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CALL FOR TENDERS

No. DEFIS/2020/OP/0002

Test Platform on Galileo HAS/CAS/OSNMA

Open procedure

TENDER SPECIFICATIONS

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1 SCOPE AND DESCRIPTION OF THE PROCUREMENT

1.1 Contracting authority

This call for tenders is launched and managed by the European Commission, referred to as the *Contracting authority* for the purposes of this call for tender, assisted by its Directorate General for Defence Industry and Space

1.2 Subject

The subject of this call for tenders is to study and test the benefits that can be obtained from the Galileo High Accuracy Service (HAS) Commercial Authentication Service (CAS) and Open Service Navigation Message Authentication (OSNMA) service, possibly in combination with other receiver technologies, for improving Positioning, Navigation and Timing (PNT) performance and robustness.

1.3 Lots

This call for tenders is not divided into lots.

1.4 Description: what do we want to buy through this call for tenders?

The services that are the subject of this call for tender, including any minimum requirements, are described in detail below.

1.4.1 Background

Galileo is the European global navigation satellite system (GNSS). The Galileo services are:

- Open Service (OS), for positioning and timing services.
- Open Service Navigation Message Authentication, integrated in the open service and authenticating OS data.
- High Accuracy Service, providing high accuracy corrections.
- Commercial Authentication Service, providing signal authentication.
- Public Regulated Service (PRS): Service restricted to government-authorized users, for sensitive applications that require a high level of service continuity.
- Search and Rescue Service (SAR): Europe's contribution to COSPAS-SARSAT, an international satellite-based search and rescue distress alert detection system.

The focus of this Invitation to Tender (ITT) is on HAS, CAS, and OSNMA. The bidders can refer to Reference Documents [1], [2], [3], Annexes 7, 8 and 9 of this tender, and other public references on the subject matter at their convenience for the bidding process. Up-to-date service documentation required for the contract will be provided to the Contractor at the project kick-off.

1.4.1.1 High Accuracy Service

The Galileo High Accuracy Service is an open-access and free service based on the provision of corrections to the Galileo signals and data transmitted in the Galileo E6 signal (E6-B, data component), at a maximum rate of 448 bps per Galileo satellite connected to an uplink

station. The HAS service will allow reducing the errors associated to the Galileo Open Service broadcast navigation messages and the GPS Standard Positioning Service navigation messages. HAS data will include orbit, clock, phase biases and atmospheric corrections. These corrections will enable users to perform a PVT process with decimetre-level accuracy.

1.4.1.2 Commercial Authentication Service

The Commercial Authentication Service (CAS) is based on the encryption of the E6C pilot signal spreading code, plus some ancillary data in E6B/E1B including data from OSNMA, and will provide signal authentication.

1.4.1.3 Open Service Navigation Message Authentication

The Open Service Navigation Message Authentication (OSNMA) consists of authenticating the origin of the Galileo OS data, and potentially GPS, by providing cryptographic information within the OS navigation message, at a rate of 40 bits every two seconds. OSNMA bit unpredictability can be used also for protecting the E1B signal against certain replay attacks.

1.4.2 Objective of the initiative

The general objective of this contract is to improve PNT performance and resilience with a focus on Galileo HAS, CAS and OSNMA services. In order to achieve that, the project is divided in two activity lines.

The first activity line (WP2 and WP3 below) includes the development/adaptation of a HAS/OSNMA/CAS-ready pre-operational prototype user terminal, and its testing against nominal and adversarial conditions. Tests will be independently conducted by the Joint Research Centre (JRC) in its facilities (Ispra, IT), with support from the Contractor.

The second activity line (WP4 below) supports Galileo HAS/CAS/OSNMA mission and service definition tasks, and user technology development, with specific or longer-term research and development actions.

1.4.3 Detailed characteristics of the purchase

This contract includes the execution of the following tasks:

Work Package 1: Management

Work Package 2: User Terminal

Work Package 3: Support to Engineering, Testing, and Experimentation

Work Package 4: Research and Development

The activities associated with these work packages and their concrete outcomes are described in detail in the following sections.

1.4.4 Work Package 1: Management

The execution of the work packages begins after the signature of the contract by all parties (T0). It will be followed by the Kick-Off meeting, which will take place in Brussels, at the latest 15 days following the signature of the contract, in order to settle all the details of the project to be undertaken. One month after the contract signature, the Contractor will be requested to provide a Project Management Plan. The Project Management Plan will contain a travel plan and a risk management plan, including a risk register. The travel plan and the risk management plan will then be updated in every Progress Report.

Progress Reports showing progress of the work shall be submitted to the Commission every three months. Progress reports shall reflect the progress on the different work packages including technical aspects, as well as the administrative status.

The main management activities to be performed over the duration of the contract are:

- Contractual management
- Organisation and coordination of internal communication flow
- Documentation management
- Track project status
- Establish and maintain the travel plan
- Review and verification of deliverables
- Organisation of progress meetings (calling notice, agenda, chairing and reporting)
- Identify needs for interfaces with external entities
- Ensure coordination between the different activities as necessary
- Quality Management

1.4.4.1 Deliverables

The contractor shall manage and collect the results of each of the WPs, and consolidate them in deliverables technical notes to be delivered according to the following table:

Table 1 - WP1 deliverable list

Ref.	Name	Delivery
D1100	Project Management Plan	T0+1
D1210	Progress Report	T0+3
D1220	Progress Report	T0+6
D1230	Progress Report	T0+9
D1240	Progress Report	T0+12
D1250	Progress Report	T0+15
D1260	Progress Report	T0+18
D1300	Final Report	T0+21

The Final Report will cover all work packages and shall include sound analysis of findings and factually based conclusions, in line with the purpose and objectives described above. The report should contain as standard technical requirements an abstract of no more than 200 words and an executive summary of maximum 4 pages.

The purpose of the abstract is to act as a reference tool helping the reader to quickly ascertain the study's subject. Using keywords is a vital part of abstract writing, to facilitate electronic information retrieval.

The contractor should give an appropriate follow-up to the comments made by the Commission and submit the revised version of the final study within 30 days after the Commission's comments.

The Commission shall approve or reject the final study as specified in article I.4.1 of the contract.

The Final Report shall include as a minimum the following items:

- Summary of the project activities
- Final recommendations and lessons learnt
- List of all submitted deliverables
- List of all meeting attendance (final version of the Travel Plan)
- Status of all accomplished work
- List of all problems, limitations or unexpected points
- Assessment of the risk management (final version of the Risk Management Plan)
- List of all coordination issues
- Inventory List (as attachment)

1.4.5 Work Package 2: User Terminal

The current work packages will allow to develop/adapt the HAS/CAS/OSNMA user terminal (UT). The project is dimensioned to develop a UT not from scratch, but based on pre-existing developments. It is understood that many of the requirements (e.g. RF and signal processing chains, PVT) are already developed in standard receivers. In order to fulfil the technical requirements, the necessary adaptations, mostly related to software will be covered by the project.

The UT shall fulfil the following technical requirements:

	General requirements
R01	The UT shall work in real time, including all its features, as an operational prototype receiver.
R02	The UT is expected to provide performance levels (accuracy, availability, sensitivity, time to fix) generally comparable to that of commercial receivers in the market. Preferably, the UT WP should be managed and performed by a GNSS receiver equipment manufacturer with a successful track record in the receiver market.
R03	At the end of the development, two UT platforms shall be delivered to the customer.
	RF Chain requirements
R04	The UT shall have RF chains for E1, E6, and E5, allowing to generate measurements in each of these frequencies.
	Signal Processing requirements
R05	The UT shall be able to process Galileo E1-B and E1-C as per the Galileo OS SIS ICD .

R06	The UT shall be able to process Galileo E6-B and E6-C as per the Galileo OS SIS ICD and the E6 technical note .
R07	The UT shall be able to process Galileo E5ab-IQ (full AltBOC) and at least one single component (E5a-IQ or E5b-IQ), in a configurable way.
R08	The UT shall be able to process GPS L1C/A and GPS L5 (according to the latest applicable GPS ICDs).
O01	The processing of other GNSS signals is optional.
O02	Robust carrier phase processing for PPP with low-cost/size antennas is desirable but optional.
	OSNMA-specific requirements
R09	The UT shall implement and use Galileo OSNMA. The required specifications on the OSNMA scheme will be provided at KOM. Bidders can use Annex 8 for the tendering process.
R10	The UT shall have an independent time reference allowing loose time synchronization for OSNMA. It will include both network synchronization, when connected to a communication channel, and synchronization to an RTC, when running in standalone mode.
R11	The UT shall handle a ‘test mode’ in which a simulated scenario is run, possibly with a time reference different than the actual time, without raising synchronization alerts.
R12	The UT independent loose time reference shall be compatible with the requirements set in the OSNMA specifications and shall implement a network resynchronization at least once a month. For bidding purposes, a loose time synchronization error below 20 seconds can be taken as a reference.
R13	The UT shall be able to store and protect the public OSNMA cryptographic material in the receiver.
R14	The UT shall implement at least one pseudorange protection technique against signal replay in real time based on the OSNMA unpredictable symbols and schemes developed by the contractor or available in the state-of-the-art.
	CAS-specific requirements
R15	The UT shall process CAS. The required specifications on the CAS will be provided at the KOM. Additionally, bidders can use CAS public documentation for the tendering process.
R16	The UT shall be able to store E6-C samples with a configurable periodicity, start time, duration, for time slots during a given period.
R17	The UT shall be able to perform a-posteriori correlation of pre-stored E6-C samples at a later time, once cryptographic information allowing the correlation is disclosed. Full details of CAS semi-assisted authentication schemes will be provided at the start of the project. They are outlined in Annex 7.
R18	The integration of a module to decrypt and track the E6-C encrypted signal in real time with a symmetric key is not required, but the development of validation tools required to validate CAS semi-assisted mode, is required.
	HAS-specific requirements
R19	The UT shall process HAS. The required specifications on the HAS will be provided at the KOM. Bidders can use Annex 9 for the tendering process.
R20	The UT shall be able to compute a PPP solution, including the estimation of the carrier phase measurement ambiguities based on at least two frequencies.
O03	Optionally, the UT may be able to compute a PPP solution, including the estimation of the carrier phase measurement ambiguities based on three or more frequencies.
R21	The UT shall be able to compute HAS PPP Galileo-only solution and a HAS

	Galileo+GPS solution.
O03	Optionally, the UT may be able to integrate other PPP corrections in addition to those of GPS and Galileo. It is understood that this may require access to some additional data sources.
O04	Optionally, the UT may implement aided-tracking techniques to improve E6-B demodulation sensitivity based on other signals (e.g. E1-C, or E5a/b pilot tones).
	PVT and other requirements
R24	<p>The UT shall incorporate the following consistency checks</p> <ul style="list-style-type: none"> ▪ Combined verification of the Automatic Gain Control (AGC) and Carrier-to-Noise density ratio (C/N0) in order to detect abnormal power emissions, ▪ Pseudorange measurement consistency and Doppler measurement consistency over time, including the detection of abrupt measurement jumps, ▪ Receiver autonomous integrity monitoring (RAIM) techniques, including the detection of inconsistent measurements with the estimated position, ▪ Position and velocity checks, including abnormal position and velocity solutions, sudden jumps, and trajectories not consistent to the dynamics of the vehicle, ▪ Time and frequency consistency, including clock jumps and drifts that are not consistent with the receiver clock characteristics. <p>The thresholds and exact implementation of the consistency checks shall be defined by the contractor.</p>
R25	<p>The UT shall be able to compute a (minimum 1Hz) PVT solution according to at least these options:</p> <ul style="list-style-type: none"> ▪ HAS PPP solution. ▪ OSNMA Data-authenticated solution. ▪ Signal-authenticated solution based on encrypted E6-C ranges, supported by OSNMA-authenticated data and potentially HAS E6-E1 biases. ▪ Combinations of the above, to be developed by the contractor.
O05	Other PVT sources, such as inertial sensors, are optional.
O06	A combined measure of receiver integrity against natural threats (e.g. multipath) and spoofing threats may be provided by the UT as an option.
R26	The UT shall be portable by a person and installable in a standard vehicle.
	Interface requirements
R28	The UT shall allowing testing both in signal simulator and in-field environments.
R29	The UT shall output files in standard format, including RINEX observation and navigation formats, and NMEA. The contractor will propose modifications to these formats to report the needed additional states from the UT (e.g. authentication, PPP fix), where considered pertinent.
R30	The UT shall output log files including its output position, measurements, authentication status, and any other data considered relevant for the purpose of the project.
R31	The UT shall report RFI alerts and the consistency check(s) or feature(s) triggering them.

Important notice: Any background IPRs related to the solutions that the Contractor may propose to test shall be declared in the proposal and updated if necessary at contract signature. If the proposed solutions depend on existing IPRs, the tenderers shall state in their proposal how this may affect the compliance of the proposed solutions with the overall EU objectives for the current activity. This information and its potential impact will be taken into account in the proposal evaluation process (as reflected in the award criteria).

The UT contractors shall license to the customer to the necessary IPRs for the future use of the UT platforms. Similarly, the customer shall allow the contractor to use any IPRs developed in the course of the project.

1.4.5.1 Deliverables

The contractor shall manage and collect the results of each of the WPs, and consolidate them in deliverables technical notes to be delivered according to the following table. The content of the documents and methodology used for the development of the UT shall be explained in the tender.

Table 2 - WP2 deliverable list

Ref.	Name	Delivery
D2010	UT Requirements Document	T0+3
D2020	UT Design Definition and Justification File	T0+6
D2030	UT Internal and External ICD	T0+6
D2040	UT Test Plan	T0+9
D2050	UT Test Report	T0+12
D2060	UT User Manual	T0+12
D2070	UT Platforms	T0+12

1.4.6 Work Package 3 – Support to Engineering, Testing, Experimentation, and Maintenance

Once the User Terminal is delivered, it will be tested in the Joint Research Centre (JRC), Ispra. The testing will include simulated scenarios and field tests including nominal conditions, RFI conditions, including jamming and spoofing, and other adverse cases (e.g. receiver tampering). The tests will measure the performance of the receivers (availability, accuracy, time to fix), and the resilience to RFI and other events.

This WP will cover the following activities:

- Support to the experimentation and testing of the UTs. The support will include configuration of the equipment, ad-hoc onsite test support, reporting, additional analysis, and support to test reporting. The support may also include the generation of HAS data for lab testing with a radio frequency constellation simulator. In addition, the UT developers will prepare an experimentation report with the results of the activity.

- General engineering support to HAS/CAS/OSNMA mission and service definition, demonstration and evolution.

A minimum of 80 person-days will be made available in this WP. Apart from this support, the Contractor will devote effort to prepare a report with the testing results of the UT. These reports may use results provided by the JRC as part of the testing.

This work package has no deliverables associated but it will contribute to the reporting and possible publication of the results by the JRC. The support carried out by the contractors will be reported in the Progress Reports in WP1.

Table 3 – WP3 deliverable list

Ref.	Name	Delivery
D3010	Support Activities Report	T0+21

1.4.7 Work Package 4 – Research and Development

This WP will cover research and development activities related to the topic of the tender. These will include specific developments, analyses, or other longer-term, higher-risk research. The WP is divided in activities, each of which can be carried out independently, and will be reported independently through a specific report. The WP will include effort devoted for publications in journals or conferences, if justified by the results. Data available from the previous WPs, and in particular WP3, may be used as an input for this WP.

The contractor will allocate to this WP between 25% and 30% of the total budget and it will be performed entirely by one or more research entities active in the domain of the project, such as non-profit research centres or university groups.

The following topics are proposed:

- Development of an open-source library (language and input/output formats to be agreed with the contractor at KOM) to decode the Galileo HAS message. Processing of the message and generation of a PPP solution as part of the library is optional as part of this topic.
- Study and test semi-assisted CAS (see Annex 7) for initialisation of OSNMA synchronisation.
- Optional:
 - Advanced anti-spoofing and signal integrity: Anti-spoofing and integrity methods based on GNSS combined with signals of opportunity (e.g. 5G, LEO mega-constellations). Integrity and authentication of carrier phase measurements and PPP positioning.
 - Fast PPP convergence: Study and test PPP snapshot positioning, understood as PPP in one or few seconds, and under which conditions (e.g. number of frequencies and satellites, and which corrections), using HAS and if necessary other sources of information. Study of Galileo Altboc signal for PPP fast ambiguity resolution.
 - Define, implement and test a HAS data authentication scheme to be incorporated in the HAS E6-B message.

Other research topics related to high accuracy and authentication may be proposed by the contractor in their tenders. At the KOM, four topics out of the above (the first two plus two out of the three optional ones, with further detail on the specific focus of the research) will be selected in agreement between the contractor and the customer and studied during the contract. The results of each R&D topic will be reported in a separate report. This report will include a short review of the state-of-the-art, description of the methodology, simulation and testing performed, conclusions and recommendations.

Table 4 - WP4 deliverable list

Ref.	Name	Delivery
D4010	Topic 1 report	T0+9
D4020	Topic 2 report	T0+9
D4030	Topic 3 report	T0+18
D4040	Topic 4 report	T0+18

1.4.8 Deliverables

The language of all communication (oral & written) will be English.

The deliverables and their schedules for the different work packages have been presented in the previous tables of this document.

The contractor may propose to extend the deliverable list if considered beneficial for the project.

1.4.8.1 Schedule and Meetings

Figure 1 presents the high-level schedule of the contract.

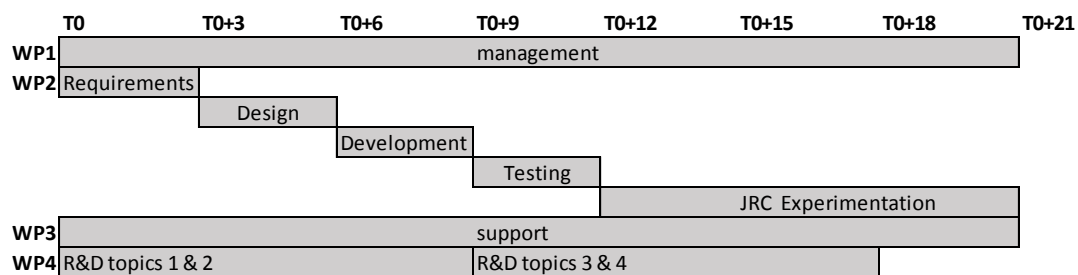


Figure 1 - Overall Project Schedule

Table 5 Project Milestones

Milestone	Time	Objectives	Venue	Payment
Kick-off (KO)	T0+0.5	Kick off the project; Agree on the TBC/TBDs; Agree WP4 topics.	Brussels	30%
Requirements Review (RR)	T0+3	Approve the UT requirement documentation.	Videoconf	
Critical Design Review (CDR)	T0+6	Approve the UT design documentation.	Contractor	15%
Test Readiness Review (TRR)	T0+9	Approve the test plan; Approve topic 1 and topic 2 Reports.	Videoconf	
Qualification Review (QR)	T0+12	Deliver the UT test results and the UT platform.	Contractor	15%
Experimentation Review (ER)	T0+18	Review the experimentation results; Approve topic 3 and topic 4 Reports.	Videoconf	
Final Review (FR)	T0+21	Approve the final report and close the project.	Brussels	40%

1.5 Place of performance: where will the contract be performed?

The platform will be developed at the contractor's premises. Tests will be independently conducted by the Joint Research Centre (JRC) in its facilities (Ispra, IT), with support from the Contractor.

1.6 Nature of the contract

The procedure will result in the conclusion of a direct contract.

In direct contracts all the terms governing the provision of the services, supplies or works are defined at the outset. Once signed, they can be implemented directly without any further contract procedures

👉 Tenderers need to take full account of the provisions of the Draft contract as the latter will define and govern the contractual relationship(s) to be established between the *Contracting authority* and the successful tenderer(s). Special attention is to be paid to the provisions specifying the rights and obligations of the contractor, in particular those on payments, performance of the contract, confidentiality, and checks and audits.

1.7 Volume and value of the contract

The estimated total amount of all purchases under this contract is indicated under Heading II.1.5 of the contract notice.

1.8 Duration of the contract

The contract(s) resulting from the award of this call for tenders will be concluded for at most **21 months**. The details of the initial contract duration and possible renewals are set out in Article I.3 of the Draft contract.

1.9 Electronic exchange system

For all exchanges with the contractor during the implementation of the contract as well as for future possible subsequent proceedings for the purposes of EDES ([European Union's Early Detection and Exclusion System](#)) the *Contracting authority* may use an electronic exchange system meeting the requirements of Article 148 of [Regulation \(EU, Euratom\) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union](#)¹. At the request of the *Contracting authority* the use of such a system shall become mandatory for the contractor(s) at no additional cost for the *Contracting authority*. Details on specifications, access, terms and conditions of use will be provided in advance.

2 GENERAL INFORMATION ON TENDERING

2.1 Legal basis: what are the rules?

This call for tenders is governed by the provisions of [Regulation \(EU, Euratom\) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union](#) (the Financial Regulation)¹.

The *Contracting authority* has chosen to award the contract resulting from this call for tenders through an open procedure pursuant to Article 164(1) (a) of the Financial Regulation. In an open procedure any interested economic operator (any natural or legal person who offers to supply products, provide services or execute works) may submit a tender.

2.2 Rules on access to procurement: who may submit a tender?

Participation in this call for tenders is open on equal terms to all natural and legal persons coming within the scope of the [Treaties](#), as well as to international organisations.

It is also open to all natural and legal persons established in a third country which has a special agreement with the European Union in the field of public procurement on the conditions laid down in that agreement. Where the Agreement on Government Procurement² concluded within the World Trade Organisation applies, the participation to this call for tenders is open to all natural and legal persons established in the countries that have ratified this Agreement, on the conditions laid down therein.

The rules on access to procurement do not apply to subcontractors. Subcontracting may not be used with the intent to circumvent the rules on access to procurement.

To enable *the Contracting authority* to verify the access, each tenderer must indicate its country of establishment (and in case of joint tender – the country of establishment of each group member) and must present the supporting evidence normally acceptable under the law of that country/-ies. The same document(s) could be used to prove country/-ies of establishment and the delegation(s) of the authorisation to sign as described in **Section 4.3**.

✎ *For tenderers established in the United Kingdom:*

Please be aware that after the UK's withdrawal from the EU, the rules of access to EU procurement procedures of economic operators established in third countries will apply to tenderers from the UK depending on the terms of any Withdrawal Agreement. In case such access is not provided by legal provisions in force tenderers from the UK could be rejected from the procurement procedure.

¹ Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012 (OJ L 193 of 30.07.2018, p.1).

² https://www.wto.org/english/tratop_e/gproc_e/gp_gpa_e.htm.

2.3 Registration in the Participant Register: why register?

Any economic operator willing to submit a tender for this call for tenders must be registered in the [Participant Register](#) - an online register of organisations and natural persons participating in European Commission's calls for tenders or proposals (participants).

On registering each participant obtains a Participant Identification Code (PIC, 9-digit number) which acts as its unique identifier in the Participant Register. A participant needs to register only once – the information provided can be further updated or re-used by the participant in other European Commission's calls for tenders or calls for proposals.

At any moment during the procurement procedure the Research Executive Agency Validation Services (hereafter *the EU Validation Services*) may contact the participant and ask for supporting documents on legal existence and status. The requests will be made through the register's messaging system to the e-mail address of the participant's contact person indicated in the register. It is the responsibility of the participant to provide a valid e-mail address and to check it regularly.

The documents that may be requested by *the EU Validation Services* are listed in the [EU Grants and Tenders Rules on Legal Entity Validation, LEAR appointment and Financial Capacity assessment](#).

🔔 **Please note that a request for supporting documents by the *EU Validation Services* in no way implies that the tenderer has been successful.**

2.4 Ways to submit a tender: how can economic operators organise themselves to submit a tender?

Economic operators can submit a tender either as a sole tenderer or as a group of tenderers. In either case subcontracting is permitted.

In order to fulfil the selection criteria set out in **Section 3.2** the tenderer can rely on the capacities of subcontractors or other entities (not subcontractors).

The role of each entity involved in a tender (hereafter referred to as *involved entity*) must be clearly specified: sole tenderer, member of a group or Group leader, subcontractor or an entity on whose capacities the tenderer relies to fulfil the selection criteria³. This applies also where the *involved entities* belong to the same economic group.

³ Such an entity is not considered a subcontractor, see Section 2.4.3.

2.4.1 Joint tenders

A joint tender is a situation where a tender is submitted by a group (with or without legal form) of economic operators regardless of the link they have between them. The group as a whole is considered a tenderer⁴.

All members of the group assume joint and several liability towards the *Contracting authority* for the performance of the contract as a whole.

Group members must appoint a *Group leader* and a single point of contact authorised to act on their behalf in connection with the submission of the tender and all relevant questions, clarification requests, notifications, etc., that may be received during the evaluation, award and until the contract signature. The model power of attorney attached in **Annex 3** is to be used.

The joint tender must clearly indicate the role and tasks of each member and of the *Group leader* who will act as the *Contracting authority's* contact point for the contract's administrative or financial aspects and operational management. The *Group leader* will have full authority to bind the group and each of its members during contract execution. If the joint tender is successful, the *Contracting authority* shall sign the contract with the Group leader, authorised by the other members to sign the contract on their behalf via power of attorney drawn up in the model attached in **Annex 3**.

Changes in the composition of the group during the procurement procedure (after the submission deadline and before contract signature) shall lead to rejection of the tender except in case of a merger or takeover of a member of the group (universal succession), provided that the new entity has access to procurement (see **Section 2.2**) and is not in an exclusion situation, (see **Section 3.1**).

In either case the selection criteria must be still fulfilled by the group and the terms of the originally submitted tender may not be altered substantially, i.e. all the tasks assigned to the excluded/rejected entity must be taken over by the group, the change must not make the tender non-compliant with the Tender specifications, and the evaluation of award criteria of the originally submitted tender may not be modified.

2.4.2 Subcontracting

Subcontracting is the situation where the contractor enters into legal commitments with other economic operators which will perform part of the contract on its behalf. The contractor retains full liability towards the *Contracting authority* for performance of the contract as a whole.

The following shall not be considered subcontracting:

- a) Use of workers posted to the contractor by another company owned by the same group and established in a Member State (“intra-group posting” as defined by Article 1, 3,

⁴ References to *tenderer* or *tenderers* in this document shall be understood as covering both sole tenderers and groups of economic operators submitting a joint tender.

(b) of [Directive 96/71/EC concerning the posting of workers in the framework of the provision of services](#)).

- b) Use of workers hired out to the contractor by a temporary employment undertaking or placement agency established in a Member State (“hiring out of workers” as defined by Article 1, 3, (c) of [Directive 96/71/EC concerning the posting of workers in the framework of the provision of services](#)).
- c) Use of workers temporarily transferred to the contractor from an undertaking established outside the territory of a Member State and that belongs to the same group (“intra-corporate transfer” as defined by Article 3, (b) of [Directive 2014/66/EU on the conditions of entry and residence of third-country nationals in the framework of an intra-corporate transfer](#)) .
- d) Use of staff without employment contract (“self-employed persons working for the contractor”) to perform substantially the same tasks as the staff with employment contract (“employees”), without the tasks of the self-employed persons being particular well-defined parts of the contract.
- e) Use of suppliers and/or transporters by the contractor, in order to perform the contract at the place of performance, unless the economic activities of the suppliers and/or the transporting services are within the subject of this call for tender (see **Section 1.4**).
- f) Performance of part of the contract by members of an EEIG (European Economic Interest Grouping), when the EEIG is itself a contractor or a group member.

The persons mentioned in points a), b), c) and d) above will be considered as “personnel” of the contractor as defined in the contract.

All contractual tasks may be subcontracted unless the *Technical specifications* expressly reserve the execution of certain critical tasks to the sole tenderer itself, or in case of a joint tender, to a member of the group.

By filling in the form available in **Annex 4**, tenderers are required to give an indication of the proportion of the contract that they intend to subcontract, as well as to identify and describe briefly the envisaged contractual roles/tasks of subcontractors meeting any of these conditions (hereafter referred to as *identified subcontractors*):

- on whose capacities the tenderer relies upon to fulfil the selection criteria as described under **Section 3.2**;
- whose individual share of the contract, known at the time of submission, is above 20%

Any such subcontractor must provide the tenderer with a commitment letter drawn up in the model attached in **Annex 5.1** and signed by its authorised representative.

Changes concerning subcontractors identified in the tender (withdrawal/replacement of a subcontractor, additional subcontracting) during the procurement procedure (after the submission deadline and before contract signature) require the prior written approval of the *Contracting authority* subject to the following verifications:

- any new subcontractor is not in an exclusion situation;
- the tenderer still fulfils the selection criteria and the new subcontractor fulfils the selection criteria applicable to it individually, if any;

- the terms of the originally submitted tender are not altered substantially, i.e. all the tasks assigned to the former subcontractor are taken over by another involved entity, the change does not make the tender non-compliant with the Tender specifications, and the evaluation of award criteria of the originally submitted tender is not modified.

Subcontracting to subcontractors identified in a tender that was accepted by the *Contracting authority* and resulted in a signed contract, is considered authorised.

2.4.3 Entities on whose capacities the tenderer relies to fulfil the selection criteria

In order to fulfil the selection criteria a tenderer may also rely on the capacities of other entities, regardless of the legal nature of the links it has with them. It must in that case prove that it will have at its disposal the resources necessary for the performance of the contract by producing a commitment letter in the model attached in **Annex 5.2**, signed by the authorised representative of such an entity, and the supporting evidence that those other entities have the respective resources.

If the contract is awarded to a tenderer intending to rely on another entity to meet the minimum levels of economic and financial capacity, the *Contracting authority* may require the entity to sign the contract or, alternatively, to provide a joint and several first-call financial guarantee for the performance of the contract.

With regard to technical and professional selection criteria, a tenderer may only rely on the capacities of other entities where the latter will perform the works or services for which these capacities are required (i.e. the latter will assume the role of subcontractors).

👉 Relying on the capacities of other entities is only necessary when the capacity of the tenderer is not sufficient to fulfil the required minimum levels of capacity. Abstract commitments that other entities will put resources at the disposal of the tenderer will be disregarded.

3 EVALUATION AND AWARD

The evaluation of the tenders that comply with the submission conditions will consist of the following elements:

- Check if the tenderer has access to procurement (see *Section 2.2*); Verification of administrative compliance (if the tender is drawn up in one of the official EU languages and signed by duly authorised representative(-s) of the tenderer);
- Verification of non-exclusion of tenderers on the basis of the exclusion criteria;
- Selection of tenderers on the basis of selection criteria;
- Verification of compliance with the minimum requirements defined in the Tender specifications;
- Evaluation of tenders on the basis of the award criteria.

The *Contracting authority* will evaluate the abovementioned elements in the order that it considers to be the most appropriate. If the evaluation of one or more elements demonstrates that there are grounds for rejection, the tender will be rejected and will not be subjected to further full evaluation. The unsuccessful tenderers will be informed of the ground for rejection without being given feedback on the non-assessed content of their tenders. Only tenderer(s) for whom the verification of all elements did not reveal grounds for rejection can be awarded the contract.

The evaluation will be based on the information and evidence contained in the tenders and, if applicable, on additional information and evidence provided at the request of the *Contracting authority* during the procedure. If any of the declarations or information provided proves to be false, the *Contracting authority* may impose administrative sanctions (exclusion or financial penalties) on the entity providing the false declarations/information.

For the purposes of the evaluation related to exclusion and selection criteria the *Contracting authority* may also refer to publicly available information, in particular evidence that it can access on a national database free of charge.

3.1 Exclusion criteria

The objective of the exclusion criteria is to assess whether the tenderer is in any of the exclusion situations listed in Article 136(1) of the Financial Regulation.

As evidence of non-exclusion each tenderer needs to submit with its tender a Declaration on Honour⁵ in the model available in *Annex 2*.⁶ The declaration must be signed by an authorised representative of the entity providing the declaration.

⁵ The European Single Procurement Document (ESPD) may not be used yet in European Commission's calls for tenders.

⁶ Unless the same declaration has already been submitted for the purposes of another award procedure of the European Commission, the situation has not changed, and the time elapsed since the issuing date of the declaration does not exceed one year.

The initial verification of non-exclusion of tenderers will be done on the basis of the submitted declarations and consultation of the [European Union's Early Detection and Exclusion System](#). The documents mentioned as supporting evidence in the Declaration on Honour need to be provided whenever requested and where this is necessary to ensure the proper conduct of the procedure within a deadline given by the Contracting authority⁷.

Annex 1 specifies which of the *involved entities* participating in a tender need to provide the Declaration on Honour and, when requested by *the Contracting authority*, the supporting evidence.

Please note that a request for evidence in no way implies that the tenderer has been successful.

3.2 Selection criteria

The objective of the selection criteria is to assess whether the tenderer has the legal, regulatory, economic, financial, technical and professional capacity to perform the contract.

The selection criteria for this call for tenders, including the minimum levels of capacity, the basis for assessment and the evidence required, are specified in the following subsections.

Tenders submitted by tenderers not meeting the minimum levels of capacity will be rejected.

When submitting its tender each tenderer shall declare on honour that it fulfils the selection criteria for the call for tender. The model Declaration on Honour available in *Annex 2* shall be used.

The initial assessment of whether a tenderer fulfils the selection criteria will be done on the basis of the submitted declaration(s).

The subsections below specify which selection criteria evidence must be provided with the tender or may be requested later, at any time during the procurement procedure⁸. In any case, to the extent that there is no ground for a waiver, the evidence must be provided, upon request

⁷ The obligation to provide the supporting evidence will be waived in the following situations:

- if the same documents have already been provided in a previous award procedure of the European Commission, have been issued no more than one year before the date of their request by the *Contracting authority* and are still valid at that date;
- if such evidence can be accessed by the *Contracting Authority* on a national database free of charge, in which case the economic operator shall provide the *Contracting authority* with the internet address of the database and, if needed, the necessary identification data to retrieve the document;
- if there is a material impossibility to provide such evidence.

⁸ The obligation to provide the supporting evidence will be waived in the following situations:

- if the same documents have already been provided in a previous award procedure of the European Commission, have been issued no more than one year before the date of their request by the *Contracting authority* and are still valid at that date;
- if such evidence can be accessed by the *Contracting Authority* on a national database free of charge, in which case the economic operator shall provide the *Contracting authority* with the internet address of the database and, if needed, the necessary identification data to retrieve the document.

and within a deadline given by the Contracting authority. The evidence must be provided in accordance with the applicable basis for assessment of each criterion: in case of a consolidated assessment – only by the *involved entities* who contribute to the fulfilment of the criterion, and in case of individual assessment – by each *involved entity* to whom the criterion applies individually.

3.2.1 Legal and regulatory capacity

Tenderers do not need to prove specific legal and regulatory capacity to perform the contract.

3.2.2 Economic and financial capacity

Tenderers must comply with the following selection criteria in order to prove that they have the necessary economic and financial capacity to perform the contract.

Criterion F1	
Minimum level of capacity	Average yearly turnover of the last two financial years above EUR 450.000.
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. a consolidated assessment of the combined capacities of all <i>involved entities</i> will be carried out.
Evidence	Copy of the profit and loss accounts and balance sheet for the last two years for which accounts have been closed from each concerned <i>involved entity</i> , or, failing that, appropriate statements from banks. The most recent year must have been closed within the last 18 months.

👉 All of the above specified evidence of economic and financial capacity must be provided with the tender.

3.2.3 Technical and professional capacity

Tenderers must comply with the following selection criteria in order to prove that they have the necessary technical and professional capacity to perform the contract.

Tenderers must be able to supply *all* the services described above.

The tenderers are asked to propose **a core team of minimum 4 persons** for the implementation of the action. Each member of the team shall have a very good knowledge of English, understood as at least level C2 both written and oral.

Criterion T1	
The tenderers are asked to propose one person for the implementation of the action with very good knowledge of the GNSS field in particular related to High Accuracy.	
Minimum level of capacity	Proven experience of at least three years in the field of satellite navigation
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. the combined capacities of all <i>involved entities</i> .
Evidence	<ul style="list-style-type: none"> • Curriculum vitae • List of publications regarding the specific domain

Criterion T2	
The tenderers are asked to propose at least one person for the implementation of the action with very good knowledge of the authentication field in particular related to GNSS.	
Minimum level of capacity	Proven experience of at least three years in the field of authentication
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. the combined capacities of all <i>involved entities</i> .
Evidence	<ul style="list-style-type: none"> • Curriculum vitae • List of publications regarding the specific domain

Criterion T3	
The tenderers are asked to propose at least one person for the implementation of the action with very good knowledge of integration of complex systems HW/SW related to satellite navigation.	
Minimum level of capacity	At least three years of experience in integrating and testing complex hardware and software systems related to satellite navigation or aerospace infrastructure.
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. the combined capacities of all <i>involved entities</i> .
Evidence	<ul style="list-style-type: none"> • Curriculum vitae • List of publications regarding the specific domain • List of previous projects proving experience

Criterion T4	
The tenderers are asked to propose a core team of minimum 4 persons for the implementation of the action with very good drafting skills; experience in drafting reports, technical reports	
Minimum level of capacity	At least level C2 both written and oral of English.
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. the combined capacities of all <i>involved entities</i> .
Evidence	<ul style="list-style-type: none"> • Curriculum vitae with Common European Framework of Reference for Languages - Self assessment grid

Criterion T5	
One Project manager and coordinator with experience in project management and coordination of EU-wide research projects related to GNSS, collection and analysis of data, assessment of impacts, working with experts at European level, with multi-lingual and multi-cultural skills	
Minimum level of capacity	At least 3 years of experience in the above.

Basis for assessment	This criterion applies to the tenderer as a whole, i.e. the combined capacities of all <i>involved entities</i> .
Evidence	<ul style="list-style-type: none"> • Curriculum vitae • A list of projects managed and coordinated in the last 5 years.

Criterion T6	
One member of the consortium shall be a research organization, such as non-profit research centres or university groups, active in the domain of the project.	
Minimum level of capacity	At least 3 years of experience in the above.
Basis for assessment	This criterion applies to the tenderer as a whole, i.e. the combined capacities of all <i>involved entities</i> .
Evidence	<ul style="list-style-type: none"> • List of publications regarding the specific domain • Proven experience in previous projects • Compliance with technical specifications

The educational and professional qualifications of the service provider or contractor and/or those of the firm's managerial staff and, in particular, those of the person or persons responsible for providing the services or carrying out the tasks; The Europass curriculum vitae format (<http://europass.cedefop.europa.eu/en/documents/curriculum-vitae>) shall be filled in and signed, by each person involved in the execution of the tasks foreseen in the tender. The precise contractual link with the tenderer will also be described.

☞ All of the above specified evidence of technical and professional capacity must be provided with the tender.

3.3 Compliance with the minimum requirements of the Tender specifications

By submitting a tender a tenderer commits to perform the contract in full compliance with the terms and conditions of the procurement documents for this call for tender. Particular attention is drawn to the minimum requirements specified in Section 1.4 of these specifications and to the fact that tenders must comply with applicable data protection, environmental, social and labour law obligations established by Union law, national legislation, collective agreements or the international environmental, social and labour conventions listed in Annex X to Directive 2014/24/EU.

The minimum requirements shall be observed throughout the entire duration of the contract. Compliance with these requirements is mandatory and cannot be subject to any assumptions, limitations, conditions, or reservations on the part of a tenderer.

☞ **Tenders that are not compliant with the applicable minimum requirements shall be rejected.**

3.4 Award criteria

The objective of the award criteria is to evaluate the tenders with a view to choosing the most economically advantageous tender.

Tenders will be evaluated on the basis of the following award criteria and their weighting:

1. Price - 30%

The price considered for evaluation will be the total price of the tender, covering all the requirements set out in the Tender Specifications.

2. Quality – 70%

The quality of the tender will be evaluated based on the following criteria:

Criterion	QUALITATIVE AWARD CRITERIA	Weighting (maximum points)
1.	Quality of content of the proposed methodology <ul style="list-style-type: none"> ➤ Quality, clarity, relevance and completeness of the technical proposal as regards the UT design/development aspects, including the elements requested as per section WP2 in the technical specification. (25 points) ➤ Quality, clarity, relevance and completeness of the capabilities of the UT proposed to be delivered (notably HAS/CAS/OSNMA), including both technical and legal aspects related to licensing and IPR during the final phase of the project, and the testing activities proposed (25 points) ➤ Suitability of the proposed support activities as requested under WP 4 (20 points) 	70
2.	Quality and adequacy of the project management: <ul style="list-style-type: none"> ➤ Adequacy of the proposed management plan, including quality of the proposed planning, monitoring and evaluation, quality control process/mechanisms for ensuring a continuous service, product assurance and risk assessment. ➤ Allocation of efforts per partner, suitability of the effort related to each activity in the work breakdown structure and work package descriptions, and suitability of the roles and responsibilities of the proposed team. 	20
3.	Adequacy of the proposed support and facilities <ul style="list-style-type: none"> ➤ Suitability of equipment, tools or facilities at the disposal of the tenderer for the execution of the tasks and justification of their contribution to the projects objectives 	10
<i>Total number of points</i>		100

The selected tender is assessed according to the above qualitative award criteria and the weighting applicable to each criterion.

Tenders scoring

- * less than 60% in the overall points total or
 - * less than 50% in the points awarded for a single criterion
- will be excluded from the rest of the assessment procedure.**

3.5 Award (ranking of tenders)

Tenders presenting a total price superior to the maximum amount of 700.000€ will be excluded from the rest of the assessment procedure.

Tenders shall be ranked according to the best price-quality ratio in accordance with the formula below:

$$\text{Score for Tender X} = (\text{Technical Score X } 0.7) + [(\text{Lowest price/Price of Tender X}) \times 100] \times 0.3$$

Where the "lowest price" refers to the lowest price among the tenders having passed the quality threshold

☝ The contract shall be awarded to the tender ranked first, which complies with the Tender Specifications and is submitted by a tenderer having access to procurement, not in an exclusion situation and fulfilling the selection criteria.

4 FORM AND CONTENT OF THE TENDER

4.1 Form of the tender: how to submit the tender?

Tenders are to be submitted via the e-Submission application according to the instructions laid down in the Invitation to tender letter and the [e-Submission Quick Guide](#).

👉 Make sure you prepare and submit your electronic tender in e-Submission early enough to ensure it is received within the deadline specified under Heading IV.2.2 of the contract notice. A tender received after this deadline will be rejected.

4.2 Content of the tender: what documents to submit with the tender?

The documents to be submitted with the tender in e-Submission are listed in *Annex 1*.

The following requirements apply to the technical and financial offer (to be uploaded as Technical tender and Financial tender in e-Submission):

- *Technical offer.*

The technical offer must provide all the information needed to assess the compliance with Section 1.4 of these specifications and the award criteria. Tenders deviating from the minimum requirements or not covering all the requirements may be rejected on the basis of non-compliance and not evaluated further.

- *Financial offer.*

A complete financial offer, including the breakdown of the price needs to be uploaded. For this purpose, the Financial Model in *Annex 6* shall be completed, duly signed and uploaded in e-Submission.

It is the responsibility of each tenderer to ensure that the total amount of the tender inserted in the relevant field of the e-Submission application corresponds to the amount indicated in the uploaded financial offer. In case of discrepancies, only the amount indicated in the financial offer will be taken into account.

The financial offer shall be:

- expressed in euros. Tenderers from countries outside the euro zone have to quote their prices in euro. The price quoted may not be revised in line with exchange rate movements. It is for the tenderer to bear the risks or the benefits deriving from any variation.
- quoted free of all duties, taxes and other charges, i.e. also free of VAT. The tenderer may indicate the amount of VAT but it must be shown separately.

The quoted price must be a fixed amount which includes all charges (including travel and subsistence). Travel and subsistence expenses are not refundable separately.

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, 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;**

Meetings with the Commission:

The Kick-Off Meeting and Final Review will take place in Brussels unless otherwise agreed by the European Commission.

Costs to participate in such meetings will not be reimbursed separately and shall be comprised in the financial proposal.

Bids involving more than one legal entity must specify the amounts under a) for each legal entity.

☞ The European Union Institutions are exempt from such charges in the EU under Articles 3 and 4 of the Protocol on the Privileges and Immunities of the European Union of 8 April 1965 annexed to the Treaty on the Functioning of the European Union. Exemption is granted to the Commission by the governments of the Member States, either through refunds upon presentation of documentary evidence or by direct exemption.

For those countries where national legislation provides an exemption by means of a reimbursement, the amount of VAT must be shown separately. In case of doubt about the applicable VAT system, it is the tenderer's responsibility to contact his or her national authorities to clarify the way in which the European Union is exempt from VAT.

4.3 Signature policy: how can documents be signed?

Where a document needs to be signed, the signature must be either hand-written, a qualified electronic signature or an advanced electronic signature based on a qualified certificate as defined in [Regulation \(EU\) No 910/2014 on electronic identification and trust services for electronic transactions in the internal market \(the eIDAS Regulation\)](#).

For hand-written signatures see Section 1 of the Invitation to tender.

For electronic signatures see: <https://ec.europa.eu/docsroom/documents/32342>.

All documents must be signed by the signatories (when they are individuals) or by their duly authorised representatives.

For the following documents, when signed by representatives, tenderers must provide evidence for the delegation of the authorisation to sign:

- The Tender report;
- The Declaration on Honour of the tenderer (in case of joint tender – the Declarations on Honour of all group members);
- (If applicable – in the case of joint tender) the power(s) of attorney drawn up using the model attached in **Annex 3**).

The delegation of the authorisation to sign on behalf of the signatories (including, in the case of proxy(-ies), the chain of authorisations) must be evidenced by appropriate written evidence (copy of the notice of appointment of the persons authorised to represent the legal entity in signing contracts (together or alone), or a copy of the publication of such appointment if the legislation which applies to signatory requires such publication or a power of attorney). A document that the Contracting authority can access on a national database free of charge does not need to be submitted if the Contracting authority is provided with the exact internet link and, if applicable, the necessary identification data to retrieve the document.

4.4 Confidentiality of tenders: what information and under what conditions can be disclosed?

Once the *Contracting authority* has opened a tender, it becomes its property and shall be treated confidentially, subject to the following:

- For the purposes of evaluating the tender and, if applicable, implementing the contract, performing audits, benchmarking, etc., the *Contracting authority* is entitled to make available (any part of) the tender to its staff and the staff of other Union institutions, agencies and bodies, as well to other persons and entities working for the *Contracting authority* or cooperating with it, including contractors or subcontractors and their staff provided that they are bound by an obligation of confidentiality.
- After the signature of the award decision tenderers whose tenders were received in accordance with the submission modalities, who have access to procurement, who are not found to be in an exclusion situation referred to in Article 136(1) of the FR, who are not rejected under Article 141 of the FR, whose tenders are not found to be incompliant with the procurement documents, and who make a request in writing will be notified of the name of the tenderer to whom the contract is awarded, the characteristics and relative advantages of the successful tender and the price of the offer and/or contract value. The *Contracting authority* may decide to withhold certain information that it assesses as being confidential, in particular where its release would prejudice the legitimate commercial interests of economic operators or might distort fair competition between them. Such information may include, without being limited to, confidential aspects of tenders such as unit prices included in the financial offer, technical or trade secrets⁹.
- The *Contracting authority* may disclose the submitted tender in the context of a request for public access to documents, or in other cases where the applicable law requires its disclosure. Unless there is an overriding public interest in disclosure¹⁰, the

⁹ For the definition of trade secrets please see Article 2 (1) of DIRECTIVE (EU) 2016/943 on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure.

¹⁰ See Article 4 (2) of the REGULATION (EC) No 1049/2001 regarding public access to European Parliament, Council and Commission documents.

Contracting authority may refuse to provide full access to the submitted tender, redacting the parts (if any) that contain confidential information, the disclosure of which would undermine the protection of commercial interests of the tenderer, including intellectual property.

☞ The *Contracting authority* will disregard general statements that the whole tender or substantial parts of it contain confidential information. Tenderers need to mark clearly the information they consider confidential and explain why it may not be disclosed. The *Contracting authority* reserves the right to make its own assessment of the confidential nature of any information contained in the tender.

APPENDIX: LIST OF REFERENCES

<i>Award criteria</i>	See Section 3.4
<i>Contracting authority</i>	See Section 1.1
<i>Entities on whose capacities the tenderer relies to fulfil the selection criteria</i>	See Section 2.4.3
<i>EU Validation services</i>	See Section 2.3 EU Grants and Tenders Rules on Legal Entity Validation, LEAR appointment and Financial Capacity assessment
<i>Exclusion criteria</i>	See Section 3.1
<i>Financial Regulation</i>	Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union
<i>Group leader</i>	See Section 2.4.1
<i>Identified subcontractors</i>	See Section 2.4.2
<i>Involved entities</i>	See Section 2.4
<i>Joint tender</i>	See Section 2.4.1
<i>Participating entities</i>	See Section 1.1
<i>Participant Register</i>	See Section 2.3 https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/participant-register
<i>Selection criteria</i>	See Section 3.2
<i>Sole tenderer</i>	See Section 2.4
<i>Subcontracting/subcontractor</i>	See Section 2.4.2
<i>Treaties</i>	The EU Treaties: https://europa.eu/european-union/law/treaties_en

LIST OF ACRONYMS

AGC	Automatic Gain Control
CAS	Commercial Authentication Service
CDR	Critical Design Review
EC	European Commission
ER	Experimentation Review
EU	European Union
FR	Final Review
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSA	European GNSS Agency
H2020	Horizon 2020
HAS	High Accuracy Service
HW	Hardware
ICD	Interface Control Document
IPR	Intellectual Property Rights
ITT	Invitation To Tender
JRC	Joint Research Centre
KOM	Kick-Off Meeting
OS	Open Service
OSNMA	Open Service Navigation Message Authentication
PIC	Participant Identification Code
PNT	Positioning, Navigation and Timing
PPP	Precise Point Positioning
PRS	Public Regulated Service
PVT	Position, Velocity and Time
QR	Qualification Review
R&D	Research and Development
RAIM	Receiver autonomous integrity monitoring
RF	Radio Frequency
RR	Requirements Review
RTC	Real-Time Clock
SAR	Search and Rescue
SG	Signal Generator
SIS	Signal In Space
SW	Software
TBD	To Be Defined
TESLA	Timed Efficient Stream Loss-tolerant Authentication
TRR	Test Readiness Review
UT	User Terminal
WP	Work Package

APPLICABLE DOCUMENTS

The following documents will be applicable for the project.

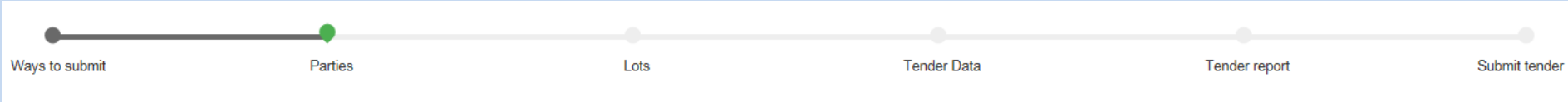
- [AD1] European Union, “OSSISICD: Open Service Signal In Space Interface Control Document, Issue 1.3,” 2016. - <https://www.gsc-europa.eu/electronic-library/programme-reference-documents>
- [AD2] European Union, "Galileo E6-B/C Codes Technical Note", 2019.- <https://www.gsc-europa.eu/electronic-library/programme-reference-documents>

REFERENCE DOCUMENTS

- [1] European Commission, *COMMISSION IMPLEMENTING DECISION (EU) 2017/224 of 8 February 2017 (CS Implementing Act)*, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32017D0224>, 2017.
- [2] European Commission, *COMMISSION IMPLEMENTING DECISION (EU) 2018/321 of 2 March 2018 amending Implementing Decision (EU) 2017/224 (CS Implementing Act)*, https://eur-lex.europa.eu/eli/dec_impl/2018/321/oj, 2018.
- [3] European GNSS Service Centre, “European GNSS Service Centre,” European GNSS Supervisory Authority (GSA), [Online]. Available: <https://www.gsc-europa.eu/>. [Accessed March 2020].

ANNEXES

Annex 1. List of documents to be submitted with the tender or during the procedure

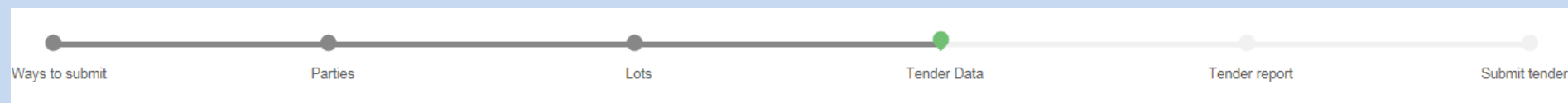
Description	Sole tenderer	Joint tender		Identified Subcontractor	Entity on whose capacity is being relied	When and where to submit the document?	Instructions for uploading in eSubmission (if applicable)	
		Group leader	Member of the group				How to name the file?	Where to upload?
1. Identification and information about the tenderer.								
<i>eSubmission view</i>								
								
Declaration on Honour on Exclusion and Selection Criteria (see Section 3.1) model in Annex 2. Declaration on Honour on exclusion and selection criteria	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	With the tender in e-Submission	'Declaration on Honour'	With the concerned entity under 'Parties' → 'Identification tenderer' → 'Attachments' → 'Declaration on Honour'.
Evidence that the person signing the documents is an authorised	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			With the tender in e-Submission	'Authorisation to sign' documents'.	With the concerned entity under 'Parties' → 'Identification tenderer'

representative of the entity ¹¹								→'Attachments'→'Other documents'.
Power of attorney (see Section 2.4.1) model in Annex 3. Power of attorney			☒			With the tender in e-Submission	'Power of attorney'	In the Group leader's section under 'Parties' →'Identification tenderer' →'Attachments'→'Other documents'.
Commitment letter (see Section 2.4.2 and 2.4.3)				☒ (model in Annex 5.1)	☒ (model in Annex 5.2)	With the tender in e-Submission	'Commitment letter'	With the concerned entity under 'Parties' →'Identification tenderer' →'Attachments'→'Other documents'.
Evidence of non-exclusion (see Section 3.1)	☒	☒	☒			Only upon request by <i>the Contracting authority</i> At any time during the procedure	n.a.	n.a.
Evidence of legal existence and status	☒	☒	☒			Only upon request by <i>the EU Validation services</i> At any time during the procedure In the Participant Register	n.a.	n.a.

¹¹ A document that the Contracting authority can access on a national database free of charge does not need to be submitted if the Contracting authority is provided with the exact internet link and, if applicable, the necessary identification data to retrieve the document.

Evidence of economic and financial capacity F1 (see Section 3.2.2)	The documents must be provided only by the <i>involved entities</i> who contribute to reaching the minimum capacity level					With the tender in e-Submission	'Balance_sheet_entity_year" Profit_Loss_Account_entity_year"	With the Group leader or the sole tenderer under 'Parties' → 'Identification tenderer' → 'Attachments' → 'Economic and financial capacity'.
Evidence of technical and professional capacity All criteria (see Section 3.2.3)	The documents must be provided only by the <i>involved entities</i> who contribute to reaching the minimum capacity level for all criteria					With the tender in e-Submission	Curriculum vitae + NAME 'Project_reference_No.1" 'Project_reference_No.2"	With the Group leader or the sole tenderer under 'Parties' → 'Identification tenderer' → 'Attachments' → 'Technical and professional capacity'.

2. Tender data.



Failure to upload the following documents in eSubmission will lead to rejection of the tender.

Technical offer (see Section 4.2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				With the tender in e-Submission	'Technical tender'	Under section 'Tender Data' → 'Technical Tender'
Financial offer (see Section 4.2)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				With the tender in e-Submission	'Financial tender'	Under 'Tender Data' → 'Financial Tender'

3. Tender report.

Once all information and documents have been encoded and uploaded in the e-Submission application and you consider that the tender is complete, the application will require you to download the Tender Report generated by the e-Submission application. It will have to be signed (hand signature or electronic signature) and uploaded, as explained in the [eSubmission](#)

[Quick Guide.](#)



Tender report	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				With the tender in e-Submission	'Tender report'	Under report'	section	'Tender
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Annex 2. Declaration on Honour on exclusion and selection criteria

Declaration on honour on exclusion criteria and selection criteria

The undersigned [*insert name of the signatory of this form*], representing:

<i>(only for natural persons)</i> himself or herself	<i>(only for legal persons)</i> the following legal person:
ID or passport number: (‘the person’)	Full official name: Official legal form: Statutory registration number: Full official address: VAT registration number: (‘the person’)

The person is not required to submit the declaration on exclusion criteria if the same declaration has already been submitted for the purposes of another award procedure of the same contracting authority¹², provided the situation has not changed, and that the time that has elapsed since the issuing date of the declaration does not exceed one year.

In this case, the signatory declares that the person has already provided the same declaration on exclusion criteria for a previous procedure and confirms that there has been no change in its situation:

Date of the declaration	Full reference to previous procedure

I – Situation of exclusion concerning the person

(1) declares that the above-mentioned person is in one of the following situations:	YES	NO
(a) it is bankrupt, subject to insolvency or winding-up procedures, its assets are	<input type="checkbox"/>	<input type="checkbox"/>

¹² The same EU institution, agency, body or office.

being administered by a liquidator or by a court, it is in an arrangement with creditors, its business activities are suspended or it is in any analogous situation arising from a similar procedure provided for under Union or national law;		
(b) it has been established by a final judgement or a final administrative decision that the person is in breach of its obligations relating to the payment of taxes or social security contributions in accordance with the applicable law;	<input type="checkbox"/>	<input type="checkbox"/>
(c) it has been established by a final judgement or a final administrative decision that the person is guilty of grave professional misconduct by having violated applicable laws or regulations or ethical standards of the profession to which the person belongs, or by having engaged in any wrongful conduct which has an impact on its professional credibility where such conduct denotes wrongful intent or gross negligence, including, in particular, any of the following:		
(i) fraudulently or negligently misrepresenting information required for the verification of the absence of grounds for exclusion or the fulfilment of eligibility or selection criteria or in the performance of a contract or an agreement;	<input type="checkbox"/>	<input type="checkbox"/>
(ii) entering into agreement with other persons with the aim of distorting competition;	<input type="checkbox"/>	<input type="checkbox"/>
(iii) violating intellectual property rights;	<input type="checkbox"/>	<input type="checkbox"/>
(iv) attempting to influence the decision-making process of the contracting authority during the award procedure;	<input type="checkbox"/>	<input type="checkbox"/>
(v) attempting to obtain confidential information that may confer upon it undue advantages in the award procedure;	<input type="checkbox"/>	<input type="checkbox"/>
(d) it has been established by a final judgement that the person is guilty of any of the following:		
(i) fraud, within the meaning of Article 3 of Directive (EU) 2017/1371 and Article 1 of the Convention on the protection of the European Communities' financial interests, drawn up by the Council Act of 26 July 1995;	<input type="checkbox"/>	<input type="checkbox"/>
(ii) corruption, as defined in Article 4(2) of Directive (EU) 2017/1371 or active corruption within the meaning of Article 3 of the Convention on the fight against corruption involving officials of the European Communities or officials of Member States of the European Union, drawn up by the Council Act of 26 May 1997, or conduct referred to in Article 2(1) of Council Framework Decision 2003/568/JHA, as well as corruption as defined in other applicable laws;	<input type="checkbox"/>	<input type="checkbox"/>
(iii) conduct related to a criminal organisation, as referred to in Article 2 of Council Framework Decision 2008/841/JHA;	<input type="checkbox"/>	<input type="checkbox"/>
(iv) money laundering or terrorist financing, within the meaning of Article 1(3), (4) and (5) of Directive (EU) 2015/849 of the European Parliament and of the Council;	<input type="checkbox"/>	<input type="checkbox"/>
(v) terrorist offences or offences linked to terrorist activities, as defined in Articles 1 and 3 of Council Framework Decision 2002/475/JHA, respectively, or inciting, aiding, abetting or attempting to commit such offences, as referred to in Article 4 of that Decision;	<input type="checkbox"/>	<input type="checkbox"/>
(vi) child labour or other offences concerning trafficking in human beings as referred to in Article 2 of Directive 2011/36/EU of the European Parliament and of the Council;	<input type="checkbox"/>	<input type="checkbox"/>

(e) it has shown significant deficiencies in complying with the main obligations in the performance of a contract or an agreement financed by the Union's budget, which has led to its early termination or to the application of liquidated damages or other contractual penalties, or which has been discovered following checks, audits or investigations by a contracting authority, the European Anti-Fraud Office (OLAF) or the Court of Auditors;	<input type="checkbox"/>	<input type="checkbox"/>
(f) it has been established by a final judgment or final administrative decision that the person has committed an irregularity within the meaning of Article 1(2) of Council Regulation (EC, Euratom) No 2988/95;	<input type="checkbox"/>	<input type="checkbox"/>
(g) it has been established by a final judgment or final administrative decision that the person has created an entity under a different jurisdiction with the intent to circumvent fiscal, social or any other legal obligations in the jurisdiction of its registered office, central administration or principal place of business.	<input type="checkbox"/>	<input type="checkbox"/>
(h) (<i>only for legal persons</i>) it has been established by a final judgment or final administrative decision that the person has been created with the intent provided for in point (g).	<input type="checkbox"/>	<input type="checkbox"/>
(i) for the situations referred to in points (c) to (h) above the person is subject to: i.facts established in the context of audits or investigations carried out by the European Public Prosecutor's Office after its establishment, the Court of Auditors, the European Anti-Fraud Office (OLAF) or the internal auditor, or any other check, audit or control performed under the responsibility of an authorising officer of an EU institution, of a European office or of an EU agency or body; ii.non-final judgments or non-final administrative decisions which may include disciplinary measures taken by the competent supervisory body responsible for the verification of the application of standards of professional ethics; iii. facts referred to in decisions of entities or persons being entrusted with EU budget implementation tasks; iv.information transmitted by Member States implementing Union funds; v.decisions of the Commission relating to the infringement of Union competition law or of a national competent authority relating to the infringement of Union or national competition law; or vi. decisions of exclusion by an authorising officer of an EU institution, of a European office or of an EU agency or body.	<input type="checkbox"/>	<input type="checkbox"/>

II – Situations of exclusion concerning natural or legal persons with power of representation, decision-making or control over the legal person and beneficial owners

Not applicable to natural persons, Member States and local authorities

(2) declares that a natural or legal person who is a member of the administrative, management or supervisory body of the above-mentioned legal person, or who has powers of representation, decision or control with regard to the above-mentioned legal person (this covers e.g. company directors, members of management or supervisory bodies, and	YES	NO	N/A
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cases where one natural or legal person holds a majority of shares), or a beneficial owner of the person (as referred to in point 6 of article 3 of Directive (EU) No 2015/849) is in one of the following situations:			
Situation (c) above (grave professional misconduct)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Situation (d) above (fraud, corruption or other criminal offence)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Situation (e) above (significant deficiencies in performance of a contract)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Situation (f) above (irregularity)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Situation (g) above (creation of an entity with the intent to circumvent legal obligations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Situation (h) above (person created with the intent to circumvent legal obligations)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Situation (i) above	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

III – Situations of exclusion concerning natural or legal persons assuming unlimited liability for the debts of the legal person

(3) declares that a natural or legal person that assumes unlimited liability for the debts of the above-mentioned legal person is in one of the following situations:	YES	NO	N/A
Situation (a) above (bankruptcy)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Situation (b) above (breach in payment of taxes or social security contributions)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IV – Grounds for rejection from this procedure

(4) declares that the above-mentioned person:	YES	NO
Was previously involved in the preparation of the procurement documents used in this award procedure, where this entailed a breach of the principle of equality of treatment including distortion of competition that cannot be remedied otherwise.	<input type="checkbox"/>	<input type="checkbox"/>

V – Remedial measures

If the person declares one of the situations of exclusion listed above, it must indicate measures it has taken to remedy the exclusion situation, thus demonstrating its reliability. This may include e.g. technical, organisational and personnel measures to prevent further occurrence, compensation of damage or payment of fines or of any taxes or social security contributions. The relevant documentary evidence which illustrates the remedial measures taken must be provided in annex to this declaration. This does not apply for situations referred in point (d) of this declaration.

VI – Evidence upon request

Upon request and within the time limit set by the contracting authority the person must provide information on natural or legal persons that are members of the administrative, management or supervisory body or that have powers of representation, decision or control, including legal and natural persons within the ownership and control structure and beneficial owners.

It must also provide the following evidence concerning the person itself and the natural or legal persons on whose capacity the person intends to rely, or a subcontractor and concerning the natural or legal persons which assume unlimited liability for the debts of the person:

For situations described in (a), (c), (d), (f), (g) and (h), production of a recent extract from the judicial record is required or, failing that, an equivalent document recently issued by a judicial or administrative authority in the country of establishment of the person showing that those requirements are satisfied.

For the situation described in point (b), production of recent certificates issued by the competent authorities of the State concerned are required. These documents must provide evidence covering all taxes and social security contributions for which the person is liable, including for example, VAT, income tax (natural persons only), company tax (legal persons only) and social security contributions. Where any document described above is not issued in the country concerned, it may be replaced by a sworn statement made before a judicial authority or notary or, failing that, a solemn statement made before an administrative authority or a qualified professional body in its country of establishment.

The person is not required to submit the evidence if it has already been submitted for another award procedure of the same contracting authority¹³. The documents must have been issued no more than one year before the date of their request by the contracting authority and must still be valid at that date.

The signatory declares that the person has already provided the documentary evidence for a previous procedure and confirms that there has been no change in its situation:

Document	Full reference to previous procedure
<i>Insert as many lines as necessary.</i>	

VII – Selection criteria

	YES	NO	N/A
(1) declares that the above-mentioned person complies with the selection criteria applicable to it individually as provided in the tender specifications:			
(a) It has the legal and regulatory capacity to pursue the professional activity needed for performing the contract as required in section 3.2.1 of the tender specifications;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(b) It fulfills the applicable economic and financial criteria indicated in section 3.2.2 of the tender specifications;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(c) It fulfills the applicable technical and professional criteria indicated in section 3.2.3 of the tender specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

¹³ The same institution or agency.

(2) if the above-mentioned person is the sole tenderer or the leader in case of joint tender, declares that:	YES	NO	N/A
(d) the tenderer, including all members of the group in case of joint tender and including subcontractors if applicable, complies with all the selection criteria for which a consolidated assessment will be made as provided in the tender specifications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VIII – Evidence for selection

The signatory declares that the above-mentioned person is able to provide the necessary supporting documents listed in the relevant sections of the tender specifications and which are not available electronically upon request and without delay.

The person is not required to submit the evidence **if it has already been submitted for another procurement procedure of the same contracting authority**¹⁴. The documents must have been issued no more than one year before the date of their request by the contracting authority and must still be valid at that date.

The signatory declares that the person has already provided the documentary evidence for a previous procedure and confirms that there has been no change in its situation:

Document	Full reference to previous procedure
<i>Insert as many lines as necessary.</i>	

The above-mentioned person must immediately inform the contracting authority of any changes in the situations as declared.

The above-mentioned person may be subject to rejection from this procedure and to administrative sanctions (exclusion or financial penalty) if any of the declarations or information provided as a condition for participating in this procedure prove to be false.

Full name

Date

Signature

¹⁴ The same institution of agency.

Annex 3. Power of attorney

Call for tenders DEFIS/2020/OP/0002

Test platform on Galileo HAS/CAS/OSNMA

POWER OF ATTORNEY

The undersigned:

– Signatory (Name, Function, Company, Registered address, VAT Number)

having the legal capacity required to act on behalf of his/her company,

HEREBY AGREES TO THE FOLLOWING:

- 1) To submit a joint tender as a member of a group of tenderers (the Group), constituted by Company 1, Company 2, Company N (Group members), and led by Company 1 (Group leader), in accordance with the conditions specified in the Tender specifications and the terms specified in the tender to which this Power of attorney is attached.
- 2) If the Contracting authority awards the contract resulting from this call for tenders to the *Group* on the basis of the joint tender to which this power of attorney is attached, all *Group members* shall be considered parties to the contract in accordance with the following conditions:
 - (a) All *Group members* shall be jointly and severally liable towards the Contracting authority for the performance of the contract.
 - (b) All *Group members* shall comply with the terms and conditions of the contract and ensure the proper delivery of their respective share of the services and/or supplies subject to the contract.
- 3) Payments by the Contracting authority related to the services and/or supplies subject to the Contract shall be made through the bank account of the *Group leader*: [Provide details on bank, address, account number].
- 4) The *Group members* grant to the *Group leader* all the necessary powers to act on their behalf in the submission of the tender and the conclusion of the contract, including:
 - (a) The *Group leader* shall submit the tender on behalf of all *Group members* and indicate in the "Tender Contact Info" section in e-Submission the name and e-mail address of an individual - single point of contact authorised to communicate officially with the Contracting authority in connection with the submitted tender on behalf of all *Group members*, including in connection with all relevant questions, clarification requests, notifications, etc., that may be received during the evaluation, award and until the contract signature.
 - (b) The *Group leader* shall sign any contractual documents — including the contract, and amendments thereto — and issue any invoices related to the performance of the contract on behalf of all *Group members*.
 - (c) The *Group leader* shall act as a single contact point with the Contracting authority in the

delivery of the services and/or supplies subject to the contract. It shall co-ordinate the delivery of the services and/or supplies by the *Group* to the Contracting authority, and shall see to a proper administration of the contract.

Any modification to the present Power of attorney shall be subject to the Contracting authority's express approval. This Power of attorney shall expire when all the contractual obligations of the *Group* have ceased to exist. The parties cannot terminate it before that date without the Contracting authority's consent.

Place and date:

Name (in capital letters), function, company and signature:

Annex 4. List of identified subcontractors

Identification details	Roles/tasks during contract execution	Proportion of subcontracting (% of contract volume)
<i>[Full official name Registered address Statutory registration number VAT registration number]</i>		
<i>[Full official name Registered address Statutory registration number VAT registration number]</i>		
<i>[REPEAT AS MANY TIMES AS THE NUMBER OF IDENTIFIED SUBCONTRACTORS]</i>		
Other subcontractors that do not need to be identified under Section 2.4.2		
	TOTAL % of subcontracting	0,00%

Annex 5.1. Commitment letter by an identified subcontractor

[Letterhead, if any]

EUROPEAN COMMISSION

Call for tenders Ref. DEFIS/2020/OP/0002

Attn:

[Insert date]

Commitment letter by identified subcontractor

I, the undersigned,

Name:

Function:

Company:

Registered address:

VAT Number:

having the legal capacity required to act on behalf of the company *[insert name of the entity]* hereby confirm that our company agrees to participate as subcontractor in the offer of *[insert name of the tenderer]* for the Call for Tenders DEFIS/2020/OP/0002

Test platform for Galileo HAS/CAS/OSNMA

In the event that the tender of the aforementioned tenderer is successful, *[insert name of the subcontractor]* commits itself to make available the resources necessary for performance of the contract as a subcontractor and to carry out the services that will be subcontracted to it in compliance with the terms of the contract. It further declares that it is not subject to conflicting interests which may negatively affect the contract performance and that it accepts the general conditions attached to the Tender Specifications for the above call for tender, in particular the contractual provisions related to checks and audits.

Done at:

Name:

Position:

Signature:

Annex 5.2. Commitment letter by an entity on whose capacities is being relied

EUROPEAN COMMISSION

Call for tenders Ref. DEFIS/2020/OP/0002

Attn:

[Insert date]

Commitment letter by an entity on whose capacity is being relied

I, the undersigned,

Name:

Function:

Company:

Registered address:

VAT Number:

having the legal capacity required to act on behalf of the company *[insert name of the entity]* hereby confirm that our company authorises the *[insert name of the tenderer]* to rely on its financial and economic capacity in order to meet the minimum levels required for the Call for Tenders DEFIS/2020/OP/0002 Test platform on Galileo HAS/CAS/OSNMA

In the event that the tender of the aforementioned tenderer is successful, *[insert name of the entity]* commits itself to make available the resources necessary for performance of the contract. It further declares that it is not subject to conflicting interests which may negatively affect the contract performance, and that it accepts the general conditions attached to the Tender Specifications for the above call for tender, in particular the contractual provisions related to checks and audits.

Done at:

Name:

Position:

Signature:

Annex 6. Financial offer form

<i>Price component</i>	<i>Unit price</i>	<i>Quantity</i>	<i>Total</i>
Cost related to contractor's main activities (a)			
Staff costs for WP1 (Managment)			
<i>Staff category (project coordinator, project assistant,...) please add as many categories as you need</i>			
Staff costs for WP2 (User Terminal)			
<i>Staff category (project coordinator, project assistant,...) please add as many categories as you need</i>			
Staff costs for WP3 (Support to Engineering, Testing, Experimentation, and Maintenance)			
<i>Staff category (project coordinator, project assistant,...) please add as many categories as you need</i>			
Staff costs for WP4 (Research and Development)			
<i>Staff category (project coordinator, project assistant,...) please add as many categories as you need</i>			
Other costs ¹⁵			
Total			

¹⁵ Shall cover all the other costs deriving from the technical specifications other than staff costs (e.g.. Meetings with the Commission.)

Annex 7. Semi-Assisted CAS

The Semi-Assisted CAS is based on the following concepts:

- The continuous transmission of the E6-C signal encrypted by Galileo satellites.
- The recording and storage by the receiver of signal samples at certain predefined instants and for a certain predefined duration.
- The publication, in a public server, of parts of the encrypted sequence, at certain predefined instants (e.g. once per minute) and for a certain predefined duration (e.g. 4 ms, the duration of one E6-C code), after a certain time.
- The a-posteriori correlation at the receiver of the signal with the encrypted sequences, and the generation of range measurements from them.
- The calculation of a position based on the above range measurements, plus authenticated data from OSNMA, at the time of the samples.

describes an implementation of this concept whereby, thanks to OSNMA, the autonomy of the receiver-server communication is increased for long periods (up to several days or even weeks). Its steps are presented hereafter.

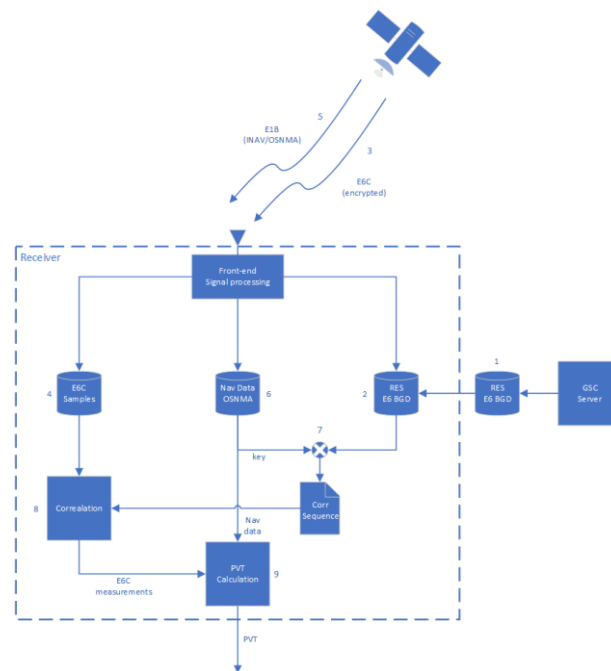


Figure 2 – Semi-Assisted CAS scheme

1. The regular publication of parts of the encrypted E6-C keystream, at certain predefined instants (e.g. once per minute) and for a certain predefined duration (e.g. 4 ms, the duration of one E6-C code), and for a certain period (e.g. 1 week). These sequences are re-encrypted with the OSNMA key to be disclosed for each instant, and will be referred as re-encrypted sequences (RES) onward. The server also provides the I/NAV and E6 signals BGDs estimated for the period, which can be configured manually as they are assumed to be stable.
2. The download and storage at the receiver of the RES/BGDs, or a subset of them, as required by the application.

3. The reception by the receiver of the E6-C encrypted signal, at the moment when the authentication is to be performed.
4. The storage of E6-C signal samples in the receiver at the time of authentication (t).
5. The reception of E1 I/NAV and OSNMA data, including the Galileo CED (clock and ephemeris data) authenticated, and later reception of the OSNMA key some seconds later.
6. The storage in the receiver of the data from step 5.
7. The decryption of the RES with the OSNMA key, and the generation of the correlation replicas for each satellite.
8. The correlation of the samples from step 4. with the replicas from step 7. and generation of the E6-C pseudoranges.
9. The position calculation following standard methods based on 8., and 5., including authenticated data, E6-C pseudoranges, and BGDs.

