**INTRODUCTION LETTER and PROPOSAL TEMPLATE**

**[N.B. Use this template to prepare your proposal. Once the proposal is complete and internally validated, please remove all captions in red colour, , add your own logos, headers/footers prior to finalising your proposal for submission to Verhaert. The proposal shall be submitted in a searchable and indexed PDF file for easier viewing.]**

**[COVER LETTER]**

From: **..........** [For the **Applicant** to insert name of the company/institute submitting the application]

Date: **..........** [For the **Applicant** to fill in the date of the proposal]

To: Verhaert New Products and Services

Hogenakkerhoekstraat 21

9150 Kruibeke

BELGIUM

**Contact person: Koen Vriesacker and Dany Robberecht**

Subject: Application for the Belgium Space Solutions Technology Transfer Demonstrators

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Dear Sir/Madam,

With reference to the above Call for Demonstrator, we are pleased to present this proposal:

1. The Applicant [potential Contractor] is:

**....** [full name of company or institute]

**....** [address of its seat]

E-mail: **........**

Telephone: **........**

County of origin [company] : **........**

VAT Number: **…….**

1. The Subcontractor[s] participating to the activity is [are]:

**Please fill in the tables below**

**TEAM and Price Breakdown Information:**

|  | **Prime Contractor**  **[Applicant]** | **Subcontractor 1** | **Subcontractor 2** |
| --- | --- | --- | --- |
| Economic Operator Complete Name and Legal Nature [[[1]](#footnote-0)] |  |  |  |
| SME [indicate YES or NO] |  |  |  |
|  |  |  |  |
| Total Price per Entity |  |  |  |  |  |
| **TOTAL PRICE** |  | | |

1. The firm-fixed price contract for the activity in accordance with the funding conditions stated in the Call, amounts to: **……...... Euro** [insert the amount of the total price] all included with the sole exception of any import duties and value added taxes. [In case of the proposal including Subcontract[s], an additional price information is to be stated in: a financial breakdown showing the amount allocated individually to each of the participants, including the own share of the Contractor].
2. The contact person of the Applicant to whom all communications relating to this letter should be addressed is the following: **......** [name of contact person[s], telephone number, e-mail address – it being understood that two [2] contact persons, one technical and one legal/commercial, might be advantageous. Please fill in as needed.]

a] for technical matters as follows:

|  | To: | With copy to: |
| --- | --- | --- |
| Name |  |  |
| Telephone No. |  |  |
| e-mail address |  |  |

b] for contractual and administrative matters as follows:

|  | To: | With copy to: |
| --- | --- | --- |
| Name |  |  |
| Telephone No. |  |  |
| e-mail address |  |  |

1. for Personal Data Protection matters to be addressed to the Data Protection contact point as follows:

|  | To: |
| --- | --- |
| Name |  |
| Telephone No. |  |
| e-mail address |  |
| Mail Address |  |

1. Regarding the technical and management contents of this Proposal, we hereby certify that this application fully complies with the technical and management requirements of the subject Call, including the latter’s Introduction Letter and all other Appendices and/or Annexes.

In addition, the technical contents of this Proposal are free from any plagiarism. When use is made of material being quotations or citations from existing public literature such use is clearly indicated and due reference indications [source and author] are provided.

1. We hereby state that we have read and understood all the terms and conditions of the Draft Contract included in the subject Call and that we accept the said terms and conditions without any reservations. We also confirm that any sales conditions of our own shall not apply.
2. With reference to the Draft Contract, we hereby specifically confirm our full compliance.
3. [One of the 2 following alternative statements 8.a] and 8.b] is to be deleted]

8. a] Concerning the feasibility to export the deliverable items of the resulting Contract as that is foreseen in the Draft Contract including its Appendices, we hereby declare that we have examined the case and drawn the conclusion that there are no export restriction issues and thus no need to obtain specific licences or authorisations.

**or**

8. b] Concerning the feasibility to export the deliverable items of the resulting Contract as that is foreseen in the Draft Contract including its Appendices, we hereby declare that we have examined the case and drawn the conclusion that export restrictions and/or need of adequate licences or authorisations exist, and that the status regarding such requirements is at present the following:

- the Applicant **or [option]** its Subcontractor ?… [name] has obtained the following authorisation[s] in order to submit this application: ?………. [to specify]

**and/or** **[option]**

- the Applicant **or [option]** its Subcontractor ?…. [name] will need to obtain prior to the placing of a Contract, the following authorisation[s]: ? …… [to specify]

1. The legal representative to sign the resulting Contract on behalf of the Contractor will be: **.....** [name and title of the person]
2. The proposal is valid during the following time period, reckoning from the closing date for application submission: **3** months

We hereby acknowledge the right of Verhaert during the validity period of this Proposal, to require the Applicant to provide evidence of any element of its Proposal and to give additional detailed information, including on the price quotation, whatever the type of price is.

1. By submitting the Proposal, I/we the undersigned herewith officially declare that the Proposal fulfils the Key Acceptance Factors listed below, as well as indicated in section 4 of the subject Call Cover Letter.
2. By submitting the Proposal, Verhaert is allowed to include the electronic version of public summary of work covered out in its database with public access.

| Key Acceptance factor |  | Reference paragraph and page in proposal |
| --- | --- | --- |
| 1. The Applicant confirms, on its behalf and on behalf of its Subcontracter[s] to satisfy the “Eligibility Requirements”; | ☐ |  |
| 2. The Applicant confirms, on its behalf and on behalf of the subcontractor, to fulfill the requirements concerning the proposal; | ☐ |  |
| 3. The Applicant confirms, on its behalf and on behalf of its Subcontractors, to be compliant with the “Non Benefit Requirements; | ☐ |  |
| 4. The Applicant confirms that the tender Cover Letter and Detailed proposal contain a binding price; | ☐ |  |
| 5. The Tenderer confirms that the Cover Letter and the Detailed Proposal contain a price type compliant with the one requested in this call; | ☐ |  |
| 6. The Applicant confirms that the proposal is compliant with the budgetary limit applicable for each Demo; | ☐ |  |
| 7. The Applicant confirms that the tender Cover Letter contains the confirmation of the validity period required in the subject call; | ☐ |  |
| 8. The Applicant confirms that the tender Cover Letter is signed by the authorized representative[s] of the applicant; | ☐ |  |
| 9. The Applicant confirms that the proposal pertains to the transfer [i.e. the use for a terrestrial application] of a space heritage technology [i.e. the space heritage technology is a piece of hardware, software, know-how, process, methodology or system developed or adapted for space applications]. The applicant confirms that the proposal does not concern the exploitation of satellite borne data, GNSS signals and satellite communication capacity; | ☐ |  |
| 10. The Applicant confirms that the Technology Description is fully filled in; | ☐ |  |
| 11. The Applicant confirms that a target terrestrial application has been identified [including identification of industry, end-users, and description of use case scenario] | ☐ |  |
| 12. The Applicant confirms that the market opportunity has been validated [validation of the problem and of the value proposition] | ☐ |  |
| 13. The Applicant confirms that the technical solution has reached TRL5 [successful breadboard verification in a relevant environment], and that the proposal provides evidence of it. | ☐ |  |
| 14. The Applicant confirms the agreed participation of a non-space receiver in the activity. In case the non-space receiver is not a subcontractor, a Letter of intent shall evidence its role as described in the work package of the Detailed Proposal Template. | ☐ |  |
| 15. The Applicant confirms that the donor of the space heritage technology is independent [organizationally and financially] from the end-user organization involved in the activity. | ☐ |  |
| 16. The applicant confirms to exclude activities promoting or being related to alcohol, tobacco, religion, politics, intolerance, violence, firearms, pornography, obscenity, gambling or illegal drugs. | ☐ |  |

Done and signed for, and on behalf of **.....................** [Name of the company or institute acting as the Applicant ]:

Signature: **..............................**

Name and title of the signatory: ........................ [Full name and function] duly authorized to commit the application entity and its proposed Subcontractor[s] if any, for this purpose.

**[END COVER LETTER]**

**[DETAILED PROPOSAL TEMPLATE]**

**DETAILED PROPOSAL FOR THE TECHNOLOGY TRANSFER DEMONSTRATORS:**

**TITLE OF THE PROPOSAL: [insert title]**

**Abstract [Key elements on the technology and its new application – Max 5 lines including keywords]**

**Technology Domain of the space heritage** [Tick TD which is applicable in the last column; otherwise describe the applicable technology domain in the last row]

| **TD #** | **Technical Domain description** | **Applicable TD** |
| --- | --- | --- |
| 1 | **On-Board Data Systems** | ☐ |
| 2 | **Space System Software** | ☐ |
| 3 | **Spacecraft Electrical Power** | ☐ |
| 4 | **Space Environments & Effects** | ☐ |
| 5 | **Space System Control** | ☐ |
| 6 | **RF Payload and Systems** | ☐ |
| 7 | **Electromagnetic Technologies & Techniques** | ☐ |
| 8 | **System Design & Verification** | ☐ |
| 9 | **Mission Operation & Ground Data systems** | ☐ |
| 10 | **Flight Dynamics & GNSS** | ☐ |
| 11 | **Space Debris** | ☐ |
| 12 | **Ground Station System & Networks** | ☐ |
| 13 | **Automation, Telepresence & Robotics** | ☐ |
| 14 | **Life & Physical Sciences** | ☐ |
| 15 | **Mechanisms & Tribology** | ☐ |
| 16 | **Optics** | ☐ |
| 17 | **Optoelectronics** | ☐ |
| 18 | **Aerothermodynamics** | ☐ |
| 19 | **Propulsion** | ☐ |
| 20 | **Structures & Pyrotechnics** | ☐ |
| 21 | **Thermal** | ☐ |
| 22 | **Environmental Control Life Support [ECLS] & In Situ Resource Utilisation [ISRU]** | ☐ |
| 23 | **EEE Components and quality** | ☐ |
| 24 | **Materials and Processes** | ☐ |
| 25 | **Quality, Dependability and Safety** | ☐ |
| 26 | **Other: Name TD** | ☐ |

1. **TECHNICAL PART** **AND APPLICATION PART**
   1. SPACE HERITAGE AND SPACE TECHNOLOGY READINESS LEVEL [TRL]:

Nota bene: A space heritage technology can be hardware, software, know-how, processes, methodologies or systems developed or adapted for space applications. Satellite borne data, GNSS signals and satellite communication capacity are not considered as space heritage technologies in the context of technology transfer. In case the technology was originally developed for terrestrial purposes [and later spun into space], the space heritage refers to the technical adaptations made on the terrestrial baseline.

Provide the following elements to describe the space heritage technology:

1. Name of the technology:
2. Abstract:

Provide an abstract of the technology in less than 3 lines including keywords – provide at least one illustrative picture.

1. Space origin:

Indicate what problem it does solve in space, and when/what it was developed for, e.g. a space mission, technology development program]. In case the technology was developed under one or more ESA contract[s], please provide the activity name[s] and contract number[s].

1. Description of the technology:

Indicate what functions it performs, its key features and capabilities, and describe how the technology is physically implemented [in case of hardware].

1. Innovation and advantages:

Describe the innovative aspects of the technology, as well as its advantages with respect to alternative technologies which perform equivalent functions.

1. TRL:

Identify with justification the current level of maturity of the technology [TRL] for space applications. Please refer to Annex 2 to this Template for the description of TRLs.

1. IPR:

Provide the IPR situation in case relevant [are background IPRs needed? Has an invention been protected by a patent, etc].

☐ The Applicant confirms and agrees to allow Verhaert and ESA to keep and publicise its technology description for further opportunities at Verhaert in the framework of Space Solutions [ i.e. post it on the ESA’s and Verhaert’s websites, bring it to the attention of non-space organisation looking for a solution, put you in contact with such organisations.

1.2 NEW APPLICATION OF THE SPACE HERITAGE [Defining the Current situation and challenge]

1. New application domain:

Describe the new domain of application.

1. Receivers:
   * Identify the intended customers of your solutions, and describe their role in the value chain. Customers shall be understood as the stakeholders who are candidates to procure directly your solutions.
   * Identify end-users and describe their operational role. End-users shall be understood as stakeholders who are candidates to operationally use the solution [possibly embedded into a larger system]
2. Current use case scenario:

* Describe the current operational situation without making use of the new solution.

1.3 MARKET OPPORTUNITY

1. Problem and Problem validation:

Describe the operational limitations or problems faced in this use case scenario [which you think the space technology can help to solve], and explain the impact[s] of those problems [e.g. large costs, safety issues, lack of performance, issues of maintenance, disposability, environmental footprint, etc…].

Provide evidence of validation of the problem[s] by receivers and possibly other relevant stakeholder[s]. Typically, evidence comes in the form of words from the receiver[s], e.g. quote[s] from a trade journal, excerpt from an interview, etc.

1. Other stakeholder[s]:

Identify all stakeholders [other than the end-users and direct customers] and describe their stake[s] with regards to the problem being solved and the solution being brought [e.g. implementation, procurement, operation, maintenance, health & safety, end of life, etc.].

1. Stakeholder requirements:

Provide the requirements from receivers and all other stakeholder[s], as previously identified. Be as specific as possible, with quantitative requirements when applicable. NB: Cover aspects related to performance, interfacing, costs, maintenance, operational availability & down time, end of life, health & safety, etc…. as applicable.

1. Value proposition and market fit validation:

* Describe the value proposition [i.e. the value that is intended to be delivered to the customer] for the primary target market, i.e. the pains which your product aims to relieve, and/or the gain[s] it intends to provide;
* Present the product features which enable this value proposition;
* Explain how this value proposition addresses and solves [or alleviates] the problems faced by the customers;
* Provide elements of validation of the value proposition by [a] end-user representative[s].

1. Competition analysis:

* Identify competitive offers.
* Compare those competitive offers with yours, in relation to salient stakeholder requirements.

Summarize your findings in the following table. The commercial situation in the last column refers to the level of presence of the competitive product on the market, e.g. is the product being developed? Has newly entered the market, or is it an established offering? How dominant is it on the market?

| **Competitor** | **Country of Origin**  **[ISO Code]** | **Salient Product Characteristics** | **Strengths** | **Weaknesses** | **Key differentiators** | **Tec. maturity**  **[current TRL]** | **Commercial situation?** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Competitor A | **……** | **……** | **……** | **……** | **……** | **……** | **……** |
| Competitor B | **……** | **……** | **……** | **……** | **……** | **……** | **……** |
| Competitor X | **……** | **……** | **……** | **……** | **……** | **……** | **……** |
| Your solution | **……** | **……** | **……** | **……** | **……** | **……** | **……** |

* Identify and describe the unique selling points of your value proposition. As a result, describe the market positioning of your value proposition with respect to competitive offers. Show chart[s] to visually represent how your value proposition stands relative to competitive offers.
* Make a SWOT analysis of your undertaking, and summarise it via a table.

1. Market:

* Identify and characterise the possible market segments
* Provide an estimate of the total market and the serviceable obtainable market, and provide evidence to justify your estimates.

## TECHNICAL SOLUTION

About the expected development stage: The applicant is expected to present the system requirements, the system design, and the experimental evidence of the feasibility of their system, as achieved prior to the demonstrator activity.

1. System requirements

Provide the system requirements, both functional and non-functional, at system level. NB: Those system requirements should derive from validated receiver requirements.

1. System design

Describe the design for the new product; provide schematics or charts of the physical and functional architectures of the solution, down to sub-system level.

1. Impact assessment

Evaluate (qualitatively and quantitatively whenever relevant) the impact of implementing the new solution, relative to the reference scenario, when the solution was not implemented.

Impacts shall be evaluated at the level of the item being changed, but also on the other subsystems, and eventually at the level of the wider system.

Impact can be related to a variety of aspects, e.g.

* + new functions
  + weight, size, power consumption
  + operational performance
  + operational range; robustness to environmental conditions
  + logistics efficiency (e.g. in relation to the supply chain, procurement, assembly and/ or distribution)
  + production efficiency (e.g. at level of manufacturing, integration, quality assurance)
  + safety

Once the practical impacts (as exemplified above) are well evaluated, they should be translated into cost gains over the product life cycle, and consolidated into a single cost metrics.

1. Justification and feasibility
   * Present the possible options at hand to implement the desired functions; justify the technical choices made for the design of the system;
   * Identify the requirements which are most critical and/or difficult to meet, in relation to the critical functions and required performance levels for the new (non-space) application. Discuss and assess the associated risks;
   * Provide experimental evidence that the solution can meet those requirements, i.e.

* Describe the prototype or breadboard which was built for the purpose of testing the solution against those critical requirements;
* Describe the test methodology and procedures which were carried out;
* Present the outcome of the tests.
  + Provide an assessment of the remaining level of risks in relations achieving those critical requirements.

1. Technical maturity

Identify with justification the current level of maturity of the technology(ies) under development in the context of the new application;

Explain if and how the technology is mature enough for a demonstration project NB: by the end of the activity, the complete solution needs to be tested for validation and acceptance in an operational (or operational like) environment.

1. Importance and suitability of space heritage

Explain the suitability and significance of the space heritage technology for achieving the value proposition, intended for the particular application which you target (NB: refer to section 1.1 for a definition of space heritage); explain how the space heritage may provide advantage(s) and added value to solve the problem of the new application (as captured by the requirements) with regard to prior art and alternative technical options.

## TECHNICAL RISKS & MITIGATION PLAN TOWARDS COMMERCIAL OPERATIONS

1. Describe the target situation for the considered undertaking at onset of operations, or early commercial operations (regardless of the scope of the demonstrator activity). Your description should cover all aspects relevant to bringing the solution to the market, including technical, business and operational matters, i.e.
   1. All elements of the business canvas model
   2. IPR situation
   3. Financial situation
   4. Product maturity & certification
   5. Supply chain & industrialization
2. Summarise in the following table the major risks and obstacles associated to implementing those objectives:

| Risk Identifier | Description | Likelihood | Severity |
| --- | --- | --- | --- |
| ……… | ……… | low/medium/high | low/medium/high |
| ……… | ……… | low/medium/high | low/medium/high |
| ……… | ……… | low/medium/high | low/medium/high |

1. Explain your current situation on each of those aspects (as listed in 1.4.(1)), and describe your implementation plan (including your plan to mitigate above mentioned risks) to reach the target situation (as described above). The implementation plan should describe the route from your current situation until early commercial operations.
2. Summarise the implementation plan on a GANTT chart, showing clearly how actions are distributed along the timeline, and showing the dependencies among actions.
3. Explain the main objectives of the demonstration activity. Indicate which elements of the implementation plan & which risks (as described in point 1.4.(3)) are addressed in the demonstration activity.
4. Provide a preliminary description of the Pilot Utilisation and Acceptance test plan, i.e.
   1. Context and objectives of the Pilot Utilisation;
   2. Pilot Utilisation approach and implementation plan (incl. preparation activities like training, integration in the user environment, etc.);
   3. Definition of acceptance objectives, Key Performance Indicators (KPIs), acceptance tests approach and implementation plan.

## PROGRAMME OF WORK

1. Work logic

The baseline work logic of the activity is presented in Appendix 1 (section 2.2) to the Draft Contract (Appendix 2 to this ITT package). Include here a compliance matrix against the baseline work logic. In case of deviation from the baseline, provide a flow chart showing the proposed work logic (including work packages, dependencies, and review meetings).

NB: this is a zoom into the GANNT chart provided in 1.4 (4), focusing on the work which is part of the demonstration activity.

1. Work package description

Provide a description of the work (in the form of work packages) which will be implemented to carry out the tasks presented in the work logic, and to eventually achieve the objectives of the activity (as outlined in the AO cover letter and again below). For each work package describe:

* Title
* Objective
* Work package leader
* Approach
* Relevant resources (incl. labour volume)
* Inputs
* Outputs
* Involvement of end-users (if applicable)

All information provided and choice made shall be justified with factual information.

1. Involvement of receiver(s) – [to be filled in only in case the receiver(s) is/are not a subcontractor(s)]

Summarise how receivers(s) will be involved (i.e. their role for each of the work packages which they are involved in), as well as other forms of contributions (e.g. financial contribution, access to facilities, etc.)

Explain the status of your discussions on cooperating over this Demonstration activity. Provide evidence of their interest in the solution, and of their willingness to take the role described, in the form of support letters;

You can summarise the end-user related information in the following table:

| **Name** | **Contributions in the demonstration activity**  **(in-kind labour, financial contribution, access to facilities, etc.)** | Involvement evidence in **support letter?** | **Indicate the status of the cooperation agreement**  (e.g. in place / expected for the negotiation meeting, etc.**)** |
| --- | --- | --- | --- |
| ……… | ……… | Yes / No | ……… |
| ……… | ……… | Yes / No | ……… |
| ……… | ……… | Yes / No | ……… |

1.7 FEASIBILITY OF THE ACTIVITY

1. Suitability of key personnel:

Introduce key personnel [incl. short CVs with information directly relevant to this activity] and explain how key personnel have the appropriate experience, expertise and skills to satisfactorily fulfil their assignment in this activity.

Nota bene: a “key person” is a person who substantially contributes, in terms of effort and knowledge, to the work carried out under a Contract, and who is explicitly nominated to perform such duties. Key persons are individuals with a certain degree of seniority and whose knowledge, reputation and/or skills in the relevant areas or disciplines are critical to achieving the objectives of the Contract.

1. Suitability of organisations facilities:

Present an overview of the involved organisations, and explain how the facilities & equipment required to implement the programme of work will be at the disposal of the activity.

1. **MANAGEMENT PART**

2.1 MANAGEMENT PLAN

[Explain how the activity will be managed to ensure compliance with the proposed schedule [2.2]].

2.2 DELIVERABLE ITEMS

The deliverable items should cover the following content as a minimum. The intent of specifying the deliverables is to clarify the objectives of the demonstrator, for the tenderers to propose suitable work packages. The Tenderer is invited to cover additional content as deemed relevant.

| 1. **Risk mitigation and Implementation plan [RMIP]**   This deliverable shall explain your implementation strategy and plan to bring this demonstration activity to a commercial product.  For each of the aspects listed below, the implementation plan should describe the following:   * The current situation; * The objective[s], at onset of operation [or early commercial operations]; * The approach / strategy and the plan to reach the objective[s]; * The risks and foreseen difficulties; * Timeline; * Resources and budget; * The mitigation plan, and the overall implementation plan.   Implementation, technical and operational aspects to consider in the implementation plan:   * Product development, verification and validation; * Product certification; * Industrialization; * IPR strategy; * Key resources; * Key activities; * Key partnerships & suppliers – value chain and logistics; * Recruitment of staff; * Financing [sourcing and gathering of funds necessary to start the business until the break-even point is reached]; * Customer acquisition, retention & market development; * All other aspects which you deem necessary to implement the solution and the associated business until you reach commercial operations. | |
| --- | --- |
| 1. **Requirement documents (RD)**   The purpose of the Requirements Document is to make sure that all the user’s needs are listed and agreed. These needs are turned into measurable requirements which can be later tested by the consortium in the System Verification Document. The RD should reflect the following activities (and outcome thereof):   * Iteration of user needs and user requirements (in cooperation with pilot users, and other user representatives); * Iteration of system requirements (at system and subsystem level), incl. interface requirements.   The requirements are supposed to be clear before the demonstration activity. The objective of this deliverable here is to have a common baseline document to share with ESA. If necessary, a small amount of time can be dedicated to revisiting the requirements.  The requirements pertain to the complete solution, as utilised by the receiver | |
| 1. **System Architecture Document (SAD)**   The purpose of the System Architecture document is to specify the overall pilot system starting from the high level architecture down to its constituent building blocks (NB: functional and physical architectures are to be summarised in the form of charts). The choice for the constituent building blocks shall be justified, as well as the sourcing of it (in-house development procurement, licensing). The SAD also describes the interfaces between building blocks, and with the demonstration environment. The pilot system is expected to be a complete solution, suitable for (pilot) utilisation by receivers. The above constitute Element 1 of SAD.  In addition, the SAD should reflect the activities in relation to the implementation of the solution, i.e.   * Procurement or licensing of hardware / software elements or subsystems which are not manufactured in-house; * Development and manufacture of in-house sub-systems, incl. all necessary interfaces between sub-systems, and interfaces between the system and its environment, to make the solution fully compliant with the system requirements; * Assembly and integration; * Upgrade of the solution following the verification tests, as required.   Those implementation related aspects are captured in Element 2 of the SAD.  An update of the Impact assessment constitutes Element 3 of the SAD. | |
| 1. **System Verification & Validation Document (SVD)**   The purpose of the System Verification & Validation Document is to plan the repeatable tests which will show how the system meets the requirements set out in the Requirements Document (RD). It shall Recall the list of requirements (with clear pass/fail criteria), as well as the associated test procedures and the test report (outcome and analysis thereof).  For the validation phase, it may be relevant to also capture the level of success of the pilot demonstration activities with KPIs. In that event the SVD shall define those KPIs and the associated measurement procedures.  For practical purposes, the SVD is split into two elements:   * Element 1 concerns the tests for verifying the system requirements. * Element 2 concerns the tests for validating the user requirements and assessing the KPIs of the pilot demonstration activities. | |
| 1. **Pilot Utilisation Plan and Deployment (PUP)**   The PUP is composed of two elements:   * Element 1 is a practical guide to how the pilot shall be run. It demonstrates that the consortium has thought about the practical consequences of taking the product to the field. * Element 2 is to report on the activities related to deploying and integrating of the solution into the (pre)-operational set up on the premises of the pilot customer. | |
| 1. **Summary slides (SS)**   The SS will be used by ESA to present the demonstrator in a nutshell. They are composed of two slides, covering the following elements:   * Space heritage technology (with illustrative image) * Application (with illustrative image) * Achievements and outcome of the demonstration activity. | |
| 1. **Final Report (FREP)**   The FR shall present in about 20 pages (pictures, Index and Appendix included) an overview of the project. It is “the business card” of the project presenting in a concise way the market opportunity, the technical solution being developed, the main activities carried out during the project, as well as the achievements and lessons learnt. Salient elements of the implementation strategy should also be reflected. The Final Report is intended for general audience and publication. Therefore, it shall not contain any sensitive information, nor complex technical details. It should provide meaningful and impactful pictures, graphs, diagrams and/ or tables.   * A description of the technology donor and its position in the project, along with the engagement statement. * The IP transfer mechanism and design, clearly explaining how the technology/knowledge will be transferred. Along with the explanation, an overview of the financial and non-financial agreements between the technology donor and receiver regarding the technology transfer is offered. * A clear description of the technology. If available, previously created technology descriptions can be used * A description of the technology receiver, showing the track record and future capabilities of the company to succeed in the technology transfer * A clear description of the problem or need that is solved by the technology transfer * A description of the technology-need fit, explaining why and how the transferred technology solves the problem/need * A description of the Donor Value Proposition, indicating how the initial technology owner benefits from the technology transfer * A description of the end user that is involved in the project, along with the demonstration that this end customer is representative for a broader market that can be targeted by the technology transfer * A description of the end customer-value proposition, explaining how the technology receiver provides value to the end customer through a sustainable business model. This business model is explained using the Business Model Canvas   (see h[ttps://en.wikipedia.org/wiki/Business\_Model\_Canvas](https://en.wikipedia.org/wiki/Business_Model_Canvas)) | |
| 1. **Technology description (TD)**   The TD is a short document (less than 2 pages) which describes the space technology under investigation in this demonstration activity, as a candidate for transfer into a terrestrial application domain. The TD shall provide an update of the information requested in paragraph 1.1 (space heritage and space technology readiness level) | |
| 1. **Summary and Achievements (S&A)**   The S&A provides a 1 page overview of the demonstration activity, as well as its main achievements and conclusions. This document will be used for reporting within and outside ESA. | |
| 1. **Project Bar Chart (PBC)**   The PBC is a GANNT chart of the demonstration activity. It is a living document, which should capture the current status and plans for the activity. | |

1. **FINANCIAL PART**
   1. PRICE QUOTATION FOR THE CONTEMPLATED CONTRACT:

[Enter here the total amount quoted as a Firm Fixed Price, in Euro, delivery duty paid, exclusive of import duties and value added taxes in BELGIUM]

3.2 DETAILED PRICE BREAKDOWN

* + 1. Breakdown of the total finances per work package
    2. Travel costs
    3. Payment Plan

[Provide a Payment Plan using the table here below, taking into account Article 4 of the Draft Contract. All claims for payment shall be linked to the achievement of defined schedule milestones with tangible deliverables including as the case may be, achieved performance of service. Examples of such milestones are the satisfactory completion of WPs and delivery of the related output.]

[You are requested to indicate below for only information purposes, the Payment Plan that is envisaged for Subcontractor[s]

| Milestone (MS) Description | Schedule Date | Payments from ESA to (Prime) Contractor  (in Euro) | Country (ISO code) |
| --- | --- | --- | --- |
|
| Progress (MS 1): Upon successful Design Review and acceptance by the Agency of all related deliverable items. | To + … months |  |  |
| Progress (MS-2): Upon successful Verification Test Review and acceptance by the Agency of all related deliverable items. | To + … months | *(not less than 35 % of the total contract price )* |
| Final Settlement (MS-3): Upon successful Final Review, 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 signed Contract Closure Documentation. | To + … months | *(not less than 35 % of the total contract price )* |
| TOTAL |  |  |  |

1. **CONTRACTUAL PART :**
   1. INTELLECTUAL PROPERTY RIGHTS

4.1.1. Right to use/modify Intellectual Property

[The Applicant confirms that they have the right to use /modify the intellectual property rights [IPR] which is subject to the technology transfer. The specific types of rights shall be identified [e.g. ownership, licence, etc.]

* 1. IMPORT AND EXPORT LICENCES

[This section is only to be completed in case of items or services that are subject to envisaged or probable inclusion of import/export restrictions, other than those from the Applicant ’s own country, in either the body of the work performed under this activity or in a resulting product or service. For the purpose of this section, ‘items’ shall be taken to include EEE parts and materials, ‘services’ shall be taken to include testing and coating and such restrictions include, as example, US ITAR, Israeli Export Control etc. ]

* + 1. Import and Export Licences applicable to this Activity

[OPTION1]

The Applicant declares that no items subject to import or export control will be used in the execution of this activity.

[END OPTION1]

[OPTION2]

The Applicant declares that the following items, subject to import or export control will be used in the execution of this activity:

| Item | Control Type and Country of Origin | Deliverable affected | Comment |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**ANNEX 1: TECHNOLOGY READINESS LEVEL [TRL]**

ESA has adopted the Technology Readiness Level [TRL] scale as a way to measure the maturity of a technology. It has now become a well-established standard. For additional information on definitions, please refer to ECSS-E-AS-11C.

|  | **Technology Readiness Levels[[2]](#footnote-1)** | |
| --- | --- | --- |
|  | **9** | Actual system “flight proven” through successful mission operations |
| **8** | Actual system completed and accepted for flight “flight qualified” |
| **7** | Model demonstrating the element performance for the operational environment |
| **6** | Model demonstrating the critical functions of the element in a relevant environment |
| **5** | Component and/or breadboard critical function verification in a relevant environment |
| **4** | Component and/or breadboard validation in laboratory environment |
| **3** | Analytical and experimental critical function and/or characteristic proof-of-concept |
| **2** | Technology concept and/or application formulated |
| **1** | Basic principles observed and reported |

**Figure 1 – Technology Readiness Levels adopted in ESA since 2005**

Regarding the maturity status of software the same number of TRL are indicatively used. A short description using software engineering terms is shown in Figure 2.

| **TRL** | **Software Maturity** |
| --- | --- |
| **9** | Live Product |
| **8** | General Product |
| **7** | Early Adopter Version |
| **6** | Product Release |
| **5** | BETA Version |
| **4** | ALPHA Version |
| **3** | Prototype |
| **2** | Algorithm |
| **1** | Mathematical Formulation |

**Figure 2 – Technology Readiness Levels using software engineering terms**

Figure 3 gives an indicative correspondence between commonly used engineering terms and TRL levels:

| **TRL** | **Commonly Used Engineering Terms** |
| --- | --- |
| **9** | Mission Operations. Flight Qualified Hardware/Software |
| **8** | Theoretical First Unit. Flight Unit. Flight Spare. |
| **7** | System Demonstration. |
| **6** | High-Fidelity Laboratory Prototype. Engineering Qualification Model. Subsystem model. Development Model. System Model. |
| **5** | High-Fidelity Breadboard. Brassboard. Engineering Breadboard. Function-Oriented Model. |
| **4** | Component. Breadboard. |
| **3** | Laboratory Experiments. |
| **2** | Systems Analysis. Pre-Phase-A Studies. |
| **1** | Scientific Research. |

**Figure 3 – Technology Readiness Levels and associated Common Engineering Terms.**

Figure 4 gives an indicative list of readiness levels for applications and service developments

| **TRL** | **Applications and Services** |
| --- | --- |
| **9** | Application/service operationally deployed and used by paying customers |
| **8** | Application/service completed and validated, commercial offer ready |
| **7** | Trials with customers/users to validate utilisation and business models |
| **6** | Demonstration of prototype in relevant environment, price policy identified |
| **5** | Application/service verified using operational elements, customers/users not involved |
| **4** | Application/service verification in laboratory environment, market segment[s] and customers/users identified |
| **3** | Concept analysis performed and target market identified |
| **2** | Application/service concept formulated, market opportunities not yet addressed |
| **1** | Scientific research |

**Figure 4 –Readiness Levels for Applications and services**

**[END DETAILED PROPOSAL TEMPLATE]**

1. Specify here the type of business entity to which the company belongs [e.g Limited Company, Société Anonyme, AG etc). [↑](#footnote-ref-0)
2. ref. Technology Readiness Levels - A White Paper April 6, 1995, John C. Mankins, Advanced Concepts Office, Office of Space Access and Technology, NASA) [↑](#footnote-ref-1)