Bureau de Normalisation de l'Aéronautique et de l'Espace bnae

Open Call for Tenders

for the execution of the work called for in the proposed Specific Agreement

SMP-STAND-2023-ESOS-01-IBA

GNSS Performance Standardization for Road Transport – Part 3

Starting date: *2024-02-26* Deadline for tenders: *2024-05-13*

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I Introduction

I.1 General

GPSTART-3 (**G**NSS **P**erformance **STA**ndardization for **R**oad **T**ransport – Part **3**) project aims at developing and enhancing EN16803 series which already propose standardized methods in order to assess GNSS based positioning system.

This new standardization project relates on pre-normative and co-normative works on parts dealing with:

- High Accuracy assessment,
- Multi-hybrid terminal assessment,
- Assessment of GNSS layer of HDMaps,
- GNSS I/Q standardization.

These activities will address new methodology and thus will have to establish the validity of methods.
The project addresses co-normative work because a focus will be made to ensure that proposed methods are repeatable and reproducible.
It also includes normative work on the last part of the project which deals with promotion at ISO level of EN16803.

Following the acceptance by the European Commission of a proposal from CEN, as prepared by the AFNOR/BNAE, funding is available for establishing a team of paid experts for this project.

Recruiting these experts has been delegated by the CEN Director General to AFNOR/BNAE.

NOTE: Established in 1991, CEN (European Standardization Committee) operates on a decentralized system covering a network of 32 national members with a central secretariat, the CEN/CENELEC Management Center (CCMC). CEN is a business facilitator in Europe, removing trade barriers for European Industry and consumers. Its mission is to foster the European economy in global trading, the welfare of European citizens and the environment. Through its services, it provides a platform for the development of European Standards and other technical specifications.

NOTE: AFNOR is the French member of the National Standardization Bodies represented at the European and International level. As a monopolistic subcontractor of AFNOR, BNAE is the French standardization office for Aeronautics and Space standardization. BNAE is responsible of the secretariat of CEN/CLC TC5/WG1.

I.2 Context

In April 1996, following the work of the European Union “Standards and Technical Regulation” Committee on Space Standardization, the European Commission requested CEN, CENELEC and ETSI to establish Space Industry Standards (Mandate M/415). This led to the identification of 10 Sectorial dossiers among which one was dedicated to the Global Navigation Satellite System (GNSS) receiver's performances for road transport. In September 2009, following up the M/415 report, the European Commission (EC) issued Mandate M/496 "Mandate addressed to CEN, CENELEC and ETSI to develop standardization regarding space industry (Phase 3 of the process)" to produce upstream and downstream space standards.

As mentioned above, one of the sectorial dossiers was dedicated to the GNSS receivers' performances for road transport. This topic was first addressed under SA 2014-11 which led to the production of technical documents related to the metrics and performance, error model, test procedures for basic performances and security performances.

Then a second follow-up has been initiated under SA 2018-12 which is currently leading to the production of technical work related to the design and validation of Record & Replay scenario as defined by EN16803, to the improvement of PVT error modelling, to the way to tackle integrity for road domain, and the development of new methodology for Assessment of hybridized GNSS device in laboratory.

II Objectives

II.1 General

The overall objective of this standardization activity is to facilitate large-scale deployment of GNSS-based ITS in Europe (especially liability-critical and safety-critical systems), and in particular the systems based upon the added values of European GNSS EGNOS and Galileo, those added values lying particularly on the robustness of the signal and the authentication capabilities.

Large deployment of these GNSS-based road transport systems is expected to:

- Increase economic activity in transport and mobility with the creation of new services based on EGNOS and Galileo,
- Make new markets emerge for the European industry,
- Save costs and energy with travel time and energy consumption reductions,
- Improve safety of the citizens,
- Strengthen the EU scientific position on the global GNSS market.

The following table indicates some recommendations issued from the special report "EU space programmes Galileo and Copernicus", written by the European court of auditors in 2021:

Ref	Recommendations :	How GPSTART3 could address the issue?
XI Page 6	In order to better exploit the potential of the EU's space programmes, the Commission should:	
XI.a) Page 6	-develop a comprehensive strategy for supporting the uptake of EU space services	One of the objectives of GPSTART3 project focuses on High Accuracy Service (HAS), which is one of the differentiators of GALILEO compared to GPS. GPSTART3 will produce new methods and metrics aiming to define how to assess highly accurate services (WP2 T2.1). Even if HAS is expected to promote the use of GNSS for autonomous driving applications, it will need to be supported by additional sensors such as cameras, lidars, odometers, etc. Deeply hybridized systems are much more complex to assess (no relevant test methods yet); therefore GPSTART3 propose to build new methodologies tailored for autonomous driving domain (WP2 T2.2). These methods will be new CEN European standards.
XI.b) Page 6	-develop a conceptual framework for estimating the benefits of the EU space programmes and improve performance measurement	GPSTART3 – as its predecessors projects – will produce several technical inputs for the EN16803 series which *by design* develop a complete standardization framework with the final objective to provide the community with methodologies and tools to estimate and compare performances of GNSS based positioning systems. GPSTART3 also will contribute to the assessment of the GNSS layer of HDMaps. Such layer could be used as a predictive means to know in advance if current area is an area where GNSS is reliable or not (typically a metric giving information on surrounding environment would be accessible). But this kind of layerhas to be reliable and thus shall be assessed (WP2 T2.3).
XI.c) Page 6	-ensure full readiness of Galileo, and better targeted action on uptake of the EU space services;	Writing standards aiming to ensure that comparison between space services is fair will highlight the fact that GNSS device using HAS

		and OSNMA have better performances than the ones that don't. EN16803 promotes standards based on "record and replay" methodologies. That means real and representative signals are recorded in real life and then replayed in laboratories with high fidelity to reality. Doing so, the whole GNSS radio-frequency environment is captured with all its complexity (diffraction / reflexion / attenuation / all frequencies of all constellations / …). Technical means deployed to achieve this objective is the usage of IQ signal (In-phase and Quadrature components). If industrial equipment is available for years, IQ data format is still mainly proprietary. Meaning that a scenario recorded by a specific equipment may not be readable by a similar equipment from another brand. Being able to produce standard defining IQ format will enhance the promotion of EU space services such HAS over E6 and OSNMA. (WP2 T2.4)
XI.d) Page 6	- use the regulatory framework better to support the uptake of EU space services	In GPSTART3, an action will be taken to promote EN16803 series at ISO level. Common actions are already on-going between ISO-TC20-SC14 and CEN-TC5-WG1 on that specific topic (WP2 T2.5)

As a follow-up of the previous studies conducted under SA/CEN/ 2014-11 and SA/CEN 2018-12 signed with DG GROW under previous FPAs, this project intends to tackle these European objectives and gaps.

II.2 Deliverables

For this call, the following deliverables are expected:

Deliverable No	Deliverable Name	WP No	Due Date (month number)	Description
D2.1	HAS - Market Report	2	M36	PDF - EN This document will cover the state of the art, the use cases and the role of current and future actors dealing with HAS.
D2.2	HAS - Performance criteria and test requirements	2	M36	PDF - EN This document will cover the technology classes, the GNSS Receiver chains, the key performance criteria, the metric, the test cases. Regarding the test requirements, it will detail the instrumentation, the measure of uncertainties, the operators (with a description of the specific skills), and the process for acceptation of data used for validation.
D2.3	HAS - Report of test results and practical cases for validation process	2	M36	PDF – EN This document will cover the test results and associated template for declaration of conformity for this kind of test. Regarding the practicle cases,

				the document will describe the test plan, the data collection phase, the GNSS signal replay, and include a test report on two DUTs (device under test) with a comparative analysis.
D2.4	Multi-Hybridization – Context of Use	2	M36	PDF – EN This document will include a state of the art on multi-hybrid terminals, use cases for operational functionalities definition, installation instructions, and profiles for operating environments.
D2.5	Multi-Hybridization – Performance criteria and test requirements	2	M36	PDF – EN This document will provide technology class definitions, key performance criteria, metrics, and test cases. For test requirements, it will include test conditions, measure of uncertainties, expected operators skills and minimum requirements for data validation.
D2.6	Multi-Hybridization – Report of test results and practical cases for validation process	2	M36	PDF – EN This document will provide test results with associated template for declaration of conformity. Regarding the practical cases, it will include the test plan, data collection process description and a test report for 2 DUTs with a comparative analysis.
D2.7	GNSS layer for HD-Maps – Context of use	2	M36	PDF – EN This document will include a state of the art both on HDMaps and GNSS disruptions sources and effects. It will also describe the use conditions of HDMaps.
D2.8	GNSS layer for HD-Maps – Performance criteria and test requirements	2	M36	PDF – EN This document will define reproductibility, representativiness and operatibility criteria for the use of a GNSS layer on HDMaps. Regarding test, the document will include a definition of the dataset need to analyse the performances, and will describe the test requirements for reproductibility, representativiness and operability.
D2.9	GNSS layer for HD-Maps – Report of test results and practical cases for validation process	2	M36	PDF – EN This document will describe the test plan, the test bench or a GNSS terminal (to be defined), and the data analysis.
D2.10	GNSS I/Q Standardization – State of the art	2	M36	PDF – EN This document will provide a detailed mapping of GNSS IQ standardization initiatives.
D2.11	GNSS I/Q Standardization – New standard and SDR	2	M36	PDF – EN This document will define a possible standard on GNSS I/Q format. An open source Software Defined Radio able to process standardized IQ signal will also be delivered.
D2.12	GNSS I/Q Standardization –	2	M36	PDF – EN

	Assessment demonstration			This document will describe the specific data collection involving two different equipement from two different manufacturers.
D2.13	EN 16803 at ISO – Submitted DIS	2	M36	PDF – EN 3 to 4 ISO Standards at DIS Stage.

Finally, based on these deliverables, the objective is that:

- WP2.T2.1 on High Accuracy services will lead to a new part EN 16803.
- WP2.T2.2 on multi-hybridized GNSS systems will either lead to a new part of EN16803 or the update of EN16803-2 and EN16803-4.
- WP2.T2.3 on evaluation of GNSS layer of HDMaps will lead to a new part of EN16803.
- WP2.T2.4 on IQ data format standardization will also lead to a new part of EN16803.
- WP2.T2.5 concerning promotion of EN16803, a task will be dedicated for their promotion in ISO TC20 SC14. This has been requested by GSA to support their discussion within UN/UNECE WG.

III Execution

III.1 General organization

To carry the work, the selection of a team composed of a work package leader and several task leaders, is requested.

Section III.2 and III.3 give for WP2 the objectives and the description of the work.

Below are given the responsibilities for the work package (WP) leader, task leaders, and Steering Committee.

WP leader

The WP leader is acting as a project leader. His duties are:

- Managing the time schedule for the respect of the deadlines
- Organizing the collaborative studies (with the task leaders and JTC5/WG1)
- Supporting the task leaders in the execution of their work
- Organizing the meetings with the task leaders and attending the meetings with CEN/CENELEC TC5/WG1
- Elaborating and delivering the deliverables which are the final outputs of the WP, from the deliverables produced by the task leaders
- Discussing the results of the work with CEN/CENELEC TC5/WG1
- Contributing to the preparation of interim and final reports to the European Commission.

Task leaders

The task leader is placed under the supervision of the WP leader and is fully responsible of the task he his leading. His duties are:

- Organizing and carrying out the work placed under his responsibility, under the supervision of the WP leader.
- Elaborating the deliverables expected as outputs of their task.
- Answering to the requests expressed by the WP leader.
- Attending the meetings organized by the WP leader.
- If needed attending JTC5/WG1 meetings.

Steering Committee

It will be created to coordinate the works done by the different experts within WP2 and for high level discussions among the main stakeholders. This steering committee will be constituted by:

- CEN/CENELEC TC5 WG1 convenor
- A representative from CEN/CENELEC Management Center
- Representatives from the European Commission (Space policy and Galileo unit)
- A representative from EUSPA
- A representative from BNAE.

The project team, under the leadership of the Work Package Leader shall ensure:

- general coordination of technical experts, coordination of functional areas activities, and link with CEN-CENELEC/JTC 5 Secretariat.
- Drafting reports, and draft standard with a well-defined Glossary used in Space and GNSS for road transport sector.
- Regular status reports provided to the Steering Committee for information and seeking assistance on issues where required.

The project team will consider and take due account inputs from the Steering Committee and its members.

III.2 Summary of the tasks

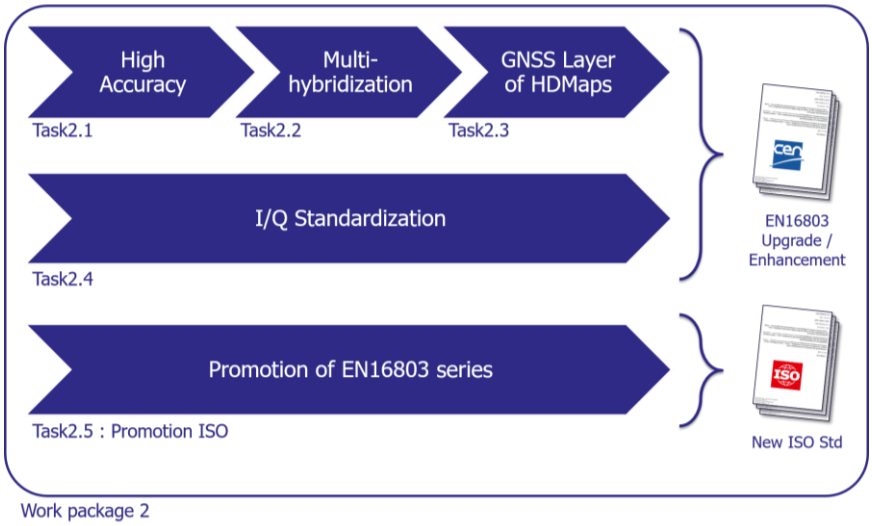
The '*Selected candidates*' will be responsible for the execution of the projects which involves the tasks described below.

The development of documents from the initial assessment to applicable standards is carried out by essential institutions of the European space community. The coordination of work packages 1 (dedicated to project management and administrative tasks, led by BNAE) and 2 is AFNOR (BNAE by delegation) responsibility. The technical work is performed by major European bodies and is monitored and supported by a steering committee of European stakeholders.
The coordinative and technical work will converge in CEN/CLC/JTC 5.
This approach is chosen in order to be able to draw on a wealth of experience in European space standardization and on structures that have grown over many years.

The project will be spread into two different Work Packages comprising several tasks.

WP1 will be dedicated to project management and administrative tasks.
WP2 will focus on the technical work to be performed.

Only **WP2** is subject to this call for tenders.
Hereafter is decribed the overview of **WP2**:



A first level of details of the related **WP2** tasks are given below:

***Task 2.1 High accuracy assessment*:** this task will tackle the assessment of High Accuracy services (PPP/NRTK), by proposing new methodology and metrics definition.

Description: The technologies enabling high-precision geolocation are regularly used by many users, particularly in the agriculture and the public works sectors.

At present, their uses are expected to expand rapidly for road applications. Indeed, GNSS based positioning terminals have become very affordable and correction services will follow the same way.

The industrial stakes are high. They impose an effort of legibility on the reliability and performances really held by each given GNSS reception chain and, if necessary, for each of embedded components.

On purpose, the actors of the sector shall refer to metrology standards able to characterize these systems and sub-systems.

***Task 2.2 Multi-hybrid terminals assessment*:** this task will aim at defining new methodology for assessing complex / distributed / hybridized localization system (field test + replay)

Description: The Geolocation technology implement first radio frequency receivers using "exteroceptive" measurements based on satellite infrastructures. They offer the unique advantage of calculating absolute positions in the GNSS system.

To mitigate errors inherent to the GNSS system and those caused by the local environment, manufacturers have developed different strategies using "proprioceptive" sensors, such as inertial units, steering sensors, or odometers.

Multi-hybrid GNSS terminals are becoming more widespread and are being marketed in the form of chipsets at very affordable costs.

In this context, many integrators need to validate the performance of these multi-hybrid GNSS terminals on the one hand, on the positioning functions to be provided and on the other hand, on the control of the industrial risks related to mass productions.

On purpose, the actors of the sector must refer to metrology standards able to assess these multi-hybrid GNSS terminals.

***Task 2.3 Assessment of GNSS layer of HDMaps*:** this task will address validation of GNSS layers of High-Definition Map (HDMap), by providing metrological tools for GNSS maps validation and a new methodology of test

Description: The GNSS layer of the High-Definition Map, so named "HDMAP" aims to increase the accuracy and reliability of position measurements of vehicles travelling on a previously characterized lane. In other words, it is possible to maintain a given level of service with cost-effective solutions. The operating principle is based on a mapping of GNSS errors likely to be encountered along the route. By

anticipating disturbances, the positioning system is thus able to weigh up the hybridization of sensor measurements more quickly. Ideally, if measurements of GNSS receivers differ from the data reported in the HDMAP, then the system is alerted to the risk of positioning hazards. Over time, the characterization of the environment may change, for example with the cycle of the seasons or the evolution of urbanism. To accompany these updates in real time, the same process can be transposed to the on-board receivers in vehicles of users. If these receivers are used to contribute to correct the discrepancies observed on the initial version of the map, then its deviations shall also be evaluated.

***Task 2.4 GNSS I/Q standardization*:** this task will focus on the strong need to have standardized data format for I/Q GNSS data. This is a key enabler and will contribute to the development of an open and fair GNSS certification framework.

Description: The activities to be conducted with this task focus on the need for I/Q format standardization. Indeed, EN16803 is based on the production of scenarios that aims at replaying GNSS signal that have been recorded previously. If we want to ensure a free market on these scenarios, we have different possibilities. Among them, we identified two: first one consists for test lab to rent the system able to read and replay the scenario. No need for standard, the specific equipment enabling to read proprietary data. This is a short-term solution that could be used for transition, waiting for a better solution. This better solution is the second possibility: to succeed in defining a standard for IQ data format.

***Task 2.5 New ISO standard*:** this task will involve the **promotion of EN16803 at ISO level**.

Description: This activity will support the promotion of the EN 16803 series in ISO TC20 SC14 (space systems and operation) which includes WG8 "Downstream space services and space-based applications", working group led by France

These new studies will lead to the production of TRs and ENs. The list of deliverables is provided in section II.2.

For coordination and monitoring purposes, the following reporting scheme is required:

- One Interim Report (T0 + 22 months), this report will include a description of the performed tasks, meeting held, main outcomes of those meetings, and possibly draft deliverables.
- Final report (T0 + 36 months), including all deliverables from WP2.
- A Gantt will be updated after each Progress Meeting from T0. This tool will be used to monitor the activity of the project from a high-level view for general purposes.

III.3 Detailed tasks

This section intends to describe detailed activities expected to be performed by the tenderer. These activities are called "SubTasks" in the following section.

Task2.1	**High Accuracy assessment**	**WP Number**	**2**
Objectives • **SubTask 1 – Market study in the high accuracy domains** Applications requiring high-precision measurements shall be carefully described to fully understand the contexts, expected services and the profile of stakeholders. The work of this task shall consider requirements of existing or experimental applications (i.e., justifying a significant R&D budget): example: Platooning, Docking. Among the list of identified applications, the nominal and degraded operating modes shall be described in order to establish the limits of what would be acceptable to maintain available the			

expected navigation functions. For example, some use cases require a permanent and stable accuracy less than 10cm while others work perfectly despite errors between 20cm and 30cm. The use cases and the needs expressed often go hand in hand with the available offer. Thus, an inventory is useful to list the main receivers and services enabling the implementation of precise positioning technologies.

- **SubTask 2 – Performance Criteria : services & devices**
  Considering the requirements of EN16803 standard and the work of the previous activity, the additional statistical distributions that assess the best these high accurate GNSS terminals shall be identified and justified.
  Applications relying on high-accuracy positioning terminals often interrupt their services when measurements become unreliable during critical phases. Application operators are therefore required to meet a higher level of requirements for selecting their geolocation solutions.
  In this context, evaluation criteria shall be standardized in order to increase trust between the parties, often involving non-specialized professionals.
  The selection criteria shall focus on measures that are representative of the performance to be assessed.
  The nature and modalities of the tests should be purposefully adapted to make the most of the technical capabilities of the tested solutions.

- **SubTask 3 – Test requirements : services & devices**
  The test method defined to assess the high accuracy measurements may differ in some places from that described in EN16803 standard for conventional performances. On purpose, a critical review of the first version of the method is useful to identify the arrangements envisaged to lead to a more advanced version. Of course, The improvements of the second version shall be validated.
  In addition to the provisions set out in the test plan, high-precision position measurements require a particular attention to the installation of the devices under test, the on-board and the laboratory instrumentation as well as the skill of the operators. The quality of the collected data shall be demonstrated with validation methods especially for measurement uncertainties that shall determine the acceptability of data and therefore results of test reports.

- **SubTask 4 – Analysis and Report of test results**
  The data processing and the analysis of test measurements may differ in some places from those described in EN16803 standard for conventional performances. On purpose, a critical review of the first version of the method is useful to identify the arrangements envisaged to lead to a more advanced version. Of course, The improvements of the second version shall be validated.
  The results shall be relevant and presented in a concise manner. They shall be rendered with predefined tables and graphs to allow seamless comparisons between the different configurations tested. The positioning performance metric rationale shall be clearly explained.
  The documents issued to clients for legal metrology purposes may consist of a declaration of conformity and a test report justifying the conclusions. Thus, templates shall be defined to standardize these pieces of evidence leading to certification processes.

- **SubTask 5 – Assessment demonstration**
  Considering the results of the previous tasks, the performance of two high-precision GNSS receivers shall be characterized and compared in 3 different environments.
  The test reports and related documents will be used to promote the method covered by the future standard.

Inputs

- EN16803-1 ;EN16803-2 ; ISO17025

- Results from previous European projects

Description of work

SubTask 1: Market study in the high accuracy domains

- STATE OF THE ART - describe the technologies available at the time of writing this task. This research shall cover the main offers (including the commercial prices) of GNSS receivers and assistance data services. A table shall combine the possible couplings.
- USES CASES - To identify the main applications using high-precision geolocation solutions and those with a high probability of breakthroughs over the next ten years (in the road sector). The For each of them, the functionalities based on high accuracy will be described, specifying the expectations in terms of cost (CAPEX&OPEX) and performance, by considering the usage constraints such as the local environment, antenna installations and ambient conditions.
- ACTORS - Define the role of current and future players within the geolocation field to make possible the high-precision positioning. In particular, the research shall identify those who will demand certified solutions before placing purchase orders.

SubTask 2: Performance Criteria : services & devices

- TECHNOLOGY CLASS - Define the different classes of high precision as part of road environments by considering their availabilities, their reliability and the accessibility of assistance data services.
- GNSS RECEIVING CHAINS – Identification and classification of components (antennas, receivers, modems) used within GNSS/RF receiving chains to evaluate their influences to determine accurate and reliable position measurements. This study will justify or not the need to assess the individual or combined performances.
- KEY PERFORMANCE CRITERIA – According to use cases, define technical requirements and success criteria to validate before implementing solutions dedicated to providing measurements of high precision geolocation.
- METRIC – Define the measurements and the statistical distributions expected to determine the performance of high accuracy measurements.
- TEST CASES – With reference to the EN16803 standard, define the test cases to be planned and their conditions of implementation. The test specifications shall demonstrate their complementarities to assess high precision performances.

SubTask 3: Test requirements : services & devices

- INSTRUMENTATION – Define the metrology instruments and the services required to perform high-precision testing. The test instruments and services shall demonstrate their complementarities to assess high precision performances. NB.: By instrumentation, we mean the instruments installed on board the test vehicle as well as those composing the test bench in the laboratory.
- MEASUREMENT UNCERTAINTY – Define the minimum conditions required to establish and verify the estimation of measurement uncertainties. In particular, the minimum requirements related to tool validations shall be specified carefully.
- OPERATORS – Define the specific skills required of the key operator to conduct a test campaign dedicated to high-precision geolocation.
- DATA VALIDATION – List of datasets to be collected and the minimum requirements for their acceptance for analysis.

SubTask 4: Analysis and Report of test results

- TEST RESULTS – Define the relevant results enabling to characterize a given GNSS terminal/ receiving chain. The numerical and graphical data shall highlight their operational performances within representative environments. These results shall be clear enough to determinate the ability of a given solution to render the expected services. In addition, the results shall be set

forth in a standardized manner in order to facilitate the comparisons and to establish the best solution for the given scenario.

- PIECES OF EVIDENCE - Define the templates of typical “declarations of conformity” dedicated to GNSS high accuracy performance as well as the typical “test reports” to justify conclusions.

SubTask 5: Assessment demonstration

- TEST PLAN – Draft a test plan in compliance with the requirements of ISO17025, EN16803 standards and those defined in the previous tasks.
  - DUT: 2 GNSS terminals with the same assistance data service
  - Service: (N)RTK
  - Test areas based on use cases previously describe.

- DATA COLLECTION (EN16803-4) – Collect data necessary to measure the performance of the 2 solutions under test (DUT). The ground truth shall be determined and validated with measurement uncertainties below 5 cm on average and 10 cm maximum, by considering all the uncertainty sources.

- GNSS SIGNAL REPLAY (EN16803-2) – Replay the data previously collected to submit the solutions under test to the same GNSS signals and assistance data.

- TEST REPORT – Characterize the performances of DUT in the related test reports. These reports shall be annexed to fictitious declarations of conformity. In addition, a technical note shall compare the performance of 2 DUT to identify the best one for the given scenarios.

Output & Deliverables (see details in II.2)

D2.1	HAS - Market Report
D2.2	HAS - Performance criteria and test requirements
D2.3	HAS - Report of test results and practical cases for validation process

Task2.2	Multi-Hybrid Terminals assessment	WP Number	2

Objectives

- **SubTask 1 – Context of use of multi-hybrid GNSS terminals**
  Applications requiring the addition of sensors with GNSS receivers shall be carefully described to fully understand the conditions of uses and the expectations of the users. This shall lead to the identification of the most critical test cases enabling to fully assess multi-hybrid GNSS receivers.
  Hybridization techniques have often been limited to the integration of inertial units. The economic and technical requirements for marketing functionalities that are both reliable and high-performance, are fostering manufacturers to exploit all available on-board measurements. This effort goes hand in hand with the sophistication of data fusion algorithms.
  The implementation of multiple sensors can be accompanied by specific installation recommendations. These constraints are likely to complicate the testability of solutions to be tested. A state of the art is required.
- **SubTask 2 – Performance Criteria**
  Considering the requirements of EN16803 standard and the work of the previous activity, the additional statistical distributions that assess the best these multi hybrid GNSS terminals shall be identified and justified.
  The selected metrics shall meet the most frequent and the most restrictive use cases identified. The metrological results shall facilitate the choice of users to implement the expected geolocation functions. In the same way, they are also intended to be compared in order to rank performance.
- **SubTask 3 – Test Requirements**
  The test method defined to assess the high accuracy measurements may differ in some places from that described in EN16803 standard for conventional performances. On purpose, a critical review of the first version of the method is useful to identify the arrangements envisaged to lead to a more advanced version. Of course, The improvements of the second version shall be validated.
  Considering the work of the previous activity, the test cases useful for the assessment of multi-hybrid GNSS receivers shall be defined and justified. In particular, the test cases shall be representative of road use conditions and provide reproducible performance for a given DUT. The test specifications shall also cover the instrumental requirements to ensure reliable results and the method dedicated to the data validation.
  In addition to the provisions set out in the test plan, multi hybrid position measurements require a particular attention to the installation of the devices under test on-board of vehicles. The quality of the collected data shall be demonstrated with validation methods especially for measurement uncertainties that shall determine the acceptability of data and therefore results of test reports.
- **SubTask 4 – Analysis and Report of test results**
  The data processing and the analysis of test measurements may differ in some places from those described in EN16803 standard for conventional performances. On purpose, a critical review of the first version of the method is useful to identify the arrangements envisaged to lead to a more advanced version. Of course, The improvements of the second version shall be validated.
  The results shall be relevant and presented in a concise manner. They shall be rendered with predefined tables and graphs to allow seamless comparisons between the different configurations tested. The positioning performance metric rationale shall be clearly explained. The documents issued to clients for legal metrology purposes may consist of a declaration of conformity and a test report justifying the conclusions. Thus, templates shall be defined to standardize these pieces of evidence leading to certification processes.
- **SubTask 5 - Practical cases for validation purposes**
  Considering the results of the previous tasks, the performance of two multi hybrid GNSS terminals shall be characterized and compared in 3 different environments. The test reports and related documents will be used to promote the method covered by the future standard.

Inputs

- EN16803-1 ;EN16803-2 ; ISO17025
- Results from previous European projects

Description of work

SubTask 1: Context of use of multi-hybrid GNSS terminals

- STATE OF THE ART - describe the technologies available at the time of writing this task. This research shall cover the main offers (including the commercial prices) of multi-hybrid GNSS terminals.
- USES CASES - Define operational functionalities using multi hybrid GNSS terminals with an impact analysis on possible position errors.
- INSTALLATION – List the usual requirements preconized by the manufacturers to install the multi hybrid GNSS terminals on board vehicles.
- OPERATING ENVIRONMENTS - Define profiles of typical environments that could induce errors/biases on GNSS and/or inertial measurements.

SubTask 2: Performance Criteria definition

- TECHNOLOGY CLASS - Define the different classes of multi hybrid technologies as part of road environments.
- KEY PERFORMANCE CRITERIA – According to use cases, define the most relevant criteria enabling to have a fair assessment of a multi-hybrid GNSS receiver.
- METRICS – Define the measurements and the statistical distributions expected to determine the performance of multi-hybrid GNSS receiver.
- TEST CASES – With reference to the EN16803 standard, define the test cases to be planned and their conditions of implementation. The test specifications shall demonstrate their complementarities to assess high precision performances.

SubTask 3: Test Requirements definition

- TEST CONDITIONS – Define minimum requirements to perform reproductible test operations.
- INSTRUMENTATION – Define all instruments having a relevant role in the executions of the test and the minimum success conditions.
- MEASUREMENT UNCERTAINTY – Define the minimum conditions required to establish and verify the estimation of measurement uncertainties. In particular, the minimum requirements related to tool validations shall be specified carefully.
- OPERATORS – Define the specific skills required of the key operator to conduct a test campaign dedicated to high-precision geolocation.
- DATA VALIDATION – List of datasets to be collected and the minimum requirements for their acceptance for analysis.

SubTask 4: Analysis and Report of test results

- TEST RESULTS - Define the relevant results enabling to characterize a given multi hybrid GNSS terminal. The numerical and graphical data shall highlight their operational performances within representative environments. These results shall be clear enough to determinate the ability of a given solution to render the expected services. In addition, the results shall be set forth in a standardized manner in order to facilitate the comparisons and to establish the best solution for the given scenario.

- PIECES OF EVIDENCE - Define the templates of typical "declarations of conformity" dedicated to multi hybrid GNSS receiver performance as well as the typical "test reports" to justify conclusions.

SubTask 5: Assessment demonstration

- TEST PLAN – Draft a test plan in compliance with the requirements of ISO17025, EN16803 standards and those defined in the previous tasks.

-DUT: 2 multi-hybrid GNSS terminals belonging to different performance classes.
-Test areas based on use cases previously describe.

- DATA COLLECTION – Collect data necessary to measure the performance of the 2 solutions under test (DUT). The ground truth shall be determined and validated with measurement uncertainties below 5 cm on average and 10 cm maximum, by considering all the uncertainty sources.

- TEST REPORT – Characterize the performances of DUT in the related test reports. These reports shall be annexed to fictitious declarations of conformity. In addition, a technical note shall compare the performance of 2 DUT to identify the best one for the given scenarios

Output & Deliverables (see details in II.2)

D2.4	Multi-Hybridization – Context of Use
D2.5	Multi-Hybridization – Performance criteria and test requirements
D2.6	Multi-Hybridization – Report of test results and practical cases for validation process

Task2.3	Assessment of GNSS Layer of HDMaps	WP Number	2

Objectives

- **SubTask 1 – Context of HDMAP uses**
  This task consists of drawing up a state of the art on the technologies related to high definition maps, and then to study use conditions of geolocation by this map.
  Indeed, HD mapping technology enables a driverless vehicle to locate itself with a high accuracy, by mapping its exact location in relation to the local environment. GNSS receivers are led to play an essential role if it is possible to eliminate all erroneous position measurements.
  The behavior of a GNSS receiver in the face of various external disturbances shall be reviewed.
  For each situation, the use of HDMAP shall be analyzed to highlight the expected benefits.
- **SubTask 2 – Performance Criteria definition**
  The objective of this task is to assess the predisposition of a given GNSS terminal to maintain the required level of performance despite local environmental constraints. Otherwise, the GNSS terminal concerned shall trigger an alarm depending on the occurrence and possible impacts of the disturbances.
  To achieve this, the GNSS terminal shall consider the information contained in the GNSS layer of the HDMAP. These data shall be reliable and based on tangible measurements.
  Taking up the conclusions of Task N°1 on the sources of disturbances caused by the environment, the metrics applied to characterize the environment shall be analyzed and evaluated on at least 2 basic of metrology principles:
  - The “Reproducibility” of metrics shall focus on the ability of the process, of map creation, to record the same data on the same routes at different time intervals. Thus, the measurements at the origin of the HDMAP data shall be intangible whatever the professional class instrumentation used. At least 3 of the 6 environments listed in EN16803 shall be considered.
  - The “Representativeness” of the metrics shall focus on the ability of the process to scale the impact of disturbances on position measurements.

  By analyzing the data contained in the GNSS layer of the HDMAP, a skilled person should be able to identify the main sources of disturbance, such as passages under a bridge, under a canopy, along a building, etc.
  Finally, the relevance of this GNSS layer shall also take into account the ability to :
  - synthesize the data to be stored based on the distance travelled,
  - Process data in real time by a GNSS terminal,
  - Update data over time and seasons
- **SubTask 3 – Test Requirements definition**
  The objective of this task is to define the set of data to be collected and studied in order to assess the quality of the GNSS layer, dedicated to an HDMAP, on the basis of the performance criteria previously established (task N°2).
  During the data collection campaign leading to the creation of the GNSS layer, the operator shall taken care to log and store all the measures useful for its development. Other concomitant data are necessary to carry out this study, i.e. at least the ground truth, the RINEX measurements of on-board receivers and videos recorded.
  All these data shall be crossed to study the reproducibility and representativeness of the GNSS layer for a series of environments referring to at least 3 types described in standard EN16803.
- **SubTask 4 – Assessment demonstration**
  The objective of this task is to verify the performance of the GNSS layer of an HDMAP by performing tests in real situations or, failing that, by simulating the position measurements resulting from its use. Three environments described in EN16803 are considered for this demonstration.

Inputs

- EN16803-1 ;
- Results from previous European projects

Description of work

SubTask 1: Context of HDMAP uses

- STATE OF THE ART - to establish the state of the art on HDMAP
- STATE OF THE ART - To establish the state of the art on sources of disruptions to GNSS signals and their effects on position measurements.
- CONDITION OF USE - To define the use conditions of the HDMAP

SubTask 2: Performance Criteria definition

- REPRODUCTIBILITY - to define the reproducibility criteria of the process used to build the GNSS layer of the HDMAP.
- REPRESENTATIVENESS - to define the fidelity criteria of the GNSS layer characterizing the original environment.
- OPERABILITY - to define the criteria for the use of the GNSS layer of an HDMAP according to the memory and processing resources to be mobilized for its implementation.

SubTask 3: Test Requirements definition

- DATASET - to define the data required to analyze the relevance and performance of the GNSS layer of an HDMAP.
- REPRODUCTIBILITY - To define the analysis procedures necessary to evaluate the reproducibility criteria of the process used to build the GNSS layer of the HDMAP.
- REPRESENTATIVITY - To define the analysis procedures necessary to evaluate the fidelity criteria of the GNSS layer characterizing the original environment .
- OPERABILITY - To define the analysis procedures necessary to evaluate the operability of the GNSS layer of an HDMAP, in particular with regard to the memory and processing resources to be mobilized.

SubTask 4: Assessment demonstration

- TEST PLAN - to define the most suitable cases and test environments for evaluating the GNSS layer of an HDMAP.
- TEST BENCH or GNSS TERMINAL - to implement a test bench or a GNSS terminal to evaluate the quality of the GNSS layer of an HDMAP.
- DATA ANALYSIS - To compare the results of previous studies with the operational evaluation.

Output & Deliverables (see details in II.2)

D2.7	GNSS layer for HD-Maps – Context of use
D2.8	GNSS layer for HD-Maps – Performance criteria and test requirements
D2.9	GNSS layer for HD-Maps – Report of test results and practical cases for validation process

Task2.4	GNSS I/Q standardization	WP Number	2

Objectives

- **SubTask 1 –** State of the art on GNSS IQ standardization.
- **SubTask 2 –** Proposition of a new standard, or contribution to an existing one, and validation with a POC (Proof Of Concept)
- **SubTask 3–** Assessment demonstration on a specific data collection (test campaign) involving two different equipment from two different brands.

Inputs

- EN16803-1 ;EN16803-2 ; EN16803-3
- Inputs from ION : "Software Defined Radio Sampled Data Metadata Standard, Revision 1.0"
- Input from GitHub : https://github.com/IonMetadataWorkingGroup/GNSS-Metadata-Standard

Description of work

SubTask 1: State of the art on GNSS IQ standardization

- Analyse of current documentation or SDO already working on the topic.
- Analyse of what is specific to each manufacturer (valuable know-how not sharable) and what is generic and could be standardized
- Initiate an active liaison with the IonMetadataWorkingGroup and / or with other relevant groups

SubTask 2: Proposition of a new standard and SDR (or enhancement of an existing ones)

- Depending on the result of Task1, either the need for a new standard will have been demonstrated, or not. In the first case a proposition is expected, in the latter case, contributions are expected.
- Proof Of Concept: based on an opened architecture such as SDR-GNSS:
  - a file containing IQ sample under proprietary format is recorded. GroundTruth (reference trajectory) is also recorded or generated
  - A software layer using the proposed standardization transforms the proprietary IQ file into a standardized IQ file.
  - Performances on a GNSS software receiver are assessed with each of the IQ files. Similar performances are expected. (Concept of similarities will have to be defined).
- Definition of an open source Software Defined Radio able to process standardized IQ signal.
  - Review of existing open source SDR GNSS receiver
  - Implementation of the required software layer able to read standardized IQ
  - Nominal test with standardized IQ samples are expected.

SubTask 3: Assessment demonstration on a specific data collection (test campaign) involving two different equipment from two different brands

- A specific data collection (test campaign) will have to be planned. At least two different GNSS digitizer (of the same quality level, or same bit of quantization number,…) will be embed, using the same antenna. Ground Truth will be needed.
- Files generated by GNSS recorder equipment will have to be converted into standardized format. The main activity of this sub-task is to develop of software layer corresponding to requirements described in the proposed standard.
- Once every GNSS IQ file will have been converted into the standardized format, the last step will consist in testing :
  -a physical DUT (same as the one identified), in order to verify if performances using one or the

other of the standardized IQ file are similar. -the Software Defined Radio GNSS receiver, as defined in previous SubTask: rawdata, and internal measurement are expected to be tested so that deep analysis could be performed.
Output & Deliverables (brief description & month of delivery) D2.10 GNSS I/Q Standardization – State of the art D2.11 GNSS I/Q Standardization – New standard and SDR D2.12 GNSS I/Q Standardization – Assessment demonstration

Task2.5	Promotion of EN16803 at ISO	WP Number	2

Objectives

- **SubTask 1 –** Submission to ISO, attendance and preparation of meetings
- **SubTask 2 –** Participation to ISO meetings
- **SubTask 3–** Comment resolution / adaptation of EN16803 Part1-2-3

Inputs

- EN16803-1 ;EN16803-2 ; EN16803-3

Description of work

SubTask 1: Submission to ISO, attendance and preparation of meetings

- In order to work on new standardization projects at ISO level, New work item proposals (NP) have to be submitted and accepted. Thus, specific documents called "Form4" have to be written and submitted to a vote. Taking into account that EN16803 Part1-Part2 and Part3 are matured and already published; this first activity should not take a long time.
- If NP are accepted, the following step in the process is to write the full version of the new future standards. Once they are enough matured, they are submitted at "Enquiry stage".

SubTask 2: Comment resolution / adaptation of EN16803 Part1-2-3

- The end of "Enquiry stage" is the comment resolution. Usually, future standards have to take into account remarks of all different international experts.
- In order to be finally published, all comments have to be resolved. The final stage being "International Standard" (ISO), or "publication stage"

Output & Deliverables (brief description & month of delivery)

D2.13 EN 16803 at ISO – Submitted DIS
Publication stage of a series of 3 international standards corresponding to the 3 EN16803-Part1-2-3, namely:
Name of the series: *Assessment of GNSS-based positioning system*
Name of ISO standard :
ISO-xxx *Part 1 : Definitions and system engineering procedures for the establishment and assessment of performances*
ISO-xxx *Part 2 : Nominal performances under clear RF environment*
ISO-xxx *Part 3 : Robustness and Security performances under Radio Frequency interferences*

III.4 Timeframe

The detailed timeframe for all tasks is given below.

Note: M1 begins 1st January 2024.

IV Financial support

The European Commission and EFTA have decided to provide financial support to this project. The financial support from the European Commission and EFTA is based on the SMP 'Single Market Programme Regulation' (including its Financing Decision) and the MGA (Multi or mono beneficiary(ies) Grant Agreement). Unless specified otherwise, costs of external subcontractors such as laboratories are generally funded at 100%, with approx. 95% being borne by EC and 5% by EFTA. Costs have to qualify as eligible as defined in *MGA (*Multi or mono beneficiary(ies) Grant Agreement) and also in compliance with EC Financial Regulation, and be justified. The payment is usually divided into several instalments after completion of defined milestones and approval of the interim/final reports and the justification of costs. The subcontractors shall fulfil the conditions of the *MGA* including those relating to liability, ownership of results, confidentiality, conflict of interests, publicity, evaluation, assignment, checks and audits.

The subcontractors' costs shall be justified with copies of the relevant invoices. All relevant evidence shall be kept in view of future payments (reports, work, drafts and deliverables, contracts & invoices, time sheets, tickets, boarding cards, hotel invoices, attendance lists with signatures, meeting agendas & reports, invoices for any consumables, purchase orders, etc…).

Costs incurred before the Grant Agreement is signed and before the selection procedure is finalized, will not be considered as eligible for EU financial support.

V Selection criteria

V.1 General criteria for WP leader and task leaders

The tenderer shall demonstrate:
- Reliability in terms of technical resources and quality control
- Reliability in terms of sufficient resources to perform the tasks within the period of tasks foreseen by the contract.
- Expertise in the field of drafting reports, surveying techniques, and drafting recommendations
- Capacity to carry on analytical reporting.
- Linguistic abilities to draft reports in English Language
- Proven experience in organizing technical and coordination meetings.
- Tenderers must demonstrate sufficient ability and means available to carry out their tasks, notably in terms of human and technical resources available and of quality systems in place.
- The tenderer must have a proven successful track record of projects relevant to this call in the last 5 years.

V.2 Specific criteria for technical and professional capacity

Contractor will be recruited to conduct technical work within the WP that cannot be dealt by CEN/CENELEC JTC5 technical body. The rules for recruiting, funding, and functioning of the experts will follow the CEN/CENELEC Guide 19 which includes the best value for money principles.

The following specific capabilities are required for the experts:
- Knowledge of existing or under development standards and guidelines in particular in the domain of GNSS
- Knowledge of current GNSS environment
- Ability to conduct in-depth studies to support and justify the work performed

Technical expertise is needed in the field:
- Market and certification processes knowledge
- System Engineering
- Test specifications, test protocols design, test execution
- GNSS signals and receivers
- GNSS positioning and hybridized positioning
- HD Maps
- Signal processing
- Radio Frequency signals
- Road Transport and ITS

The criteria for selecting contractors will be based on the principle “best-value-for-money”, the contract with the contracts will include clear tasks and expected results to be fulfilled by the contractors.

V.3 Criteria for financial and economic capacity

Tenderers shall demonstrate:
- Sufficient economic and financial capacity to guarantee continuous and satisfactory performance throughout the envisaged lifetime of the contract.
- Sufficient financial capacity in relation to the pre-financing foreseen under the contract (where relevant)
- Reliability of the mitigating measures presented to cover possible deficiencies in the evidence presented for the above criteria.

In addition, the tenderers shall provide:
- Sufficient turnover in relation to the volume of tasks under this contract
- Positive equity or at least a guarantee of a third party to cover the problem of negative equity.

VI Award criteria

The selection of the most suitable candidate will be made on the basis of the following criteria.

a) Documented experience (70%) *(the list below is given by way of example*):
- number of years performing relevant activity;
- (typical) annual activity / number of relevant activities;

- experience with comparable projects on the development and validation of test methods;
- Industrial and academic background of the relevant personnel involved;
- general project management and communication skills of the relevant personnel involved;
- years of experience in European and/or International standardization work of the relevant personnel involved;
- experience in the management of task groups (working groups);

b) Organization (demonstration of the ability to carry out the project, (20%) *(the list below is given by way of example*):

- equal representation of sectors, countries and skills, as well as the expected 'chemistry' within the project team
- infrastructure (equipment, description of the monitoring site, etc.);
- planning/organisation of the development and validation of test methods;
- established analytical quality system;
- ability to submit agreed deliverables at specified dates and detailed cost estimations.
- Representativeness of the European actors – Applicants to the call should try to build their answer around multi-european actors.

c) Price (10% of the overall total points). the selection will be based on the principle of best value for money, considering the day rate of the expert and the number of days the expert requires to execute the work.

A selection committee will be constituted in order to evaluate the tenders, select the tenderers and award the contract(s).
The selection committee will be constituted by:

- CEN-CENELEC JTC5 WG1 Convenor
- a representative of BNAE
- a representative from the CEN - CENELEC Management Centre.

The candidate who will reach the highest score will be considered as the best value for money offer and hence should be the candidate selected to perform the expected activities (unless force majeure).

The report of the selection committee on the selection of the Contractor or Contractors in case of a Consortium will be submitted for approval to the European Commission and EFTA prior to the contracting.

VII Eligibility criteria

The following candidates will be excluded:

- Candidates who were the subject of a non-likely judgment of recourse for a professional infringement
- Candidates who are in an irregular tax situation or in an irregular special taxation situation
- Candidates who provide incomplete or erroneous information.
- Candidates who submit their application after the submission deadline.
- Candidates with any conflict of interest.

VIII Tenders

VIII. 1 General Terms and conditions for the submission of tenders

Tenders shall cover all tasks described in the sections above.

Participation in tendering procedures is open on equal terms to all natural and legal persons from one of the EU Member States and to all natural and legal persons in a third country which has a special agreement with the Communities in the field of public procurement on the conditions laid down in that agreement.

Operators in third countries which have signed a bilateral or multilateral agreement with the Communities in the field of public procurement must be allowed to take part in the tendering procedure on the conditions laid down in this agreement. The selection committee refuses tenders submitted by operators in third countries which have not signed such agreements for the present call for tender.

Submission of a tender implies acceptance of the terms and conditions set out in this invitation to tender, in the tendering specifications and in the draft contract and, where appropriate, waiver of the tenderer's own general or specific terms and conditions. It is binding on the tenderer to whom the contract is awarded for the duration of the contract.

Once the tender has been accepted, it shall become the property of the Selection Committee and the Selection Committee shall treat it confidentially.

Expenses incurred in preparing and submitting tenders shall not be reimbursed.
Variants are not allowed.

VIII.2 No obligation to award the contract

This invitation to tenders is in no way binding on AFNOR/BNAE. AFNOR's contractual obligation commences only upon signature of the contract with the successful tenderer.
Up to the point of signature, the contracting authority may either abandon the procurement or cancel the award procedure. This decision must be substantiated and the candidates or tenderers notified.
No compensation may be claimed by tenderers whose tender has not been accepted, including when the Selection Committee decides not to award the contract.

VIII.3 Joint Offers

A joint offer is a situation where an offer is submitted by a group of tenderers. If awarded the contract, the tenderers of the group will have an equal standing towards AFNOR/BNAE in executing a supply, service or works contract.

A joint offer shall explicitly specify the different responsibilities of each member of the group with respect to the different tasks described in this specification.

AFNOR will not request consortia to have a given legal form in order to be allowed to submit a tender but reserves the right to require a consortium to adopt a given legal form before the contract is signed if this change is necessary for proper performance of the contract. This can take the form of an entity with or without legal personality but offering sufficient protection of the AFNOR's contractual interests (depending on the Member State concerned, this may be, for example, a consortium or a temporary association).
The documents required and listed in the present specifications must be supplied by every member of the grouping.

The offer has to be signed by all members of the group.

Each member of the group will have a separate contract with AFNOR covering the tasks he is responsible for in the joint offer. BNAE will be responsible for verifying the correct execution of the contracts.

VIII.4 Form and content of the tender: general

Tenders must be signed by the tenderer(s) or his (their) duly authorized representative(s). Tenders must be perfectly legible so that there can be no doubt as to words and figures.

Tenders must be clear and concise, with continuous page numbering, and assembled in a coherent fashion (e.g. bound or stapled, etc.).

Tenders must be written in English language.

Tenders must include the following information:

- All the information and documents requested by AFNOR/BNAE in this call for tender in order to assess the tender
- The price in euros
- One specimen signature of an authorized representative on the legal entity form and a statement confirming the validity of the tender (preferably in blue ink), the tender must provide evidence of the authorization to sign in name of the tenderer
- The name of a contact person in relation to the submission of the bid.

VIII.5 How to submit a tender

Tenders should be sent by legal representative, i.e. to be considered, any possible association has to be formalized according to the local legislation before submitting the tender. Working teams, partnerships and other groups of people, particularly under the aegis of an institute qualify as contractors for the service contracts awarded in the course of this CfT (Call for Tender). Partnerships or joint ventures and other legally binding co-operations regardless of their organizational form qualify as well, provided they are recognized entities under the applicable national laws. Potential candidates may come from the public sector as well as from the private industry. It is essential however that the qualifications and experience of the individual fulfilling the tasks are properly described.

Tenders can be sent either by mail, or courier service, or by email (or by both).

Evidence of timely submission by mail or courier service will be constituted by the date of dispatch, the postmark or the date of the deposit slip. In the case of hand-delivery, the signed and dated receipt will serve as evidence.

In case of submission by e-mail, acknowledgement of receipt will be sent by BNAE and this will serve as evidence. Thus, tender has to make sure he well received the acknowledgement of receipt.

Late delivery will lead to the non-admissibility of the tender and its rejection from the award procedure for this contract.

Tenders shall be sent to **Marie-Noëlle Touzeau, Standardization Project Manager, BNAE**, as soon as possible, to be received at the latest by ***2024/05/13.***

Bureau de Normalisation de l'Aéronautique et de l'Espace
Mme TOUZEAU Marie-Noëlle
199 rue Jean-Jacques Rousseau
92138 Issy les Moulineaux
Marie-noelle.touzeau@bnae.fr

Regarding question concerning the information provided in this call for tender or in case of need for clarification or additional information please contact:

Bureau de Normalisation de l'Aéronautique et de l'Espace
Mme TOUZEAU Marie-Noëlle
199 rue Jean-Jacques Rousseau
92138 Issy les Moulineaux
Marie-noelle.touzeau@bnae.fr

If due to queries or other reasons supplementary information to this call for tender is required, this will be published on the website of the CEN/CENELEC and AFNOR.

VIII.6 Structure of the tender

All tenders must be presented in five sections:

- Section one: Administrative information – Presentation of the tender, with (non-exhaustive list):

- Contractor information (Company, address, contact, email…), to be duplicated in case of a consortium, for each member of the consortium ;
- Experts information (title, name, surname, company, phone, email…) to be duplicated for all the experts participating to the consortium. Each expert must precise which role they will have (Work package leader, task leader, expert).
- Curriculum Vitae (maximum 4 pages) of each relevant person participating in the project, demonstrating the necessary expertise for the 'Advertised position';
- Expertise and skills list relevant to this call, of each relevant person participating to the project, with references to other relevant projects ;
- Any required accreditation certificates;

- Section two: Evidence relating to the exclusion criteria (non-exhaustive list)
  - A signed declaration, by which the candidate(s) certifies not to be subject to one of the exclusion criteria as described in Clause "Eligibility criteria" and the veracity of the adjoining documents.
  - Any further documents to prove the qualification required in the above Clauses on Exclusion criteria.

- Section three: Evidence relating to the selection criteria (non-exhaustive list)
  - Appropriate documentation to prove the economic and financial capacities.
  - Any further documents to prove the qualification required in the above Clauses on Selection criteria.

- Section four: Technical Proposal – Addressing technical specifications and award criteria (non-exhaustive list)
  - Technical proposal with schedule and description of the execution of the tasks which will be carried out in the project.
  - Any further documents to prove the qualification required in the above Clauses on Award criteria.

- Section five: Financial Proposal
  - A table with detailed information on the costs per expert and per task, and the total price in euros.

The tender shall be in English and contain a conformity statement for each expert participating to the project (see below):

CONFORMITY STATEMENT

I certify that all documents provided are veracious and in conformity with reality and certify not to be in any situation described below:

1. subject of a non-likely judgment of recourse for a professional infringement
2. to be in an irregular tax situation or in an irregular special taxation situation
3. to provide with incomplete or erroneous information

I also certify that I had no conflict of interest by submitting the present offer.

completed by	**on**
Name	Date

VIII.6.1 Administrative information

Whichever type of bid is chosen (joint bid or sole contractor), the tender must stipulate the legal status and role of each legal entity in the tender proposed and the monitoring arrangements that exist between them and, failing this, the arrangement they foresee to establish if they are awarded the contract.

A **Legal Entity Form** is to be signed by a representative of the tenderer authorized to sign contracts with third parties. There is one form for individuals, one for private entities and one for public entities.

A **Financial identification Form** shall be duly filled in and signed by an authorized representative of the tenderer and his or her banker.

The Legal Entity Form **must be accompanied by all the information** indicated in the form.

All tenderers must provide their legal entity files as well as the necessary evidence.

VIII.6.2 Technical proposal

Tenderers must include in their bids the technical proposal addressing all aspects detailed in the specifications set out in sections above.

The technical proposal must respond to these technical specifications and provide, as a minimum, all the information needed for the purpose of awarding the contract.

Please note that, to grant equal treatment of all tenders, it is not possible to modify offers after their submission in relation to the technical and financial proposals. As a consequence, incompleteness in this section can only result in negative impact for the evaluation of award criteria. Please note also, that proposals deviating from the technical specifications may be rejected for non-conformity.

The technical specifications and the tenderer's bid shall be integral parts of the contract and will constitute annexes to the contract.

VIII.6.3 Financial proposal

The tenderer's attention is drawn to the following points:

- Prices must be expressed in euros.
- Prices should be quoted free of all duties, taxes and other charges, i.e. also free of VAT
- Since this invitation to tender relates to several tasks and sub-tasks (tasks within Work packages), tenderers must indicate a separate price for each of the tasks and sub-tasks they propose providing. They may indicate any price reduction they are prepared to grant in the event of being awarded a contract either for all the tasks or for a specified group of tasks, this reduction will, however, not be taken into account to award the contracts in each task but will be taken into account for establishing the contract when relevant.
- Prices shall not be conditional and be directly applicable by following the technical specifications.
- Prices shall be fixed and not subject to revision.

The reference price for the award of the contract shall consist of two amounts:

a) The amount in payment of the tasks executed

For each category of staff to be involved in the project, the tenderer must specify:

- The total labour costs.
- The daily rates and total number of days (man-days) each member of staff will contribute to the project.
- Other categories of costs, except for the costs specified under point b) below, indicating the nature of the cost, the total amount, the unit price and the quantity. Flat-rate amounts should be avoided. If, exceptionally, they are used, specimen quotations for the flat-rate amounts must be provided.
-

b) The amount corresponding to the reimbursable expenses.
NOT APPLICABLE

Tenders where no technical offers or financial offers are proposed will be rejected.

The Contractor, or each member of the Consortium in case of a Consortium, will sign an Agreement with AFNOR/BNAE. Applicants should be forewarned that the elapsed time between completion of the deliverables and AFNOR/BNAE being in a position to issue the payment is at least five months. This will be partly overcome by the fact that CEN and the European Commission have agreed on the following payment steps:

Step 0: Pre-financing (70 % of the total budget) - following signature of the Agreement with AFNOR/BNAE;

Step 1: Final payment[1] - subject to the approval of the final report by the European Commission and EFTA

[1] Up to 70% of the total budget, reflecting the actual number of man-days spent.