European
Global Navigation
Satellite Systems
Agency

DFMC SBAS Receiver Development

Please note that this presentation is also published on the GSA website

DFMC SBAS Receiver Prototype
Objective

This DFMC SBAS Receiver Prototype activity is envisaged by GSA, yet the presentation or any part of it is non-binding for GSA at this stage

*The **objective** is :*

- *to design, develop and test a prototype of the DFMC SBAS user terminal for the aviation SoL service, augmenting GPS and Galileo capabilities.*
- *The developed receiver, besides the SBAS DFMC functions (for GPS and Galileo), shall also:*
  - ✓ *include Horizontal ARAIM (and, de facto, RAIM)*
  - ✓ *be at a sufficient level of maturity to, as a minimum, carry out flight tests in a representative environment (i.e. TRL 7*)*
  - ✓ *enable industrialisation of a commercial product (i.e. TRL 9*) upon completion of the contract.*

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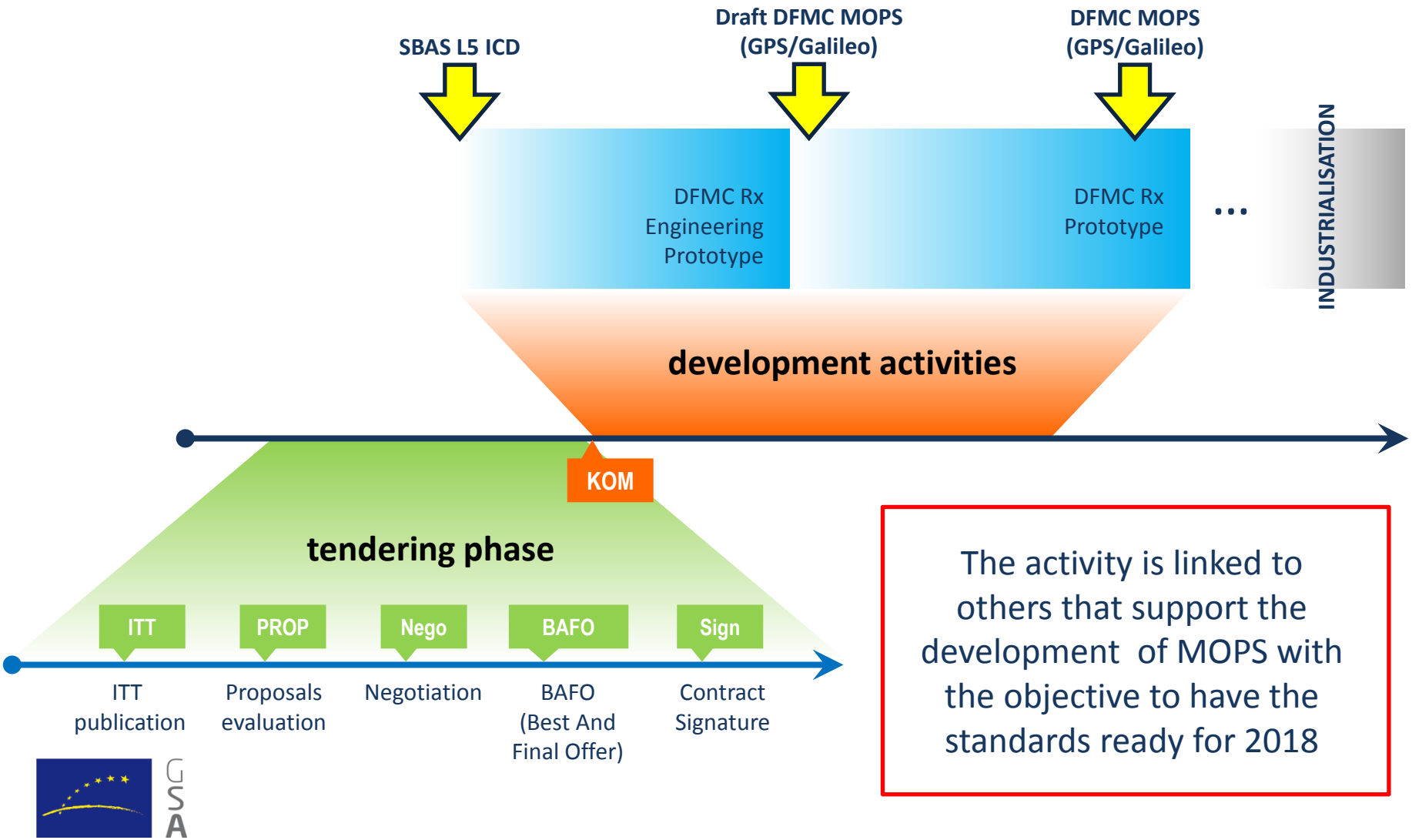
** TRL = Technology Readiness Level*

DFMC SBAS Receiver Development
Overall phasing



The activity is linked to others that support the development of MOPS with the objective to have the standards ready for 2018

Architecture Definition

The first activities are focused on the architecture definition including initial **trade offs**. The trade offs shall address:

- design choices (e.g. modularity, scalability, packaging),
- functions implementation (e.g. H-ARAIM integration, interference mitigation)
- technology choices (e.g. use of SDR technology)

The architecture shall be defined in the first part of the project and, then, refined based on the inputs from the Draft DFMC MOPS.

NB: while the receiver prototyping project progresses, the GSA will also allocate resources, in a separate activity, to the technical analyses required to consolidate technical decisions on open points of the L5 SBAS ICD (cf. work within IWG)

DFMC SBAS Receiver Engineering Prototype Development

The activities aim to develop an engineering prototype to test the functionalities and to verify early performance.

The activities shall include:

- development of the SBAS DFMC Receiver prototype in its version 1
- development and/or update (if already available) of the Testing Tools
- integration and test of the SBAS DFMC Receiver v1 with early performance verification (e.g. in terms of acquisition and tracking sensitivity, pseudo range computation accuracy, etc…).

DFMC SBAS Receiver Version 2 Development

The activities aim to develop the SBAS DFMC receiver in its version 2 i.e. at a sufficient level of maturity to, as a minimum, carry out flight tests in a representative environment (i.e. TRL 7).

The activities shall include:

- delta design to align the architecture to the Draft DFMC MOPS
- development of the SBAS DFMC Receiver in its version 2
- update (if needed) of the Testing Tools
- integration and test of the SBAS DFMC Receiver v2 with full performance verification (using the Testing Tools)

Tests & Trials

The aim is to define testing activities including flight trials.

The tests shall be carried out in a real environment, representative of the operational use of the aviation receiver, for the EGNOS SoL service in order to verify, to the maximum extent, that the TRL target level is reached.*

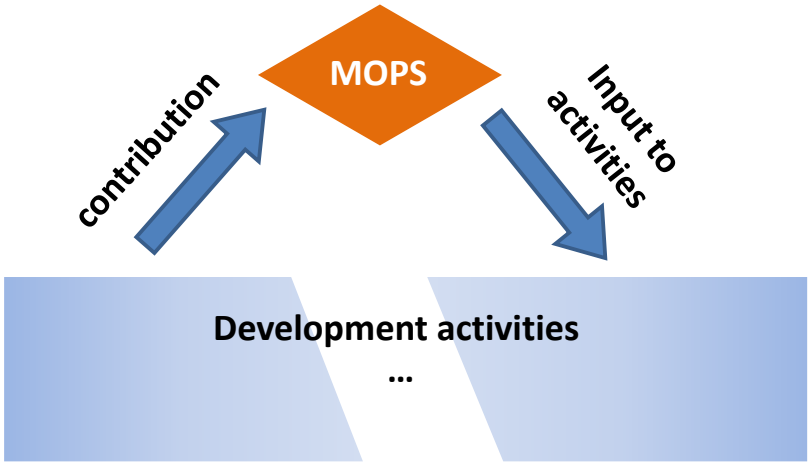
The tests shall be complemented, where needed, with simulated data (e.g. EGNOS V3 data).

* Since GNSS/SBAS systems may not be yet fully operational during the Flight Trials, the activities shall take into account alternative means to complete the testing objectives.

Standardisation & Dissemination

The following activities are addressed:

- Standardisation: participate to RTCA-SC-159 and EUROCAE WG-62, bringing technical input and feedback from the prototyping activity to support the preparation of the DFMC MOPS.
  Link with EC projects that develops the MOPS ("ATLAS") will be organised by the GSA.
  The result of the performance tests shall also contribute to consolidate the DFMC ICD and the DFMC Definition Document in IWG.



- Dissemination: of the results of the work in the most relevant international groups, to industry and users communities, to foster the use of multi-constellation multi-frequency solutions.

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THANK YOU !