proposal.

**The length of the completed Full Proposal without Annexes shall not exceed 90 pages (without changing font size or page margins). If the activity entails the optional ground segment product/technology development component (Section I) then the proposal should not exceed 130 pages**.

Please use this page as the cover page of the Full Proposal and remove the previous three pages (Template Title page and Introduction)

Project Name

Full Proposal for Space and 5G Convergence: Transport and Logistics Demonstration Project

Date: …

Reference: ……

ESA Template Ref 1.0 issued 02/07/2020

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List of Acronyms

|  |  |
| --- | --- |
| ARTES | Advanced Research in Telecommunication Systems |
| BDR | Baseline Design Review |
| BP | Business Plan |
| CBA | Cost Benefit Analysis |
| CDR | Critical Design Review |
| COD | Contract Outcome Data |
| DM | Digital Media (as part of the FDP) |
| ESA | European Space Agency |
| FAT | Factory Acceptance Tests |
| FDP | Final Data Package |
| FR | Final Review |
| FREP | Final Report |
| HW | Hardware |
| IAP | Integrated Applications Promotion |
| IRR | Internal Rate of Return |
| KSF | Key Success Factor |
| KPI | Key Performance Indicator |
| MOM | Minutes of Meetings |
| MPR | Monthly Progress Report |
| NPV | Net Present Value |
| PBC | Project detailed Bar Chart |
| PD | Portable Demonstrator |
| PilUP | Pilot-Demonstration Utilisation Plan |
| POSR | Pilot-Demonstration Operations Summary Report |
| PSS Forms | Procedures Specifications and Standards Forms, used to break down and give transparency to the total cost and price of the proposal |
| PWP | Project Web Page |
| RD | Requirements Document |
| S&A | Summary and Achievements |
| SAT | On-Site Acceptance Tests |
| SSA | System and Service Architecture |
| SVD | System Verification Document |
| SW | Software |
| WBS | Work Breakdown Structure |
| WP | Work Package |
| WPD | Work Package Description |

# COVER LETTER

THE COVER LETTER IS PROVIDED AS A SEPARATE DOCUMENT

# PROJECT SUMMARY AND RATIONALE

This section should *summarise* the following components:

## Background Information

Project Name: ……

Prime and contact points: ……

Prime information: ……

Rest of the consortium: ……

## Service Description and Selling Point(s)

Description of the product / service you intend to offer

Innovation / key selling point(s) with respect to what is available in the market

How does the proposed final product / service fit within your current business activities and your mid-/long-term strategy?

What is the relevance to the thematic call objectives? Which topic and application area(s) do you propose to address? How?

## 5G and Space Asset(s) and Rationale

Provide a high-level description of the 5G and Space technology / space asset(s) intended to be used, the rationale for their usage, and the added-value of their integration/convergence.

A detailed description of the architecture is expected in [**Section D.2.1**](#_Space_and_5G)

## Scope of Product and Technology Development (Optional)

*This section is to be included only if the activities of the project entail development of new Ground segment product(s) and technology/s.*

*Please note that the product / technology to be developed shall be commercialised in the context of the proposed service*

Clarify if ground segment technologies and/or products (e.g. modem, hub, antenna, ASIC,) instrumental to the service need to be developed.

Clarify the development phase(s) (Definition, Technology, Product and/or Demonstration), for which financial support is being requested in the present proposal specifically for the optional ground segment technologies and/or products

Additional detail is expected in [**Section I**](#_(Optional)_PRODUCT_DEVELOPMENT)

# BUSINESS PLAN

## Customer Segments

The key customers/customer segments targeted by our product / service are: ……

The pains (e.g. problems) and gains (e.g. benefits) are: ……

The potential customers already identified are: ……

The following table provides a summary overview of the customers and associated high level characterisation in relation to the target product(s).

Table C.1 Key Customers/Customer Segments and their Needs

|  |  |  |
| --- | --- | --- |
| **Customer/Customer Segment** | **Customer Problems/Needs** | **Representativeness for the Targeted Market** |
| ……… | ……… | ……… |
| ……… | ……… | ……… |
| ……… | ……… | ……… |

## Value Propositions

The table below identifies the specific characteristics of our product / service that will address the previously-identified customer problems/needs. (e.g. performance, cost, new features) and define its value proposition i.e.: value that the product or service offers to its customers.

Table C.2 Key Product Characteristics

|  |  |  |  |
| --- | --- | --- | --- |
| **Customer Segment** | **Problem/Need** | **Product Characteristics Addressing this Problem/Need** | **Value proposition** |
| Customer Segment 1 | …… | …… | …… |
| Customer Segment 2 | …… | …… | …… |
| …… | …… | …… | …… |

Explain the relevance of your value proposition to address user needs in the selected use case(s).

## Channels

In the commercial exploitation stage, our product / service will be sold to the customers via these channels: ……

*Describe where you will reach and interact with your customer segments, with reference to the following (where applicable):*

* *Awareness - how do you make the customer aware of the value proposition (e.g. app store, ads, word of mouth...)*
* *Evaluation - how do you enable the customer to evaluate the value proposition (e.g. reviews, demo's/trials...)*
* *Purchase - how do you collect payment from customers*
* *Delivery - how do you deliver the value proposition*
* *After Sales - how do you support the customers after purchase.*

## Customer Relationships

Describe *how* you will interact with customer segments (e.g. personal service, self-service, automated, communities, co-creation model…)…

Our relationships with the key customers already exist / must be created / have to be improved.

## Revenue Streams

Describe the sources of revenues made from each customer segment (e.g. product sales, usage/service fees, subscription fees, leasing, licensing, advertising…).

In the commercial exploitation stage, our product / service will be sold to our customers as described in the tables below, based on the market analysis reported in [Section C.12.](#_Market_Analysis_1)

To justify the assumptions about the price to which the product will be sold, some high level considerations about the Cost Benefit Analysis (CBA) for the customers should be provided. Such considerations should give the rationale that the acquisition of the product for its cost is worthwhile for the customers. Financial tables such as that below can be found in the [Financial Indicators Workbook](https://business.esa.int/sites/default/files/ARTES_Business_Applications_Financial_Forecast_Workbook.zip).

Table C.3 Product Pricing

|  |
| --- |
| Customer Segment 1(\*)  Customer Segment 2  Customer Segment 3  Churn Rate  Product  unit price  Product  installation  charge per  unit  Service fee  per product  per year  Customer Segments  *(\*) Please use the definition used in Table C.2* |

## Key Resources and Dependencies

To realise our product / service and deliver the value propositions we need the critical resources and dependencies that are defined in the following table, as applicable.

Table C.4 Key Resources and Dependencies

|  |  |  |
| --- | --- | --- |
| **Required Resource** | **In Place** | **Potential Issues** |
| ……… | yes/no | ……… |
| ……… | yes/no | ……… |
| ……… | yes/no | ……… |

## Key Activities

To realise our product / service and deliver the value propositions we need to perform the key activities identified in the table (note that this refers to activities expected during provision of the *operational* service).

Table C.5 Overview of Key Activities

|  |  |
| --- | --- |
| **Key Activity** | **Description** |
| ……… | ……… |
| ……… | ……… |
| ……… | ……… |

## Key Partners

The value chain involves the key partners defined in the table below.

Table C.6 Key Partners

|  |  |  |  |
| --- | --- | --- | --- |
| **Partner Name** (company name, country, web link) | **Background / Experience** | **Involvement in the Project and/or in commercial exploitation** (e.g. none, subcontractor, supplier, pilot user, customer, integrator) | **Type of Agreement** (e.g. NDA, partnership agreement, contract) |
| ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… |
| ……… | ……… | ……… | ……… |

Please, take into account partners during the project stage may not be the same as during exploitation (e.g. HW factory producing the designed product may not have a role during the project, but it will be necessary during exploitation). Please explain the status of those relationships (existing, in progress, to be established…) complementary to the info of the table above.

## Service Value Chain

The following diagram describes the service value chain including all relevant project partners and their role in the project and in the commercial exploitation stage of the product / service.

Figure C.7 Project Team Composition and Roles



## Cost Structure

Describe the sources of costs that you will incur for provision of the operational service (e.g. from reaching customers, maintaining customer relationships, acquiring key resources, performing key activities, establishing key partnerships…).

The key elements of cost for realising the value proposition are presented in the following tables ([Financial Indicators Workbook](https://business.esa.int/sites/default/files/ARTES_Business_Applications_Financial_Forecast_Workbook.zip)).

|  |
| --- |
| Table C.8 Cost of Sales  Jan-18  0  1  2  3  4  5  6  7  8  Commercial Exploitation Phase  Simplified CoS for product  unit  Cost Element N.1  Estimated Cost of Sales  Cost Element N.2  Cost Element N.3  Cost Element N.4 |

|  |
| --- |
| Table C.9 Operational Expenditures |

|  |
| --- |
| Table C.10 Capital Expenditures |

The following assumptions have been used to derive the figures provided in the tables above: ……

## Market Analysis

Our product / service is addressing the market of …… (e.g. provide few examples), which has the following characteristics: …. (e.g. size, geographical reach, trends, sales model).

The position of our product / service in the market is summarised in the matrix below.

Table C.11 Market positioning

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| MARKETS | New (MN) | ………. | ………. | ………. |
| Adjacent (MA) | ………. | ………. | ………. |
| Existing (ME) | ………. | ………. | ………. |
|  | | Existing (PE) | Incremental (PI) | New (PN) |
| PRODUCT / SERVICE | | |

## Competitive Landscape

Our key competitors and the nature of the competition are identified in the table below.

Table C.12 Summary of the Competition

|  |  |  |  |
| --- | --- | --- | --- |
| **Competitor** | **Characteristics** | **References** | **Our Competitive Advantage** |
| ……… | ……… | ……… |  |
| ……… | ……… | ……… |  |
| ……… | ……… | ……… |  |

## Exploitation Plan

Time of commercial entry into the market and way forward to bring the activity results to commercial product / service: ….

Our projection in terms of the market we aim to capture in the short term for each of the identified customer segments is shown in the following table.

Table C.13 Served Obtainable Market 

The assumptions behind the above sales projection are ……

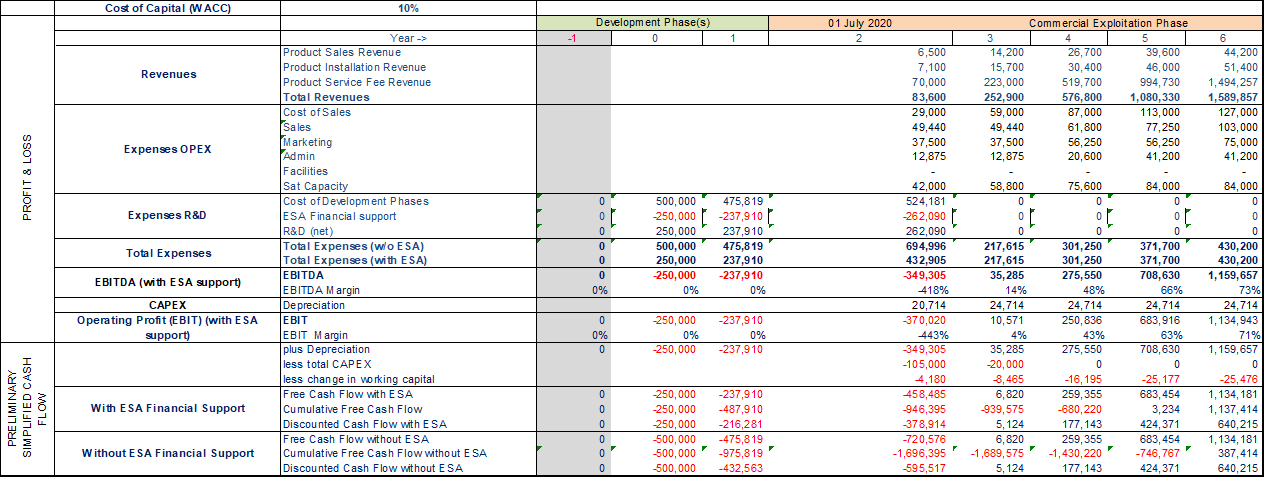
Are you compliant with the relevant regulatory framework? Are there regulatory barriers? How will the deployment and commercial sustainability of the hybrid terrestrial/satellite networks required for the service provision be provided?

Expected economic, social or environmental benefits inside and outside the consortium, and associated timescale: …..

## Financial Indicators

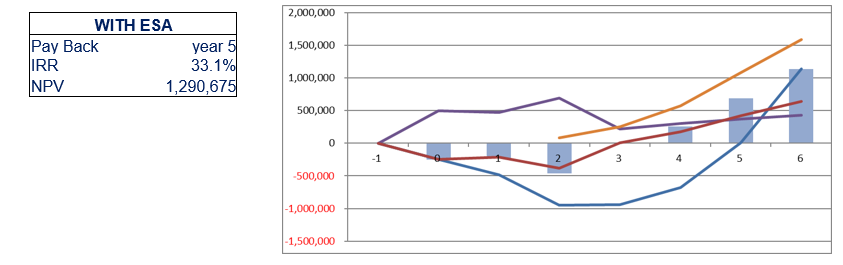
A profit and loss and cash flow statement is provided in the table below.

Table C.14 Profit & Loss and Cash Flow Statement

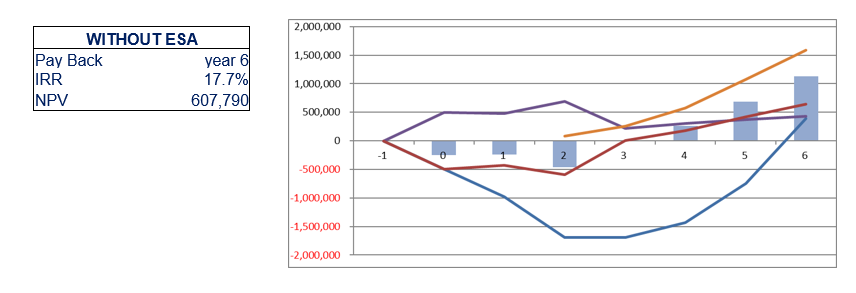


(The above is just an example. The above table can be found in the spreadsheet file - [Financial Indicators Workbook](https://business.esa.int/sites/default/files/ARTES_Business_Applications_Financial_Forecast_Workbook.zip))

Table C.15 Financial Indicators with and without ESA Support



(The above is just an example. The above table can be found in the spreadsheet file)



# TECHNICAL PROPOSAL

Note: if you completed Section 5 of the Outline Proposal (Product/Technology Development) and as such your proposal includes a Product/Technology Development component, you should (in addition to this section) complete the Ground Segment Product/Technology Development Section ([Section I](#_(Optional)_GROUND_SEGMENT))

## User Requirements

The following table provides a first iteration of the user requirements.

Table D.1 User Requirements

| **Req. ID** | **User Requirement Name** | **Description and Rationale** | **Related customer segments** |
| --- | --- | --- | --- |
| UR-A\_001 | ……. | ……. | ……. |
| ……. | ……. | ……. | ……. |
| ……. | ……. | ……. | ……. |

## System / Service Architecture

A high level block diagram of the system / service showing the key attributes and key building blocks and the main interfaces is provided in the below figure.

Table D.2 System/service Architecture



EXAMPLE

With reference to the figure above, the pilot system to be deployed in the proposed activity will consist of the following elements (**include a short description of each**):

If more than one pilot demonstrator is proposed, identify which parts of the pilot system are used in each proposed pilot demonstrator

### Space and 5G Convergence

Describe in detail the convergence of Satellite Communications and 5G technologies in the proposed system architecture, with justification for the proposed integration.

## Implementation Approach

### Service Maturity

The starting point for our project is: ……

The elements to be developed in the proposed activities are ……

The maturity of the components of the service is summarised in the table below:

Table D.3 Maturity of Service Components

|  |  |
| --- | --- |
| **System/Service Architecture Component** | **Maturity (COTS[[1]](#footnote-2), existing, to be developed, to be enhanced…)** |
| ……… | ……… |
| ……… | ……… |
| ……… | ……… |

### Implementation Activities

The expected goals / outputs at the end of the activity and the way they will contribute to the final product / service are: ……

The key activities proposed to implement the project are:

Our proposed development approach is the following: …… (describe the methodology for developing and integrating the building blocks into the final solution)

## Pilot-Demonstration Service

### Pilot Objectives

The success criteria / goals to be achieved during the pilot-demonstration to gain customer commitment are: …..

Preliminary considerations for evaluating system and service performance during the pilot-demonstration are here summarised:

* Define the specific objectives of the pilot (list of high level objectives technical, business, etc.)
* Identify the Key Performance Indicators (KPIs) to assess whether the objectives have been met
* Map each objective to one or more KPI
* Identify an expected value for each of the KPI
* Describe tools and procedures to collect the value of each KPI…..

*The success criteria / goals shall be presented in terms of Key Performance Indicators (KPI’s) that are quantitatively measurable and are relevant for inferring commercial uptake of the service after the end of the project. Therefore, the KPI’s must be relevant to the pilot users and potential customers and their interest in adopting the service. KPI’s must be related to the value propositions.*

### Pilot Activities

The pilot/s will take place in … [country/s] in the following location/s…. and it will start at … *x months* *after the kick-off* and will last ….. *y months****.***

*Please note that the execution of at least one pilot in the United Kingdom is mandatory.*

The pilot-demonstration service activities will be based on the following undertakings: objectives, users/customers involvement, envisaged utilisation of the system, e.g. 2 hours of use every day, duration of the pilot-demonstration stage e.g. 8 months, etc.

The following 5G and space asset(s) will be used in the pilot-demonstration (refer to the type, justification, major elements such as data or services to be procured): ….

*Evidence of the preliminary-agreement with the considered 5G terrestrial operator(s) should be provided in* [*Section D.6*](#_Annex_D_–)*.*

The expected preparation activities of the pilot-demonstration will include: specify as needed (e.g. deployment, integration within the user environment, acceptance, logistics, training).

The users, customers, stakeholders participating in the pilot-demonstration, the related level of involvement and a short description of the activities to be performed by them is summarised in the table below.

Table D.4 Involvement of Users, Customers and Other Stakeholders in the Pilot-Demonstration

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Role in the Pilot-Demonstration** | **Activities** | **Agreement and associated status (in place, to be secured in Full Proposal, etc.** |
| ……… | ……… | ……… | In place / in Full Proposal… |
| ……… | ……… | ……… | In place / in Full Proposal… |
| ……… | ……… | ……… | In place / in Full Proposal… |

*Please provide here evidence of the necessary authorizations and related documentation required to operate in a certain area(s)/site(s) in order to successfully perform the pilot.*

## 

## Technical and Non-Technical Risks

The major technical, operational, regulatory and business related risks associated with the proposed activity and the associated mitigation plans are summarised in the following table. (If optional product development is included in the proposal, a separate risk analysis should be provided in [Section I](#_(Optional)_PRODUCT_DEVELOPMENT)).

(Complete the following table as appropriate)

Table D.5 Overview of the Major Risks and the proposed Risk Mitigation Actions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Risk Identifier** | **Risk Type (Technical, Commercial…)** | **Description** | **Likelihood** | **Severity** | **Mitigation Actions** |
| ……… |  | ……… | low/medium/high | low/medium/high | ……… |
| ……… |  | ……… | low/medium/high | low/medium/high | ……… |
| ……… |  | ……… | low/medium/high | low/medium/high | ……… |

## Annex D – Letters of Commitment

**Statement from users, customers and other external partner organisation(s) and evidence of the agreement with the 5G operator(s)**

*[Please, enclose a ‘Letter of Interest / Commitment’ for each participant (customer, user, other external partner organisation) not appearing explicitly as subcontractor, containing information on their motivation for their participation (in their own words) as well as information on their contributions to the various study tasks.* *Communication infrastructure providers shall confirm their commitment to make available the necessary assets to perform the pilot.*

*Contributions to the demo project may include:*

* + *identification of current operational processes and their issues,*
  + *support to definition of user scenarios/processes,*
  + *support to definition of user requirements,*
  + *identification of expected benefits and financial constraints,*
  + *support with validation of the Pilot,*
  + *support to promotion of the targeted services*
  + *evidence of the agreement with the 5G operator(s)]*

# Management and Administrative Proposal

## Background experience

*Presentation of the Tenderer / Subcontractor(s) and their organisational structure (e.g. key company details, turnover, ownership…).*

*Background description and relevant experience of the tenderer, subcontractors, users, partners (if applicable).*

*Description of direct and indirect results of any previous ESA ARTES Applications contracts (for instance via the relevant Summary & Achievements document, if available) involving any company of the bidding team. The direct results shall show the revenues and profits, in Euro, obtained in the 3 years following the end of the ESA projects. Presentation of the service provider and its role in the consortium team, if included.*

*Indicate the “Vision” of the tenderer and, where relevant, of its subcontractor(s). How does it fit into the company(ies) strategy / roadmap.*

## Organisation and management

*Presentation of the project team and of the structure of the project organisation (including users / stakeholders), and where it is proposed to subcontract part of the work, the structure of the industrial group. Include identification of the nominated Project Manager and Contractual Manager, both should usually belong to the organisation of the Prime Contractor. Provide a diagram.*

*Lines of communication and reporting, and means for settling disagreements.*

*Management plans, policies and procedures: management control organisation, procedures that will be used to exercise control over the project and the proposed subcontracting control (if any) and coordination with the user community.*

## Facilities

*Description of all facilities to be used including those facilities which are still to be developed / built and / or purchased, with a statement on whether the costs of developing / building / purchasing the facility are to be directly or indirectly charged to the Contract. Modifications to existing facilities are also to be described. For this purpose, facilities may include, as applicable, hardware, computer software, manufacturing equipment, test equipment, production and integration lines, service centres and infrastructures hosting the user communities.*

*Description of means of access to space assets and space based services as relevant, information resources, such as libraries, databases… the company has, if these are required for the work proposed.*

Table E.1 Summary of Facilities to be used in the proposed activity

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Facility ID** | **Facility Type1** | **Description/ Capabilities** | **Facility Owner/Role in Project** | **Status2** |
| 1 | RF Test | … | “Company X”/Subcontractor | Existing |
| 2 | … | … | … | … |
| … | … | … | … | … |
| … | … | … | … | … |

1For example, hardware, software, manufacturing equipment, test equipment, production and integration lines.

2 For example, “existing”, “requires modification”, “still to be developed/built”, “purchased”.

## Key personnel

Key personnel are identified as persons who, because of their individual qualifications and positions are proposed for the work and indicated as such in the tenderer's Organisation Breakdown Structure. As a minimum, each person assigned as Work Package Manager shall be nominated as Key Personnel. Key representative of the users shall also be presented.

The following table provides an overview of the allocation of the Key Personnel to the proposed activities.

Table E.2 Key Personnel

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Role in the Project** | **Company** | **Manager of WP** | **WP(s) allocation in h** | **Average allocation of time for the duration of the project** |
| ……… | Project Manager | ……… | WP1100 | WP1100 [120h], WP2300 [230h] | 80 % |
| ……… | Business Developer | ……… | WP1200 | ……… | ………% |
| ……… | ……… | ……… |  | ……… | ………% |

The CVs for all key personnel are provided in Annex E. Each CV provides:

- a summary of the work experience of the person concerned;

- a brief description of their present job and responsibilities;

- their specific qualifications and experience of direct relevance to their role in the project.

## Travel and subsistence plan

Travel and subsistence plan is provided in the Exhibit B of the PSS-A2 forms.

The first project meeting (Negotiation or Kick Off Meeting) and the last project meeting (Final Review) shall be done at ESTEC or ECSAT (if possible) and shall be included in the travel and subsistence plan.

## Monthly Progress Reports

A concise monthly progress report will be provided to the Agency within the first five working days of each month. The template available in the [Business Applications web site](https://business.esa.int/documents), section “documents” will be used.

## Minutes of Meetings

Each review meeting will be organised using the Draft Agenda available in the [Business Applications web site](https://business.esa.int/documents). Formal written minutes of meetings attended by the Agency will be agreed and will be signed and made available to the Agency at the end of the meeting.

The minutes will, as a minimum, identify all agreements made and actions accepted during the meeting.

The following identification scheme will be used to define the Action Items:

Action X.Y

where X is the identifier of the meeting (0: Negotiation Meeting, 1: First Review Meeting, 2: Second Review Meeting, etc.), and Y is the Action number starting from 1 at each new meeting.

All Actions Items will be recorded in the Distributed Project Collaboration Tool made available by ESA, and the associated status will be kept up-to-date by the Project Manager.

## Project Web Page

A first version of the project web page will be produced as part of the deliverable documentation package for the first review milestone using the latest template specified by the Agency.

The project web page will be updated periodically during the development so that the project and its current status are properly portrayed.

For each milestone review as a minimum, the current status paragraph of the project web page and, if appropriate, other web page content, will be updated and communicated to the Agency.

The final version of the project web page will be provided to the Agency together with the final version of the Final Report. It will include a paragraph summarising the most significant achievements of the project.

## (Optional) Product Assurance Plan / Quality Plan

*Include this section only if the Full Proposal includes an optional part for Ground Segment product(s) and technology/s development for Product and/or Demonstration Phase.*

The product assurance / quality plan is attached to this proposal as Annex X. We consider it to be in line with our customer’s quality requirements and commensurate with the current maturity of the product development.

## Annex E - CV of Key Personnel

**Curricula Vitae of the Key Personnel**

Provide completed CVs for all members of the key personnel using the following template, or equivalent. Competence in technical, business development, market expert or insider, commercial and sales shall be explicitly presented.

|  |  |
| --- | --- |
| **Name** | |
| Specific Qualifications and Experience Relevant to the Project Role: | … |
| Entity: | … |
| Present Position and Responsibilities in the Entity: | … |
| Education: |  |
| Year(s) | Educational details |
| Year(s) | Educational details |
| Work Experience: |  |
| Year(s) | Entity, Project, Position, Responsibilities, Achievements |
| Year(s) | … |
| Year(s) | … |

# IMPLEMENTATION Proposal

For information regarding general review milestones and associated documentation, refer to the *Management Requirements* document.

## List of Deliverables

### Documentation and Media

The documents that will be delivered during the project are summarised in the table below.

Table F.1 Deliverable documents

| **Name** | **Deliverable** | **Initial Submission** | **Updating** | **Final Submission** |
| --- | --- | --- | --- | --- |
| PBC | Project Bar Chart | with the proposal | as part of the MPR and at reviews |  |
| MPR | Monthly Progress Report | TO + 1 month | every month, within first five working days |  |
| MOM | Minutes of Meetings | NM | every meeting | FR |
| RD | Requirements Document | with the proposal | BDR | FR |
| SSA | System and Service Architecture | with the proposal | CDR | FR |
| PilUP | Pilot-Demonstration Utilisation Plan | with the proposal | FAT, SAT | FR |
| DM | Digital Media (as part of the FDP) | FR |  |  |
| SVD | System Verification Document | CDR | FAT | SAT |
| BP | Business Plan | with the proposal | BDR, other milestones as relevant | FR |
| POSR | Pilot-Demonstration Operations Summary Report | SAT | Once every two weeks basis, unless otherwise agreed with ESA | FR |
| PWP | Project Web Page | BDR | current Status to be updated as part of the Monthly Progress Report | FR |
| FREP | Final Report | FR |  |  |
| FDP | Final Data Package | FR |  |  |
| S&A | Summary and Achievements | FR |  |  |

Each deliverable document will include a title page reporting the project name, the contract number, the title of the document, a reference identifier, the author(s) and related organisation(s), the date of issue and the revision number.

All deliverable documents will include a record of the document history, indicating in short for each document revision the corresponding date and the reason(s) for the revision. The relevant copyright marking in line with the contract provisions shall be clearly identified.

All documentation will be delivered in electronic form, in MS Word or equivalent, with all pictures and tables embedded in the document. The documentation will be able to be printed and will allow the insertion of comments and track changes. Intermediate versions of the documents, before its final official release, shall be delivered in Track Changes.

All deliverable documents will be delivered using the Agency’s web-based project planning and collaboration tool. Documents will be delivered at least five working days prior to the associated review.

#### (Optional) Product/Technology Development Documentation

*If the activity optionally addresses ground segment product/technology development then please complete the table below indicating the relevant deliverables and the associated review milestones at which they will be delivered to the Agency. (Suggested review milestones and deliverables are referenced in the Management Requirements document).*

| **Document Reference** | **Deliverable Document** | **Contributing Work Package(s)** | **Initial Submission** | **Updating** | **Final Submission** |
| --- | --- | --- | --- | --- | --- |
| **Management** | | | | | |
| … | title | WP…, etc. | … | … | … |
| … | title | WP…, etc. | … | … | … |
| … | title | WP…, etc. | … | … | … |
| **Engineering** | | | | | |
| … | title | WP…, etc. | … | … | … |
| … | title | WP…, etc. | … | … | … |
| … | title | WP…, etc. | … | … | … |
| **(Document category)** | | | | | |
| … | Title | WP…, etc. | … | … | … |
| … | Title | WP…, etc. | … | … | … |
| … | Title | WP…, etc. | … | … | … |

### Hardware, Software and Manuals

The following table describes the list of Hardware and Software and associated Documentation that will be delivered to ESA as part of the proposed project.

Table F.2 Deliverable Items

Entries in the table are just examples to be amended as relevant

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Type** | **ID** | **Item description** | **Number of Items** | **Deliverable Point** | **Notes** | **Derived from Optional Product Development? (Yes/No, if Yes indicate Development Phase)** |
| Portable  Demonstrator (when practical) | PD | ……… |  | ESA | Self-contained setup to support visual presentation of the product / service to non-expert people |  |
| Hardware | HW.01 | SatCom user terminal | 6 | User sites A, B, … | 80 cm dish… |  |
| HW.02 | Handheld tablet | 8 | User sites c, d, … | Model…. |  |
| HW.03 | Server | 1 | Service centre | Model .... |  |
| HW.04 | Portable Demonstrator | 1 | To ESA at the FR | ……… |  |
| ……… | ……… | ……… |  | ……… |  |
| Software(\*) | SW.01 | M&C Fleet | 1 | Service centre | ……… |  |
| SW.02 | Mobile App | 8 |  | Embedded in HW.02 |  |
| ……… | ……… | ……… |  | ……… |  |
| Manuals | DOC.01 | User manual | 8 | Together with HW.02 | ……… |  |
| DOC.02 | Service Centre Installation | 1 | Together with HW.03 | ……… |  |
| ……… | ……… | ……… |  | ……… |  |

Please list all main deliverable items from the optional product and technology development (if included) and indicate from which development phase they are derived as an outcome.

Please note that the Hardware (listed above) shall only include the items fully costed to the project.

Hardware procured and charged under an amortisation scheme (e.g. two years use of a server with a five years lifetime) are not project deliverables, but shall be itemised in the Exhibit A of the PSS-A2 forms.

(\*) Delivery of the Software will be performed by storing the SW modules and versions developed under the project in a secure software repository (on-site or in the cloud). Up to two years after the contract closure date, ESA will be provided access to the repository by contacting the Project Manager.

## Work Breakdown Structure (WBS)

The figure below presents the work breakdown structure, covering the entire scope of the proposed work.

Replace the following diagram with an equivalent showing the proposed work breakdown structure; provide at least two levels. Entries in the table are just examples to be amended as relevant. Work packages related to the optional product development (if applicable) should be made distinct from the broader service development work packages.

Figure F.3 Work Breakdown Structure

Project Name

WP1000  
Management

(Prime)

WP2000  
Req.s and Design (……)

WP3000  
Dev. and Integ.

(……)

WP4000  
Pilot Service

(……)

WP5000  
Business Development

(……)

WP1100  
Pr. Management

(Prime)

WP1200  
User management

(…….)

WP1200  
……..

(…….)

WP2100  
User/ Sys. Req.

(…….)

WP2200  
Analysis   
(…….)

WP2300  
……..

(…….)

WP3100  
SW Development

(…….)

WP3200  
Verification

(…….)

WP3300  
……..

(…….)

WP4100  
Inst. and Commiss.

(…….)

WP4200  
Pilot Service

(…….)

WP4300  
……..

(…….)

WP5100  
Business Plan

(…….)

WP5200  
Service Exploitation

(…….)

WP5300  
……..

(…….)

Level 1 WPs

Level 2 WPs

## Work Package Descriptions (WPDs)

A work package description form (PSS-A20) is presented herewith below for each of the work packages at the lowest level of the work breakdown structure.

In general, in case the WBS is based on two levels WPs, the WPDs will refer only to the second level WPs, and the first WPs will not be associated to any WPD.

The work package descriptions comply with the following requirements:

* There is a single work package manager for each work package, who is a member of the key personnel.
* Work packages start and end on milestone events and do not span the entire duration of the activity (except for the project management work package and the closely associated management functions).
* Inputs from other work packages are clearly identified.
* The work to be performed is described in sufficient detail for the Agency to be able to judge the value for money, including scope of work and man-hours.
* Each task is traceable with a corresponding work package output.
* Each work package has at least one traceable work package output (hardware, software and/or documentation item, deliverable to the Agency).
* All deliverable hardware, software and documentation items are traceable to the identified work packages.

Provide completed work package descriptions for each work package identified in the work breakdown structure. Entries in the table are just examples to be amended as relevant

|  |  |
| --- | --- |
| PROJECT: Project Name PHASE: N.A. | WP: 1100 |
| WP Title: Pr. Management  Company: Prime  WP Manager: Project Manager Name  Start Event: KOM Planned Date: To  End Event: FR Planned Date: To+24m | Sheet 1 of 1  Issue Ref …  Issue Date … |
| Inputs:  - Project Proposal  - IAP Management Requirements for IAP Demo Projects, v.X.Y  …  Tasks:  - Coordinate activities with Subcontractors  - Liaise with ESA  - Quality Control of Deliverables  …  Outputs:  - Minutes of Review Meetings  - Monthly Progress Report  - Project Web Page  - Final Report  - Summary and Achievements  … | |

## Planning

### Review Milestones

Indicate the selected review milestones and the associated timing below.

If the activity includes the optional product/technology development component, please indicate the review milestones that apply exclusively to these activities, and those that can be held in parallel with broader service development/pilot-related review milestones (as appropriate).

Table F.4 Intended Review Milestones

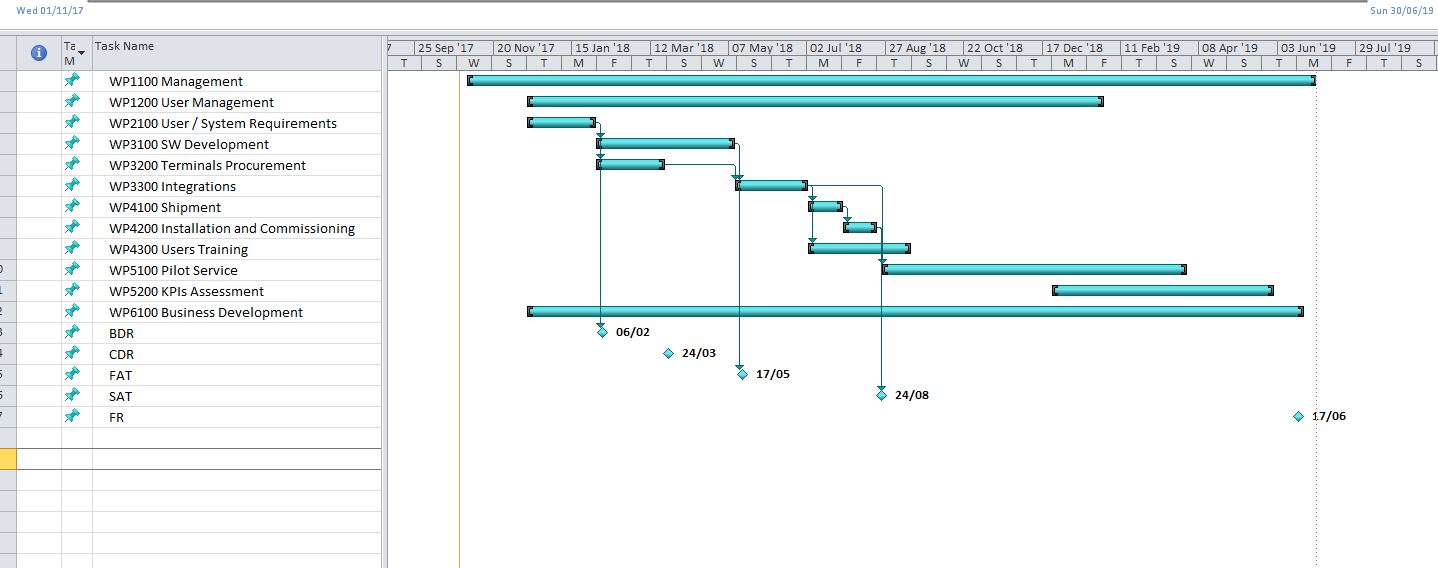
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Title** | **Date** (months) | **Objectives** | **Milestone Type** (Service Development, Product/Technology Development, Both) | **Development Phase** (If Product Development component is included) |
| Kick-off Meeting | T0 | … |  |  |
| … | T0 + … | … |  |  |
| … | T0 + … | … |  |  |
| Final Review | T0 + … | … |  |  |

### Project Schedule

*The project schedule shows the start date, the end date and the duration of each work package and the timing of the contractual reviews and other review meetings. The planning takes into account the need of the Agency to review and / or approve intermediate deliverables and allows at least 10 working days for the Agency to do this.*

The GANNT chart below is just a simple explicative example

F**igure F.5 GANTT Chart**



# FINANCIAL Proposal

## Cost and Price Summary

The cost and price for the project is as defined in the following table.

**Table G.1 Cost and Price Summary**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity** | **Country**  **(ISO Code)** | **Role** | **Cost in Euro** | **Price in Euro** |
| Tenderer | … | Prime | €…,… | €…,… |
| Subcontractor 1 | … | Subcontractor | €…,… | €…,… |
| Subcontractor 2 | … | Subcontractor | €…,… | €…,… |
| … | … | … | … | … |
|  | | **Total:** | **€…,…** | **€…,…** (…% of total cost) |

*[When mentioning the Price of the activity, please, refer to the amount to be funded by ESA. The total cost of the activity is the complete activity cost composed of the ESA funding (firm fixed price to ESA) and the company’s contribution.*

Table G.2 External Service Providers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Service Provider** | **Country**  **(ISO Code)** | **Charged to Entity** | **Nature of the service** | **Cost Breakdown in Euro** | **Cost in Euro** |
| Service Provider 1 | … | Prime | … | Number of units, €/unit €…,… | €…,… |
| Service Provider 2 | … | Subcontractor 1 | … | €…,… | €…,… |
| Service Provider 3 | … | Subcontractor 1 | … | €…,… | €…,… |
| … | … | … | … | … | … |

*Costs related to marketing activities (PR material, participation in conferences, exhibitions, etc.) are eligible up to 3% of the total cost.]*

*Please explain if and how such expenditures are planned to be spent outside of the countries of the bidding consortium*

Table G.3 Expenditure *Outside* of the Bidding Consortium

|  |  |  |  |
| --- | --- | --- | --- |
| **Destination of Expenditure** | **Total Expenditure** | **Country** | **Nature of Expenditure, Potential Supplier(s) and Justification** |
| … | … | … | … |
|  |  |  |  |

### (Optional) Product Development Costing

If the activity includes the optional Product Development part, please complete the financial table below:

Table G.4 Cost Breakdown of Product Development (Optional)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Contractor** | **Subcontractor 1** | **Subcontractor ..** |
| Tenderer’s Complete Name | ........ | ........ | ........ |
| SME | yes/no | yes/no | yes/no |
| Large Space Integrator | yes/no | yes/no | yes/no |
| Country | ........ | ........ | ........ |
| Price Type | FFP | FFP | FFP |
| Price and cost for Definition Phase *(remove this row if not applicable)* | Price €........  Cost €........ | Price €........  Cost €........ | Price €........  Cost €........ |
| Price and cost for Technology Phase *(remove this row if not applicable)* | Price €........  Cost €........ | Price €........  Cost €........ | Price €........  Cost €........ |
| Price and cost for Product Phase *(remove this row if not applicable)* | Price €........  Cost €........ | Price €........  Cost €........ | Price €........  Cost €........ |
| Price and cost for Demonstration Phase *(remove this row if not applicable)* | Price €........  Cost €........ | Price €........  Cost €........ | Price €........  Cost €........ |
| Total Price to ESA per Contractor/Sub | €........ | €........ | €........ |
| Total Cost per Contractor/Sub | €........ | €........ | €........ |

## PSS Forms

The PSS forms are attached in Annex PSS Forms for the Tenderer and for each of the proposed Subcontractor(s), showing, per entity, the total cost of the proposed work (i.e. including the entity’s share):

PSS-A1;

PSS-A2 (including Exhibits A and B, where applicable);

PSS A8 (reflecting the lowest level of the WPDs);

PSS A15-1.

The PSS forms in Excel format can be downloaded from EMITS, Reference Documentation > Administrative Documents > PSS Forms. The PSS Forms shall be signed (in particular the PSS-A1 and A2) by an authorised representative of the relevant contractors (Prime and each subcontractor, as relevant). Insert in this template the scanned PSS-A1 and PSS-A2 forms signed.

Notes for the compilation of the PSS Forms:

1. PSS-A1 shall include the validity period covering the full duration of the project
2. PSS-A2 shall include Exhibit A (other direct cost elements) and Exhibit B (travel plan and cost detail)
3. In order to facilitate the participation of the key users to major projects reviews (typically, BDR and FR), travel costs incurred by users can also be included in the project costs
4. Contributions from users and/or other stakeholder(s) can be recognised as allowable cost of the project. These contributions must be restricted exclusively to the demonstration project supported by ESA. They must be recorded in the PSS-A2 form(s) of the Tenderer (or its Subcontractor, where applicable) under “OTHER COST ELEMENTS”, and be further detailed in a letter of support signed by the user or stakeholder and in the Exhibit A of the relevant PSS A2 form, indicating the number of hours and hourly rates, facilities (if any) and the WP number(s) to which the users/stakeholder contributes
5. All hardware, software and or services procured for the project shall be listed in the PSS-A2 under the voice 3.6-External Major Products (for hardware and software) and 3.7-External Services (for services). These costs shall be broken down detailing each single cost element in the Exhibit A of the PSS-A2, indicating the number of units and the total costs. The cost elements detailed in exhibit A shall be self-explanatory
6. Hardware and software whose use is not limited to the demonstration project shall be amortised over its lifetime and only the period (months) in which they will be used for the project shall be listed as eligible project costs
7. All hardware, software whose cumulative value exceed 10.000 Euro shall be provided with details of the procurement source (Name of the company and country)
8. All external services whose cumulative value exceed 10.000 Euro shall be provided with details of the procurement source (Name of the company, country, number of man hours quoted and rate/hour, detailing any major additional cost item quoted in the service)
9. If the country of procurement of hardware, software and/or external services is different from the one of the company that is procuring them, an approval of the National Delegation of the country may be required. It is duty of the prime contractor to inform the National Delegation of the intention to procure the item outside the country of origin and seeking for its approval
10. PSS-A8 shall be compiled taking into account the WPs for which a WPD does exist. Typically, if the WBS is structured with a two levels WPs, the PSS-A8 shall refer to the WPs of Level 2, e.g. WP1100, WP1200, .., WP2100, WP2200, …
11. PSS\_A15 shall show the full cost profile of the company disbursement, and the payments received  
    from ESA (e.g. 50% of the project costs) reflected in the Milestone Payment Plan; the advance payment shall not be recorded

## Annex G - PSS Forms

PSS-A1;

PSS-A2 (including Exhibits A and B);

PSS A8;

PSS A15.1.

## Source of the Entity Contribution

The source of the entity contribution (including from any private third party) to the overall development costs is as follows:

Tenderer name (tenderer): ….

Candidate Subcontractor 1 name (subcontractor): …….

Candidate Subcontractor …. name (subcontractor): …….

It is confirmed that, in all cases, the entity contribution excludes:

overheads included in rates charged to the Agency for the contract, or any other contract with the Agency, or sub-contract awarded under an Agency contract

Examples of possible sources of co-funding are: existing funds in bank account coming from sales/profit, already approved/prospective bank loan, investment from external source e.g. private investment funds, other contributions. EU and/or national funds coming from e.g. R&D programmes are not allowed.

The purpose of this information is to provide evidence on the capabilities of the involved company(ies) to pay their share of the cost of the proposed activity elements (procurements, facilities, manpower) and, as such, can serve the obligations of the activity.

The bidder(s) is(are) kindly invited to provide evidence of the co-funding in the form of a letter(s) of commitment from investor(s), bank guarantee(s), loan(s) or own resources (e.g. cash and other liquidity).

## Statement of Profit

This financial offer is exclusive of profit.

## Currency and Conversion Rates

This financial proposal is presented in Euro. All members of the Bidding Team are located in countries participating in the Euro, so no currency exchange rates are applicable.

or include and complete the following information for all members of the Bidding Team located in countries not participating in the Euro.

The following table identifies the entities within the Bidding Team who are not located in countries participating in the Euro and the currency exchange rates that have been applied in each case.

This exchange rate shall be stated in the PSS forms and shall be clearly explained in Exhibit A to form PSS‑A2. Any other factors (e.g. hedging costs, forward buying rates, etc.) used for the purpose of its calculation shall be indicated.

**Table G.6.2 Summary of exchange rates applied**

**Summary of exchange rates applied**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Entity** | **National Currency** | **Exchange Rates Applied** | **Detailed in the Entity’s PSS-A2 Form and its Exhibit A** | **Other Factors Used to Calculate the Exchange Rates** |
| … | … | … | yes/no | … |
| … | … | … | yes/no | … |
| … | … | … | yes/no | … |
| … | … | … | yes/no | … |

*Should any country(ies) to which the above entity/entities belong adopt the Euro following the submission of proposals, the applicable conversion rates shall be the ones then adopted by the appropriate European Authorities.*

## Type of Price

The price quoted is a Firm Fixed Price.

## Quotations Free of Taxes and Customs Duties

The price quoted is free of taxes and customs duties.

or

We believe that we cannot obtain exemption from tax or customs duties because ……. Consequently, we consider that we will remain subject to the payment of taxes or customs duties under the conditions indicated below:

|  |  |
| --- | --- |
| Applicable rates: | …… |
| Estimated total tax amount: | …… |
| Estimated total customs duty amount: | …… |

## Milestone Payment Plan

The proposed milestone payment plan is detailed in the tables below. It is based on the information provided in for PSS-A15.1 and reflects the economic reality of the project.

The proposed payment plan shall take into account Article 3 of the Draft Contract and the following provisions:

* All claims for payment shall be linked to the achievement of defined schedule milestones
* These milestones are to be in the form of significant events in the programme, to be selected on the basis of providing a check point for progress of the work performed
* The payment plan shall consist of progress and final payment milestones only, adding up to the total contract price
* The final payment shall not be less than 15% of the total contract price also taking into account any offsetting of the Advance Payment(s) amount

Table G.5 Milestone Payment Plan

|  |  |  |  |
| --- | --- | --- | --- |
| **Milestone Description** | **Schedule Date** | **Payments from ESA to Contractor (in Euro)** | **Country (ISO Code)** |
| Progress (MS1): Upon successful completion of WP … and/or successful [review and] the Agency’s acceptance of all related deliverables. | T0 + … months | €…,… | … |
| Progress (MS2): Upon successful completion of WP … and successful [review and] the Agency’s acceptance of all related deliverables. | T0 + … months | €…,… |
| Progress (MS..): Upon successful completion of WP … and successful [review and] the Agency’s acceptance of all related deliverables. | T0 + … months | €…,… |
| … | … | … |
| Final Settlement (FR): Upon the Agency’s acceptance of all deliverable items due under the Contract and the Contractor’s fulfilment of all other contractual obligations, including submission of the Contract Closure Documentation. | T0 + … months | €…,…  (min. 15%) |
|  | **Total** | **€…,…** |  |

Include the following explanatory text and table if you wish to propose an advance payment plan.

The advance payment shall take into account Article 3 of the Draft Contract and the following provisions:

* An advance payment is not granted automatically, it is required to demonstrate a significant need for cash disbursement at the beginning of the execution of the contract.
* The amount of any proposed advance payment and the corresponding amount(s) to be offset against the relevant milestone payment(s) shall be clearly stated in Euro, along with a justification for the need for cash disbursement at the beginning of the execution of the contract. Nevertheless, whenever an SME (as per definition in <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003H0361&from=EN>) is involved as prime or subcontractor, it shall be entitled to a 35% advance payment irrespective of any cash disbursement needs. Further, the SME has the right to request the offset of the 35% advance at the end of the contract i.e. the two last milestones (ideally 25% at the last milestone and 10% at the preceding milestone), if this can be justified in view of the economic progress in the contract.

*[if needed]:* An advance payment is proposed in the table below. This proposal reflects the need for significant cash disbursement at the beginning of the activity, as shown in the cash flow profile presented in form PSS‑A15.1.

*[in case of no SME involved]:* The reasons for this early cash disbursement are …….

Table G.6 Advance Payment Plan

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Prime (P)** | **Company Name** | **Country (ISO Code)** | **Advance Payment (in EUR)** | **Off-Set against** | **Off-set by (amount in EUR)** | **Condition for release of the Advance Payment (if applicable)** |
| P | … | … | … | MS1 | … | After signature of the Contract by both parties |
| … | … |
| … | … |
| … | … |
| FR | … |

# CONTRACTUAL Proposal

## Compliance with the Contract Conditions

The contract conditions have been read, are understood and accepted. No sales conditions of our own are applicable.

Tenderers shall explicitly state that they have read, understood and accepted the Personal Data Processing Annex (PDPA) to the Contract. This Annex forms an integrated part of the Contract and the Tenderer’s attention is drawn to the fact that it will not be subject of separate signatures. Should the tender lead to a Contract award, the PDPA will enter into force upon signature of the Contract by both Parties.

## Insurance Waiver

A waiver of subrogation rights from our insurer will be available at the time of contract signature.

or

A waiver of subrogation rights from our insurer will notbe available. The hold harmless agreement specified in Clause 18.1.6 of the General Clauses and Conditions for ESA Contracts shall apply.

## Statement Relating to Export Import Licences / Authorisations and Related Documentation

There are no export or import restriction issues and thus no need to obtain specific licences or authorisations.

or include and complete the following statements as appropriate

Export or import restrictions and/or a need of adequate licences or authorisations exist, and the status regarding such requirements is at present the following:

* the Tenderer/Subcontractor … (name) has obtained the following authorisation(s) in order to submit this tender: ….

and/or

* the Tenderer/Subcontractor … (name) will need to obtain, prior to the placing of a Contract, the following authorisation(s): ....

and/or

* the Tenderer/Subcontractor … (name) will need to obtain the following authorisation(s) for the implementation of the contract: ....

# (Optional) GROUND SEGMENT PRODUCT AND TECHNOLOGY DEVELOPMENT Proposal

If ground segment technologies and/or products (e.g. modem, hub, antenna, ASIC) instrumental to the service need to be developed then you should complete this section, if not then remove it from the proposal.

## Technical Proposal for Ground Segment Product and Technology development

## Description of the Final Product

### Product Overview

The top-level technical description of the overall product and its main sub-systems is the following: …

*You may include images to show what the product and its constituent modules will look like and block diagrams to show their implementation details*

The role of the product in the context of the overall system/service of its target users is …

*For example: the high power amplifier will provide RF amplification within a small transportable VSAT terminal.*

The external interfaces of the product are: …

### Product Tree

The following product tree is a hierarchical breakdown of the product into the hardware and software elements that are required to perform the product functions identified previously:

(insert a product tree block diagram)

*For example, refer to ECSS-M-ST-10C-Rev.1, section 4.3.4*

### Baseline Architecture

The main product or elements are described below.

Name of Module 1

Functions and features: …

Design Concept:…

Main requirements: …..

Critical Technologies:…

Name of Module 2

Functions and features: …

Design Concept:…

Main requirements: …..

Critical Technologies:…

### Design Trade-Offs

The following table summarises the main design trade-offs that led to the selection of the baseline implementation, including the rationale for the selection in each case.

Table I.1 Summary of the Main Design Trade-Offs

|  |  |  |  |
| --- | --- | --- | --- |
| **Trade-Off** | **Affected Performance Parameters** | **Implementation Options** | **Reason for Selecting the Baseline Implementation** |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |

A more detailed discussion of each trade-off, including its implications and a justification for selecting the baseline solution, is provided in the following paragraphs.

The trade-off between ….

### Third Party Products/Rights

No products or rights of third parties are planned to be used in the development of this product.

*or*

*(delete the inapplicable paragraph)*

The following third party products/rights are planned to be used in this product development: ….

The technical reasons for adopting a solution based on these third party products/rights are ….

The impact of this approach on the technical activities and the resulting products and their usage is ….

## Product Heritage and Current Development Status

### Description of the Heritage and Starting Point

The product is an evolution of existing product or product line.

The heritage product is … *summary details about the heritage products*

The new product will offer the following features over the current products:

* Function/capability 1 *(e.g. 20% mass saving, automatic level control or operation in a new frequency band).*
* Function/capability 2.

Key details of the heritage product can be found in document reference.

or

(delete the inapplicable paragraph)

The product represents a new product line for the entity. Relevant company capabilities are presented in the Management and Administrative Proposal.

### Current Development Status of the Product

Readiness levels definitions are available on the ARTES web site at <https://artes.esa.int/documents>  
(“TRL Definitions in ARTES Technology & Product Developments”)

The table below indicates the current readiness levels (RL) of the product, of each of its key modules/subsystems and of the technologies that are critical to the success of the development. The basis for each RL assessment is indicated in the table.

Table I.2 Summary of the Current Development Status

|  |  |  |
| --- | --- | --- |
| **Item** | **Current RL** | **Basis of the RL Assessment** |
| Product … | … | … |
| Module 1 … | … | … |
| MMIC xx … | … | … |
| … | … | … |

The following paragraphs describe in more detail the development status of the product, its constituent parts and its critical technologies. Etc.

## Overall Product Development Constraints

### Key Product Requirements

The requirements detailed in the following table are the main driving factors in the design and development of the product, its subsystems and modules.

Key requirements are those considered essential to the success of the proposed development, or those that are likely to significantly affect the course of the development (e.g. design drivers).

The Tenderer should consider which of these key requirements should be included in the risk register.

The key product specification is further detailed in [Annex I.2](#_Annex_I.2_)

Table I.3 Key Product Requirements

|  |  |  |
| --- | --- | --- |
| **Product Requirements** | | |
| **Requirement ID** | **Requirement** | **Description of criticality** |
| … | … | … |
| … | … | … |
| … | … | … |

### Other Constraints

No other constraints than those listed above affect the product development plan.

or

(delete the inapplicable paragraph)

The table below summarises other constraints that affect the product development plan.

Table I.4 Other Product Development Constraints

|  |  |  |
| --- | --- | --- |
| **Type of Constraint** | **Nature of the Constraint** | **Impact/Criticality** |
| Implementation (e.g. STM and PFM instead of EQM) | … | … |
| Qualification/Certification/ Type Approval | … | … |
| Verification (e.g. test limitations due to size of item or availability and complexity of test set-up) | … | … |
| Other | … | … |

## Technical Risk Analysis and Mitigation Plan

The table below identifies the technical risks associated with the development of the product based on a preliminary risk analysis. They have been analysed in terms of their severity (potential impact) and probability of occurrence.

Table I.5 Technical Risks

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description of Risk** | **Severity** | **Probability of Occurrence** | **Description of Impact** | **When Mitigated (Dev. Phase)** | **Mitigation Plan** |
| … | High / medium / low | High / medium / low | … | Technology | … |
| … | … | … | … | Product | … |
| … | … | … | … | … | … |
| … | … | … | … | … | … |

Provide further information below as required to properly explain the risk mitigation strategy and plans

The risk mitigation plan is …

The risk management plan can be found in ….

Include this section if this full proposal includes a Technology Phase

The specific technology risks to be retired during the Technology Phase are: …

The test/verification method(s) to be used during the Technology Phase to demonstrate that each technology risk has been retired are: …

## Dependencies on Other Activities

### Dependencies on Previous Activities

The proposed activity is/is not a follow-up of a previous activity/previous activities. There are/are no dependencies between the proposed activity and other activities falling outside of the scope of the proposed activity.

Include the text and complete the table below only if the proposed activity is a follow-up of a previous activity or activities or if there are dependencies between the proposed activity and other activities falling outside of the scope of the proposed activity

Further details are provided in the table below.

Table I.6 Dependencies on Previous, Ongoing or Future Activities

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Programme** | **Activity Name** | **Brief Description** | **Start Date** | **End Date** | **Main outcomes/Nature of Dependency** |
| … | … | … | … | … | … |
| … | … | … | … | … | … |
| … | … | … | … | … | … |

### Overlap

We confirm that the work proposed does not overlap with any previous or currently running activity.

### Management of Interdependencies

Include this section if the proposed development is dependent on any on-going or future activities

Interdependencies between the proposed activity and the related activities identified in the previous section will be managed as follows. …

## Overall Product Development Plan

### Development Phases

The table below is a list of the Development Phases needed to advance the product from its current development status to the point where it is ready for commercial exploitation.

*Indicate, for each Development Phase, its status, how the Development Phase is/was/will be supported (e.g. internal project, ARTES 4.0 Element, national programme) and whether or not the project is included in the present proposal.*

Table I.7 Summary of Development Phases

|  |  |  |  |
| --- | --- | --- | --- |
| **Development Phase** | **Status** | **Supported By** | **Included in This Proposal** |
| Definition*(delete if not applicable)* | intended/running/completed | internal project | yes/no |
| Technology*(delete if not applicable)* | intended/running/completed | national programme | yes/no |
| Product*(delete if not applicable)* | intended/running/completed | ARTES 4.0 | yes/no |
| Demonstration*(delete if not applicable)* | intended/running/completed | … | yes/no |

### Objectives

For the requirements of each development phase see Requirements for Proposal Content ([Annex I.1](#_Annex_I.1__1)).

The objectives of the Development Phases included in this proposal are summarised in the table below.

Table I.8 Objectives of the Proposed Phase(s)

|  |  |
| --- | --- |
| **Development Phase** | **Objective** |
| Definition*(delete if not applicable)* | Generate a complete set of Product Requirements |
| Complete an initial design concept to allow development work to continue |
| Generate the appropriate supporting analyses demonstrating technical and economic feasibility of the product |
| Technology*(delete if not applicable)* | Objective 1 |
| Objective 2 |
| Etc. |
| Product*(delete if not applicable* | Objective 1 |
| Objective 2 |
| Etc. |
| Demonstration *(delete if not applicable)* | Objective 1 |
| Objective 2 |
| Etc. |

*Include the text below if this Proposal includes a Technology Phase*

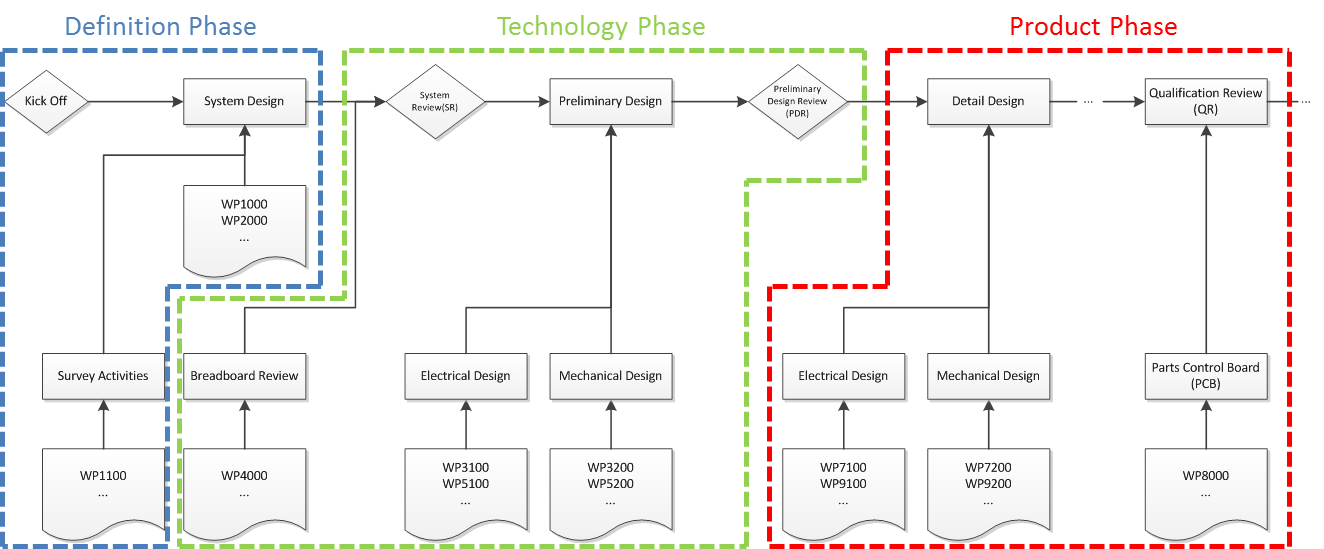
We confirm that the work to be undertaken in the Technology Phase does not include any of the following:

* Materials qualification activities;
* Component qualification activities;
* Process qualification activities;
* Qualification activities on the equipment;
* Industrialisation of the product.

### Development logic

The following figure shows the overall development logic and, for the Development Phase(s) included in this Proposal, provides a visual description of the work packages interrelations as well as the logical flow of activities.

*Replace the example diagram below with that of the work logic and associated work packages. The development logic shall be structured in such a way that it provides a clear traceability to all cost elements defined in both the Management and the Financial proposals. If relevant, the system engineering methodology (e.g. Agile, V cycle, model-based, etc.) applied may be described.*



The above development logic is further described in the table below:

Table I.9 Development Logic

|  |  |  |
| --- | --- | --- |
| **Item** | **Development Phase(s)[[2]](#footnote-3)** | **Development Activities[[3]](#footnote-4)** |
| Module xxx | ……… | ……… |
| sub-system yyy | ……… | ……… |
| Component, material or process zzz | ……… | ……… |

*An item could be, for example, a module, sub-system, component, key technology, manufacturing process, or industrialisation. Provide supplementary text as necessary to fully explain the development approach. The work to be performed on all modules that form the final product shall be described, even if not part of this activity. If a module development is not included in the proposed activity, its development approach shall in described in the column “when developed”.*

*Please provide a concise product roadmap, if relevant.*

### Verification Approach

The table below identifies the verification activities to be undertaken through dedicated tests or analyses during the development of the product, indicating the Development Phase in which they will be carried out and on which model they will be performed.

Table I.10 Summary of the Verification Approach

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Development Phase** | **Functionalities/ Requirements Verified** | **Verification Method** | **Model** | **Standard(s)** |
| … | … | … | … | … |
| … | … | … | … | … |
| … | … | … | … | … |
| … | … | … | … | … |

Column 1: Development Phase during which the verification activity will be performed.

Column 2: The aspect(s) of the product to be confirmed by the verification activity (e.g. product functions, technical performance, market potential, certification, etc.).

Column 3: The verification method (test, analysis, simulation, inspection, etc.).

Column 4: The analytical, simulation, hardware or software model that will be used as a vehicle to perform the verification.

Column 5: The main standard(s) (e.g. ECSS, MIL, ESCC, ISO) applicable to the activity, if any.

Provide below any additional details to complement the information given in the table.

The verification approach in the development of the product from its current state to the point where it is ready for commercial exploitation is as follows. …

The product test sequence is the following:…

The product test matrix is the following:…

The elements test sequence is:…

## Ground Segment Demonstration Phase

Include this section only if a Ground Segment Demonstration Phase is proposed.

The following products are proposed to be developed and tested as part of the Ground Segment Demonstration Phase.

Table I.11 Items to be Developed and Tested in the Demonstration Phase

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Product** | **Total Number of Units** | **Number of Units Supported by ARTES 4.0** | **Function/Usage Within the Ground Segment Architecture** *\** | **Fully Representative of Recurrent Product** |
| Product 1 | … | … | … | Yes/No |
| Product 2 | … | … | … | Yes/No |
| Product 3 | … | … | … | Yes/No |
| … | … | … | … | Yes/No |

\* Explain how the units supported by ARTES 4.0 will be embedded within the Ground Segment architecture.

Provide supplementary information as necessary to fully describe how each product is embedded in the Ground Segment architecture and its intended operational use in the context of both the proposed Demonstration Phase and the end-to-end system.

The operational use of Product 1 will be …

The operational use of Product 2 will be …

Include the following statement and table if any of the above items are not fully representative of the recurrent product.

Some of the items identified above are not fully representative of the recurrent product. The following table explains the differences in each case and provides a justification for why a fully recurrent product is not proposed for the Demonstration Phase.

Table I.12 Rationale for Items Not Being Fully Representative of the Recurrent product

|  |  |  |
| --- | --- | --- |
| **Product** | **Differences with Respect to the Recurrent Product** | **Rationale for Not Employing a Representative Example of the Recurrent Product in the Demonstration Phase** |
| Product … | … | … |
| Product … | … | … |
| Product .. | … | … |
| … | … | … |

## Annex I.1 - Requirements for Proposal Content

|  |  |
| --- | --- |
| **Requirement** | **Template Section** |
| * 1. The Tenderer shall indicate the target (ending) readiness level (RL) of the product and of its major subsystems and key enabling technologies at the end of the proposed Development Phase. | [Section I.7.2](#_Objectives_2) Objectives |
| * 1. The Tenderer shall confirm that the objectives of the **Definition Phase** shall at least be to: * establish the technical baseline for the product; * consolidate the user requirements and/or technical specifications and verification plans for the product; * assess the performance at system level with the aim to establish the technical baseline of the product to be developed; * assess the overall improvement at system level provided by the product to be developed; * consolidate the initial business case of the target product; * identify and establish a mitigation plan for risks. | [Section I.7.2](#_Objectives_2) Objectives |
| * 1. The Tenderer shall confirm that the objectives of the **Technology Phase** shall at least be to: * mitigate the technical risks of the product development up to and including the manufacturing and test of a representative model of the product, but excluding qualification or industrialisation.   This phase may include demonstrators to verify the functioning of the technology in a system context. The size of the demonstrator shall be the minimum required to verify correct functioning. | [Section I.7.2](#_Objectives_2) Objectives |
| * 1. The Tenderer shall confirm that the objectives of the **Ground Segment and System** **Product Phase** shall at least be to: * be a product verified in a non-operational environment; * complete the product design and industrialisation, ready for commercial exploitation; * complete the verification of the product performance, via a suitable test program. This verification shall confirm the performance of the product is suitable for the target market | [Section I.7.2](#_Objectives_2) Objectives |
| * 1. The Tenderer shall confirm that the objective of any **Demonstration Phase** shall at least be to validate the product or service in its operational environment (i.e. involving users and/or customers). | [Section I.7.2](#_Objectives_2) Objectives |
| * 1. The Tenderer shall confirm that the objective of **Ground and user segment Demonstration Phase** shall validate key performance in the operational environment prior to commercialisation and on a scale sufficient to demonstrate the commercial attractiveness of the product. | [Section I.7.2](#_Objectives_2) Objectives |
| * 1. For the **Ground Segment and System related activities,** the Product Specification shall define the technical requirements at a level of detail commensurate with the development status of the product. The technical requirements shall cover the following: * functional requirements; * performance requirements; * interface requirements; * environmental requirements; * design requirements; * quality requirements; * implementation requirements; * operational scenarios requirements, user needs and use cases (if applicable); * verification requirements, in particular those established for the product by any third party. * Quality   *For example, third-party verification requirements could be received from the customer(s), or from a certification authority such as the FCC. Verification methods include test, analysis, similarity, review of design, inspection, or some combination of these.*  *Requirements needing further elaboration should be highlighted (e.g. TBC/TBD).* | [ANNEX I.2](#Spec) Technical Requirements |
| * 1. For the **Ground Segment and System related activities,** the Tenderer shall provide a copy of the technical requirements for any major subsystem of the product at a level of detail commensurate with the development status of the product. | [ANNEX I.2](#Spec) Technical Requirements |
| * 1. The requirements should be specified using unique identifiers. | [ANNEX I.2](#Spec) Technical Requirements |

## Annex I.2 - Product Specification

### Technical Requirements

|  |  |
| --- | --- |
| **Content Requirements** | **Phase(s)** |
| [Annex I.1](#_Annex_I.1__1) (7, 8, 9) | All |

Include the requirements of the product to be developed and the main technical requirements of its constituent parts (in particular for the new assemblies to be developed such as sub-assemblies, modules, components, etc.)

Include the following statement if the product specification is provided as a separate document

The requirements for the product and its constituent parts are presented in document reference(s), a copy/copies of which is/are attached to this proposal.

### Statement of Compliance to the Requirements

Include this section only if some or all requirements have been provided by a third party/external entity (for example, a satellite prime, an operator, or an ESA mission), or if the proposal addresses a Demonstration Phase, and there are differences between the proposed product configuration and the generic/fully operational one.

A statement of compliance to the requirements for the product and its constituent parts is presented in document reference(s), a copy/copies of which is/are attached to this proposal.

### Requirements Traceability

Include this section if the product complexity is such that multi-level specifications are used and the development maturity of the product enables the traceability to be defined

A requirements traceability matrix is presented in document reference, a copy of which is attached to this proposal.

1. Commercial Off The Shelf [↑](#footnote-ref-2)
2. The development phase(s) in which the proposed development will take place. [↑](#footnote-ref-3)
3. Brief description of the proposed main development activities for this item. [↑](#footnote-ref-4)