Part 3B

Product Development Plan

Proposal Reference: (reference number)

**Notes for the Use of this Template**

Material presented in this plain style is suggested content for a Full Proposal. 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.

This style is used to identify information that must be modified and/or completed by the Tenderer for the proposed activity. This supplementary information should be 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 optional. However, the Agency recommends not to change the structure of this Part of the Full Proposal (i.e. the table of contents should remain as indicated in this Full Proposal Template).

 Table of Contents

[1 Introduction 3](#_Toc476227579)

[2 Description of the Product 4](#_Toc476227580)

[2.1 Product Overview 4](#_Toc476227581)

[2.2 Functional Overview 4](#_Toc476227582)

[2.3 Product External Interfaces 4](#_Toc476227583)

[2.4 Product Context 5](#_Toc476227584)

[2.5 Product Tree 5](#_Toc476227585)

[2.6 Preliminary (Baseline) Implementation Architecture 5](#_Toc476227586)

[2.7 Design Trade-Offs 5](#_Toc476227587)

[3 Third Party Products/Rights 6](#_Toc476227588)

[4 Product Heritage and Current Development Status 6](#_Toc476227589)

[4.1 Description of the Heritage and Starting Point 6](#_Toc476227590)

[4.2 Current Development Status of the Product 7](#_Toc476227591)

[5 Overall Product Development Constraints 8](#_Toc476227592)

[5.1 Key Requirements 8](#_Toc476227593)

[5.2 Other Constraints 8](#_Toc476227594)

[6 Dependencies on Other Activities 9](#_Toc476227595)

[6.1 Dependencies on Previous Activities 9](#_Toc476227596)

[6.2 Dependencies on On-Going or Future Activities 9](#_Toc476227597)

[6.3 Management of Interdependencies 9](#_Toc476227598)

[6.4 Overlap 9](#_Toc476227599)

[7 Overall Product Development Plan 10](#_Toc476227600)

[7.1 Development Phases 10](#_Toc476227601)

[7.2 Overall Development Logic 10](#_Toc476227602)

[7.3 Development of Key Product Building Blocks 10](#_Toc476227603)

[7.4 Key Decision Points 11](#_Toc476227604)

[7.5 Model Philosophy 11](#_Toc476227605)

[7.6 Overall Verification Approach 12](#_Toc476227606)

[7.7 Overall, Qualification, Certification and/or Type Approval Approach 13](#_Toc476227607)

[7.8 Margin Philosophy 13](#_Toc476227608)

[8 Overall Product Development Schedule 14](#_Toc476227609)

[9 Risk Analysis and Management 14](#_Toc476227610)

# Introduction

This document describes the final product and its current development status. It presents an overall product development plan for the product and its constituent parts, from the current status up to the point where the product will be ready for commercialisation.

or the following statement

The product development plan for the product and its constituent parts is presented in document reference(s), copies of which are attached to this proposal. It describes the final product, its current development status and the steps necessary to develop the product from its current status up to the point where it will be ready for commercialisation.

The Product Development Plan includes an overview of the work to be performed in names of Development Phases covered by the proposal, which are the subject of this proposal. A detailed Design, Development and Verification Plan is provided in a separate Part 3C of our proposal for each of these Development Phases for which support under ARTES ScyLight Element is being requested.

The Product Development Plan has been produced in compliance with the following standard(s): standard reference(s).

include the following (if appropriate)

The following supporting documents related to this Product Development Plan are attached to the proposal.

**Supporting documentation**

|  |  |  |
| --- | --- | --- |
| **Document Title** | **Scope** | **Reference** |
| *e.g. Risk Register* … | … | … |
| *e.g. Company Margin Philosophy* … | … | … |
| … | … | … |
| … | … | … |

# Description of the Product

## Product Overview

The product is a …top level description of the product.

The role of the product is ….

or

The product is an enabling item for the … equipment. The role of this equipment is …. Within this equipment, the product provides the following capabilities:

* Function/capability 1.
* Function/capability 2.
* Etc.

## Functional Overview

The figure below is a functional block diagram of the product that identifies its main functional modules and external interfaces.

insert a functional block diagram of the product

The main functional modules are described in the table below.

**Functional modules**

|  |  |  |  |
| --- | --- | --- | --- |
| **Product Development Plan Template** | **Functions/Features** | **Description** | **Critical Technologies** |
| Name of module 1 | … | … | … |
| Name of module 2 | … | … | … |
| Etc. | … | … | … |

## Product External Interfaces

The external interfaces of the product are summarised in the table below.

**External interfaces**

|  |  |  |
| --- | --- | --- |
| **Interface Identification** | **Key Parameters** | **Purpose** |
| … | … | … |
| … | … | … |
| … | … | … |

## Product Context

The product will be used within the …e.g. laser communications terminal… to provide …e.g. wavefront correction....

## 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:

1. Product.
	1. Element 2.
		1. Element 3.
			1. Element 4.
	2. …

## Preliminary (Baseline) Implementation Architecture

The overall architecture of the product is shown in the functional block diagram presented previously. The baseline implementation of the product and its constituent modules is summarised in the table below. Further implementation details are provided in the subsequent text.

**Product implementation summary**

|  |  |  |  |
| --- | --- | --- | --- |
| **Module** | **Design Concept** | **Implementation** | **Build Standard** |
| Name of module 1 | … | See Figure … | … |
| Name of module 2 | … | See Figure … | … |
| Etc. | … | … | … |

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

The implementation of Name of module 1 is …. The choice of components and materials is …. The build standard is ….

The implementation of Name of module 2 is …. The choice of components and materials is …. The build standard is …. Etc.

## Design Trade-Offs

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

**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

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 ….

Financial information relating to the use of third party products/rights is provided in section … Part 6 of the Financial Proposal.

# 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 has been … 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

The product is the first of a new product line, however the entity has heritage in …. details of related products which the entity has already developed.

or if the entity is new or an SME

The product represents a new product line for the entity. However members of the team working on the programme have had experience with ….details of related experience…

The entity has the following infrastructure enabling it to develop the new product line. ….details of related equipment, processes and capabilities…

## Current Development Status of the Product

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.

**Summary of the current development status**

| **Item** | **Product Tree Ref.** | **Current RL** | **Basis of the RL Assessment** |
| --- | --- | --- | --- |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |

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

The development status of item is as follows: …. Etc.

# Overall Product Development Constraints

## Key Requirements

The requirements detailed in the following table are the main driving factors in the design and development. All/… of these are covered in the project risk register.

**Key product requirements**

| **Product Requirements** |
| --- |
| **Criticality ID** | **Requirement ID** | **Requirement** | **Description of criticality** |
| 1 | … | … | … |
| 2 | … | … | … |
| 3 | … | … | … |
| … | … | … | … |

## Other Constraints

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

**Other product development constraints**

| **Type of Constraint** | **Nature of the Constraint** | **Impact/Criticality** |
| --- | --- | --- |
| Implementation(e.g. model/prototype constraints) | … | … |
| Qualification/Certification/ Type Approval | … | … |
| Verification | … | … |
| Business Plan(time to market) | … | … |
| Business Plan(cost) | … | … |
| Other | … | … |

# Dependencies on Other Activities

## Dependencies on Previous Activities

The proposed activity is/is not a follow-up of a previous activity/previous activities.

include the text and complete the table below only if the proposed activity is a follow-up of a previous activity or activities

Further details are provided in the table below.

**Previous activities followed up by the proposed activity**

| **Programme** | **Activity Name** | **Completion Date** | **Brief Description** | **Main Outcomes** |
| --- | --- | --- | --- | --- |
| … | … | … | … | … |
| … | … | … | … | … |
| … | … | … | … | … |

## Dependencies on On-Going or Future 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 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.

**Dependencies on ongoing or future activities**

| **Programme** | **Activity Name** | **Brief Description** | **Status** | **Start Date** | **Completion Date** | **Nature of Dependency** |
| --- | --- | --- | --- | --- | --- | --- |
| … | … | … | planned/ongoing | … | … | … |
| … | … | … | … | … | … | … |
| … | … | … | … | … | … | … |

## 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. …

## Overlap

We confirm that the work proposed does not overlap with any previous or currently running ESA contract(s) awarded to any entity in the proposed project team.

# 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.

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

**Summary of development phases**

| **Development Phase** | **Status** | **Supported By** | **Included in This Proposal** |
| --- | --- | --- | --- |
| Definition | intended/running/completed | internal project | yes/no |
| Technology | intended/running/completed | national programme | yes/no |
| ScyLight Technology Demonstration | intended/running/completed | ARTES ScyLight | yes/no |
| Product | intended/running/completed | ARTES ScyLight | yes/no |

## Overall Development Logic

The overall development logic is ….

## Development of Key Product Building Blocks

The table below indicates which product subsystems/building blocks will require development to achieve the product development objectives. It indicates the Development Phase in which each development will be performed.

The term “modification” in the table means that adaptations/modifications are planned to be made to an existing building block. New building blocks are indicated as “to be developed”.

**Summary of the product building block developments**

| **Subsystem/Building Block** | **Development Phase** | **Nature of the Development** | **Comments** |
| --- | --- | --- | --- |
| … | … | modification | … |
| … | … | to be developed | … |
| … | … | … | … |
| … | … | … | … |

## Key Decision Points

The key decision points upon which the course of the development will depend are summarised in the table below. The table indicates in which Development Phase and at which review meeting the decision will be made. It includes all key decisions up to the point where the product is ready for commercial exploitation.

**Summary of the key decision points**

| **Key Decision** | **Development Phase** | **Review Meeting** | **Comments** |
| --- | --- | --- | --- |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |

## Model Philosophy

The table below identifies the models (development models, ground support equipment, integration tools, test equipment or external items) that are necessary to verify the product.

The table identifies the characteristics of the product to be verified by each model and the Development Phase in which the item will be developed.

**Summary of the model philosophy**

| **Model** | **Product Characteristics to be Verified** | **Development Phase** | **Comments** |
| --- | --- | --- | --- |
| breadboard | … | … | … |
| ground support equipment | … | … | … |
| … | … | … | … |
| … | … | … | … |

provide a description of the model philosophy to complement the information given in the table

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

## Overall Verification Approach

The table below identifies the major verification activities to be undertaken 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.

**Summary of the qualification/certification/type approval approach**

| **Verification Activity** | **Model** | **Development Phase** | **Comments** |
| --- | --- | --- | --- |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |

provide a description of the verification approach to complement the information given in the table, including the verification approach and plans for each product in terms of methods/levels

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. …

## Overall, Qualification, Certification and/or Type Approval Approach

The table below summarises the approach to obtaining the qualifications/ certifications/type approvals that will required prior to the commercial release of the product.

**Summary of the qualification/certification/type approval approach**

| **Key Decision** | **Development Phase** | **Model** | **Comments** |
| --- | --- | --- | --- |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |

## Margin Philosophy

include this section if the proposal is for a Space Segment development

The margin philosophy related to different parameters at different levels of design maturity is presented in document reference(s), a copy/copies of which are attached to this proposal.

or

The table below provides a summary of the margin philosophy to be applied during the development. The margins reflect the increase in the maturity of the product as the development progresses.

**Margin philosophy**

| **Requirement** | **Model/Review 1** | **Model/Review 2** | **Model/Review 3** | **Model/Review 4** |
| --- | --- | --- | --- | --- |
| mass | 10% | 5% | 2% | … |
| CPU memory | 50% | … | … | … |
| Link Capacity | … | … | … | … |
| … | … | … | … | … |

# Overall Product Development Schedule

The table below summarises the overall product development schedule from the current development status up to the point where the product is ready for commercial exploitation.

**Overall product development schedule**

| **Development Phase** | **Start Date** | **End Date** | **Comments** |
| --- | --- | --- | --- |
| … | mm/yyyy | mm/yyyy | … |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |

# Risk Analysis and Management

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.

**Technical risks**

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

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

The risk mitigation plan is …

The risk management plan can be found in ….