EUROPEAN COMMISSION

DIRECTORATE-GENERAL ENERGY AND TRANSPORT

Brussels, 12 August 2008

INVITATION TO TENDER No. TREN/311/1/1-2008

(open procedure)

Dear Sir/Madam,

1. The European Commission invites tenders for a service contract regarding the following project: *EGNOS GEO Satellite Transponder Service Replenishment*

This invitation to tender follows the publication of:

- the contract notice in OJEU 2008/S 155-208650 of 12. 8. 2008.

2. If you are interested in this contract, you must submit a tender in **triplicate**, in one of the official languages of the European Union.

Tenders must be:

(a) either sent by registered mail or by private courier

The tender must be sent by registered mail or by private courier, dispatched not later than 15/10/2008 (the postmark or the receipt issued by the courier service serving as proof of the dispatch) to the following address:

By registered mail

European Commission
Directorate-General Energy and Transport
DM 28 - 0/110 - Archives
B-1049 Brussels
Belgium

By private courier

European Commission
Directorate-General Energy and Transport - DM 28 - 0/110
Avenue du Bourget, 1
B-1049 Brussels (Evere)
Belgium

(b) <u>or delivered by hand</u>

Tenders must be delivered by hand at the **Central Mail of the European Commission** by 15/10/2008 **not later than 16 p.m.** (Brussels time), at the following address:

European Commission
Directorate-General Energy and Transport – DM 28 0/110
Avenue du Bourget, 1
B-1140 Brussels (Evere)
Belgium

In this case, a receipt must be obtained as proof of submission, signed and dated by the official in the Commission's central mail department who took delivery. The department is open from 08.00 to 17.00 Monday to Thursday, and from 8.00 to 16.00 on Fridays. It is closed on Saturdays, Sundays and Commission holidays.

3. Tenders must be placed inside two sealed envelopes, one inside the other. **The inner envelope should be marked:**

Call for tenders No. TREN/311/1/1-2008
<u>not to be opened by the internal mail department</u>
DM 28 0/110 – Archives

If self-adhesive envelopes are used, they must be sealed with adhesive tape and the sender must sign across this tape.

The non-compliance with these formal conditions will entail the rejection of the bids at the opening session.

4. Tenders will be opened at 10 a.m on 22/10/2008, at 28 Rue De Mot (Directorate-General Energy and Transport, mail department, ground floor, office 110 1040-Brussels).

This opening session will be public. Each tenderer may be represented by not more than one person. At the end of the opening session, the Chairman of the opening committee will indicate the name of the tenderers and the decision concerning the admissibility of each offer received. The prices mentioned in the bids will not be communicated.

5. The specification, listing all the documents that must be produced in order to tender, including supporting evidence of economic, financial, technical and professional capacity and the draft contract are attached.

6. Tenders must be signed by the tenderer or his duly authorised representative and perfectly legible so that there can be no doubt as to words and figures.

7. Validity period of the tender: six months as from the final date for submission of tenders mentioned under point 2 above.

8. Submission of a tender implies acceptance of all the terms and conditions set out in this invitation to tender, in the specification, in the draft contract and, where applicable, waiver of the tenderer's own general or specific terms and conditions.

9. Contacts between the awarding authority and tenderers are prohibited throughout the procedure except in exceptional circumstances and under the following conditions only:

Before the closing date for submission of tenders

- At the request of the tenderer, the awarding authority may provide additional information solely for the purpose of clarifying the nature of the contract.

  Requests for additional information must be sent in writing not later than six calendar days before the closing date for submission of tenders to the following address:

  Mr Paul Flament
  European Commission
  DM 28- 4/113
  B-1049 Brussels
  Belgium

  Fax (+ 32 2) 296.53.72
  e-mail:paul.flament@ec.europa.eu
- The Commission may, on its own initiative, inform interested parties of any error, inaccuracy, omission or any other material shortcoming in the text of the tender documents.

Further information will be sent simultaneously to all tenderers who have requested the specification in writing, where this is appropriate. Tenderers who have downloaded the documents from the Directorate-General Energy and Transport website (DG TREN) are invited to consult this site regularly until the deadline for submission.

After the opening of tenders

If a tender requires clarification, or if there is a need to correct material errors which have occured in the drafting of the tender, the Commission may take the initiative and contact the tenderer(s). Such contact shall not lead to the conditions of the tender being altered in any way.

10. This invitation to tender is in no way binding on the Commission. A commitment will come about only when a contract with the successful tenderer has been signed.

Until a contract is signed, the awarding authority may decide not to award a contract or to cancel the tendering procedure, without the candidates or tenderers being entitled to claim any compensation. Where appropriate, the decision will be substantiated and brought to the attention of the tenderers.

11. Tenderers will be informed of whether their tenders have been accepted or rejected.

12. The follow-up of your response to the invitation to tender will require the recording and further processing of personal data (i.e. name, address, CV, etc.). This data will be processed in accordance with the requirements of Regulation (CE) 45/2001 on the protection of individuals with regard to the processing of personal data by Community institutions and bodies and on the free movement of such data. Unless if otherwise stated, replies to questions and personal data requested are necessary for the purpose of assessing your tender (according to the specifications of the invitation to tender) and will only be processed within DG TREN as data controller, for this purpose. You may, upon request, have your personal data sent to you and rectify any inaccurate or incomplete particulars. Should you have any queries concerning the processing of your personal data, please address them to the entity acting as

data controller within DG TREN. As regards the processing of your personal data, you have the right to bring the matter before the European Data Protection Supervisor at any time.

13. You are informed that for the purposes of safeguarding the financial interest of the Communities, your personal data may be transferred to internal audit services, to the European Court of Auditors, to the Financial Irregularities Panel and/or to the European Anti-Fraud Office (OLAF).

Data of economic operators which are in one of the situations referred to in Articles 93, 94, 96(1)(b) and 96(2)(a) of the Financial Regulation may be included in a central database and communicated to the designated persons of the Commission, other institutions, agencies, authorities and bodies mentioned in Article 95(1) and (2) of the Financial Regulation. This refers as well to the persons with powers of representation, decision making or control over the said economic operators. Any party entered into the database has the right to be informed of the data concerning it, up on request to the accounting officer of the Commission.

Yours faithfully,

Fotis Karamitsos
Director

EGNOS GEO Transponder Service Replenishment

Conditions of Tender

(Open procedure after the publication of a contract notice)

Table of contents

Acronyms

C	Compliant
CAPEX	Capital Expenditure
CFI	Customer Furnished Item
EGNOS	European Geostationary Navigation Overlay System
EGS	EGNOS GEO Transponder Service
EGSP	EGNOS GEO Transponder Service Provider
ESA	European Space Agency
EU	European Union
GEO	Geostationary Orbit
GNSS	Global Navigation Satellite System
ICAO	International Civil Aviation Organisation
NC	Non Compliant
NLES	Navigation Land Earth Station
OJ	Official Journal (of European Union)
OPEX	Operations Expenditure
OSD	Operations Start Date
PC	Partially Compliant
PMP	Project Management Plan
RD	Reference Document
RF	Radio Frequency
SBAS	Satellite Based Augmentation Systems
SBS	Service Breakdown Structure
SoW	Statement of Work
WBS	Work Breakdown Structure
WP	Work Package

Definitions

Commission	Commission of the European Communities;
EGNOS GEO Transponder Service (EGS)	means the service provided by the Contractor which includes the 2 following aspects: The procurement and the operations service of the EGNOS GEO transponder payload. The hosting and operations service of the 2 NLES associated to the GEO transponder (including adaptation of RF sections to uplink the

	signals to the satellite);
Hosting Site	means the premises where EGNOS NLES assets are located for the purpose of their recurrent operation;
Operations Start Date (OSD)	means the date at which the EGNOS GEO Transponder Service is qualified to start its operations within the EGNOS system (either in EGNOS-OP or in EGNOS-test).

1 INTRODUCTION

1.1 Object of the tender

European Community represented by the Commission of the European Communities (Commission) is procuring services of two EGNOS GEO transponders, which are defined in the attached SOW.

The present procurement shall be conducted in two separate lots:

1. EGNOS GEO-1 Transponder Service
2. EGNOS GEO-2 Transponder Service

The Bidder is invited to submit a proposal for one or two of these lots (GEO-1 and/or GEO-2).

One contract shall be awarded per each lot. If the same bidder is awarded both of these lots, one single contract shall be signed for both of them.

1.2 Tender Documents

The proposal to be submitted by the Candidate must comply with the requirements defined in the following three documents (further - Tender documents):

[RD 1] EGNOS GEO Transponder Service Procurement – Statement of Work

[RD 2] EGNOS GEO Transponder Service Procurement – Annex 1 to the Statement of Work

[RD 3] EGNOS GEO Transponder Service Procurement – Draft Contract.

Access to the Reference and Applicable documents referred to in the Tender documents which are listed below shall be granted upon request. All requests should be addressed to Mr Paul Flament and sent to the following address not later than 15/09/2008: paul.flament@ec.europa.eu.

The following Reference and Applicable documents are available:

1. Technical Specifications AD 1: EGNOS SIS Specifications from SARPS - This document shall be purchased from ICAO.
2. Technical Specifications AD 2: EGNOS NLES-Hosting Site IRD – EGN-ATMG-AIV-DRD204/0002, Issue 3, Rev. D.
3. Technical Specifications AD3: Annex A – NLES-Hosting Site IRD – EGN-ASPI-NLES-DRD204/0001, Issue 1, Rev. E
4. Technical Specifications AD4: DCN to Annex A of the NLES Hosting Site IRD: Migration to Inmarsat 4 – Ref: 200344641N
5. Technical Specifications RD1: EGNOS GEO Transponder Service Replenishment – Statement of Work, Issue 1.0 – Provided as part of the RFP data-package.
6. Technical Specifications RD2: SBAS L1/L5 Preliminary Technical Specifications

7. Technical Specifications RD3: Galileo Open Service Signal In Space ICD, Draft 1
8. Technical Specifications RD4: Interface Control Document between ARTEMIS NLES and ARTEMIS GEO Transponder – E-TS-ITF-E25-001-ESA, Issue 1, Rev. 1
9. Technical Specifications RD5: ARTEMIS Satellite Characteristics for Use in the EGNOS AOC Project – APP-R/JS/0892/js, Issue 1.0
10. Technical Specifications RD6: EGNOS Mission Requirements, Issue 2.0

The Commission reserves the right to amend the Tender documents to the extent compatible with the applicable laws and granting to the bidders an extension of the bidding period, as the case may be.

Bidders must acquaint themselves with the above Tender documents in order to prepare and present their tenders. If the bidder finds some of the Tender documents unclear, ambiguous or incomplete for him to understand the requirements of the Tender documents, he shall seek clarifications from the Commission. All requests for clarification shall be submitted in writing and presented not later than 7 calendar days before the deadline for the submission of the proposal.

2 TERMS OF CONTRACT

In drawing up his offer, the bidder should bear in mind the provisions of the draft Contract attached to this invitation to tender. Any limitation, amendment or denial of the terms of contract will be considered in the evaluation of the tender.

The Commission may, before the contract is signed, either abandon the procurement procedure or cancel the award procedure without the tenderers being entitled to claim any compensation.

2.1 Terms of payment

Payments shall be made in accordance with the provisions specified in the service Contract.

2.2 Financial guarantees

Guarantee on pre-financing

The draft Contract does not foresee any pre-financing.

2.3 Subcontracting

If the bidder intends to subcontract part of the service, he shall indicate in his offer which part will be subcontracted and to what extent (% of the total contract value).

Bidders must inform the subcontractor(s) that Article II.17 of the Contract will be applied to them. Once the Contract has been signed, Article II.13 of the above-mentioned contract shall govern the subcontracting.

2.4 Legal form of the bidders (including groupings)

Only limited liability companies may submit a bid.

Groupings of limited liability companies, irrespective of their legal form, may submit bids. Bidders may, after forming a grouping, submit a joint bid on condition that it complies with the rules of competition. Such groupings (or consortium) must specify the company or person heading the project and must also submit a copy of the document authorising this company or person to submit a bid. If awarded, the contract will be signed by the company of the person heading the project, who will be, vis à vis the Commission, the only contracting party responsible for the performance of this contract. Tenders from a consortium of firms or groups of service providers, contractors or suppliers must specify the role, qualifications and experience of each member of the consortium or group. Each member must provide all the necessary documents for assessing the bid as a whole with regard to the exclusion criteria, selection criteria (all of them) and award criteria.

3 FORM AND CONTENT OF THE TENDER

3.1 General

Tenders must be written in one of the official languages of the European Union. However, and due to the technical nature of the project, bidders are invited to submit their bids (or at least the technical part thereof) preferably in English.

Tenders must be clear and concise, with continuous page numbering, and assembled in a coherent fashion (e.g. bound or stapled, etc…). Since bidders will be judged on the content of their submitted bids, they must make it clear that they are able to meet the requirements of the specifications laid out in the Tender documents.

3.2 Structure of the tender

All tenders must be submitted with a cover letter and include four sections:

- an administrative proposal;
- an implementation proposal;
- a financial proposal; and
- a contractual proposal and risk management approach.

3.2.1 Cover Letter

The tender shall have a cover letter duly signed by a person authorized and explicitly stating it is a binding proposal in compliance with the procurement documents. In his cover letter, the bidder shall clearly state whether he tenders for lot one, lot two or both (EGNOS GEO-1 and/or GEO-2 Transponder Services (EGS)).

3.2.2 Section One: Administrative proposal

This section must provide the following information, set out in the standard identification forms attached to these tender specifications (Annexes 1, 2 and 3):

- Bidders' identification (Annex 1)
  - All bidders must provide proof of registration, as prescribed in their country of establishment, on one of the professional or trade registers or provide a declaration or certificate.
- Financial identification (Annex 2)

  The bank identification form must be completed and signed by an authorised representative of the bidder. In the case of a grouping, this form must only be provided by the person heading the project.

- Legal entities (Annex 3)

  The legal entity form in Annex 3 must be completed in and should be accompanied by requested supporting documents. In the case of a grouping, this form must only be provided by the person heading the project.

The Commission reserves the right, however, to request additional evidence in relation to the bid submitted for evaluation or verification purposes within a time-limit stipulated in its request.

3.2.3 Section Two: Implementation proposal

This section is of great importance in the assessment of the bids, the award of the contract and the future execution of any resulting contract.

Some guidelines are given below, but attention is also drawn to the award criteria, which define those parts of the technical proposal to which the bidders should pay particular attention. The technical proposal should address all matters laid down in the Tender documents. The level of detail of the tender will be extremely important for the evaluation of the tender.

The Bidders shall organize the Implementation proposal in two parts: a Technical proposal and a Management proposal.

In case the Bidder is tendering for two lots (for both GEO-1 and GEO-2), the Bidder shall clearly separate his implementation proposal for lot one (GEO-1) and lot two (GEO-2) as these 2 lots will be evaluated separately.

3.2.3.1 Technical Proposal

The Bidders must present in their bids a technical proposal on the methodology to carry out the EGNOS GEO Transponder Service. In particular, the technical proposal shall include as a minimum:

1. A description of the tasks to be executed in order to provide the EGS in compliance with the requirements expressed in the Statement of Work [RD 1] and in the Technical Specifications [RD 2].

2. A description on the proposed GEO payload architecture and impact on satellite design.

3. A description of the proposed NLES Hosting Site and the RF station architecture. The bidder should also provide his views on a possible change of the Hosting Site interface baseline as described in [RD 2], section 3.2.

4. A complete Statement of Compliance to the technical requirements defined in the Annex 1 to the Statement of Work [RD 2] (for each GEO separately). The Contractor shall pay particular attention to the following requirements failure to state full compliance with which will lead to automatic exclusion:

   i. Maximum Operations Start Date: End Q4 2011 for GEO-1 and End Q4 2011 for GEO-2

   ii. RF Uplink Station Location: EGN-GEO-SPEC-0.2.1, EGN-GEO-SPEC-0.2.2 of Annex 1 to the Statement of Work [RD 2].

5. A complete Statement of Compliance on Hosting Site Security Requirements: EGN-GEO-SPEC-0.2.4 of Annex 1 t the Statement of Work [RD 2] and associated references.

6. A complete Statement of Compliance to the Statement of Work requirements [RD 1].

3.2.3.2 Management Proposal

As part of the management proposal, the Bidder shall provide:

1. A draft Project Management Plan (PMP) as defined in [RD 1]. Emphasis shall be put on the following elements:
    - A complete definition of the Work Breakdown Structure (WBS) taking into account the Service Breakdown Structure (SBS) defined in the Statement of Work:
        - Taking into account the Service Preparation Phase and Service Provision Phase
        - Taking into account the different sub-services defined in each of the phases.
    - A detailed description of work-packages that, in addition to the formal contract deliverables, shall identify the non-contractual outputs to be produced in the frame of the contract and will detail the interfaces to be established with external entities to provide the required service (s).
    - A description of the deliverables.
    - A list of expected input material to be provided by the Commission. This list of input material shall be limited to documents strictly required to provide the service (s) and shall be duly justified.
    - A draft risk register including all possible technical, programmatic and contractual risks (probability of occurrence and impact) together with their mitigation actions;
2. The committed Operations Start Date (OSD) for the proposed GEO Transponder Service.
3. A detailed schedule for the executions of the tasks defined in the PMP and main milestones

The Bidders shall also describe as part of their management proposal all prior experience relevant to provide the requested service (s):

- Experience in satellite procurement and operations (number of satellites in the fleet, experienced in-orbit failures…)
- Experience in system integration

- Experience in satellite navigation

The Bidders shall submit CVs for key personnel involved in the different tasks.

3.2.4 Section Three: Financial proposal

3.2.4.1 General Considerations

All tenders must contain a financial proposal. The bidder's attention is drawn to the following points:

- Prices must be quoted in euros, including the countries which are not in the euro-area. As far as the bidders of those countries are concerned, they cannot change the amount of the bid because of the evolution of the exchange rate. The bidders choose the exchange rate and assume all risks or opportunities relating to the rate fluctuation.

- Prices must be fixed amounts and include all expenses, such as travel expenses and daily allowances.

- Prices should be quoted free of all duties, taxes and other charges, i.e. also free of VAT, as the Communities are exempt from such charges in the EU under Articles 3 and 4 of the Protocol on the Privileges and Immunities of the European Communities of 8 April 1965 (OJ L 152 of 13 July 1967). 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 is to be shown separately. In case of doubt about the applicable VAT system, it is the bidder's responsibility to contact his or her national authorities to clarify the way in which the European Community is exempt from VAT;

- Prices shall be fixed and not subject to revision during the performance of the contract.

3.2.4.2 EGNOS GEO Transponder Service Duration

The procurement approach for the EGNOS GEO Transponder Service assumes a complete procurement of the GEO transponders service and associated tasks by the Contractor at its own costs and yearly service fees (flat fee) for the Commission.

In light of the budget available at the date of signature, the contract duration has been fixed up to 31st January 2014.

Notwithstanding the foregoing the Commission draws the attention of the Bidders to the fact that the GNSS Regulation:

1) entrusts the Commission with the role of programme manager of the EGNOS project;

2) sets forth that the European Community shall finance the operation of EGNOS.

These two provisions reflect the European Institutions objective to put in place the conditions for a long term EGNOS operations and service provision, compatible with securing the continuity of EGNOS Service for Safety of Life applications in the long run.

Consistently with this perspective the contract is contemplating a renewal clause, after its expiry in January 2014, subject only to the availability of funds.

The bidders shall consider that this approach is driven by the need to reconcile the long term objectives of the European Institutions in relation to EGNOS operation and service provision with the procedures governing the European Community budget approval.

In the preparation of their bid the bidders are therefore invited to take into account a total duration of minimum 13 years, or more depending on the satellite lifetime, though this does not amount to a contractual and budget commitment by the Commission

3.2.4.3 EGNOS GEO Transponder Service Preparation Phase Cost

A maximum amount of 180 K€ will be paid to the Contractor for the support of the EGS Preparation Phase, which will cover:

- The Contractor engineering work costs for the preparation of the service provisioning (study, deliverables documents)
- The Contractor management work costs for the preparation of the service provisioning phase (reviews organisation, meetings with customer/EGNOS Service Provider, regulatory aspects management…)

3.2.4.4 EGNOS GEO Transponder Service Provisioning Phase Target Price

In his proposal, the Bidder should take into account the following target price (annual fee) for the Provisioning Phase of the EGNOS GEO Transponder Service Contract:

Assuming EGNOS GEO-1 Transponder Service is procured to the Contractor: 3,5 M€/year for a 13-years contract term.

Assuming EGNOS GEO-2 Transponder Service is procured to the Contractor: 3,5 M€/year for a 13-years contract term

The target price is considered for the complete EGNOS GEO Transponder Service (both the leasing of the EGNOS GEO Transponder and the RF Uplink Service).

The purpose of this target price is only to provide an indication to the Bidders on the level of price reference that is expected by the Commission.

3.2.4.5 Required Quotations

The following quotations are expected from the bidder depending on the proposed EGNOS GEO Transponder Services (GEO-1 and/or GEO-2):

1. GEO-1 Transponder Service, a separate quotation for OPTION 1 and OPTION 2 [RD 2]:
   - Yearly fee quotation (flat annual fee) based on a 13 years term service, taking into account the contractual limitations defined in 3.2.4.2
   - The quotation shall include the RF uplink services from the two Hosting Sites.

2. GEO-2 Transponder Service, a separate quotation for OPTION 1 and OPTION 2 [RD 2]:

   – Yearly fee quotation (flat annual fee) based on a 13 years term service, taking into account the contractual limitations defined in 3.2.4.2.

   – The quotation shall include the RF uplink services from the two Hosting Sites.

3. Combined quotation (*) in case both GEO-1 and GEO-2 Transponder Services are awarded to the bidder (for OPTION 1 and/or OPTION2).

   – Yearly fee quotation for GEO-1 and GEO-2 (flat annual fee)) based on a 13 years term service, taking into account the contractual limitations defined in 3.2.4.2.

(*) In case the Bidder is bidding for both GEO-1 and GEO-2, the bidder shall provide a quotation for the procurement of GEO-1 and GEO-2 separately and a combined quotation (separately for GEO-1 and GEO-2) in case the two lots (procurement GEO-1 and GEO-2) are awarded to the bidder. In the case the same bidder has been awarded both lots, the Commission will conclude one single contract, based on the combined quotation. The combined quotation will not be taken into account if the bidder has submitted the best proposal in relation to only one of the two lots.

As further addressed under chapter 3.2.5.2., the interruption of continuity of the EGNOS signal in space is one of the major risks for the Commission.

The financial proposal shall therefore include the costs and the description of the means of risk mitigation for the customer for, at least, the risks listed in the following. Such means could also include insurance coverage.

- On-ground delivery delay;
- Launch Failure;
- 1st year in orbit failure;
- In-orbit failure after the 1st year;
- Satellite relocation;
- Service Underperformance;
- Service Interruption.

In the definition of his quotation, the Bidder shall include the fixed financial amount to be paid by the Commission for the EGNOS GEO transponder Service Preparation Phase.

The financial proposal shall also include the cost breakdown which will be applied by the Contractor in case the Commission would opt for a variation according to clause 7.1. iii, 10.1. ii or 11.1. of the Draft Contract.

3.2.5 Section Four: Contractual proposal and Risk Management Approach

3.2.5.1 General Considerations

As part of the Contractual proposal bidders shall submit a Statement of Compliance to the Contract. The compliance to the contract should be provided in a table format indicating where the Contractor is "compliant" (c), "partly compliant" (pc) and "non compliant" (nc). In case of "pc" and/or "nc" the Contractor shall give a clear reasoning why a full compliance can not be given and shall include a precise wording of the contractual provisions that he proposes to delete, amend or insert.

The contract evaluation will be made according to the level of compliance reached by the contractor.

The Contractor shall pay particular attention to the Section 3 "General provisions" of the contract, failure to state full compliance with which will lead to automatic exclusion.

3.2.5.2 Contractual Risks Management

This section is of great importance in the assessment of the bids, the award of the contract and the future execution of any resulting contract.

As part of his contractual proposal, the Bidder shall address the issues described below, considered as contractual risks. The main concern for the Commission when defining the specific contractual clauses covering the risks inherent to the program (delay, underperformances, interruption), is to ensure the continuity of the EGNOS Service which relies on the GEO Transponder Service availability.

1. Delay in Operation Start Date (OSD)

In his proposal, the Bidder shall define the committing dates for the Operations Start Date (OSD) of GEO-1 and/or GEO-2, in accordance to the requirements in [RD 2]) which define the latest acceptable dates for the start of operation of GEO-1 and GEO-2, respectively.

The Delay in OSD is understood as any delay of the OSD beyond the committing date which can be cause either by

- On-Ground delivery Delay (e.g. manufacturing), or
- Launch failure,

(a) In case of On-Ground delivery Delay, a delay in OSD can be accepted up to a maximum of 12 months. The Contract shall give right to the Commission to a one time service provision fee adjustment pro rate the incurred delay according to the following formula:

Service provision fee adjustment = (Yearly Fee/12) x Delay [Months], limited to a maximum of 12 months of delay.

In case the delay for On-Ground delivery shall induce a delay in OSD exceeding 12 months, the Commission shall have the right to terminate the Contract.

(b) In case of Launch Failure, where a major Delay in OSD (> 12 months) is expected, the Contract shall give the right to the Commission to terminate the Contract. The Bidder shall describe as part of his proposal the additional assurances he can offer with regards to:

- Maximum latency (in month) upon which the Bidder can guarantee the re-launch of the satellite with the EGNOS payload or provide a back-up solution. The potential costs associated to the re-procurement and re-launch shall be at the risk of the Contractor.

2. Service Underperformances

In the execution of the contract, the Contractor shall ensure the availability of the EGNOS GEO Transponder Service of 99,9% over the agreed contract term according to requirements EGN-GEO-SPEC-0.1.4 defined in [RD 2]. The technical specifications document [RD 2], section 8 defines the parameters that trigger the availability underperformance regime.

The Contractor shall ensure the implementation of a cost effective performance monitoring system of these parameters.

In case the EGNOS Transponder Service is unavailable for more than 0,1% over the each of 12 months periods after the OSD but less than 30 continuous days and less than 60 cumulated days over the each of 12 months periods after the OSD, the Service Underperformance Regime should be triggered and the Commission shall be granted pro rata service provision fee adjustment (outage credits) according to the following formula:

Service provision fee adjustment = Yearly Fee x (Cumulated Unavailability [%] – 0,1 %)

For the above equation, the unavailability events shall be considered after a continuous service unavailability of 5 minutes.

Unavailability of the Service due to Force Majeure shall not be taken into account.

3. Service Interruption

Service Interruption Regime is triggered when the service is unavailable for more than 30 continuous days or more than 60 cumulated days over the each of 12 months periods after the OSD. In case of Service Interruption, the Contract shall give the right to the Commission to terminate the contract. Two types of Service Interruptions are considered:

(a) Planned Service Interruption due to Satellite Relocation outside the EGNOS Orbital Arc [RD 2].

During the execution of the contract, should the Contractor decide to re-locate the satellite during the lease contract outside the EGNOS arc, the Contractor should preferably notify the Commission of such a relocation with a notice period of 30 months or be in a position to provide a replacement alternative within one month after the relocation in order to ensure the possibility for initiating a new procurement and ensuring service continuity with minimum interruption.

In his proposal, the Bidder shall define the assurances he offers in case of satellite re-location outside the EGNOS arc (notice period guarantee, possible alternative for payload replacement, most likely re-location scenarios…).

(b) Unplanned Service Interruption due to in-orbit failure.

In case of Service Interruption (unavailability above the threshold defined in 2), the Commission shall be entitled to terminate the contract.

- <u>In-Orbit Failure during the first year of operations</u>

In case the service interruption occurs during the first year of operations of the EGNOS GEO Transponder Service, the Commission may envisage re-procuring a back-

up EGNOS GEO Transponder Service from the Contractor. In his proposal, the Bidder shall indicate the assurances he can offer with regards to:

- Maximum latency (in month) upon which the Bidder can guarantee the re-procurement and the re-launch of the satellite with the EGNOS payload or provide a back-up solution. The potential costs associated to the re-procurement and re-launch shall be at the risk of the Contractor.

- In-Orbit Failure after the first year of operations

In case the service interruption occurs after the first year of operations of the EGNOS GEO Transponder Service, the Commission shall have the right to terminate the contract or order a EC Variation for remedial measures. In case the In-orbit failure is due to the fault of the Contractor the Commission reserves the right to order the remedy by the Contractor without any compensation of additional costs of the Contractor.

4 ASSESSMENT AND AWARD OF THE CONTRACT

The assessment will be based on each bidder's bid.

The assessment will be made per lot (GEO-1 and GEO-2) and per OPTION (OPTION 1 and OPTION 2).

All the information will be assessed in the light of the criteria set out in these Conditions of Tender. The procedure for the award of the contract, which will concern only admissible bids, will be carried out in three successive stages.

The aim of each of these stages is:

1) to check on the basis of the exclusion criteria, whether bidders can take part in the tendering procedure;

2) to check on the basis of the selection criteria, the technical and professional capacity and economic and financial capacity of each Bidder;

3) to assess on the basis of the award criteria each bid which has passed the exclusion and selection stages.

The contract for one given lot (GEO-1 or GEO-2) will be awarded to the Bidder with the bid ranked best for this lot when the bids are evaluated.

4.1 Exclusion criteria (exclusion of bidders)

4.1.1 To be eligible for participating in this contract award procedure, tenderers must not be in any of the following situations:

(a) they are bankrupt or being wound up, are having their affairs administered by the courts, have entered into an arrangement with creditors, have suspended business activities, are the subject of proceedings concerning those matters, or are in any analogous situation arising from a similar procedure provided for in national legislation or regulations;

(b) they have been convicted of an offence concerning their professional conduct by a judgement which has the force of res judicata;

(c) they have been guilty of grave professional misconduct proven by any means which the contracting authority can justify;

(d) they have not fulfilled obligations relating to the payment of social security contributions or the payment of taxes in accordance with the legal provisions of the country in which they are established or with those of the country of the contracting authority or those of the country where the contract is to be performed;

(e) they have been the subject of a judgement which has the force of res judicata for fraud, corruption, involvement in a criminal organisation or any other illegal activity detrimental to the Communities' financial interests;

(f) they are currently subject to an administrative penalty referred to in Article 96(1) of the Financial Regulation[1] for being guilty of misrepresentation in supplying the information required by the contracting authority as a condition of participation in a contract procurement procedure or by the authorising officer as a condition of participation in a grant award procedure, for failing to supply this information or for having been declared to be in serious breach of their obligations under contracts or grants covered by the Community budget.

2. The cases referred to in point IV.1.1. e) above shall be the following:

a) cases of fraud as referred to in Article 1 of the Convention on the protection of the European Communities' financial interests established by the Council Act of 26 July 1995 (OJ/C 316 of 27.11.1995, p. 48);

b) cases of corruption as referred to in 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, established by the Council Act of 26 May 1997 (OJ/C 195 of 25.6.1997, p. 1);

c) cases of involvement in a criminal organisation, as defined in Article 2(1) of Joint Action 98/733/JHA of the Council (OJ/L 315 of 29.12.1998, p. 1);

d) cases of money laundering as defined in Article 1 of Council Directive 91/308/EEC (OJ/L 166 of 28.6.1991, p.77).

4.1.2 Other cases of exclusion

Contracts will not be awarded to tenderers who, during the procurement procedure:

a) are subject to a conflict of interest;

Tenderers must declare:

- that they do not have any conflict of interest in connection with the contract; a conflict of interest could arise in particular as a result of economic interests, political or national affinities, family or emotional ties, or any other relevant connection or shared interest;
- that they will inform the contracting authority, without delay, of any situation constituting a conflict of interest or which could give rise to a conflict of interest;
- that they have not made and will not make any offer of any type whatsoever from which an advantage can be derived under the contract;
- that they have not granted and will not grant, have not sought and will not seek, have not attempted and will not attempt to obtain, and have not accepted and will not accept, any advantage, financial or in kind, to or from any party whatsoever, constituting an illegal practice or involving corruption, either directly or indirectly, as an incentive or reward relating to the award of the contract.

The Commission reserves the right to check the above information.

b) are guilty of misrepresentation in supplying the information required by the contracting authority as a condition of participation in the procurement procedure or fail to supply this information.

[1] Council Regulation (EC, Euratom) n° 1605/2002 of 25 june 2002 on the Financial regulation applicable to the general budget of the European Communities, OJ L 248 of 16 September 2002, p. 1, amended by Council Regulation (EC, Euratom) n° 1995/2006 of 13 December 2006, OJ L 390 of 30 December 2006, p.1.

c) find themselves in one of the situations of exclusion, referred to in paragraph IV.1.1. above for this procurement procedure.

4.1.3 Evidence to be provided by the tenderers

1. When submitting their bids, each tenderer (including subcontractor(s) or any member of a consortium or grouping) shall provide a declaration on their honour, duly signed and dated, stating that they are not in one of the situations mentioned above (cf. IV.1.1 and VI.1.2). For that purpose, they must complete and sign the form attached in Annex 4. Where the tenderer is a legal entity, they shall, whenever requested by the Commission, provide information on the ownership or on the management, control and power of representation of the legal entity.

2. The tenderer to whom the contract is to be awarded shall provide, within 15 calendar days after notification of the results of the procurement procedure and in any case before the signature of the contract, the following evidence, confirming the declaration referred to above:

   The Commission shall accept, as satisfactory evidence that the tenderer is not in one of the situations described in point IV.1.1 (a), (b) or (e) above, a recent extract from the judicial record or, failing that, an equivalent document recently issued by a judicial or administrative authority in the country of origin or provenance showing that those requirements are satisfied.

   The Commission accepts, as satisfactory evidence that the tenderer is not in the situation described in point IV.1.1 (d) above, a recent certificate issued by the competent authority of the State concerned.

   Where no such document or certificate is issued in the country concerned, it may be replaced by a sworn or, failing that, a solemn statement made by the interested party before a judicial or administrative authority, a notary or a qualified professional body in his country of origin or provenance.

3. Depending on the national legislation of the country in which the candidate or tenderer is established, the documents referred to in paragraph 1 and 2 above shall relate to legal and/or natural persons including, if applicable with regard to points b) and e), company directors or any person with powers of representation, decision-making or control in relation to the tenderer.

4. When the subcontracted part is above 20% of the contract value, the subcontractor(s) must also provide the above-mentioned declaration on honour. In case of doubt on this declaration on the honour, the contracting authority may also request the evidence referred to in paragraphs 2 and 3 above..

5. The Commission reserves the right to request any other document relating to the proposed tender for evaluation and verification purpose, within a delay determined in its request.

4.1.4 Administrative and financial penalties

1. Without prejudice to the application of penalties laid down in the contract, candidates or bidders and contractors who have been guilty of making false declarations or have been found to have seriously failed to meet their contractual obligations in an earlier procedure will be excluded from all contracts and grants financed by the Community

budget for a maximum of two years from the time when the infringement is established, as confirmed after an adversarial procedure with the contractor.

That period may be extended to three years in the event of a repeat offence within five years of the first infringement.

Bidders or candidates who have been guilty of making false declarations will also incur financial penalties representing 2% to 10% of the total value of the contract being awarded.

Contractors who have been found to have seriously failed to meet their contractual obligations will incur financial penalties representing 2% to 10% of the value of the contract in question.

This rate may be increased to 4% to 20% in the event of a repeat offence within five years of the first infringement.

2. In the cases referred to in points a), c), d) of section 4.1, the candidates or tenderers will be excluded from all contracts and grants for a maximum of two years from the time when the infringement is established, as confirmed after an adversarial procedure with the contractor.

   In the cases referred to in points b) and e) of section 4.1, the candidates or tenderers will be excluded from all contracts and grants for a minimum of one year and a maximum of four years from the date of notification of the judgment. Those periods may be extended to five years in the event of a repeat offence within five years of the first infringement or the first judgment.

3. The cases referred to in point e) of section 4.1 cover:

   a) cases of fraud as referred to in Article 1 of the Convention on the protection of the European Communities' financial interests established by the Council Act of 26 July 1995 (OJ/C 316 of 27.11.1995, p. 48);

   b) cases of corruption as referred to in 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, established by the Council Act of 26 May 1997 (OJ/C 195 of 25.6.1997, p. 1);

   c) cases of participation in a criminal organisation, as defined in Article 2(1) of Joint Action 98/733/JHA of the Council (OJ/L 315 of 29.12.1998, p. 1);

   d) cases of money laundering as defined in Article 1 of Council Directive 91/308/EEC (OJ/L 166 of 28.6.1991, p.77).

4.2 SELECTION CRITERIA (SELECTION OF BIDDERS)

To be eligible, the bidders must have the economic and financial capacity as well as the technical and professional capacity to perform the tasks required in this call for tender.

4.2.1 Economic and financial capacity – References required

Bidders must provide proof of their financial and economic capacity by means of the following documents: the balance sheets or extracts from balance sheets for the last three financial years, and a statement of overall turnover and turnover relating to the relevant services for the last three financial years.

This rule applies to all service providers, regardless of the percentage of tasks they intend to execute, once they have chosen to submit a tender. However, if the tender includes

subcontractors whose tasks represent less than 20% of the contract, those subcontractors are not obliged to provide evidence of their economic and financial capacity.

4.2.2 Technical and professional capacity – References required

Bidders must provide evidence of their technical and professional competence on the following points:

- Deep knowledge of satellite procurement process
- Experience in satellite procurement, satellite operations
- Experience in ground segment provisioning, integration and operations

If several service providers/subcontractors are involved in the bid, each of them must have and show that they have the professional and technical capacity to perform the specific tasks assigned to them.

Tenderers should provide with their bid detailed curriculum vitae of main work package managers, including his or her educational background, degrees and diplomas, professional experience.

The CV's shall be presented, preferably, in accordance to Recommendations on a common European format for curricula vitae, published in OJ L79 of 22 March 2002, p. 66.

4.3 EVALUATION OF TENDERS – AWARD CRITERIA

The evaluation of the tenders will performed according to the criteria given below. Evaluation will me made per lot and per option.

Based on the results of assessment the bids will be ranked per each lot (GEO 1 and GEO 2). The EGS contract for each GEO (GE0-1 and GEO-2) will be awarded to the most economically advantageous tender for that lot.

The price/quality weighting shall be respectively 35/65. The tenders shall be evaluated according to the following formula:

Score for tender A = [cheapest price/price of tender A x 35] + [total quality score (out of 100) for all technical award criteria of tender A/100 x 65]

The Bidder shall at least achieve 60% of possible points in all the Technical Award Criteria (Adequacy of the implementation proposal and quality of the contractual proposal) to be eligible.

1. Price

Pricing of the proposed EGNOS GEO Transponder Service will be assessed in terms of Yearly Fee. The quotation used for the assessment will be based on a 13-years service duration. The required quotation is described in section 3.2.4.5 of this document.

The quotation of the bidder (Proposed Price) will be scored against the lowest minimum proposed price among the eligible competitors for the respective OPTION (OPTION 1 or OPTION 2).

2. Technical award criteria

N°	Technical Award Criteria	Number of Points
1	Adequacy of the Implementation Proposal – Quality of content of the technical proposal o Bidder analysis and critical review of the requirements o Completeness and adequacy of the proposed design and development approach (technical solution including the interfaces) o Compliance to Statement of Work and Technical Specifications o Compliance to the Site Security Requirements – Quality of the content of the management proposal o Suitability and credibility of proposed work programme and adequacy of approach o Completeness and adequacy of the Project Management Plan (project organisation and processes) o Experience of the Contractor in System integration, satellite procurement and operations, satellite navigation. – Adequacy of the proposed Operational Start Date (Proposed OSD) of the proposed EGNOS GEO Transponder Service with regards to requirements defined in [RD 2]. o The Maximum OSD is end Q4 2011 for GEO-1 and end Q4 2012 for GEO-2. o The Preferred OSD is defined for each GEO: end Q2 2011 for GEO-1 and end Q2 2012 for GEO-2.	55
2	Quality of Contractual Proposal and Risk Management Approach: – Statement of Compliance to the draft contract – Launch Failure: Proposal for re-launch capability as	45

	described in section 3.2.5.2, paragraph 1 (b) – Relocation: Adequacy of guarantees in case of satellite relocation, as described in section 3.2.5.2, paragraph 3 (a) – In-orbit failure: Adequacy of guarantees in case of in-orbit failure, as described in section 3.2.5.2, paragraph 3 (b): o In-Orbit Failure during the first year of operations (re-launch capability or other alternative) o In-Orbit Failure after the first year of operations	
Total number of points		100

4.4 Information for bidders

The Commission will inform bidders of decisions reached concerning the award of the contract, including the grounds for any decision not to award a contract or to recommence the procedure.

If a written request is received, the Commission will inform all rejected bidders of the reasons for their rejection and all bidders submitting an admissible tender of the characteristics and relative advantages of the selected tender and the name of the successful tenderer.

However, certain information may be withheld where its release would impede law enforcement or otherwise be contrary to the public interest, or would prejudice the legitimate commercial interests of economic operators, public or private, or might prejudice fair competition between them.

4.5 Annexes

1. Identification of the Tenderer
2. Financial Identification
3. Legal Entity Form
4. Declaration by the Tenderer (relating to the exclusion criteria)

ANNEX 1

IDENTIFICATION OF THE TENDERER

(Each service provider, including subcontractor(s) or any member of a consortium or grouping, must complete and sign this identification form)

Identity	
Name of the tenderer	
Legal status of the tenderer	
Date of registration	
Country of registration	
Registration number	
VAT number	
Description of statutory social security cover (at the level of the Member State of origin) and non-statutory cover (supplementary professional indemnity insurance)[2]	
Address	
Address of registered office of tenderer	
Where appropriate, administrative address of tenderer for the purposes of this invitation to tender	
Contact Person	
Surname: First name: Title (e.g. Dr, Mr, Ms) : Position (e.g. manager): Telephone number: Fax number:	

[2] For natural persons

E-mail address:	
Legal Representatives	
Names and function of legal representatives and of other representatives of the tenderer who are authorised to sign contracts with third parties	
Declaration by an authorised representative of the organisation[3] I, the undersigned, certify that the information given in this tender is correct and that the tender is valid.	
Surname: First name:	Signature:

[3] This person must be included in the list of legal representatives; otherwise the signature on the tender will be invalidated.

ANNEX 2 - Financial Form

(to be completed by the tenderer)

FINANCIAL IDENTIFICATION

ACCOUNT HOLDER

NAME			
ADDRESS			
TOWN/CITY		POSTCODE	
COUNTRY		VAT NUMBER	
CONTACT PERSON			
TELEPHONE		FAX	
E - MAIL			

BANK

BANK NAME			
BRANCH ADDRESS			
TOWN/CITY		POSTCODE	
COUNTRY			
ACCOUNT NUMBER			
IBAN (optional)			

REMARKS :

BANK STAMP + SIGNATURE of BANK REPRESENTATIVE (Both Obligatory)	DATE + SIGNATURE of ACCOUNT HOLDER : (Obligatory)

ANNEX 3 - Legal Entity Form

(to be completed by the tenderer)

Please note that we can only accept either original documents or certified copies, which must be less than 6 months old.

In the case of a grouping, this form must only be provided by the person heading the project.

ANNEX 4

DECLARATION BY THE TENDERER

Each service provider, including subcontractor(s) or any member of a consortium or grouping, must sign this identification form

1. In accordance with Article 93 of the Financial Regulation of the European Communities (Council Regulation 1605/2002 of 25.6.2002) published in Official Journal L 248 of 16 September 2002, I declare on my honour that I am not in any of the following situations which would exclude me from participating in this procurement procedure:

   a) I am not bankrupt, being wound up or having my affairs administered by the courts, I have not entered into an arrangement with creditors, I have not suspended business activities, I am not the subject of proceedings concerning any such matters, and I am not in any similar situation arising from a similar procedure provided for in legislation or regulations;

   b) I have not been convicted of an offence concerning my professional judgement by a judgment which has the force of res judicata;

   c) I have not been found guilty of grave professional misconduct proven by any means which the contracting authority can justify;

   d) I have not failed to fulfil obligations relating to the payment of social security contributions or the payment of taxes in accordance with the legal provisions of the country in which I am established or with those of the country or the contracting authority or those of the country where the contract is to be performed;

   e) I have not been the subject of a judgment which has the force of res judicata for fraud, corruption, involvement in a criminal organisation or any other illegal activity detrimental to the Communities' financial interests;

   f) as a consequence of another procurement or grant procedure financed by the Community budget, I have not been declared to be in serious breach of contract for failure to comply with my contractual obligations,

2. In addition, the undersigned declares on his or her honour:

   a) that on the date of submission of the tender, the company or organisation I do represent and the staff proposed for this tender are not subject to a conflict of interests in the context of this invitation to tender; I undertake to inform the Commission without delay of any change to this situation after the date of submission of the tender.

   b) that the information provided to the Commission within the context of this invitation to tender is accurate, sincere and complete.

Done at …… on……

Name ……...

Title ……

Company……..

Signature:

EGNOS GEO Transponder Service Replenishment

Statement of Work

Table of contents

Table of Figures

Table of Tables

Acronyms

AD	Applicable Document
AR	Acceptance Review
CDR	Critical Design Review
CFI	Customer Furnished Items
CPF	Core Processing Facility
DDP	Delivered Duty Paid
DG-TEN	Directorate General – Energy and Transport
EC	European Community
ECAC	European Civil Aviation Conference
EoL	End of Life
ESA	European Space Agency
ESP	EGNOS Service Provider
ESSP	European Satellite Service Provider
EGNOS	European Geostationary Navigation Overlay System
EGNOS-OP	EGNOS Operation System
EGNOS-TEST	EGNOS Test System
EGS	EGNOS GEO Transponder Service
EGSP	EGNOS GEO Transponder Service Provider
EGSPR	EGNOS GEO Transponder Service Progress Report
EGS-QR	EGNOS GEO Transponder Service Qualification Review
EGSSR	EGNOS GEO Transponder Service Status Report
ESSP	European Satellite Service Provider
EU	European Union
E2E	End to End
GEO	Geostationary Earth Orbit
GPS JPO	Global Positioning System Joint Program Office
GPSW	Global Positioning System Wing
GSA	European GNSS Supervisory Authority
I/F	Interface
IOT	In-Orbit Test
ITR	In-orbit Test Review
ITU	International Telecom Union
KOM	Kick-Off Meeting
KPI	Key Performances Indicator
MRD	Mission Requirements Documents

NLES	Navigation Land Earth Station
NLES-AR	NLES RF Station Acceptance Review
OJ	Official Journal (of the European Union)
OSD	Operations Start Date
PA	Product Assurance
PFM	Proto Flight Model
PMP	Project Management Plan
PRN	Pseudo Random Noise
QR	Qualification Review
RD	Reference Document
RF	Radio Frequency
RFP	Request for Proposal
RR	Requirements Review
SARPS	Standards and Recommended Practices
SBAS	Satellite Based Augmentation System
SBS	Service Breakdown Structure
SES	Single European Sky
SIS	Signal In Space
SOW	Statement Of Work
SPOC	Single Point Of Contact
SS	Sub-Service
TEB	Tender Evaluation Board
WBS	Work Breakdown Structure
WP	Work Package

Definitions

Commission	Commission of the European Communities;
EGNOS Arc	means the orbital arc suitable for providing the EGNOS GEO Transponder Service over the complete FIR ECAC coverage with a minimum elevation angle of 5 degrees.
EGNOS GEO Transponder Service (EGS)	means the service provided by the Contractor which includes the 2 following aspects: The procurement and the operations service of the EGNOS GEO transponder payload. The hosting and operations service of the 2 NLES associated to the GEO transponder (including adaptation of RF sections to uplink the signals to the satellite);
EGNOS GEO Transponder Service Provider (EGSP)	means the Contractor selected to provide the EGNOS GEO Transponder Service;
EGNOS GEO Transponder Service Project (EGS Project)	means the set of activities performed by the Contractor in view of the procurement of the EGNOS GEO Transponder Service;
EGNOS Service Provider (ESP)	means the ESSP selected to operate the EGNOS system and provide the EGNOS Signal In Space (SIS) service;
Hosting Site	means the premises where EGNOS NLES assets are located for the purpose of their recurrent operation;
Operations Start Date (OSD)	means the date at which the EGNOS GEO Transponder Service is qualified to start its operations within the EGNOS system (either in EGNOS-OP or in EGNOS-test).

1 SCOPE AND PRESENTATION OF SOW REQUIREMENTS

1.1 Scope

This Statement of Work (SOW) defines the two EGNOS GEO Transponder Services (EGS) procured by the European Community, and the deliverables of such services.

Each EGS shall consist of:

1. EGS Preparation Phase:
    a. Preparation of SBAS signal in-orbit capacity (not applicable if the operator who is awarded the contract is already flying a SBAS payload the use of which he has proposed in his bid);
    b. Preparation of the EGNOS NLES Hosting Site and RF Station and support to the NLES integration;
2. EGS Provisioning Phase:
    a. Operations of the SBAS payload;
    b. Operations of the NLES Station.

Detailed service technical specifications for the EGNOS GEO Transponder Services GEO-1 and GEO-2 are defined in Error! Reference source not found. and form an integral and inseparable part of the present SOW.

1.2 Presentation of the SOW requirements

The language used to define the various items in the present SOW shall signify the following:

"Shall" is used to indicate a mandatory requirement compliance with which must be stated in the tenders. Within each requirement subject, each use of the word 'shall' is to be understood as a separate requirement, for which compliance must be stated separately.

- "Should" is used to indicate a preferred alternative of the EC but is not mandatory and tenderers may choose to propose a different alternative in their tenders;
- "May" is used to indicate an option and bidders are free to propose any alternative;
- "Will" and the present tense are used to indicate a statement of intention or fact;
- "Days" mean calendar days unless otherwise specified.

The numbering of requirements in this SOW follows the following nomenclature:

- Each requirement subject is numbered "EGN-ESP-SOW-x.y.z", where:
    - 'x' identifies a first level of sub-service within the EGS
    - 'y' identifies a second level of sub service.
    - 'z' identifies a specific subject ruled by the requirement heading.

2 BACKGROUND INFORMATION

This section is included for information purposes only to facilitate understanding of the SOW requirements and does not contain any requirements for the bidders.

2.1 Current EGNOS GEO transponders situation

The general objective of the public sector for the exploitation phase of EGNOS is to provide an EGNOS Signal-In-Space and associated services, with the level of performance adequate to meet the needs of the user communities, as defined by the mission requirements and applicable standards captured in the EGNOS Mission Requirements Document (MRD).

The EGNOS SoL service continuity and availability requirements defined in the EGNOS MRD imply that the ECAC service area is continuously covered by at least 2 GEO transponders. These 2 GEO transponders are part of the so-called EGNOS-OP system.

Besides, an additional GEO transponder has to be made available to the EGNOS operator. It is used either for technical qualification of EGNOS new releases/upgrades or for operational qualification of EGNOS operator before a new release if deployed in the operational GEO transponders. Moreover, the third GEO transponder is required in order to ensure the long term continuity and availability of the EGNOS service, as it is used in case of unplanned failure of one of the two "primary" GEO transponders. This additional GEO transponder is part of the so-called EGNOS-TEST system.

In the current baseline, INMARSAT AOR-E (3F2) and INMARSAT IND-W (3F5) are used by the EGNOS-OP system to provide the EGNOS service. ESA's ARTEMIS satellite is currently used and planned to be used for industrial qualification of EGNOS upgrades in the EGNOS-TEST system.

As indicated in the table below, it is expected that two of the three available GEO transponders will cease to be available in a time frame of 2011-2013:

- The ARTEMIS satellite End of Life (EoL) is foreseen around mid 2010 – 2011;
- The Inmarsat 3F2 satellite EoL is anticipated to be around 2012-2013.

In addition, the Inmarsat 3F5 satellite will be moved in November 2008 to a new orbital position (54°W), no longer suitable for serving the ECAC region. This will be replaced by the Inmarsat 4F2 following its relocation at 25°E.

Inmarsat AOR-E (3F2)	PRN 120	15.5°W	EoL 2012
Inmarsat IND-W (3F5)	PRN 126	25.0°E	EoL 2018 but will move out of the ECAC full coverage in Nov. 2008
ARTEMIS	PRN 124	21.5°E	EoL 2010/2011

2.2 Replenishment needs and timeline plan

In order to ensure the continuity of the EGNOS service during the exploitation phase of EGNOS, the European Commission representing the European Community has to prepare the replenishment of the EGNOS GEO transponders with the procurement of 2 new EGNOS GEO Transponder Services:

- GEO-1, with an Operational Start Date in 2011; and

- GEO-2, with an Operational Start Date in 2012.

Subject to the approval by the budgetary authority of the European Community regarding the availability of funds, the European Community expects to maintain EGNOS GEO Transponder Service for a total duration of minimum 13 years, depending on the satellite lifetime.

This long term perspective is required in order to secure the continuity EGNOS Service for Safety of Life applications. Therefore the Commission intends to maintain the EGNOS signal in space and services for the aviation sector for 20 years.

The new European GNSS Regulation, which shall be formally published on the EU Official Journal (OJ) by the time the present tender is issued, will provide a legal basis and spell out the main principles for the Community action in managing and implementing the EGNOS programme.

Figure 1 presents the desirable high-level replenishment plan of the Commission for the EGNOS GEO transponders, highlighting the Operational Start Dates (OSD) of GEO-1 and GEO-2. This plan will be finalised following the award decision taking into account the availability date of the two EGS proposed by the winning bidder(s).

As can be seen on Figure 1, it is expected that an additional third EGNOS GEO transponder service (GEO-3) will also be procured in the future with an operational start date in 2013/2014. This third EGS is not part of the present tender and is described solely to give full background information to the bidders.

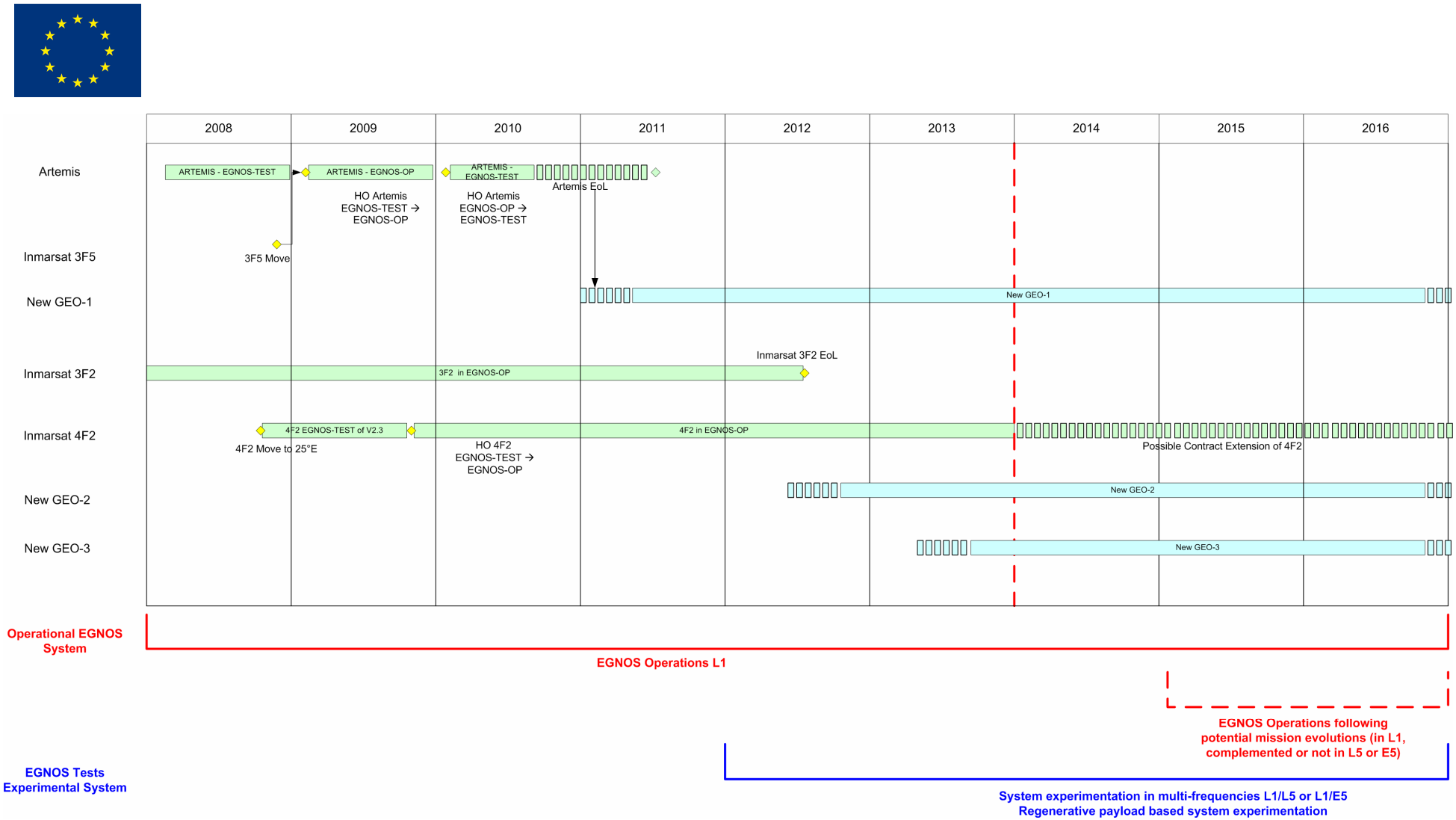

Figure 1 EGNOS GEO Transponder Replenishment Plan

2.3 EC Project organisation principles

Current procurement and the resulting contract for the EGS is part of the EC EGNOS programme managed by the Commission. In general, the Commission has the responsibility to manage the exploitation phase of EGNOS and ensure operation, maintenance and service provision of the EGNOS system. In this capacity it considers organising the relationships with its various service providers as follows.

Figure 2 below represents the interactions between the different parties in relation to the procurement of the EGS before and after the start of EGNOS GEO Transponder Service operations.

At first, the EGS contract(s) is procured and signed by the Commission acting on behalf of the EC.

Prior to or at the start of the EGNOS GEO Transponder Service operations, the EGS contract may be transferred from the EC to the EGNOS Service Provider (ESP) through resorting to the EGS contract assignment clause (see the draft contract). In this case, the ESP shall than become the management interface of the Contractor for the execution of the contract. The Contract would be assigned as such so that no additional effort is created on the Contractor side.

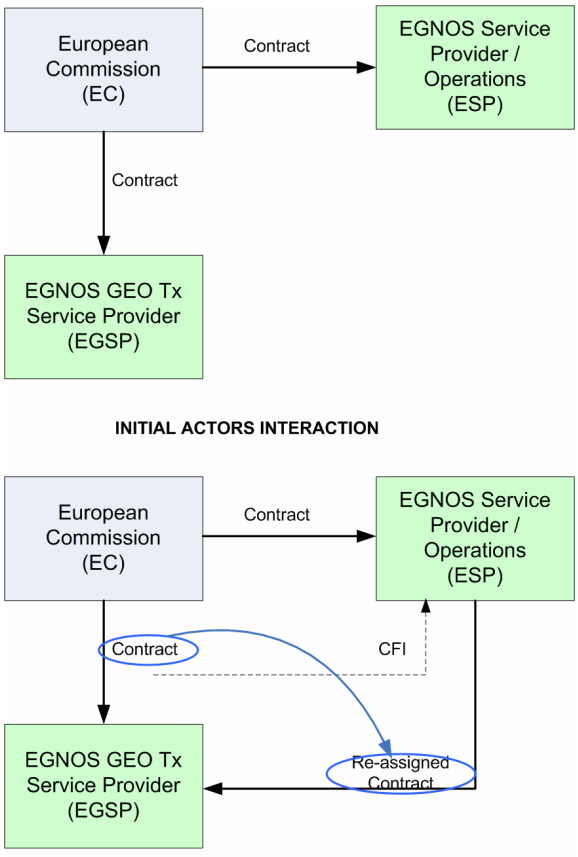

Figure 2 General Contractual Organisation

3 DOCUMENTS

The EGS shall be provided in compliance with the documents identified below.

3.1 Applicable Documents

The Applicable documents are listed in Annex 1 Technical Specifications and may be obtained upon request (see Conditions of Tender for more information). These documents contain EGS requirements against which the tenderers shall state compliance in their tenders. In case of inconsistencies between the documents, the order of precedence is the order in which they are listed. Any such inconsistencies shall be brought to the attention of the Commission.

3.1.1 CFI Documents

A subset of the Applicable documents shall be delivered to the Contractor by the EC as Customer Furnished Items.

It is the Commission's objective to provide the Contractor before or at the start of the Kick-Off Meeting (KOM) with the complete detailed list of CFIs. These documents refer to the CFI items defined in section 4.2.

3.2 Reference Documents

The Reference documents are listed in Annex 1 Technical Specifications and may be obtained upon request (see Conditions of Tender for more information).

4 EGNOS GEO TRANSPONDER SERVICES

This section provides an overview of main requirements by which the Customer specifies how the Contractor shall execute the EGNOS GEO Transponder Service.

4.1 Service Requirements

EGN-GEO-SOW-0.1.1 EGNOS GEO Transponder Service operations Duration

The EGNOS GEO Transponder Service solution proposed by the Contractor shall be capable to provide the service during at least 13 years.

EGN-GEO-SOW-0.1.2 Service Underperformance and Service Interruption

The Contractor shall ensure that the EGNOS GEO Transponder Service meets a service availability of 99,9% as defined in Error! Reference source not found..

In case the EGNOS Transponder Service is unavailable for more than 0,1 over the each of 12 months periods after the OSD but less than 30 continuous days and less than 60 cumulated days over the each of 12 months periods after the OSD, it shall be considered as Service Underperformance and the Commission shall be granted pro rata service provision fee adjustment (outage credits) according to the following formula:

Service provision fee adjustment = Yearly Fee x (Cumulated Unavailability [%] – 0,1 %)

For the above equation, the unavailability events shall be considered after a continuous service unavailability of 5 minutes.

In case the EGNOS GEO Transponder Service is unavailable for more than 30 cumulated days or 60 cumulated days over the each of 12 months periods after the OSD, it is considered a Service Interruption and related contractual clauses proposed by the winning tender shall be applied.

EGN-GEO-SOW-0.1.3 Satellite Relocation Outside the EGNOS Arc

In case the Contractor decides to re-locate the satellite during the term of validity of the EGS contract outside the EGNOS Arc, the Contractor should notify the Commission of such a re-location with a notice period of 30 months or be in a position to offer an alternative satellite transponder within one month after the satellite relocation to ensure the continuity of the operations (in this case, the Contractor should ensure that the regulatory aspects for the use of this satellite within the EGNOS system have been performed).

4.2 Customer Furnished Items

The following elements shall be provided by the EC as Customer Furnished Items (CFI) for the Contractor:

1) NLES Equipments: These are the NLES baseband subsystems, which will be provided and deployed by the EGNOS Ground Segment Provider. These equipments are currently hosted in the current EGNOS Hosting Site and will be transferred in due time to the new hosting sites proposed by the Contractor. A description of all NLES subsystem interfaces is provided in Error! Reference source not found..

4.3 EGNOS GEO Transponder Service (EGS) Organisation

The following Service Breakdown Structure (SBS) defines how the Commission expects EGNOS GEO Transponder Service to be organised. In his proposal, the Contractor shall submit a Work Breakdown Structure in order to ensure the provisioning of the required EGNOS GEO Transponder Service. The Contractor shall take this SBS as an input in order to define its project organisation (EGS Project) with its associated Work Breakdown Structure (WBS) and Work Packages (WP).

As a matter of definition, as illustrated in the figure, level 1 (or n) of Service is the EGNOS GEO Transponder Service provision (left column of Figure 3), level 2 (or n-1) is the headings of the main Sub-Services (middle column of Figure 3) and level 3 (n-2) is the breakdown of each Sub-Service (right column of Figure 3).

The EGNOS GEO Transponder Service is organised in 2 Phases:

1. EGS Preparation Phase
2. EGS Provisioning Phase

The EGNOS GEO Transponder Service is, as result, organised around 4 main Sub-Services (SS) as defined in the scope of the EGS (section 1.1:

1. SS1: EGNOS In-Orbit Capacity Provisioning
2. SS2: NLES Hosting and RF Station Preparation
3. SS3: EGNOS In-Orbit Capacity Operations
4. SS4: NLES Operations

Sub-Services SS1 and SS2 (highlighted in blue) belong to the EGS Preparation Phase while the Sub-Services SS3 and SS4 (highlighted in green) belong to the EGS Provisioning Phase.

The Management Sub-Service (SS0) is an ad-hoc Sub-Service defined for the overall management of the other Sub-Services.

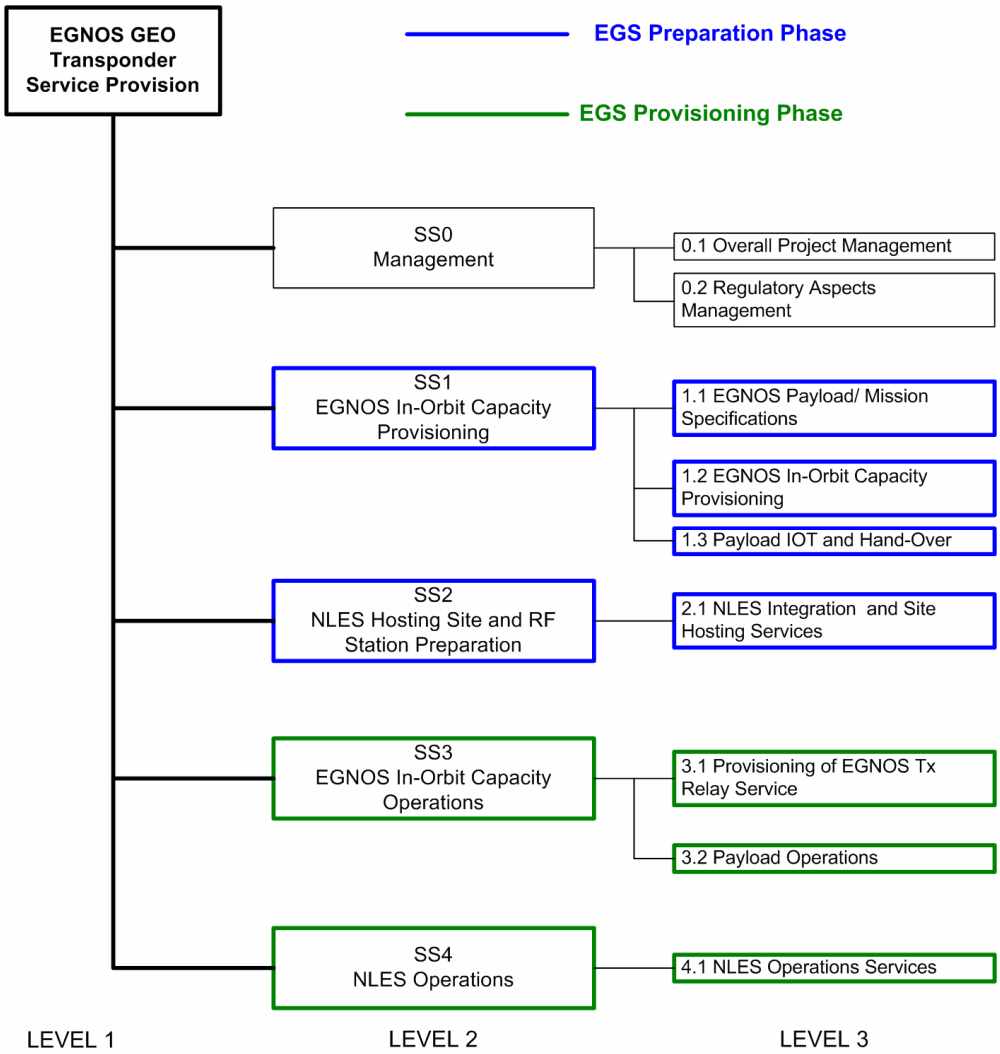

Figure 3 EGNOS GEO Transponder Service Organisation (SBS)

Figure 4 below presents an indicative schedule for the phasing of the different phases and their associated Sub-Services in the implementation of the EGS contract.

The tasks to be performed by the Contractor throughout the entire term of validity of the contract are considered to be an EGS project (Project) and shall cover the execution of the following Sub-Services:

- SS0: Management of the Project. This Sub-Service shall cover the entire duration of the project. This includes:
  i. Overall Project Management (coordination of activities, interface with ESA/EC/ESP for contractual, technical and managerial aspects, meeting and documentation preparation, execution of project management plan);
  ii. Regulatory aspects management (PRN registrations, frequency filing at ITU);
- SS1: EGNOS In-Orbit Capacity Provisioning. This Sub-Service shall be started as soon as possible after the Contract KO and shall last till the in-orbit delivery (In-Orbit Test Review) of the payload. It includes(*):
  i. Detailed specification of the EGNOS payload (not required if the proposed SBAS payload already in orbit) and preparation the Requirements Review

(RR) for approval of any deviation in the Error! Reference source not found.;

ii. EGNOS In-Orbit Capacity Provisioning under full responsibility of the Contractor (not required if the proposed SBAS payload already in orbit);

iii. EGNOS Payload IOT and Handover. This task is concluded by the In-Orbit Test Review (ITR) for approval by the Customer of the compliance of the payload/Signal In Space performances with the Error! Reference source not found. (not required if the proposed SBAS payload already in orbit);

– SS2: NLES Hosting Site and RF Station preparation. This Sub-Service focuses on the preparation of the NLES Hosting Site and the RF Station and deployment of the NLES:

i. NLES Hosting Site and RF Station Preparation with the ground/space interface validation, concluded by the NLES Acceptance Review (NLES-AR), at which point the NLES Station is declared ready for the deployment of the NLES equipments.

ii. NLES Deployment: This activity includes the deployment of the NLES in the Hosting Site and the End-to-End validation of the EGNOS GEO Transponder Service. This activity is concluded by the EGNOS GEO Transponder Service Qualification Review (EGS-QR). This milestone corresponds with the Operations Start Date (OSD), i.e. the start of the EGNOS GEO Transponder Service Provisioning Phase.

– SS3: EGNOS In-Orbit Capacity Operations. This Sub-Service shall cover the entire duration of the EGNOS GEO Transponder Service Operations Phase (13-years lease term as baseline) and includes the following:

i. Provision of the transponder relay service (nominal operations of the payload);

ii. Payload operations (contingency operations).

– SS4: NLES Operations. This work shall cover the entire duration of the EGNOS GEO Transponder Service Operations Phase (13-years lease term as baseline)

i. NLES Operations Services which includes the provisioning of the RF uplink service and monitoring of the NLES station.

(*) In case the winning bidder has proposed the lease of an SBAS payload already operating in-orbit for the EGNOS GEO Transponder Service, the procurement activities (i), (ii) and (iii) of SS1 will not be performed. However, the Contractor shall provide at Kick-Off Meeting the required documentation (In-Orbit Test Results Document) certifying the performances of the proposed payload in adequacy with the requirements expressed in Error! Reference source not found..

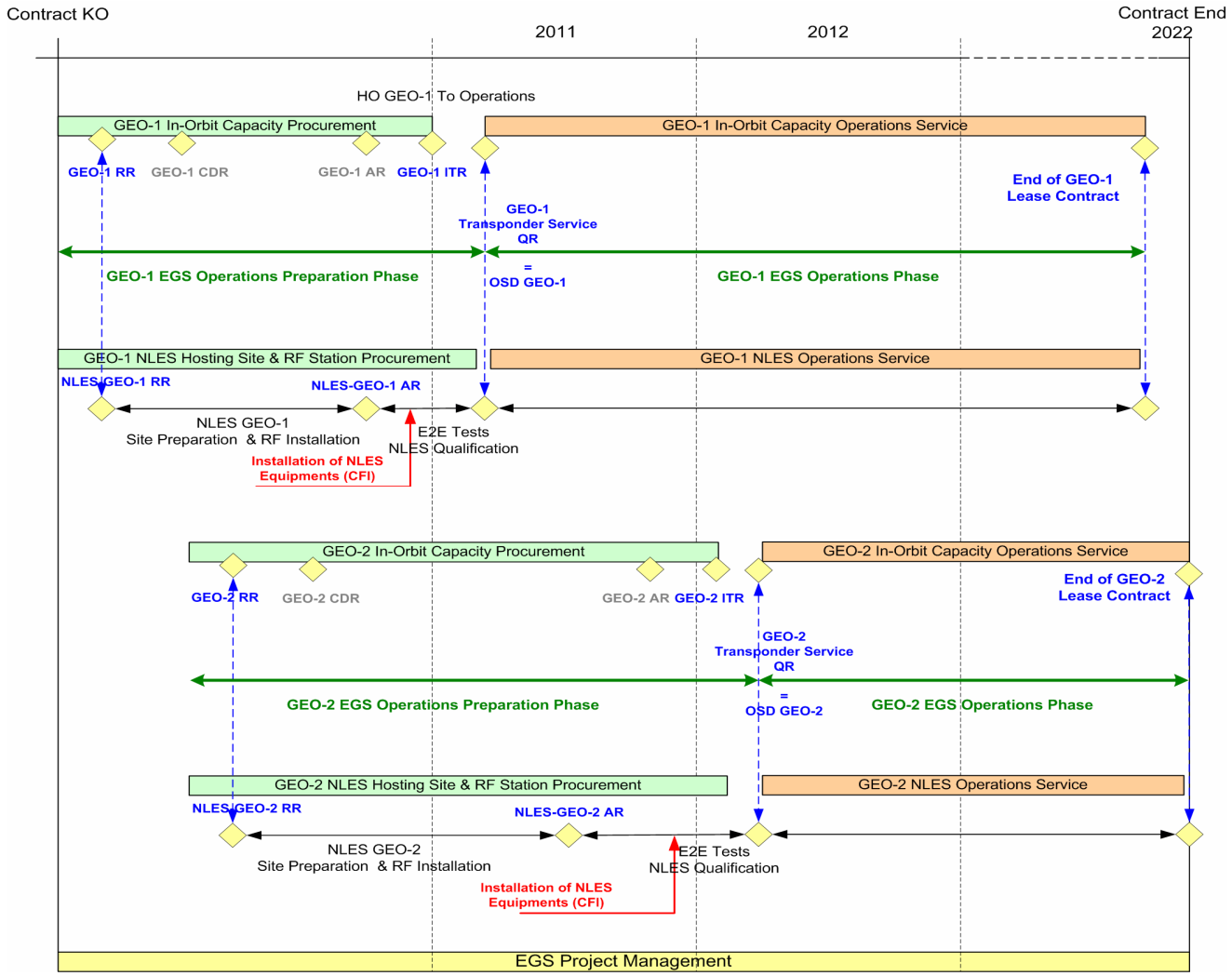

Figure 4 EGNOS GEO Transponder Service Phases

NOTE: The figure is only illustrative. The start dates for both contracts could be the same. The contract end should be understood as 2024 instead of 2022.

4.4 Meetings and Deliverables

4.4.1 Meetings and Reviews

EGN-GEO-SOW-0.1.4 Preparation, and attendance to EGS Project meetings

The Contractor shall attend and support the preparation to all project meetings. Unless otherwise stated, the contractor shall be responsible for the organisation of the meetings as well as preparation and distribution of minutes for all meetings. In its proposal and Project Management Plan, the contractor shall propose the most beneficial location for the meetings based on the meeting objectives.

A number of reviews shall be organized by the Contractor in order to support the EGS Project execution. The following table presents the proposed reviews to be conducted during the execution of the project.

- Reviews R1 to R7 belong to the EGS Preparation Phase.
- Review 8 belongs to the EGS Provisioning Phase.

Reviews classified as "optional" are not mandatory for the EGS contract execution. However the Commission shall have the right to request visibility on these optional reviews. The Contractor shall adapt the proposed list to the actual status of its satellite procurement (existing in-orbit payload, initiated satellite procurement…).

#	Name	Purpose	Frequency	Review Type	Proposed Location
R1	Kick-Off Meeting (KOM)	Review of the Project Management Plan.	Once	Mandatory	Contractor's premises
R2	Requirements Review (GEO-RR)	Review of the EGNOS GEO transponder Service Requirements (not required if Contractor is proposing the lease of an existing in-orbit SBAS payload).	One per EGNOS GEO transponder Service	Mandatory	Commission's Premises
R3	Critical Design Review (GEO-CDR)	Review of the EGNOS GEO Transponder Design (not required if Contractor is proposing the lease of an existing in-orbit SBAS payload).	One per EGNOS GEO transponder Service	Optional	Commission's Premises
R4	Acceptance Review (GEO-AR)	Acceptance of EGNOS GEO Transponder following integration tests and validation (not required if Contractor is proposing the lease of an existing in-orbit SBAS payload).	One per EGNOS GEO transponder Service	Optional	Contractor's Premises or Payload Manufacturer Premises
R5	In-orbit Test Review (GEO-ITR)	Acceptance of the EGNOS GEO Transponder in-orbit performances. In case the Contractor is proposing the lease of an existing in-orbit SBAS payload, ITR test report shall be provided and the Commission may request to replay a subset of the	One per EGNOS GEO transponder Service	Mandatory	Contractor's Premises

#	Name	Purpose	Frequency	Review Type	Proposed Location
		tests.			
R6	NLES Acceptance Review (NLES-GEO-AR)	Acceptance of the 2 NLES after integration of RF subsystem and site preparation	One per EGNOS GEO transponder Service	Mandatory	Contractor's Premises
R7	EGNOS GEO Transponder Service Qualification Review (QR)	Acceptance and qualification of the end-to-end operation of the EGNOS GEO transponder Service (this includes the NLES qualification)	One per EGNOS GEO transponder Service	Mandatory	Contractor's Premises
R8	Coordination Meeting	Review of operations performances, payload health status…	Yearly	Mandatory	Commission's premises

Table 1 List of Meetings and Reviews

EGN-GEO-SOW-0.1.5 Actions items management

The actions managed in the frame of the project are the ones which answer to one, at least, of the following conditions:

Actions of which execution condition the progress of the project, on both technical and schedule levels

Actions decided by the Commission.

Actions decided by an entity of which responsibility falls under the Project managers (ex progress meeting, system board,..)

The decision to engage an action falls under the responsibility of the chairman of the meeting where the action has been decided. In case of meeting Commission/Contractor, the action shall be the result of a consensus between the two parties.

At each meeting, a status on the actions shall be done by the contractor

4.4.2 Deliverables

EGN-GEO-SOW-0.1.6 Documents Deliverable List

The contractor shall deliver all documentation specified in the list of deliverable documents presented here below.

#	Document Name	Description	Document Type	Document Delivery
D1	EGNOS GEO Transponder Project Management Plan	The Content of the Project Management Plan (PMP) is described in EGN-GEO-SOW-0.1.7	For Approval	Draft at proposal level Updates at KOM Updates as appropriate
D2	EGNOS GEO Transponder Service	This document shall synthesize the requirements	For Approval	Requirements Review

	Requirements Document	for the complete EGNOS GEO Transponder Service. This includes the payload requirements but also the NLES interface requirements (RF interface, interface with NLES equipment)		
D3	EGNOS Transponder Service SoC	This document shall provide a complete Statement of Compliance to the technical requirements for the EGNOS GEO Transponder Service provided in Error! Reference source not found.	For Approval	Draft at Proposal Level Update at the Requirements Review Update at the In-Orbit Test Review
D4	EGNOS GEO Transponder Architecture and Design Document	This document shall describe the complete architecture of the proposed transponder for the EGNOS GEO Transponder Service and its integration on the satellite.	For Information	Critical Design Review
D5	EGNOS GEO Transponder Acceptance Tests Definition Document	This document shall describe the set of tests that will be performed for the validation of the EGNOS payload. This document shall not be provided in case the proposed SBAS payload for the EGNOS Geo Transponder Service is already operating in orbit.	For Information	Critical Design Review
D6	EGNOS GEO Transponder Acceptance Tests Results Document	This document shall provide the results to the tests defined for the validation of the EGNOS payload. This document shall not be provided in case the proposed SBAS payload for the EGNOS Geo Transponder Service is already operating in orbit	For Information	Acceptance Review
D7	EGNOS GEO Transponder In-Orbit Tests Definition Document	This document shall describe the set of tests that will be performed for the validation of the EGNOS payload in orbit. In case the Contractor is proposing the lease of an SBAS payload already operating in orbit, this document shall be required by the Kick-Off Meeting.	For Information	Acceptance Review

D8	EGNOS GEO Transponder In-Orbit Test Results Document	This document shall provide the results to the tests defined for the validation of the EGNOS payload in orbit. In case the Contractor is proposing the lease of an SBAS payload already operating in orbit, this document shall be required by the Kick-Off Meeting.	For Approval	In-Orbit Test Review
D9	EGNOS GEO Transponder Service Regulatory document	This document shall provide evidence of: - ITU filings for the use of the downlink and uplink frequencies - PRN registration to the GPSW	For Approval	In-Orbit Test Review
D10	EGNOS GEO Transponder Service Tests Document	This document shall describe the set of tests that will be performed for the validation of the EGNOS GEO Transponder Service (combined system validation NLES + GEO).	For Information	In-Orbit Test Review
D11	EGNOS GEO Transponder Service Acceptance Tests Results Document	This document shall provide the results to the tests defined for the validation of the EGNOS Geo Transponder Service acceptance.	For Approval	EGNOS GEO Transponder Service Qualification Review
D12	EGNOS GEO Transponder Service Ground/Space Interface Document	This document shall describe the interface requirements to be met by the ground segment in order to access to the GEO Transponder	For Review	EGNOS GEO Transponder Service Qualification Review
D13	NLES Implementation Architecture Document	This document shall describe how the 2 NLES associated to each EGNOS GEO transponder will be implemented (site hosting, architecture, interface description, RF subsystem implementation…)	For Information	Requirements Review
D14	NLES RF Part List Document	This document shall provide the complete list of RF parts that shall be procured for NLES RF subsystem.	For Information	Requirements Review
D15	NLES Station Implementation Plan	The implementation plan shall describe the different steps the Contractor intends to follow to achieve the integration and acceptance of	For Information	Requirements Review

		the complete NLES station.		
D16	NLES Integration and Test Report	This document shall provide a complete report on the NLES integration activities at the Contractor selected sites.	For Approval	NLES Acceptance Review (Draft) EGNOS GEO Transponder Service Qualification Review (Final Issue)
D17	EGNOS GEO Transponder Service Status Report (EGSSR)	This report shall contain a description of the status of the EGNOS GEO Transponder Service. This shall include heath status of the payload and the satellite, achieved performances over the year, causes of unavailability, status of the NLES operations and an update of the expected End of Life of the GEO satellite.	For Information	Monthly (from start of operations)
D18	EGNOS GEO Transponder Service Progress Report (EGSPR)	The progress report shall present an overview of the project progress, project risks, schedule, and presenting the status of each WP described in this SOW.	For Information	Every 3 months
D20	Minutes of Meeting		For Review[1]	At each Meeting
D21	Risk Management Plan	The Content of the Risk Management Plan (RMP) is described in EGN-GEO-SOW-0.1.7	For Approval	Draft at proposal level Updates at KOM Updates as appropriate

Table 2 List of Deliverable Documents

All deliverable documents shall be delivered in Microsoft Word and Adobe PDF formats. Reviews of documents shall be planned by the Contractor and agreed with the customer.

[1] Agreements taken during the meetings will be translated into the necessary amendments of the Contract.

5 EGNOS GEO Transponder Service Project Execution Requirements

5.1 SS 0: Project Management

5.1.1 Overall Project Management

5.1.1.1 Project Management Plan

The Commission will approve the Contractor's Project Management Plan (PMP) at the Kick-Off Meeting (KOM). The PMP identifies how the project will be executed and lays out in detail the tasks, completion criteria, deliverables, documentation and schedule for the project. The PMP will clearly spell out how its management structure meets the project objectives, and detail the interfaces between the different roles, in terms of interaction processes, decision key points, control boards, interaction points with the customer.

EGN-GEO-SOW-0.1.7 Project Management Plan content

In light of the management requirements stated in the above sections, the contractor shall document and implement the Project Management Plan (PMP) which describes how these aspects of the project will be performed:

- The Contractor shall identify the project organization, key roles and responsibilities.
- The Contractor shall identify the key project stakeholders and state how these stakeholders will be managed.
- The Contractor shall define their subcontractor and major procurement management plans.
- The Contractor shall define the processes and procedures used by the project for program administration, correspondence, meetings, action items, documentation.
- The Contractor shall define their risk identification, mitigation and management process.
- The Contractor shall identify and quantify the risks for the project and associated mitigation plans.
- The Contractor shall identify their Product Assurance (PA), Configuration Management, Integrated Logistic Support and Manufacturing processes[2].
- The Contractor shall identify the milestones, tasks, task completion criteria, required resources, deliverables, documentation and schedule for the project. A Work Breakdown Structure to at least Level 3 and associated WBS dictionary shall be used to identify and describe the tasks.
- The Contractor shall identify a Single Point of Contact (SPOC), acting as an interface to the EGNOS Service Provider in order to ensure an optimal coordination between the EGNOS GEO Transponder Service Operations and the EGNOS System Operations performed by the ESP.

The Contractor shall execute the contract in accordance with the PMP.

[2] This requirement is only applicable for a new procurement and not to the lease of an already in-orbit transponder.

5.1.1.2 Risk Management

EGN-GEO-SOW-0.1.8 Project Risk Management

Throughout the Contract Period, the Contractor shall write and maintain a Risk Management Plan. The Commission will approve the Contractor's Risk management Plan at the KOM. The Risk management Plan identifies how the contractor will monitor the risks of the project.

The Contractor shall keep and document an EGS Project (EGSP) Risk Register according to the Risk Management Plan.

The Risk Register shall contain:

- Risk identification matrix and risk occurrence probability;
- Risk impact assessment;
- Risk mitigation plan.

The risk register shall be updated on a 3 months basis and provided to the Commission as part of the EGNOS GEO Transponder Service Progress Report (EGSPR) The contractor and the Commission shall have dedicated meeting for the analysis and mitigation of the major identified risks.

5.1.1.3 Service Status Reporting

EGN-GEO-SOW-0.1.9 EGNOS GEO Transponder Service Performances and Status Reporting

The contractor shall provide to the Commission a monthly EGNOS GEO Transponder Service Status Report (EGSSR) presenting:

- The achieved value for the Service availability of the EGNOS GEO Transponder Service and specific signal performances.
- The health of the EGNOS payload and satellite
- Any planned specific operations for the next period, which could affect the EGNOS GEO Transponder Service.

5.1.2 Regulatory Issues Management

EGN-GEO-SOW-0.2.1 ITU Filing

The Contractor shall be responsible for the regulatory aspects concerning the filing with the International Telecommunication Union (ITU) for the use of all downlink and uplink frequencies associated to the EGNOS Geo Transponder Service. Proper coordination with other satellite operators for uplink frequencies shall also be performed in due time.

A letter of support from the National Administration in charge should be provided.

EGN-GEO-SOW-0.2.2 PRN Registration

The Contractor shall also submit an application to the Global Positioning System Wing (GPSW) of the Navstar Global Positioning System Joint Program Office (GPS JPO) for assignment of the necessary C/A (L1) code. In case Option 2 is selected, the Commission may also ask to the Contractor to register for the L5 SBAS PRN code as well.

The Contractor shall also coordinate with ICAO during the PRN registration process.

In case the Contractor is proposing the use of SBAS payload already in-orbit, evidence of the fulfilment of these requirements shall be provided in the proposal.

5.2 EGNOS GEO Transponder Service Preparation Phase

5.2.1 SS1:EGNOS In-Orbit Capacity Provisioning Service

5.2.1.1 EGNOS Payload Specifications

EGN-GEO-SOW-1.1.1 EGNOS Payload Detailed Specifications

Based on the Technical Specifications provided in Annex 1, the Contractor should flow down the high-level system and payload requirements to detailed technical specifications for the payload and the satellite. This task shall be completed by the Requirements Review (RR). Any deviation proposed by the Contractor on the Technical Specifications shall be submitted for approval by the Commission.

EGN-GEO-SOW-1.1.2 NLES RF Subsystem Specifications Consistency

The Contractor shall ensure that the NLES RF Subsystem specifications are consistent with the Payload Specification defined in EGN-GEO-SOW-1.1.1. This task shall be completed by the Requirements Review (RR).

EGN-GEO-SOW-1.1.3 Requirements traceability

The Contractor should establish and maintain a full traceability between the applicable customer technical requirements and the payload and NLES RF subsystem technical specifications. This traceability should be documented and provided at the Requirements Review (RR).

5.2.1.2 EGNOS In-Orbit Capacity Procurement

EGN-GEO-SOW-1.2.1 EGNOS In-Orbit Payload Procurement Responsibility

The Contractor shall be responsible for the supervision of the design, qualification (if required), manufacturing, integration and test of the EGNOS payload and its equipment on the satellite throughout all phases of the satellite manufacturing process up to the satellite on-ground acceptance.

The Contractor shall be responsible to cover all the preparation activities linked to the launch of the satellite hosting the EGNOS payload.

EGN-GEO-SOW-1.2.2 Participation of the Commission to major Reviews

The Contractor shall invite the Commission's representatives/experts to participate to the major reviews/progress meeting planned in the procurement of the EGNOS payload/Hosting satellite. This includes as a minimum the Critical Design Review and the Acceptance Review.

The Commission shall have the right to witness launch preparations activities.

5.2.1.3 Payload IOT and Handover

EGN-GEO-SOW-1.3.1 In-Orbit Testing and Payload Commissioning

The Contractor shall be responsible for performing the In-Orbit Testing and commissioning of the EGNOS payload with support of the manufacturer. The Contractor shall provide to the Commission the list of tests that shall be performed on the EGNOS payload during the IOT campaign. These tasks shall be completed by the In-Orbit Test Review (ITR).

Upon successful completion of the In-Orbit Test Review (ITR), the Contractor shall provide to the Commission a statement of Compliance of the in-orbit payload with regards to the Technical Specifications provided in Annex 1 and revised within EGN-GEO-SOW-1.1.1.

The Contractor shall then ensure the handover of the payload to the operations teams.

5.2.2 SS2: NLES Hosting Site and RF Station Preparation Service

EGN-GEO-SOW-2.1.1 RF Uplink Services and Site Preparation Study

The Contractor shall perform the following tasks in view of the NLES hosting site preparation and the provisioning of the RF Uplink services (RF Station preparation):

- Selection of the 2 locations of the hosting sites for the NLES;
- NLES RF Station Architecture definition, including interface between the NLES equipments and the RF subsystem (Error! Reference source not found. and Error! Reference source not found.)and possible interfaces with the main telecommunication mission RF uplink equipments. The definition of the architecture shall ensure that the EGNOS Transponder Service requirements are met. The Contractor shall also take into account the constraints introduced by the implementation of the EGNOS GEO Transponder and the different operational modes of the EGNOS GEO transponder;
- Definition of the required additional RF equipments to be procured. This includes:
  - Ku or C and L-band antenna(s) including tracking system;
  - HPAs and redundancy mechanism;
  - LNAs and redundancy mechanism;
  - Integration (rack harness);
- Definition of the site modification specifications.

The Contractor shall produce:

- Detailed level diagrams in transmission and reception chains (including signal and noise)
- Detailed reporting in the redundancies provided for the station in accordance with availability, reliability requirements.
- Equipment layout including cable path

The Contractor shall also produce the complete NLES implementation plan, which shall describe the different steps the Contractor intends to follow to achieve the complete NLES integration and acceptance (RF Station and deployment of NLES equipments). In the establishment of such an implementation plan, the Contractor shall also take into account the installation of the NLES subsystem equipments provided as CFI to this contract.

This task shall be completed at the Requirements Review. At the outcome of this task, the Contractor shall provide the following documentation (as defined in Table 2):

1. NLES RF Station Implementation Architecture Document
2. NLES RF Part List Document
3. NLES Implementation Plan Document

EGN-GEO-SOW-2.1.2 NLES FR Station Implementation – RF Integration

Upon successful completion of the Requirements Review (RR), the Contractor shall be authorized to procure the identified components and to proceed with the implementation of the proposed design according to the implementation plan.

EGN-GEO-SOW-2.1.3 NLES RF Station Tests and Acceptance

The Contractor shall submit the acceptance tests procedure to the Commission at least one month before the Acceptance Review. The Contractor shall perform the tests and report the results in the NLES Integration and Test Report document.

The NLES RF Station Acceptance Review (NLES-AR) shall be performed in the presence of the Commission Representatives and possibly of the Contractors in charge of the NLES deployment. Documentation and acceptance test results shall be reviewed during that meeting.

Upon request from the Commission, the Contractor shall reproduce a set of the acceptance tests that will be witnessed by the Commission's Representatives.

All the information deemed necessary for the following phase (deployment, NLES qualification and operations) should be reported in the minutes of the review (site security features, site access requirements, local installation rules and standards…)

EGN-GEO-SOW-2.1.4 Support to NLES Deployment

After successful completion of the NLES RF Station Acceptance Review (NLES-AR), the station will be declared ready for the deployment of the NLES.

The Contractor shall ensure access to the site for the delivery of the NLES equipments as well as for external staff involved in the NLES deployment activities. Suitable office accommodation with fax/telephone/internet access shall be provided to this staff by the Contractor.

The Contractor shall take in charge the subsystems delivered on site, providing suitable storage compliant with the storage specification (room, environment…)

The Contractor should participate to the Commissioning activity and should witness the executed deployment activities. Namely, local host technicians who will act later as local maintenance staff, should follow-up the deployment activities in order to familiarize themselves with the equipment. In addition, the Contractor shall provide the NLES deployment team with a technical support by means of qualified personnel. The personnel involved shall be suitably skilled and available on-site throughout the entire deployment activity during normal working hours.

The duration of the NLES deployment should not exceed 15 working days.

EGN-GEO-SOW-2.1.5 EGNOS GEO Transponder Service Qualification

Once the physical installation of the NLES equipment is completed, test and end-to-end (with the GEO transponder provided by the Contractor) validation tests activities will be carried out before the NLES (and EGNOS GEO Transponder Service in general) can be declared as operational.

The Contractor shall support this qualification phase through:

- Provision of skilled personnel to operate the station during the tests (e.g. switch HPAs, depointing the antenna, control of EGNOS payload on-board etc.)
- Provision of skilled personnel for troubleshooting activities and to analyse the test results

- Lending of test equipment (e.g. spectrum analyser, power meter…)

The personnel involved shall be available on-site throughout the entire qualification phase during normal working hours.

This task shall be completed by the EGNOS GEO Transponder Service Qualification Review (EGS-QR).

After qualification has been successfully performed, the EGNOS GEO Transponder Service will be considered as operational. This milestone corresponds to the Operations Start Date (OSD), i.e. the start of the EGS Provisioning Phase (Operational Phase)

5.3 EGNOS GEO Transponder Service Provisioning Phase

5.3.1 SS3: EGNOS In-Orbit Capacity Operations Services

5.3.1.1 EGNOS Geostationary Transponder Services

EGN-GEO-SOW-3.1.1 EGNOS GEO Transponder Service Availability

The Contractor shall ensure the availability of the EGNOS GEO Transponder Service in order to meet the requirements expressed in Error! Reference source not found.. The availability of the EGNOS GEO Transponder Service will depend on the availability of:

- EGNOS GEO Transponder;
- NLES Stations.

EGN-GEO-SOW-3.1.2 Outages Reporting

The Contractor shall report in due time to the Commission any outage in the EGNOS GEO Transponder Service Operations.

Every month, the Contractor shall also provide an EGNOS GEO Transponder Service Status Report (EGSSR) as defined in EGN-GEO-SOW-0.1.9. The EGSSR will include a summary of the cumulative outage duration in the EGNOS GEO Transponder Service.

EGN-GEO-SOW-3.1.3 EGNOS GEO Transponder Service Operational Mode Switching in Option 2

In case Option 2 is selected, and upon request from the Commission, the Contractor shall ensure Operational Mode Switching of the EGNOS GEO Transponder Service in accordance with the Operational Mode Specification defined in Error! Reference source not found., OPTION 2:

- C1->L1
- C1/C5 -> L1/L5
- C1/C5 -> L1/E5
- C1/C5 -> L1/E5b

Availability of the EGNOS GEO Transponder Service should be guaranteed during operational mode switching.

5.3.1.2 Payload and Satellite Operations

EGN-GEO-SOW-3.2.1 Contingency Operations

In a contingency situation, the Contractor shall ensure that the most appropriate actions are taken in order to maintain the EGNOS GEO Transponder Service or reduced the duration of the service outage.

EGN-GEO-SOW-3.2.2 EGNOS GEO Transponder Service Switch-Off

If in a contingency situation, the Contractor is forced to switch-off the EGNOS GEO Transponder Service (payload switch-off or RF link switch-off), the Contractor shall inform the Commission in the shortest delays, preferably before proceeding to the service switch off.

EGN-GEO-SOW-3.2.3 Planned Orbital Manoeuvres

In the event of a planned orbital manoeuvre of the satellite (such as station keeping) by the Contractor, the Contractor shall assess if such manoeuvre will affect the EGNOS GEO Transponder Service (e.g. outage) and shall report the conclusions to the Commission in the EGSSR.

EGN-GEO-SOW-3.2.4 Satellite Relocation inside the EGNOS GEO Orbital Arc

In case the Contractor decides to relocate the satellite in a new orbital position inside the orbital arc compatible with the EGNOS coverage requirements, the Contractor shall assess and provide information to the Commission on:

- The duration of the foreseen Service unavailability (falling into the Service Underperformance regime described in EGN-GEO-SOW-0.1.2)
- The updated coverage map of the EGNOS payload
- The updated on-ground received power geographical distribution

The Contractor shall ensure that compliance to the service specifications as defined in Error! Reference source not found. is maintained.

EGN-GEO-SOW-3.2.5 External Data Server Access

The Contractor shall set-up an external Data Server on which the Commission can access in real time the main parameters related to the satellite and the payload:

- Orbital parameters of the satellite
- Planned manoeuvre and orbital parameters after the manoeuvre
- Navigation payload telemetry

This server shall be used as an interface between the Commission and the Contractor.

5.3.2 SS4: NLES Operations Service

EGN-GEO-SOW-4.1.1 NLES RF Uplink Service

The Contract shall ensure the availability of the NLES RF Uplink service in accordance with the requirements expressed in Error! Reference source not found..

EGN-GEO-SOW-4.1.2 NLES Equipment Monitoring

The contractor shall monitor all systems, subsystems, and operational functions of the Navigation Land Earth Stations (NLES) and report all issues to the ESP.

EGNOS GEO Transponder Service Replenishment

Annex 1 to Statement of Work: Technical Specifications

Table of contents

Table of Figures

Table of Tables

1 DOCUMENTATION

The following Applicable and Reference documents may be obtained upon request (see Conditions of Tender for more information).

1.1 Applicable Documents

[AD 1] EGNOS SIS Specifications from SARPS

[AD 2] EGNOS NLES-Hosting Site IRD – EGN-ATMG-AIV-DRD204/0002, Issue 3, Rev. D

[AD 3] Annex A – NLES-Hosting Site IRD – EGN-ASPI-NLES-DRD204/0001, Issue 1, Rev. E

[AD 4] DCN to Annex A of the NLES Hosting Site IRD: Migration to Inmarsat 4 – Ref: 200344641N

1.2 Reference Documents

[RD 1] EGNOS GEO Transponder Service Replenishment – Statement of Work, Issue 1.0

[RD 2] SBAS L1/L5 Preliminary Technical Specifications

[RD 3] Galileo Open Service Signal In Space ICD, Draft 1

[RD 4] Interface Control Document between ARTEMIS NLES and ARTEMIS GEO Transponder – E-TS-ITF-E25-001-ESA, Issue 1, Rev. 1

[RD 5] ARTEMIS Satellite Characteristics for Use in the EGNOS AOC Project – APP-R/JS/0892/js, Issue 1.0

[RD 6] EGNOS Mission Requirements, Issue 2.0

1.3 Acronyms

CCF	Central Control Facility
CFI	Customer Furnished Item
CPF	Central Processing Facility
ECAC	European Civil Aviation Conference
EGNOS	European Geostationary Navigation Overlay System
EGS	EGNOS GEO Transponder Service
EGSP	EGNOS GEO Transponder Service Provider
EIRP	Effective Isotropic Radiated Power
ERP	EGNOS Regenerative Payload
ESA	European Space Agency
GEO	Geostationary Satellite

GNSS	Global Navigation Satellite System
GPS	Global Positioning System
ICAO	International Civil Aviation Organisation
I/F	Interface
IRD	Interface Requirements Document
KPI	Key Performances Indicators
MCC	Mission Control Centre
MTBF	Mean Time Between Failure
NLES	Navigation Land Earth Station
NSGU	Navigation Signal Generation Unit
RF	Radio Frequency
RHCP	Right Hand Circular Polarization
RIMS	Ranging and Integrity Monitoring Station
Rx	Reception
SARPS	Standards and Recommended Practices
SBAS	Satellite Based Augmentation System
SIS	Signal In Space
TBC	To Be Confirmed
TWAN	Transport Wide Area Network
Tx	Transmission

1.4 Definitions

EGNOS Arc	means the orbital arc suitable for providing the EGNOS GEO Transponder Service over the complete FIR ECAC coverage with a minimum elevation angle of 5 degrees;
EGNOS GEO Transponder Service (EGS)	means the service provided by the Contractor which includes the 2 following aspects: o The procurement and the operations of the EGNOS GEO transponder payload. o The hosting and operations of the 2 NLES associated to the GEO transponder (including adaptation of RF sections to uplink the signals to the satellite);
Hosting Site	means the premises where EGNOS NLES assets are located for the purpose of their recurrent operation;
Operations Start Date (OSD)	Means the date at which the EGNOS GEO Transponder Service is qualified to start its operations within the EGNOS system. This represents the dates at which the leasing of the EGNOS GEO Transponder Service operations phase starts.

2 INTRODUCTION

2.1 General

In order to ensure the continuity of the EGNOS Service during its exploitation, the European Commission has to anticipate the replenishment of the EGNOS GEO transponders with the procurement of 1 or 2 new EGNOS GEO Transponder Services (EGS):

- GEO-1, with an Operational Start Date in 2011
- GEO-2, with an Operational Start Date in 2012

In addition the procurement of the 1 or 2 new EGNOS GEO Transponder Services (EGS) may allow in case Option2 (see section 2.2) is selected:

- Mitigation of service discontinuity in case of satellite orbital relocation
- Potential EGNOS SIS broadcast in additional bands (e.g. L5, E5)

The EGNOS GEO Transponder Service shall consist of:

1. EGS Operations Preparation Phase:
    a. Procurement of SBAS signal in-orbit capacity (if required; not applicable if the operator who is awarded the contract is already flying a SBAS payload the use of which he has proposed in his bid);
    b. Procurement of the EGNOS NLES Hosting Site and RF Station and support to the NLES integration;
2. EGS Operations Phase:
    a. Operations of the SBAS payload;
    b. Operations of the NLES Station.

The notion of EGNOS GEO Transponder Service (EGS) is thus used to define the Service provided by the Contractor which includes the 2 following technical aspects:

- The In-Orbit Capacity procurement and operations
- The Hosting Site and RF station procurement and NLES operations

This document presents the technical specifications to which the Contractor shall comply for the provision of the EGNOS GEO Transponder Service GEO-1 and/or GEO-2.

2.2 Introduction to the Technical Specifications

The first objective of the EGNOS GEO Transponder Service Procurement is to ensure the continuity of the operations of the EGNOS system by replacing the EGNOS space segment for those satellites coming in end of life in the time frame 2011-2013.

The current EGNOS system as defined in the mission requirements [RD 6] is based on augmentation service in the L1-band only. This is the version of EGNOS that will be certified in the early phase of the operations.

The primary objective of the present procurement is therefore to ensure the continuity of EGNOS SIS GEO broadcast in L1 band at the most advantageous costs and in a time frame compatible with the current expected EGNOS GEO replacement schedule.

In order to ensure full re-usability of the NLES developments as part of the EGNOS System version to be qualified by 2010, it is required that the ground/space interfaces for GEO-1 and GEO-2 are compatible with the current existing ones. In the proposed solution for the Transponder, the Contractor shall carefully trade-off the re-utilisation of on the shelf equipments with other alternatives which might lead to a cost reduction.

Besides this primary objective, the procurement of a dual-frequency capability payload/service may also be envisaged, in the perspective of potential evolution of the EGNOS mission towards the broadcast of EGNOS SIS through two frequencies.

For the GEO Transponder Services he proposes (GEO-1 and/or GEO-2), the Contractor is requested to provide a quotation for each of the 2 following options:

1. OPTION 1: L1 Only Payload
2. OPTION 2: Flexible L1/E5 Payload

Decision on the selected Option (Option 1 or 2) will be done during the proposals evaluation phase, before the signature of the Contract, based on a strategy analysis to be done by the Customer.

The following table summarizes these high-level considerations to be taken into account for the preparation of the proposal by the Contractor.

	GEO Transponder Service 1 (GEO-1)	GEO Transponder Service 2 (GEO-2)
Mission Primary Objective	Ensure continuation of EGNOS operations in L1	Ensure continuation of EGNOS operations in L1
Mission Secondary Objective	Prepare for potential dual frequency capability in case OPTION 2 is selected.	Prepare for potential dual frequency capability in case OPTION 2 is selected.
Minimum Requirement	Option 1: SBAS L1 (and Compatibility with one of the current NLES interfaces) Option 2: Mission Evolution Requirements (L1/E5)	Option 1: SBAS L1 (and Compatibility with one of the current NLES interfaces) Option 2: Mission Evolution Requirements (L1/E5)
Quotations to be provided in the proposal	Quotations for Option 1 and for Option 2	Quotations for Option 1 and for Option 2

2.3 Document Organisation

The present document is organised as follows.

Section 3 provides an overall overview of the EGNOS system and defines the contours of the EGNOS GEO Transponder Service procurement.

Section 4 provides the generic requirements for the EGNOS GEO Transponder Service that shall apply for the procurement of both option 1 and option 2 in the GEO-1/2 transponder service.

Section 5 describes the specific requirements for the EGNOS GEO Transponder Service based on Option 1 to be taken into account in addition to the requirements defined in Section 4.

Section 6 describes the specific requirements for the EGNOS GEO Transponder Service based on Option 2 to be taken into account in addition to the requirements defined in Section 4.

Section 7 describes the key performances parameters that will be taken into account to characterize conditions of Underperformances Regime [RD 1].

3 EGNOS GEO Transponder Service Overview

3.1 Overall EGNOS System Architecture

The purpose of EGNOS is to implement a system that fulfils a range of user services requirements by means of an overlay augmentation to GPS, based on the broadcasting through GEO satellites of GPS-like navigation signals containing integrity and differential corrections information applicable to the navigation signals of the GPS satellites and the EGNOS GEO satellites themselves. As a result, the EGNOS system can provide integrity positioning with Safety-of-Life (SoL) quality that allows it to address needs of all modes of transport, including civil-aviation.

The EGNOS will primarily cover the ECAC region complementarily to other augmentation systems initiatives (such as WAAS in US) but extensions are being investigated to cover other adjacent regions to the ECAC region. An exact definition of the ECAC region and its limits can be found in [RD 6] and an example of the coverage extension for the Flight Information Region (FIR) is given in Figure 5.

The EGNOS ground segment is responsible for the computation of the integrity measurements and wide area differential corrections. To this purpose a number of Ranging and Integrity Monitoring Stations (RIMS) are deployed over the European countries (and for some of them worldwide) which collect the GPS and EGNOS GEO raw pseudo-range measurements. The network of RIMS is connected to 4 Master Control Centres (MCCs) (of which one is master) where the integrity, differential corrections, ionospheric delays are computed by the Core Processing Facility (CPF). This information is sent in a message to the Navigation Land Earth Station (NLES) to be uplinked in a GPS-like signal (following the SBAS signal specification as defined in [AD 1]) to the space segment (3 GEO satellites). The GEO satellites broadcast the GPS-like signals transparently on the GPS L1 frequency (1575.42 MHz).

Following the recent modernization of the GPS, two new signals are expected to be available for civil use: L2 at 1227.6 MHz and L5 at 1176.45 MHz. Adaptations of the EGNOS system are currently under study and prototyping to support integrity messages broadcast in the L5-band simultaneously to L1-Band, as a potential future EGNOS mission evolution [RD 2].

Furthermore, potential evolutions of the EGNOS mission will take into due account its integration with the Galileo system, and in particular the Galileo SoL service, which relies on L1 and E5 signals broadcast.

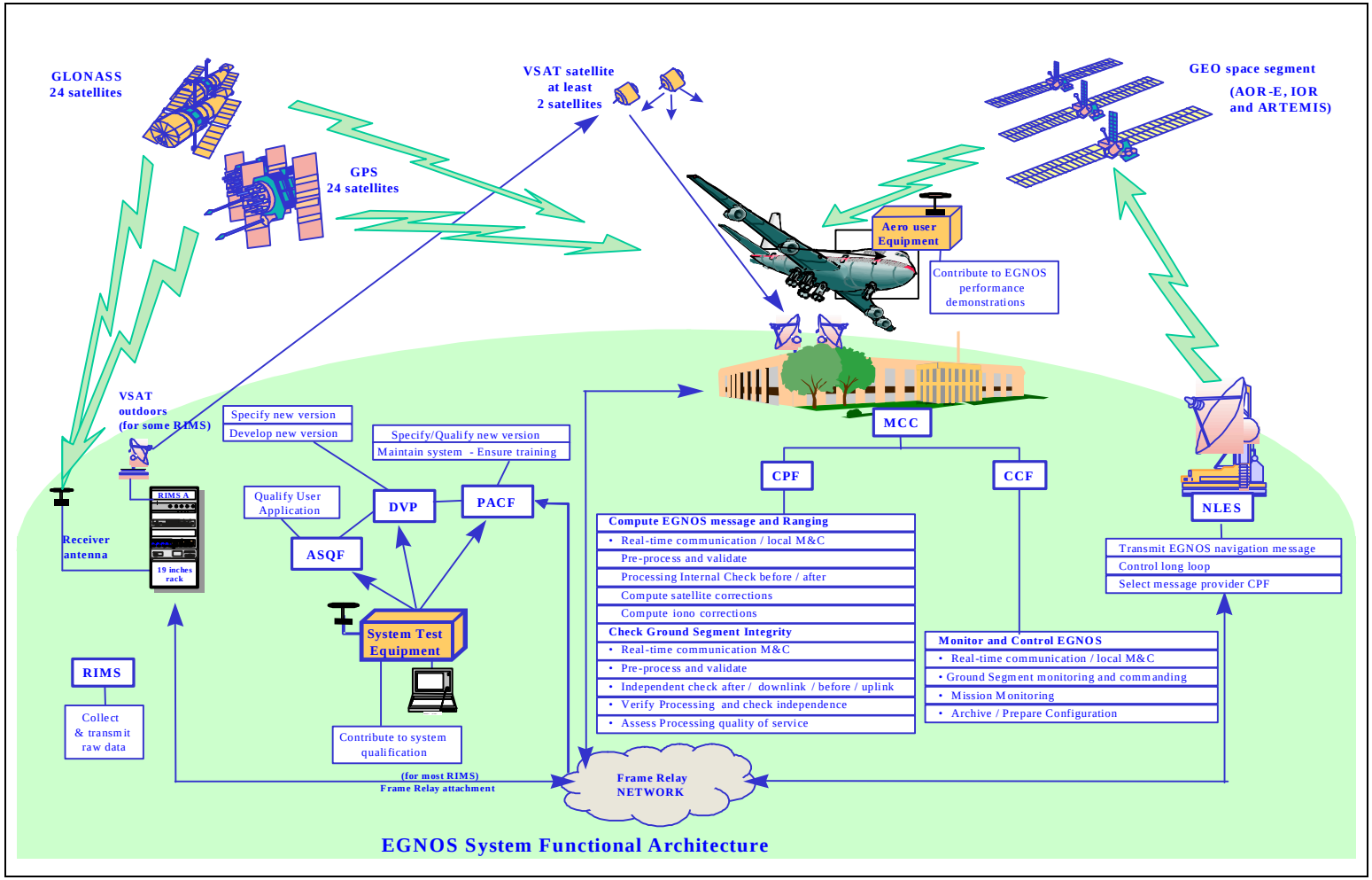

Figure 1 EGNOS Functional Architecture

3.2 EGNOS GEO Transponder Service Framework

3.2.1 GEO Transponder Service Provider Framework

3.2.1.1 Baseline Interface: Hosting Site – NLES Equipments Interface at RF Level

Figure 2 presents the overall framework of the EGNOS GEO Transponder Service procurement, applied to the case of OPTION 1 (for GEO-1 and/or GEO-2).

The Contractor shall procure and operate the EGNOS space segment and the RF transmission and reception facilities. This RF station shall interface at RF level with the NLES subsystem (which will be installed on the site and is provided as a CFI to the Contractor) through the RF adapter. The Contractor shall host and operate the NLES equipments.

In the case of OPTION 1, the following 3 interface types are possible:

- Interface 1: C1 (uplink) à L1 (Downlink) similar to Inmarsat 4F2 use[1]
- Interface 2: C1 (uplink) à L1/C2 (Downlink) similar to Inmarsat 3F2
- Interface 3: Ku1 (uplink) à L1/Ku2 (Downlink) similar to Artemis

Figure 3 presents the overall framework of the EGNOS GEO Transponder Service procurement, applied to the case of OPTION 2 (for GEO-1 and/or GEO-2).

In this case of OPTION 2, only Interface 1 or Interface 3 (without the Ku2 Downlink) shall be considered at the level of the NLES RF Station implementation (for initial operations). However the payload shall present a C1/C5 or Ku1/Ku5 à L1/E5 interface to allow activation of additional operational modes (e.g. dual frequency) in the future.

3.2.1.2 Potential Interface Evolution: Hosting Site – NLES Equipments Interface at IF Level

The baseline interface reference to be considered by the Contractor for the purpose of the preparation of the proposal to the present RFP shall be an interface at RF level as described in 3.2.1.1.

However it may be envisaged during the execution of the Contract to shift the interface to the IF level instead. In this case the Contractor would become responsible for the procurement of the RF adapter, ensuring the adequate interface at IF level.

Should this technical change be decided, a variation to the contract would be discussed with the Contractor. In the preparation of his proposal, the Contractor shall present his views on the possible impacts of modifying the NLES – Hosting Site interface from RF to IF.

[1] Although the Inmarsat 4F2 transponder is a C1/C5 à L1/L5 transponder, only the C1/L1 channel is used in the EGNOS system.

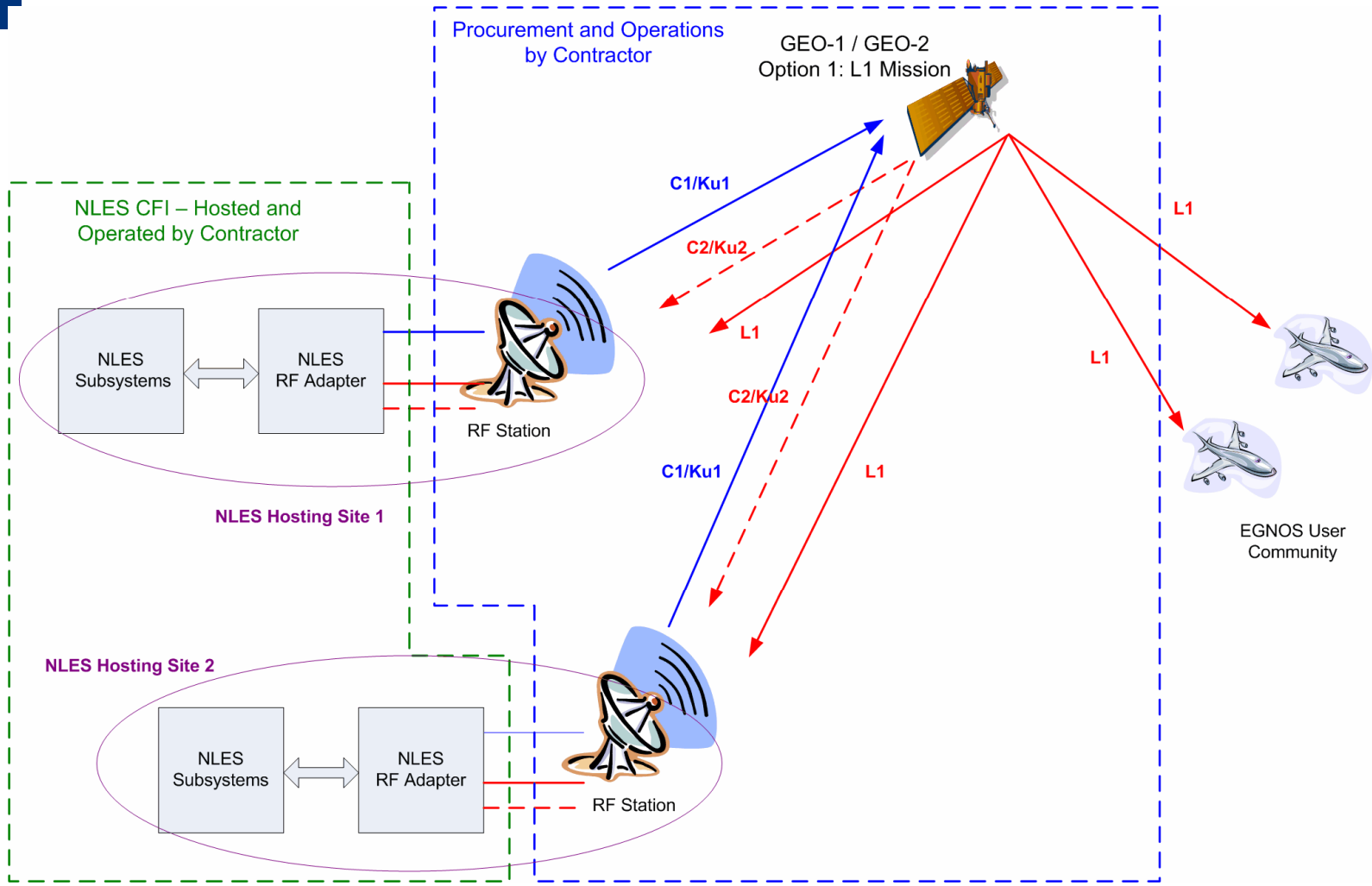

Figure 2 EGNOS GEO Transponder Service Procurement Framework – OPTION 1

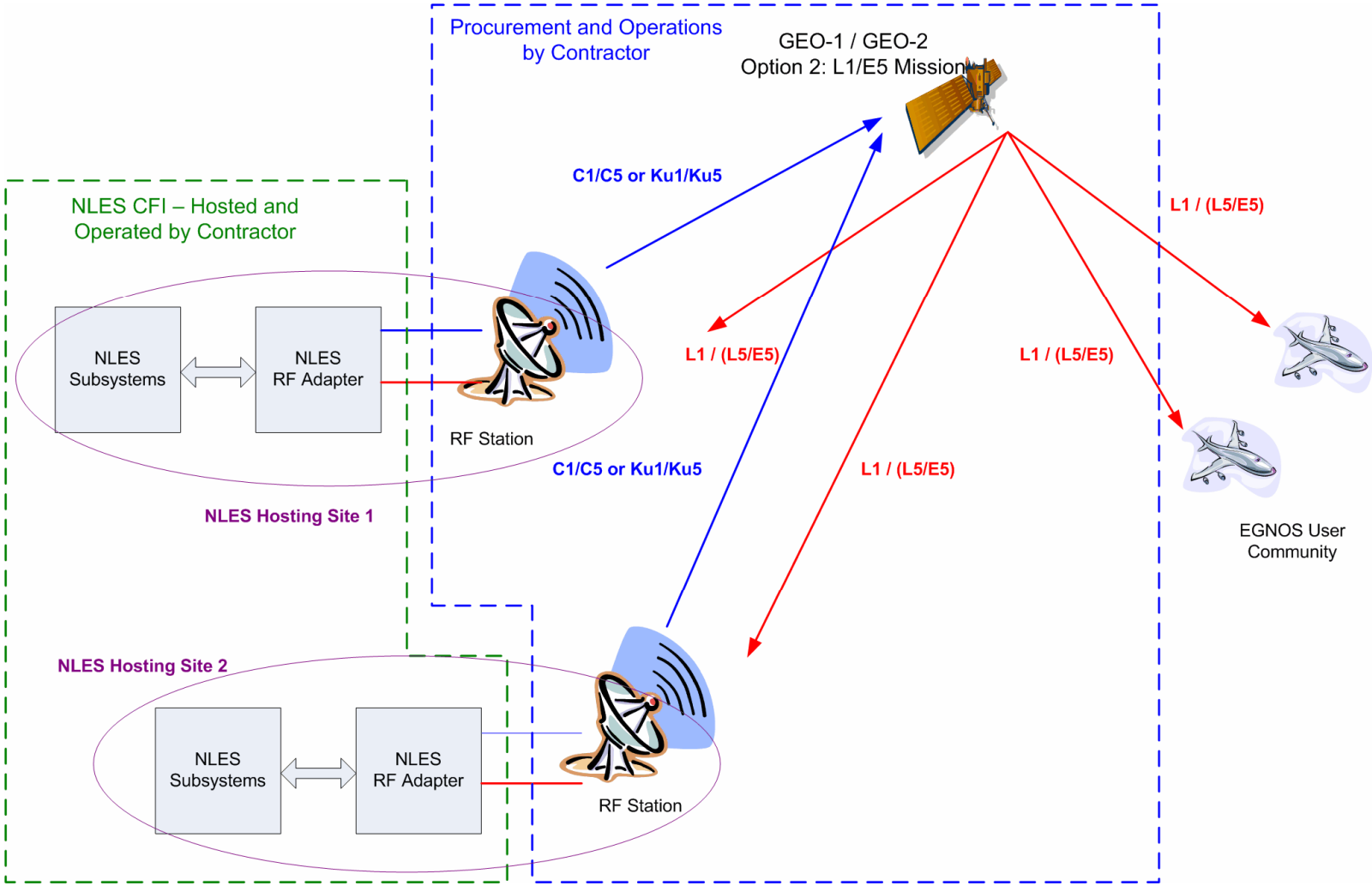

Figure 3 EGNOS GEO Transponder Service Procurement Framework – OPTION 2

3.2.2 NLES Description

The NLES is the connection mean of the EGNOS system to the GEO satellite. The aims of the NLES stations are to:

- generate and send a GPS-like signal to the GEO,
- synchronize this signal in accordance with the GPS time on the L1-band antenna of the GEO
- Send the EGNOS correction and integrity messages to the GEO.

The NLES station contains an RF adapter that is used to adapt it to an already existing RF and antenna equipment for signal emission and synchronisation. Except for reliability needs, it is not requested any internal redundancy in a NLES channel because redundancy is provided already at by the global architecture of the Ground Segment.

The NLES consists of the following components as shown in Figure 4.

- NLES Core Computer
- NLES Long-Loop
- NLES Core receiver
- NLES Integrity Box
- NLES RF Adapter
- NLES Frequency Standard
- NLES RF Subsystem: this component is provided by the Host Site (EGNOS GEO Transponder Service Provider).

Detailed specifications for the Hosting site interface are provided in [AD 2] and [AD 3].

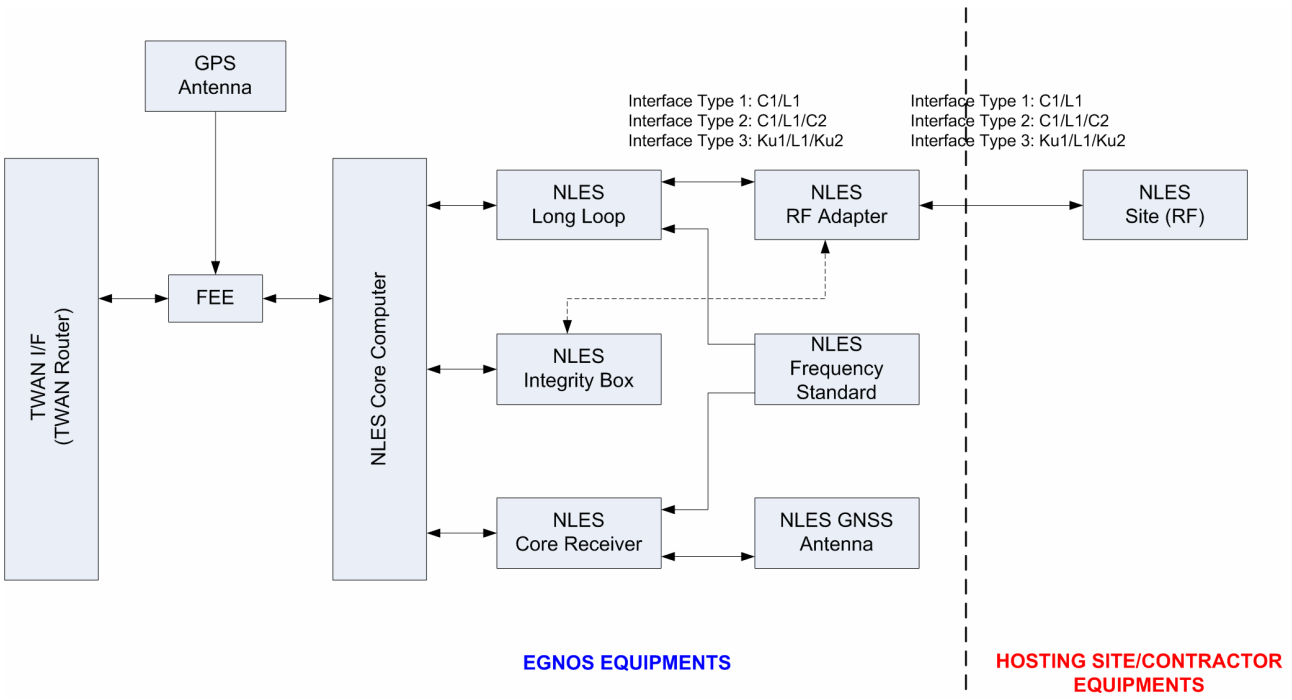

Figure 4 NLES Components

4 GENERIC TRANSPONDER SERVICE REQUIREMENTS

This section presents the generic requirements for the EGNOS GEO Transponder Service that shall apply for both OPTION 1 and OPTION 2.

4.1 EGNOS GEO Transponder

4.1.1 Functional Requirements

EGN-GEO-SPEC-0.1.1 Transmit Coverage

The satellite shall ensure transmit GEO coverage over the ECAC region as specified in Figure 5. Global coverage to all points in view of the satellite shall be provided in the L-band frequency band with a minimum elevation of 5 degrees.

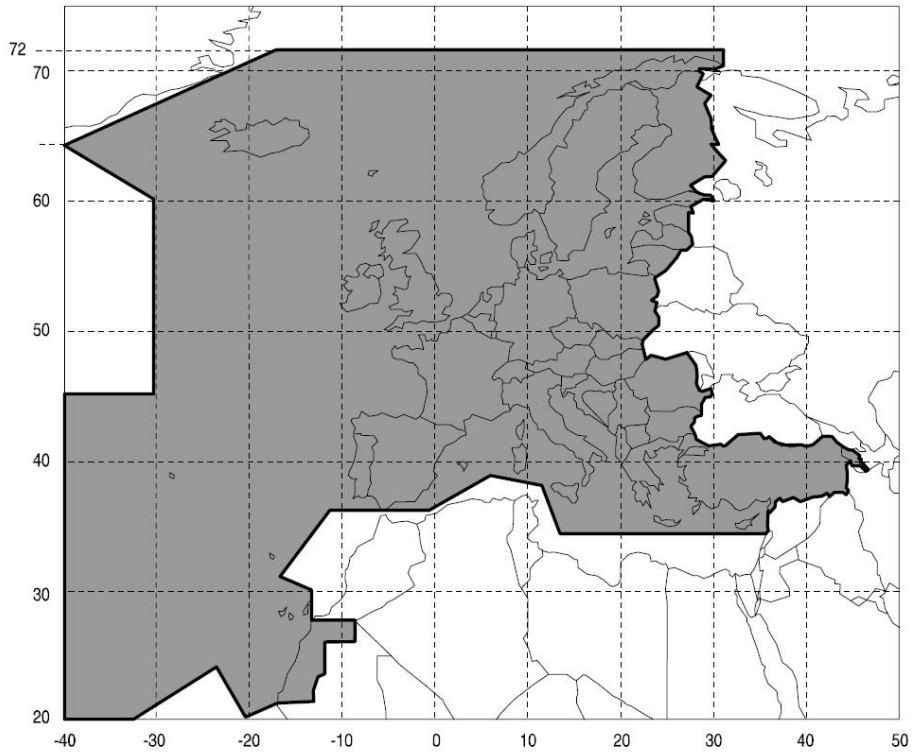

Figure 5 ECAC Region Coverage FIR

EGN-GEO-SPEC-0.1.2 Receive Coverage

The receive coverage of the EGNOS GEO transponder shall ensure the uplink signal can be transmitted from 2 different stations located in Europe. The two different hosting sites shall not be co-localized (see EGN-GEO-SPEC-0.2.2).

4.1.2 Performances Requirements

EGN-GEO-SPEC-0.1.3 L1 Downlink Signal Performances

The L1 signal characteristics shall comply with the following parameters values presented in the table below.

In addition, for those parameters not specified in Table 1, the L1 downlink signal performances shall satisfy with the SBAS L1 specifications described in [AD 1].

Centre Frequency	1575.42 MHz
Polarization	RHCP
Bandwidth (0,5 dB)	≥ 4 MHz
EIRP	≥ 30 dBW
Coverage	Global

Table 1 L1 Downlink Signal Performances

EGN-GEO-SPEC-0.1.4 EGNOS GEO Transponder Service Availability

The EGNOS GEO Transponder Service shall ensure a signal availability of 99,9%, meeting the specified performances.

EGN-GEO-SPEC-0.1.5 Overall Reliability

The reliability of the transponder shall be greater than:

- 0,99 for a mission duration of 3 years
- 0,97 for a mission duration of 5 years
- 0,93 for a mission duration of 10 years
- 0,90 for a mission duration of 13 years

EGN-GEO-SPEC-0.1.6 EGNOS GEO Transponder EIRP Stability

The change in EIRP, at any location in the defined coverage area shall not exceed 1.2 dB peak-to-peak for 24 hours and 1.9 dB peak-to-peak over the service life.

EGN-GEO-SPEC-0.1.7 Gain to Noise Temperature Ratio

The receive Gain to noise Temperature ratio (G/T) measured at any frequency within any of the transmission channels and at any location within the specified received coverage should not be less than:

- -10 dB/K assuming an uplink in C Band
- -2.3 dB/K assuming an uplink in Ku Band (Artemis performances)

EGN-GEO-SPEC-0.1.8 Frequency Translation Accuracy

The frequency translation accuracies shall be better than 1 part in 10^6

EGN-GEO-SPEC-0.1.9 Carrier Frequency Stability

The frequency stability of the local oscillator shall be better than 10^{-11} over 1 to 100 seconds and better than 2×10^{-7} over the service life time.

EGN-GEO-SPEC-0.1.10 Frequency Inversion

The output frequency spectrum of any transponded signal shall not be inverted with respects to the input spectrum.

EGN-GEO-SPEC-0.1.11 Phase Linearity

The phase linearity requirements are defined as being measured over the total transmission channel, including the reception and transmission antenna with adjacent channels switched-off.

The EGNOS GEO Transponder shall ensure phase linearity for each channel of ±3° across any 1 MHz over the entire channel and ±5° across any 50 kHz over the entire channel.

EGN-GEO-SPEC-0.1.12 Phase Noise Spectral Density

The single side band phase noise spectral density induced on a carrier by the payload shall not exceed the following values for the appropriate frequency range (fm):

5Hz – 100Hz: $-15-30\log_{10}(fm)$ dBc/Hz

100Hz – 25 kHz: $-55-10\log_{10}(fm)$ dBc/Hz

Beyond 25 kHz: -99 dBc/Hz

EGN-GEO-SPEC-0.1.13 Group Delay Stability

The absolute group delay stability shall be better than 10 ns over 24 hours.

EGN-GEO-SPEC-0.1.14 In-Band and Close-to Band Spurious Outputs

The total EIRP towards any point within the defined coverage area, resulting from the sum of all spurious signals shall be lower than the following values in any 4 kHz slot within the frequency range:

- 1500 MHz to 1589 MHz:
    - o – 20 dBW for spurious signals independent of the EIRP level of the carriers
    - o – 40 dBc for spurious signals which are dependent on the EIRP level of the carriers (with 0 dBc corresponding to the carrier level)

EGN-GEO-SPEC-0.1.15 Out of Band Spurious Outputs

The total EIPR towards any point within the defined coverage area resulting from the sum of all spurious signals shall be compliant with Recommendation ITU-R RA.769 "Protection Criteria Used for Radioastronomical Measurements".

EGN-GEO-SPEC-0.1.16 L1 Transmit Out of Band Response

Typical values for the transmit out of band response, relative to the response at band centre, should be:

- o Below 1559 MHz: -40 dB
- o Above 1591 MHz: -40 dB

EGN-GEO-SPEC-0.1.17 Antenna Gain Variation

The variation of the Tx antenna gain from any location within the global coverage shall not exceed 1.0 dB.

EGN-GEO-SPEC-0.1.18 Axial Ratio

The axial ratio shall not be greater than 2 dB within the coverage area of the full operational bandwidth.

EGN-GEO-SPEC-0.1.19 AM/PM Conversion

The AM/PM conversion coefficient for any transponder channel with single carrier RF drive levels up to power amplifier saturation shall not exceed 3,5°/dB for any modulating frequency up to 50 MHz.

4.1.3 Operational Requirements

EGN-GEO-SPEC-0.1.20 EGNOS GEO-1 Transponder Latest Availability Date

The EGNOS GEO-1 Transponder shall be available for operations at the latest by end of Q4 2011.

EGN-GEO-SPEC-0.1.21 EGNOS GEO-2 Transponder Latest Availability Date

The EGNOS GEO-2 Transponder shall be available for operations at the latest by the end of Q4 2012

EGN-GEO-SPEC-0.1.22 EGNOS GEO-1 Transponder Preferred Availability Date

The EGNOS GEO-1 Transponder should be available for operations by end of Q2 2011.

EGN-GEO-SPEC-0.1.23 EGNOS GEO-2 Transponder Preferred Availability Date

The EGNOS GEO-2 Transponder should be available for operations by the end of Q2 2012

EGN-GEO-SPEC-0.1.24 Satellite Life-Time

The remaining life time of the satellite at start of the GEO Transponder Service operations shall be at least 13 years.

EGN-GEO-SPEC-0.1.25 Satellite Orbital Location

The satellite shall remain located in the EGNOS Arc.

EGN-GEO-SPEC-0.1.26 GEO Transponder Path Control

The transponder channels shall have adjustments and command functions for power amplifier switch ON/OFF, channel gain and level control setting. The gain shall be adjustable in steps of 2 dB.

EGN-GEO-SPEC-0.1.27 Cessation of Emission

It shall be possible to turn each individual transmission channel on or off by ground command. This operation shall be independent of gain settings.

EGN-GEO-SPEC-0.1.28 Doppler Shift Impact on Operations

The Doppler shift, as perceived by a stationary user, on the signal broadcast by the satellite shall be less than ±40 meters per second (210 Hz at L1) in the worst case (at the end of life of the GEO satellite). The Doppler shift is sure to the relative motion of the GEO satellite.

4.2 EGNOS NLES Hosting Site and Operations

This section describes the generic requirements that shall apply for the procurement and Operations of the NLES Hosting Site (including RF station). The generic hosting requirements are described in the NLES Hosting Site IRD document [AD 3]

4.2.1 Hosting Site Requirements

EGN-GEO-SPEC-0.2.1 Number of NLES Sites

The Contractor shall propose 2 NLES site location per EGNOS GEO Transponder Service.

EGN-GEO-SPEC-0.2.2 NLES Site Location Requirements

The NLES sites shall be located in Europe (EU 27 + Switzerland and Norway) and shall be distant by 50 km minimum.

EGN-GEO-SPEC-0.2.3 NLES Hosting Site Requirements

The NLES Hosting Site shall meet the generic requirements expressed in [AD 2].

EGN-GEO-SPEC-0.2.4 NLES Hosting Site Security Requirements

The Contractor shall be able to demonstrate that the Hosting Sites satisfies to minimum security requirements expressed in [AD 2], Section 9.

EGN-GEO-SPEC-0.2.5 NLES Hosting Site RF Interface

The NLES Hosting Site RF interface shall be compliant with the requirements expressed in Annex A of the Hosting Site IRD [AD 3][AD 4].

EGN-GEO-SPEC-0.2.6 Wide Area Network Separation

The Wide Area Network (WAN) shall be separated between the EGNOS MCC and the 2 different stations (Hosting Sites)

4.2.2 NLES RF Services Performances Requirements

EGN-GEO-SPEC-0.2.7 NLES RF Station Availability

The NLES RF Station availability should be better than 99.95%, meeting the specified performances. The NLES RF Station availability shall ensure the overall EGNOS GEO Transponder Service availability expressed in EGN-GEO-SPEC-0.1.4.

EGN-GEO-SPEC-0.2.8 NLES RF Station Mean Time Between Failures

The NLES RF station Mean Time Between Failure (MTBF) shall not be less than 5000 hours.

EGN-GEO-SPEC-0.2.9 NLES RF Uplink Frequency

The NLES RF uplink frequency shall be either C-band or Ku-band. The choice of the RF uplink frequency will depend on NLES RF interface (Interface 1, 2 or 3) selected by the operator (see description in section 5).

EGN-GEO-SPEC-0.2.10 NLES RF Uplink Frequency Tunability

The NLES RF Uplink transmitting equipment shall accommodate the full range of uplink Doppler shift for up to ±5° of orbital inclination, with an additional ±1 KHz allowance for frequency translation errors.

EGN-GEO-SPEC-0.2.11 NLES RF Uplink EIRP

The NLES RF Uplink EIRP shall ensure the link budget equation of the EGNOS link. The EIRP shall depend on the chosen RF uplink frequency. Specific requirements for the different RF uplink cases are presented in sections 5 and 6.

EGN-GEO-SPEC-0.2.12 NLES RF Uplink EIRP Stability

The EIRP of RF Uplink Signal shall be maintained to within ±0.7 dB of the specified values.

EGN-GEO-SPEC-0.2.13 NLES Receive L1-Band Requirements

The NLES L-Band receive capabilities include reception of the navigation message signal carrier formats described in the L1 SBAS specifications.

The L1 receive pass-band (0,5 dB points) shall be 1565.2 – 1585.6 MHz.

EGN-GEO-SPEC-0.2.14 NLES Receive L1-Band G/T

The L-band G/T in the direction of the satellite over the entire receive pass-band under clear sky and average wind conditions shall provide a C/N0 of at least 62 dBHz assuming the EGNOS Transponder payload is transmitting at the nominal output power (see req. EGN-GEO-SPEC-0.1.3).

EGN-GEO-SPEC-0.2.15 NLES Transmitted EIRP Density in Antenna Sidelobes (Ref. ITU-R Rec. 524-2)

The EIRP density in any direction within 3 degrees of the geostationary satellite orbital arc, at the indicated off-axis angle, shall not exceed:

Off-Axis Angle – Degrees	EIRP – dBW per 4 kHz
2.5° < • < 7°	32-25 $\log_{10}$ •°
7°< • < 9.2°	+11
9.2° < • < 48°	35-25 $\log_{10}$ •°
48° < • < 180°	-7

EGN-GEO-SPEC-0.2.16 NLES Transmit Phase Noise

The total phase noise induced on an unmodulated test carrier (C or Ku-band) transmitted by the NLES shall have a single sided power density spectrum in which each sideband, above and below the carrier, shall not exceed the following limits:

- 4 – 10 Hz from f_c: -25-30$\log_{10}f_m$ dBc/Hz
- 10- 100 Hz from f_c: -35-20$\log_{10}f_m$ dBc/Hz
- 100 – 1000 Hz from f_c: -55-10$\log_{10}f_m$ dBc/Hz
- > 1000 Hz from f_c : -85 dBc/Hz

Where f_c is the carrier frequency and f_m is the separation between f_c and the measurement frequency.

If any discrete phase noise components are present, at a level which exceeds the mask, the sum of the discrete phase noise components and continuous spectral component integrated over a bandwidth of ±10 Hz on either side of the discrete component shall not exceed the phase noise mask.

Phase noise very close to the carrier will be tracked and therefore compensated for by the NLES closed loop timing process, to ensure compliance with the total phase tracking error requirement of the SBAS signal specification.

EGN-GEO-SPEC-0.2.17 NLES Transmit Channel Characteristics

The NLES transmitting channel, between the signal modulator IF interface and the RF transmit antenna feed, shall meet the following requirements:

(a) AM/PM Conversion

The total AM/PM conversion shall not exceed 2.5° /dB at the operational output power of the NLES

(b) Phase Linearity

±0.1 rad over 4 MHz centred at the nominal operating frequency

(c) Gain Flatness

±1 dB over 4 MHz centred at the nominal operating frequency

4.2.3 NLES Operations Requirements

EGN-GEO-SPEC-0.2.18 GEO-1 NLES Service Latest Availability Date

The EGNOS GEO-1 Transponder Service NLES shall be available for operations at the latest by end of Q4 2011.

EGN-GEO-SPEC-0.2.19 GEO-2 NLES Service Latest Availability Date

The EGNOS GEO-1 Transponder Service NLES shall be available for operations at the latest by end of Q4 2012.

EGN-GEO-SPEC-0.2.20 GEO-1 NLES Service Preferred Availability Date

The EGNOS GEO-1 Transponder Service NLES shall be available for operations by end of Q2 2011.

EGN-GEO-SPEC-0.2.21 GEO-2 NLES Service Preferred Availability Date

The EGNOS GEO-1 Transponder Service NLES shall be available for operations by end of Q2 2012.

EGN-GEO-SPEC-0.2.22 NLES Antenna Steerability and Tracking

The antenna shall be capable of tracking a satellite in nominal geostationary orbit. The maximum expected deviation by the satellite from its nominal position will be ±0.1° in longitude and 3° (TBC) in inclination.

The antenna shall be capable of being pointed to any location on the geostationary arc visible to the NLES and be capable of tracking the satellite movements to an accuracy such that the EIRP stability requirement expressed in EGN-GEO-SPEC-0.2.12 is met.

5 OPTION 1 TRANSPONDER SERVICE SPECIFICATIONS

As described in section 3.2, the OPTION 1 Transponder Service shall be provided such that no or minimum adaptations are required to the EGNOS system Ground Segment (version 2.3). As a result, the GEO-1/GEO-2 Option 1 Transponder Service shall comply with one of the three existing interface types which will co-exist in EGNOS V2.3:

- Interface 1: Uplink C1 à Downlink L1
- Interface 2: Uplink C1 à Downlink L1/C2
- Interface 3: Uplink Ku1 à Downlink L1/Ku2

In the description of the following requirements (for the GEO Transponder and NLES RF Station), it is clearly specified if the requirement applies to Interface type 1, 2 or 3. If not specified, the requirement shall be considered as applicable to all interfaces.

5.1 Option 1 Transponder Specification

5.1.1 Functional Requirements

EGN-GEO-SPEC-1.1.1 Option 1 Satellite to Ground Interfaces Alternatives

In Option 1, the EGNOS GEO Transponder Service shall ensure that the satellite/ground interfaces are compatible with one of the current NLES interfaces of the EGNOS System:

1. Interface 1: Uplink: C-Band (C1) / Downlink: L-band (L1)
2. Interface 2: Uplink: C-Band (C1) / Downlink: L-band (L1) and C-band (C2)
3. Interface 3: Uplink: Ku-Band (Ku1) / Downlink: L-band (L1) and Ku-band (Ku2)

As a result, the EGNOS GEO Transponder solution proposed by the Contractor shall satisfy one of these interface requirements.

EGN-GEO-SPEC-1.1.2 Interface 1 Transponder Description

The Interface 1 shall ensure transparent channel transposition from C1 uplink signal to the L1 downlink signal and shall have the following characteristics as defined in Table 2.

Parameter	Value
Uplink Frequency C1	6534.52 MHz[2]
Uplink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Uplink Polarization	RHCP
Satellite Uplink Minimum G/T	- 10 dB/K
Downlink Frequency L1	1575.42 MHz
Downlink Polarization	RHCP
Downlink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Satellite Radiated Power	≥ 31 dBW

[2] The proposed value for the Interface 1 uplink frequency corresponds to the current Inmarsat 4 navigation transponder uplink frequency. The 6534.52 MHz frequency value is the baseline for the replenishment in Interface 1 type, but this may potentially be changed by the Contractor in case of unfeasibility to use this frequency.

Coverage	Global

Table 2 Option 1 – Interface 1 (C1 à L1) Channel Characteristics

EGN-GEO-SPEC-1.1.3 Interface 2 Transponder Description

The Interface 2 shall ensure transparent channel transposition from C1 uplink signal to L1 downlink signal and C2 transparent downlink signal and shall have the following characteristics as defined in Table 3.

Parameter	Value
Uplink Frequency C1	6455.42 MHz[3]
Uplink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Uplink Polarization	RHCP
Satellite Uplink G/T	- 10 dB/K
Downlink Frequency L1	1575.42 MHz
Downlink Polarization L1	RHCP
Downlink Frequency C2	3630.42 MHz
Downlink Polarization C2	RHCP
Downlink Frequency Bandwidth (0,5 dB)	4.0 MHz
Satellite Radiated Power EIRP L1-Band	≥ 31 dBW
Satellite Radiated Power (EIRP) C2 Band	≥ 0 dBW
Coverage	Global

Table 3 Option 1 – Interface 2 (C1 à L1/C2) Channel Characteristics

EGN-GEO-SPEC-1.1.4 Interface 3 Transponder Description

The Interface 2 shall ensure transparent channel transposition from Ku1 uplink signal to L1 downlink signal and Ku2 transparent downlink signal and shall have the following characteristics as defined in Table 4.

Parameter	Value
Uplink Frequency Ku1	13875 MHz[4]
Uplink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Uplink Polarization	RHCP
Satellite Uplink G/T	-2.3 dB/K
Downlink Frequency L1	1575.42 MHz
Downlink Polarization L1	RHCP
Downlink Frequency Ku2	12748 MHz
Downlink Polarization C2	RHCP
Downlink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz

[3] The proposed value for the Interface 2 uplink frequency corresponds to the current Inmarsat 3 navigation transponder uplink frequency. The 6455.42 MHz frequency value is the baseline for the replenishment in Interface 2 type, but this may potentially be changed by the Contractor in case of unfeasibility to use this frequency.

[4] The proposed value for the Interface 3 uplink frequency corresponds to the current Artemis navigation transponder uplink frequency. The 13875 MHz frequency value is the baseline for the replenishment in Interface 3 type, but this may potentially be changed by the Contractor in case of unfeasibility to use this frequency

Satellite Radiated Power EIRP L1-Band	≥ 31 dBW
Satellite Radiated Power (EIRP) Ku2 Band	≥ 17 dBW
Coverage	Global

Table 4 Option 1 – Interface 3 (Ku1 à L1/Ku2) Channel Characteristics

5.1.2 Operational Requirements

EGN-GEO-SPEC-1.1.5 GEO-1/GEO-2 L1 Downlink Operation

Notwithstanding the Interface type (1, 2 or 3) selected by the Contractor, it shall be always be possible to operate the EGNOS GEO Transponder in L1 downlink mode only.

5.2 Option 1 NLES RF Service Specifications

EGN-GEO-SPEC-1.2.1 Satellite to Ground Interfaces Alternatives

The EGNOS GEO Transponder Service shall ensure that the satellite/ground interfaces are compatible with one of the current NLES interfaces of the EGNOS System:

4. Interface 1: Uplink: C-Band (C1) / Downlink: L-band (L1)
5. Interface 2: Uplink: C-Band (C1) / Downlink: L-band (L1) and C-band (C2)
6. Interface 3: Uplink: Ku-Band (Ku1) / Downlink: L-band (L1) and Ku-band (Ku2)

As a result, the EGNOS NLES RF Station solution proposed by the Contractor shall satisfy these interface requirements.

Interfaces requirements between the NLES RF station and the NLES RF Adapter are described in [AD 3] and [AD 4].

EGN-GEO-SPEC-1.2.2 Interface 1 NLES RF Characteristics

The Interface 1 based NLES shall ensure transmission of C1 uplink signal and the reception of the L1 downlink signal and shall have the following characteristics as defined in Table 5.

Parameter	Value
Uplink Transmission Frequency C1	6534.52 MHz
Uplink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Uplink Polarization	RHCP
Uplink Nominal EIRP	78 dBW
Downlink Reception Frequency L1	1575.42 MHz
Downlink Polarization	RHCP
Downlink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Downlink Minimum G/T in L1-Band	Such that minimum C/N0 of 62 dBHz is guaranteed (see EGN-GEO-SPEC-0.1.7)
Coverage	Global

Table 5 Option 1 – Interface 1 (C1 à L1) NLES RF Characteristics

EGN-GEO-SPEC-1.2.3 Interface 1 NLES Transmitter Noise and Spurious Signals

In any 3 kHz band between 1 MHz and 18 GHz excluding the bands 6532.52 and 6536.52 MHz, the EIRP of the inherent transmitter noise and all spurious signals, excluding harmonics and intermodulation products shall be less than 0.5 dBW. Within the bands 6532.52 and 6536.52 MHz, this EIRP shall be less than 10.5 dBW.

EGN-GEO-SPEC-1.2.4 Interface 1 NLES Transmitter Harmonic Signals

The total EIRP of any harmonic signal below 40 GHz generated by the navigation carriers shall not exceed 20 dBW.

EGN-GEO-SPEC-1.2.5 Interface 2 NLES RF Characteristics

The Interface 2 based NLES shall ensure transmission of C1 uplink signal and the reception of the L1 and C2 downlink signals and shall have the following characteristics as defined in Table 6.

Parameter	Value
Uplink Transmission Frequency C1	6455.42 MHz
Uplink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Uplink Polarization	RHCP
Uplink Nominal EIRP	78 dBW
Downlink Reception Frequency L1	1575.42 MHz
Downlink Polarization	RHCP
Downlink Frequency C2	3630.42 MHz
Downlink Polarization C2	RHCP
Downlink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Downlink Minimum G/T in L1-Band	Such that minimum C/N0 of 62 dBHz is guaranteed (see EGN-GEO-SPEC-0.1.7)
Downlink Minimum G/T in C2-Band	30 dB/K (clear sky and average wind conditions)
Coverage	Global

Table 6 Option 1 – Interface 2 (C1 à L1/C2) NLES RF Characteristics

EGN-GEO-SPEC-1.2.6 Interface 2 NLES Transmitter Noise and Spurious Signals

In any 3 kHz band between 1 MHz and 18 GHz excluding the bands 6417.5 and 6456.6 MHz, the EIRP of the inherent transmitter noise and all spurious signals, excluding harmonics and intermodulation products shall be less than 0.5 dBW. Within the bands 6417.5 and 6456.6 MHz, this EIRP shall be less than 10.5 dBW.

EGN-GEO-SPEC-1.2.7 Interface 2 NLES Transmitter Harmonic Signals

The total EIRP of any harmonic signal below 40 GHz generated by the navigation carriers shall not exceed 20 dBW.

EGN-GEO-SPEC-1.2.8 Interface 2 NLES C-Band Received Phase Noise

The design of the NLES C-Band receiving system shall be such as to ensure full compliance with the performances requirements when operating with C-band downlink signal having phase noise characteristics determined by the combination of NLES transmit phase noise requirements (EGN-GEO-SPEC-0.2.16) and the satellite navigation payload (see requirement EGN-GEO-SPEC-0.1.12).

EGN-GEO-SPEC-1.2.9 Interface 3 NLES RF Characteristics

The Interface 3 based NLES shall ensure transmission of Ku1 uplink signal and the reception of the L1 and Ku2 downlink signals and shall have the following characteristics as defined in Table 7.

Parameter	Value
Uplink Transmission Frequency Ku1	13875 MHz
Uplink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Uplink Polarization	RHCP
Uplink Nominal EIRP	85 dBW
Downlink Reception Frequency L1	1575.42 MHz
Downlink Polarization	RHCP
Downlink Frequency Ku2	12748 MHz
Downlink Polarization Ku2	RHCP
Downlink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz
Downlink Minimum G/T in L1-Band	Such that minimum C/N0 of 62 dBHz is guaranteed (see EGN-GEO-SPEC-0.1.7)
Downlink Minimum G/T in Ku2-Band	34 dB/K (clear sky and average wind conditions)
Coverage	Global

Table 7 Option 1 – Interface 3 (Ku1 à L1/Ku2) NLES RF Characteristics

EGN-GEO-SPEC-1.2.10 Interface 3 NLES Ku-Band Received Phase Noise

The design of the NLES Ku-Band receiving system shall be such as to ensure full compliance with the performances requirements when operating with C-band downlink signal having phase noise characteristics determined by the combination of NLES transmit phase noise requirements (EGN-GEO-SPEC-0.2.16) and the satellite navigation payload (see requirement EGN-GEO-SPEC-0.1.12).

EGN-GEO-SPEC-1.2.11 Interface 3 NLES Transmitter Noise and Spurious Signals

The in-band spurious shall be lower than -50 dBc.

The maximum out-of-band EIRP density transmitted by the NLES (interface type 3) shall be lower than:

(a) -19 dBW/MHz for any band between 15.5 and 21.5 MHz from the nominal carrier frequency

(b) -36 dBW/MHz for any band more than 21.5 MHz from the nominal carrier frequency.

5.3 Option 1 Interface Type Selection for EGNOS GEO Transponder Service

As explained in the section above, the Contractor shall select one of the operational interfaces proposed (Interface 1, 2 or 3) in order to ensure that integration with the current EGNOS ground segment can be performed without major upgrades required.

For some of the parameters (e.g. exact uplink frequency, G/T…), some flexibility is possible should this lead to more cost effective solution proposed by the Contractor.

6 OPTION 2 TRANSPONDER SERVICE SPECIFICATIONS

As described in section 2.2, two different technical Options are being considered for the Transponder Service Specifications:

- Option 1: Based on L1 service only.
- Option 2: Advanced Transponder Service providing a combined L1/E5 service.

Option-2 is defined in order to support the potential future evolutions of the EGNOS mission, taking into account the satellite lifetime of 10-15 years.

The current EGNOS MRD [RD 6] only considers EGNOS operations in the L1 band. Specifications for SBAS in L5 are currently under consideration to address augmentation of GPS L5 in the future (post 2015 period). However no implementation decision has been taken in this direction by any SBAS provider. Galileo is offering an E5b signal for safety of life applications.

This has triggered the need to consider the procurement of EGNOS GEO broadcast capability in additional bands (on top of L1 only) such as L5 or E5.

To this end the concept of flexible L1/E5 payload is introduced and proposed for quotation by the Contractor. Technical specifications for this OPTION 2 flexible payload are presented below.

The decision on the Option (1 or 2) will be taken during the proposal evaluation phase, before the contract signature and it is therefore requested to the Contractor to provide in its proposal two quotations per EGNOS GEO Transponder Service, one for each option.

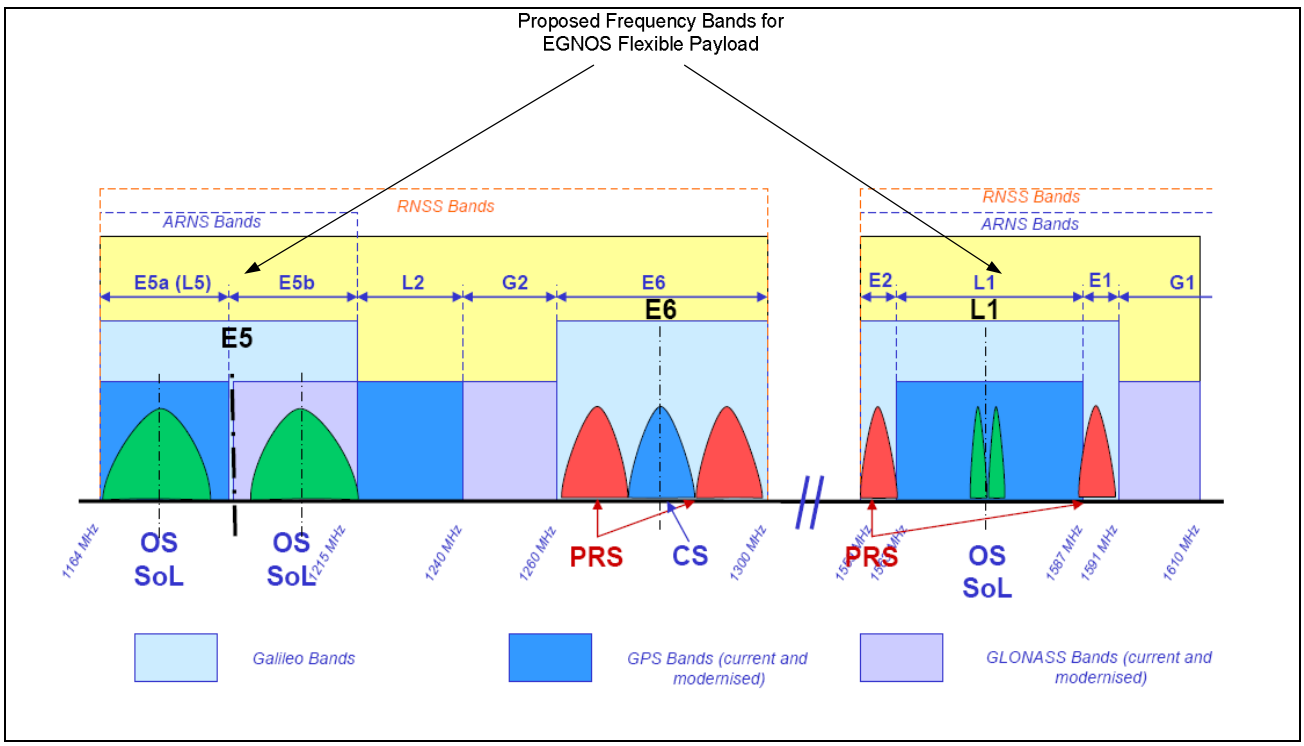

Figure 6 EGNOS Option 2 Frequencies within RNSS Frequency Band Allocations

6.1 Option 2 Transponder Specifications

EGN-GEO-SPEC-2.1.1 Option 2 Satellite to Ground Interface

The EGNOS GEO Transponder Service shall provide the following interface between the space and ground segment:

- Uplink: C Band (C1/C5 Frequency) or Ku Band (Ku1/Ku5 Frequency)
- Downlink: L Band (L1/E5 Frequency)

The selection for the use of C-Band or Ku-Band for the uplink is left to the Contractor.

EGN-GEO-SPEC-2.1.2 Option 2 Transponder Performances Description

The Option 2 Transponder shall ensure transparent channel transposition from C1 or Ku1 uplink signal to the L1 downlink signal and from C5 or Ku5 uplink signal to E5 downlink signal and should have the following characteristics as defined in Table 8.

For the E5 signal performances, the Contractor shall also take into account as reference the technical specifications provided in the Galileo Open Service Signal In Space ICD [RD 3].

Parameter	Value
Uplink Frequency C1	6534.52 MHz[5]
Uplink Frequency Ku1	13875 MHz[6]
Uplink Frequency C5	6501.795 MHz[7] (TBC)
Uplink Frequency Ku5	13845 MHz[8]
Uplink Frequency C1 or Ku1 Bandwidth (0,5 dB)	≥ 4.0 MHz Target: 20 MHz
Uplink Frequency C5 or Ku5 Bandwidth (0,5 dB)	≥ 51 MHz
Uplink C1 Polarization	RHCP
Uplink C5 Polarization	RHCP
Satellite Uplink Minimum G/T (C-Band)	- 10 dB/K
Satellite Uplink Minimum G/T (Ku-Band)	- 2.3 dB/K
Downlink Frequency L1	1575.42 MHz
Downlink Frequency E5	1191.795 MHz
Downlink Polarization L1	RHCP
Downlink Polarization E5	RHCP
Downlink Frequency L1 Bandwidth (0,5 dB)	≥ 4.0 MHz Target: 20 MHz
Downlink Bandwidth E5 (0,5 dB)	≥ 51 MHz
Nominal EIRP in L1-Band	≥ 31 dBW
Nominal EIRP in E5-Band	≥ 33 dBW TBC[9]

[5] The proposed value for the C1 uplink frequency corresponds to the current Inmarsat 4 navigation transponder uplink frequency.
[6] The proposed value for the Ku1 uplink frequency corresponds to the current Artemis navigation transponder uplink frequency.
[7] The proposed value for C5 uplink frequency shall be confirmed by the Contractor. Another value can be proposed.
[8] The proposed value for Ku5 uplink frequency shall be confirmed by the Contractor. Another value can be proposed.

Coverage	Global

Table 8 Option 2 – Interface (C1/C5 or Ku1/Ku5 à L1/E5) Channel Characteristics

EGN-GEO-SPEC-2.1.3 Option 2 Transponder Operation Modes

It shall be possible to operate the EGNOS Option 2 Transponder in the following modes:

1. C1(Ku1) à L1 Mode only: In this mode the C5(Ku5) /E5 channel is switch-off. This mode supports the current EGNOS System version (v2.3). Due to power saving on C5(Ku5) /E5 channel being switched-off, it shall be possible to increase the L1 downlink EIRP by 3 dB (TBC). This mode will be the baseline operational mode in the initial operations of the EGNOS GEO Transponder Service if Option 2 is retained.
2. C1(Ku1) à L1 and C5(Ku5) à L5 Mode: In this mode both channels (C1(Ku1) /L1 and C5(Ku5)/L5) are active. However no transmission is by the NLES uplink station in the spectrum corresponding to the E5b part of the band; such that the satellite only retransmit in the E5a spectrum (E5a=L5)
3. C1(Ku1) à L1 and C5(Ku5) à E5b Mode: In this mode both channels (C1(Ku1)/L1 and C5(ku5)/L5) are active. However no transmission is by the NLES uplink station in the spectrum corresponding to the E5a part of the band; such that the satellite only retransmit in the E5b spectrum
4. C1(Ku1) à L1 and C5(Ku5) à E5 Mode: In this mode both channels are active and fully occupied.

6.2 Option 2 NLES Specifications

The Option2 NLES specification is defined for the use of the EGNOS GEO Transponder in C1(Ku1) à L1 Mode only. This C1(Ku1) à L1 mode shall be considered as baseline for the Contractor quotation on the NLES implementation (in Option 2). Should the potential evolutions of the EGNOS Mission be decided, the NLES RF station would require further adaptations in order to support the operations of the EGNOS GEO Transponder Option 2 in the other modes.

EGN-GEO-SPEC-2.1.4 Option2 NLES Primary RF Characteristic

The GEO-2 Option 2 based NLES shall primarily ensure transmission of C1(Ku1) uplink signal and the reception of the L1 downlink signal (C1(Ku1) à L1 Mode) and should have the following characteristics as defined in Table 9.

Parameter	Value
Uplink Transmission Frequency C1	6534.52 MHz
Uplink Transmission Frequency Ku1	13875 MHz
Uplink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz Target: 20 MHz
Uplink Polarization	RHCP
Uplink Nominal EIRP C1	78 dBW
Uplink Nominal EIRP Ku1	85 dBW

[9] This EIRP value has been set-up in order to meet the received power requirements in E5 on I and Q channels. The EIRP shall be confirmed after link budget analysis.

Downlink Reception Frequency L1	1575.42 MHz
Downlink Polarization	RHCP
Downlink Frequency Bandwidth (0,5 dB)	≥ 4.0 MHz Target: 20 MHz
Downlink Minimum G/T in L1-Band	Such that minimum C/N0 of 62 dBHz is guaranteed (see EGN-GEO-SPEC-0.1.7)
Coverage	Global

Table 9 Option 2 NLES Primary RF Characteristics

EGN-GEO-SPEC-2.1.5 Option2 NLES RF Station Upgrade

It shall be possible to upgrade the RF station in order to support the other mode of operations of the EGNOS GEO Transponder.

7 SERVICE UNDERPERFORMANCE INDICATORS

The following table contains the EGNOS GEO Transponder Service Specifications that shall trigger the Underperformance Regime for the operational phase as defined in the Statement of Work [RD 1].

The EGNOS GEO Transponder Service availability EGN-GEO-SPEC-0.1.4 will be the main requirements against which the Underperformance Regime will be assessed.

The EGNOS GEO Transponder Service is defined as available when the following minimum requirements are met

EGN-GEO-SPEC-0.1.1	Transmit Coverage
EGN-GEO-SPEC-0.1.3	L1 Downlink Signal Performances
EGN-GEO-SPEC-0.1.6	EGNOS GEO Transponder EIRP Stability
EGN-GEO-SPEC-0.1.12	Phase Noise Spectral Density
EGN-GEO-SPEC-0.2.7	NLES RF Station Availability
EGN-GEO-SPEC-2.1.2	Option 2 Transponder Performances Description

The unavailability events are counted after a continuous unavailability of 5 minutes.

EGNOS GEO SATELLITE TRANSPONDER SERVICE CONTRACT

CONTRACT NUMBER […]

by and between

The European Community (hereinafter referred to as "the Community"), represented by the Commission of the European Communities (hereinafter referred to as "the Commission"), which is represented for the purposes of the signature of this contract by [name in full, function, department],

of the one part,

and

……., with its registered office at ……., ……, represented by ……, in his capacity of ……, (hereinafter referred to as "the Contractor")

of the other part,

hereinafter jointly referred to as "the Parties" and individually as "the Party"

TABLE OF CONTENTS

WHEREAS

a) pursuant to article [….][1] of the GNSS Regulation, the Commission, assisted by the European GNSS Programmes Committee, shall be responsible for the management of the EGNOS and Galileo programmes;

b) as part of its management tasks, the Commission must ensure the continuity of the EGNOS signal in space and data provisioning during the EGNOS operational phase, scheduled to begin in March 2009;

c) to fulfil such task, the Commission must procure the EGNOS GEO Transponder Service, which shall be provided as from [2011][2] for GEO-1 and [2012][3] for GEO-2;

d) the Commission has launched an open tender pursuant to article 122 of the Implementing Rules of the Financial Regulation to select the provider to be entrusted with the provision of the EGNOS GEO Transponder Service;

e) pursuant to the evaluation of the bids received by the Commission, […..][4] has been found the preferred bidder for the award of the present Contract.

now therefore the Parties agree as follows:

1. Definitions

ADR Rules	Shall mean the Alternative Dispute Resolution Rules of the International Chamber of Commerce
Applicable Documents	Shall mean the document listed under Schedule 1
Arbitration Rules	Shall mean the Rules of Arbitration of the International Chamber of Commerce
Contract	Shall mean the present Contract and its Schedules, which constitute an integral and substantial part thereof
ECAC	Shall mean the European Civil Aviation Conference
Effective Date	Shall mean the date on which the Contract is signed by the last Party
EGNOS GEO Transponder Service	Shall mean the: - procurement and operation service of the EGNOS GEO transponder payload; and - hosting and operation service of the 2

[1] To be inserted at Contract signature
[2] To be amended according to the Contractor's tender.
[3] To be amended according to the Contractor's tender.
[4] To be inserted after the award decision.

	NLES associated to the GEO transponder (including adaptation of RF sections to uplink the signals to the satellite) as specified in the Applicable Documents
EGNOS GEO Transponder Service Qualification Review	Shall have the meaning specified under Schedule 1 No. 7
EGNOS Orbital Arc	Shall mean the orbital arc suitable for providing the EGNOS GEO Transponder Service over the complete FIR ECAC coverage with a minimum elevation angle of 5 degrees
EGNOS Service Provider (ESP)	Shall mean the ESSP selected to operate the EGNOS system and provide the EGNOS SIS service
ESSP	Shall mean European Satellite Service Provider
Expiry Date	Shall mean 31 January 2014
Financial Regulation	Shall mean Council Regulation (EC, Euratom) No 1605/2002 on the Financial Regulation applicable to the general budget of the European Communities
FIR	Shall mean Flight Information Region
GEO-1	Shall mean the transponder with an operational start date in 2011[5]
GEO-2	Shall mean the transponder with an operational start date in 2012[6]
GNSS Regulation	Shall mean the Regulation of the Council and European Parliament on the further implementation of the European satellite radionavigation programmes (EGNOS and Galileo)
GPS JPO	Shall mean Global Positioning System Joint Program Office
GPSW	Shall mean Global Positioning System Wing
ICAO	Shall mean the International Civil Aviation Organization
Implementing Rules of the Financial Regulation	Shall mean Commission Regulation (EC, Euratom) No 2342/2002 laying down detailed rules for the implementation of Council Regulation (EC, Euratom) No 1605/2002 on the Financial Regulation applicable to the general budget of the European Communities, as amended
ITU	Shall mean the International Telecommunication Union

[5] To be amended according to the Contractor's tender.
[6] To be amended according to the Contractor's tender.

MUICP	Shall mean Monetary Union Index of Consumer Prices
NLES	Shall mean Navigation Land Earth Station
NLES Equipment	Shall mean the NLES baseband subsystems, a description of which is provided in the Applicable Documents
Operation Start Date	Shall mean the date on which the EGNOS GEO Transponder Service is qualified, through the successful completion of the EGNOS GEO Transponder Service Qualification Review, to start its operations within the EGNOS system
PRN	Shall mean Pseudo Random Noise
RF	Shall mean Radio Frequency
Satellite Emergency Situation	Shall mean situations endangering the primary mission of the satellite
Service	Shall mean the EGNOS GEO Transponder Service
Service Provision Price	Shall mean the amount indicated under article 9 of the Contract
Service Interruptions	Shall mean the unavailability of the Service for either: • 30 consecutive days in a 12-month period starting from the Operation Start Date; • 60 days accumulated in a 12-month period starting from the Operation Start Date.
SIS	Shall mean Signal In Space

2. Subject

2.1 The subject of this Contract is the provision by the Contractor to the Commission of the EGNOS GEO Transponder Service to guarantee the continuity of the EGNOS signal in space throughout the duration of the Contract. The EGNOS GEO Transponder Service shall be composed of two phases:

i) a Service preparation phase, starting on the Effective Date and ending on the Operation Start Date;

ii) a Service provision phase, starting on the Operation Start Date and ending on the Expiry Date.

3. Applicable Documents

3.1 The Contractor shall perform its obligations under the Contract and observe all of the provisions of the Applicable Documents listed under Schedule 1 of this Contract. The

Contractor shall not vary or depart from any of the said obligations or provisions, unless it has been agreed according to article 40 of the Contract.

3.2 All deliverables listed under Schedule 1 No. 7 requiring the Commission's approval shall become Applicable Documents upon the Commission's written approval.

3.3 In case of inconsistencies between the Applicable Documents, the order of precedence is the order in which they are listed. The Contractor shall bring any inconsistencies to the Commission's attention.

SECTION 1

SERVICE PREPARATION PHASE

4. Commission furnished items

4.1 For the purposes of the Service preparation phase, the Commission shall make available to the Contractor the NLES Equipment within [6] months from the Effective Date.

4.2 The Contractor shall ensure the Commission's access to the site for the delivery of the NLES Equipment. The same right of access shall be enjoyed by external staff involved in the NLES deployment activities appointed by the Commission. Suitable office accommodation with fax/telephone/internet access shall be provided by the Contractor to the Commission.

4.3 Any Commission delay or failure in providing the Contractor with the NLES Equipment shall not relieve the latter of his obligations under the Contract, unless the Contractor submits to the Commission a specific application for relief detailing and justifying the obligations from which relief is sought.

4.4 Pursuant to the application under article 4.3 of the Contract and subject to the assessment of the justification thereof, the Commission may either:

i) relieve the Contractor of the specified obligations; and/or
ii) issue a Commission variation notice pursuant to article 29 of the Contract.

5. Rights and obligations of the Parties relating to the service preparation phase

5.1 The service preparation phase shall be completed with the successful completion of the EGNOS GEO Transponder Service Qualification Review. The date of the successful completion of the EGNOS GEO Transponder Service Qualification Review is the Operation Start Date. The Operation Start Date related to the GEO-1 shall occur

not later than ____ (see Contractor's Tender). The Operation Start Date related to the GEO-2 shall occur not later than ____(see Contractor 's Tender).

5.2 The Contractor shall organize the reviews specified under Schedule 1 No. 7 and shall invite the Commission's representatives/experts with due advance notice to participate in such reviews.

5.3 The documents to be delivered by the Contractor to the Commission at the reviews are specified under Schedule 1 No. 7.

5.4 The requirements against which the progress and successful completion of the technical milestones of the Service preparation phase will be assessed are detailed in the deliverables specified under Schedule 1 No. 7.

5.5 The successful completion of any of the completion milestones under Schedule 1 No. 7 (list of meetings, reviews and deliverables) shall only be declared by the Commission in light of the requirement under article 5.4 of the Contract.

5.6 The Contractor shall notify the Commission of any event which will or is likely to cause a delay in the achievement of the Operation Start Date and put in place all the required measures to prevent or reduce such delay.

6. Service preparation price

6.1 The total price for the Service preparation phase shall be … and shall be paid upon successful completion of the EGNOS GEO Transponder Service Qualification Review and presentation of the relevant invoice.

6.2 Subject to article 29 of the Contract, the price referred to in article 6.1 of the Contract shall be firm and fixed and not subject to revision for the entire duration of the Contract.

7. Operation Start Day delay

7.1 Subject to article 26 of the Contract, should the Operation Start Date be delayed due to:

i) delivery delays not exceeding 12 months, the Service Provision Price shall be adjusted as of the first instalment to be paid according to article 19 of the Contract. The following formula shall be applied:

a. Service Provision Price adjustment = (Yearly Fee/12) x Delay [Months], limited to a maximum 12-month delay.

ii) delivery delays exceeding 12 months, the Commission shall apply the formula under article 7.1.i.a and reserves the right to :

a. terminate the Contract for Contractor default; or

b. issue a Commission variation notice pursuant to article 29 of the Contract.

iii) launch failures, the Commission shall apply the formula under article 7.1.i.a and reserves the right to:

a. terminate the Contract for Contractor default; or

b. issue a Commission variation notice pursuant to article 29 of the Contract, consisting of the launch of the activities according to terms and conditions under Schedule …..(Contractor's Tender);

The Commission shall notify the Contractor of the decision taken pursuant to the present article 7 within [30] days starting from the Contractor's notification under article 5.6 of the Contract.

SECTION 2

SERVICE PROVISION PHASE

8. Rights and obligations of the Parties relating to the Service provision phase

8.1 The Contractor shall ensure the provision of the EGNOS GEO Transponder Service in accordance with the requirements defined in the Applicable Documents.

8.2 The Contractor shall report in due time to the Commission any under-performance in the EGNOS GEO Transponder Service. The Contractor shall ensure that the most appropriate actions are taken in order to reduce the duration and mitigate the impacts of the Service under-performance.

8.3 If forced to switch-off the EGNOS GEO Transponder Service (payload switch-off or RF link switch-off) because of a Satellite Emergency Situation, the Contractor shall, whenever possible, promptly inform the Commission before switching off the Service. article 9.3 of the Contract shall apply when the Service is switched off because of a Satellite Emergency Situation.

8.4 Subject to article 11 of the Contract, the Contractor shall report to the Commission any planned manoeuvre that may affect the Service.

8.5 Upon the Commission's request, the Contractor shall ensure operational mode switching of the EGNOS GEO Transponder Service in accordance with the operational mode specification defined in the Applicable Documents.[7]

8.6 The Contractor shall set-up an external data server accessible by the Commission in real time. This server shall store the following main parameters related to the satellite and the payload:

- orbital parameters of the satellite;
- planned manoeuvre and orbital parameters after the manoeuvre; and
- navigation payload telemetry.

9. Service Provision Price and adjustments for Service under-performance

9.1 The total amount to be paid by the Commission for the Service provision phase is equal to EURO …… [8](Firm and Fixed Price).

9.2 The Commission shall start paying the Service Provision Price only upon successful achievement of the Operation Start Date.

9.3 Subject to article 26 of the Contract, if the Contractor, at any time during the Service provision phase, delivers the Service that does not comply with the performance requirements under Schedule 1 No.1 the Service Provision Price will be adjusted pursuant to the following formula:

Service Provision Price Adjustment = Yearly Fee x (Accumulated Unavailability [%] – 0,1 %)

The Service is considered unavailable after a continuous unavailability of the Service for 5 minutes.

Where the Contractor disputes the amount and/or the application of the Service Provision Price adjustment, it shall send the Commission a note explaining the reasons for and evidence of his claims. The Parties shall use reasonable endeavours to settle the dispute within [30] days of the Contractor sending the note. If the Parties fail to agree on the amount payable within that [30]-day period, the dispute shall be solved according to article 43 of the Contract.

10. Service Interruptions

10.1 Subject to article 26 of the Contract, if Service Interruptions occur within the first year after the Operation Start Date, the Commission shall have the right to:

[7] Applicable only if option 2 is selected.
[8] To be completed according to the Contractor's proposal

i) terminate the Contract for Contractor default; or

ii) order a Commission variation notice pursuant to article 29.1 of the Contract, in which case the Commission variation notice shall reflect the terms and conditions proposed by the Contractor in its tender under Schedule …, section ….., page ….. (Contractor's Tender).

10.2 Subject to article 26 of the Contract, if Service Interruptions occur after the first year of the Operation Start Date, the Commission shall have the right to:

i) terminate the Contract for Contractor default; or

ii) issue a Commission variation notice according to article 29.1 of the Contract.

10.3 The Contractor shall not be entitled to receive the Service Provision Price during Service Interruptions periods.

11. Satellite relocation

11.1 In case of satellite relocation outside the EGNOS Orbital Arc, the Contractor undertakes to issue a Contractor variation notice, the content of which shall be as specified in the relevant section of the Contractor's tender under Schedule …., section ….., page …..(Contractor's Tender).

11.2 The Commission shall have the right to:

i) accept the Contractor variation notice under article 11.1 of the Contract and amend the Contract accordingly pursuant to article 40 of the Contract; or

ii) voluntarily terminate the Contract, in which case article 32 of the Contract shall apply.

12. Regulatory issues

12.1 The Contractor shall be responsible for the regulatory aspects concerning the filing with the ITU for the use of all downlink and uplink frequencies associated with the EGNOS Geo Transponder Service. In this respect proper coordination with other satellite operators for uplink frequencies shall be performed in due time.

12.2 The Contractor shall submit an application to the GPSW of the Navstar GPS JPO for the assignment of the required C/A (L1) code and notify the Commission of the result. The Contractor shall also coordinate with ICAO during the PRN registration process.

13. Contract and risk management

13.1 The Contractor shall deliver to the Commission the documents specified under Schedule 1 No. 7 in Microsoft Word and Adobe PDF formats. If a delivered document require its approval, the Commission shall notify the Contractor of its approval or comments within [30] days from receipt of the document. If the Commission provides comments to a document, the Contractor has to amend such document accordingly within [30] days from receipt of the comments and re-submit it to the Commission.

13.2 Unless otherwise agreed by the Parties, the Contractor shall organise and attend all project meetings as well as prepare and distribute minutes of all meetings.

SECTION 3

GENERAL PROVISIONS

14. Performance of the Contract

14.1 The Contractor shall perform the Contract to the highest professional standards. The Contractor shall have sole responsibility for complying with any legal obligations incumbent on him, notably those resulting from employment, tax and social legislation.

14.2 The Contractor shall have sole responsibility for taking the necessary steps to obtain any permit or licence required for performance of the Contract under the laws and regulations in force at the place where the tasks assigned to him are to be executed.

14.3 Without prejudice to article 17 of the Contract, any reference made to the Contractor's staff in the Contract shall relate exclusively to individuals involved in the performance of the Contract.

14.4 The Contractor must ensure that any staff performing the Contract have the professional qualifications and experience required for the execution of the tasks assigned to him.

14.5 The Contractor shall have sole responsibility for the staff who execute the tasks assigned to him.

14.6 The Commission may not under any circumstances be considered to be the staff's employer, and the said staff shall undertake not to invoke in respect of the Commission any right arising from the contractual relationship between the Commission and the Contractor.

14.7 Should any unforeseen event, action or omission directly or indirectly hamper execution of the tasks, either partially or totally, the Contractor shall immediately and on his own initiative record it and report it to the Commission. The report shall include a description of the problem and an indication of the date on which it started and of the remedial action taken by the Contractor to ensure full compliance with his obligations under the Contract. In such event the Contractor shall give priority to solving the problem rather than determining liability.

14.8 Should the Contractor fail to perform his obligations under the Contract in accordance with the provisions laid down therein, the Commission may - without prejudice to its right to terminate the Contract - reduce or recover payments in proportion to the scale of the failure.

15. Liability

15.1 The Commission shall not be liable for damage sustained by the Contractor in performance of the Contract except in the event of wilful misconduct or gross negligence on the part of the Commission.

15.2 The Contractor shall be liable for any loss or damage caused by himself in performance of the Contract, including in the event of subcontracting. The Commission shall not be liable for any act or default on the part of the Contractor in performance of the Contract.

15.3 The Contractor shall provide compensation in the event of any action, claim or proceeding brought against the Commission by a third party as a result of damage caused by the Contractor in performance of the Contract.

15.4 In the event of any action brought by a third party against the Commission in connection with performance of the Contract, the Contractor shall assist the Commission. Expenditure incurred by the Contractor to this end may be borne by the Commission.

16. Insurances

16.1 The Contractor shall take out insurance against risks and damage relating to performance of the Contract as detailed under Schedule …, section ….., page ….. . A copy of all the relevant insurance contracts shall be sent to the Commission should it so request.

17. Conflict of interests

17.1 The Contractor shall abstain from any contact likely to compromise his independence or that of his staff.

17.2 The Contractor shall take every necessary measure in order to avoid all risk of conflict of interests. He shall ensure that his staff, boards, directors or any persons working under his authority are not placed in a situation which could give rise to conflict of interests.

17.3 The Contractor shall bring to the Commission's attention, without delay and in writing, all situations of conflict of interests or situations that might lead to such conflict in respect of the Contractor himself, his staff, bodies, administrators or any other person working under his authority or collaborating with him.

17.4 The Commission may check at any time whether the measures taken by the Contractor to ensure that no conflict of interests arises are being properly and effectively applied. The Commission may, if necessary, require the Contractor to take other measures to this end.

17.5 The Contractor shall immediately replace, upon a duly justified request from the Commission, any member of his staff.

18. Contract Price

18.1 The total amount to be paid by the Commission for the entire scope of the Contract, including the Service preparation phase and Service provision phase shall be EURO ……[9]

18.2 Subject to article 29 of the Contract, the total amount referred to in article 18.1of the Contract shall be firm and fixed and not subject to revision up to the first year after the Operation Start Date

18.3 From the beginning of the second year after the Operation Start Date, the amount may be revised upwards or downwards each year, where such revision is requested by one of the Parties by registered letter received by the other no later than three months before the anniversary of the Operation Start Date. This revision shall be determined by the trend in the [harmonised] consumer price index MUICP published for the first time by the Office for Official Publications of the European Communities in the Eurostat monthly bulletin at http://www.ec.europa.eu/eurostat/.

Revision shall be calculated in accordance with the following formula:

$$Ar = Ao \frac{Ir}{Io}$$

where

Ar = revised total amount;
Ao = total amount in the original tender;
Io = index for the month corresponding to the final date for submission of tenders;

[9] To be inserted in accordance with the Contractor' tender.

Ir = index for the month in which the revised prices take effect.

19. Payments

19.1 With the exception to the price for the Service preparation phase under article 6 of the Contract, the Contract price under article 18 of the Contract shall be divided into 6-monthly instalments. Each instalment shall be paid at the end of every 6-month period upon presentation of the relevant invoice.

19.2 In case the Commission decides to adjust the Service Provision Price pursuant to article 9.3 of the Contract, the price adjustment to be applied pursuant to such article will be deducted by the Commission from the first six-monthly Service Provision Price instalment falling due after the under-performance has been assessed.

19.3 Payments under the Contract will be due only if the Contractor has fulfilled all his contractual obligations as set forth in this Contract by the date on which the invoice is submitted.

20. General provision concerning payments

20.1 Payments shall be deemed to have been made on the date on which the Commission's account is debited.

20.2 The payment periods referred to in article 19 of the Contract may be suspended by the Commission at any time if it informs the Contractor that his payment request is not admissible, either because the amount is not due or because the necessary supporting documents have not been properly produced. In case of doubt on the eligibility of the expenditure indicated in the payment request, the Commission may suspend the time limit for payment for the purpose of further verification, including an on-the-spot check, in order to ascertain, prior to payment, that the expenditure is eligible.

20.3 The Commission shall notify the Contractor accordingly and set out the reasons for the suspension by registered letter with acknowledgment of receipt or equivalent. Suspension shall take effect from the date of dispatch of the letter. The remainder of the period referred to in article 19 of the Contract shall begin to run again once the suspension has been lifted.

20.4 In the event of late payment the Contractor shall be entitled to interest, provided the calculated interest exceeds EURO 200. In case interest does not exceed EURO 200, the Contractor may claim interest within two months of receiving the payment. Interest shall be calculated at the rate applied by the European Central Bank to its most recent main refinancing operations (“the reference rate”) plus seven percentage points (“the margin”). The reference rate in force on the first day of the month in which the payment is due shall apply. Such interest rate is published in the C series of the Official Journal of the European Union. Interest shall be payable for the period elapsing from the calendar day following expiry of the time limit for payment up to

the day of payment. Suspension of payment by the Commission may not be deemed to constitute late payment.

21. Recovery

21.1 If total payments made exceed the amount actually due under the Contract or if recovery is justified in accordance with the terms of the Contract, the Contractor shall reimburse the appropriate amount in EURO on receipt of the debit note, in the manner and within the time limits set by the Commission.

21.2 In the event of failure to pay by the deadline specified in the request for reimbursement, the sum due shall bear interest at the rate indicated in article 20.4 of the Contract. Interest shall be payable from the calendar day following the due date up to the calendar day on which the debt is repaid in full.

21.3 The Commission may, after informing the Contractor, recover amounts established as certain, of a fixed amount and due by offsetting, in cases where the Contractor also has a claim on the Communities that is certain, of a fixed amount and due. The Commission may also claim against the guarantee, where provided for.

22. Confidentiality

22.1 The Contractor undertakes to treat in the strictest confidence and not make use of or divulge to third parties any information or documents which are linked to performance of the Contract. The Contractor shall continue to be bound by this undertaking after completion of the tasks.

22.2 The Contractor shall obtain from each member of his staff, board and directors an undertaking that they will respect the confidentiality of any information which is linked, directly or indirectly, to the performance of the Contract and that they will not divulge to third parties or use for their own benefit or that of any third party any document or information not available publicly, even after completion of the tasks.

23. Use, distribution and publication of information

23.1 The Contractor shall authorise the Commission to process, use, distribute and publish, for whatever purpose, by whatever means and on whatever medium, any data contained in or relating to the Contract, in particular the identity of the Contractor, the subject matter, the duration, the amount paid and the reports. Where personal data is concerned, article 24 of the Contract shall apply.

23.2 Any distribution or publication of information relating to the Contract by the Contractor shall require prior written authorisation from the Commission.

23.3 The use of information obtained by the Contractor in the course of the Contract for purposes other than its performance shall be forbidden, unless the Commission has specifically given prior written authorisation to the contrary.

24. Data protection

Any personal data included in the Contract shall be processed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. It shall be processed solely for the purposes of the performance, management and follow-up of the Contract by [entity acting as data controller] without prejudice to possible transmission to internal audit services, to the European Court of Auditors, to the Financial Irregularities Panel and/or to the European Anti-Fraud Office (OLAF) for the purposes of safeguarding the financial interests of the Community. The Contractor shall have the right of access to his personal data and the right to rectify any such data that is inaccurate or incomplete. Should the Contractor have any queries concerning the processing of his personal data, he shall address them to [entity acting as data controller]. The Contractor shall have right of recourse at any time to the European Data Protection Supervisor.

25. Taxation

25.1 The Contractor shall have sole responsibility for compliance with the tax laws which apply to him. Failure to comply shall make the relevant invoices invalid.

25.2 The Contractor recognises that the Commission is, as a rule, exempt from all taxes and duties, including value added tax (VAT), pursuant to the provisions of articles 3 and 4 of the Protocol on the Privileges and Immunities of the European Communities.

25.3 The Contractor shall accordingly complete the necessary formalities with the relevant authorities to ensure that the goods and services required for performance of the Contract are exempt from taxes and duties, including VAT.

26. Force majeure

26.1 Force majeure shall mean any unforeseeable and exceptional situation or event beyond the control of the Parties which prevents either of them from performing any of their obligations under the Contract, was not due to error or negligence on their part or on the part of a subcontractor, and could not have been avoided by the exercise of due diligence. Defects in equipment or material or delays in making it available, labour disputes, strikes or financial problems cannot be invoked as force majeure unless they stem directly from a relevant case of force majeure.

26.2 Without prejudice to the provisions of article 14.7 of the Contract, if either Party is faced with force majeure, it shall notify the other Party without delay by registered letter with acknowledgment of receipt or equivalent, stating the nature, likely duration and foreseeable effects.

26.3 Neither Party shall be held in breach of its contractual obligations if it has been prevented from performing them by force majeure. Where the Contractor is unable to perform his contractual obligations owing to force majeure, he shall have the right to remuneration only for tasks actually executed.

26.4 The Parties shall take the necessary measures to reduce damage to a minimum.

27. Subcontracting

27.1 The Contractor shall not subcontract without prior written notification to the Commission nor cause the Contract to be performed in fact by third parties.

27.2 Even where the Contractor subcontracts to third parties, he shall none the less remain bound by his obligations to the Commission under the Contract and shall bear exclusive liability for proper performance of the Contract.

27.3 The Contractor shall make sure that the subcontract does not affect rights and guarantees to which the Commission is entitled by virtue of the Contract, notably checks and audits under article 38 of the Contract and access to sites and information under article 39 of the Contract.

28. Assignment

28.1 The Contractor shall not assign the rights and obligations arising from the Contract, in whole or in part, without prior written authorisation from the Commission.

28.2 In the absence of the authorisation referred to in article 28.1of the Contract, or in the event of failure to observe the terms thereof, assignment by the Contractor shall not be enforceable against and shall have no effect on the Commission.

28.3 The Contractor hereby expressly agrees to the assignment of this Contract from the Commission to the EGNOS Service Provider. The assignment will be notified to the Contractor in writing together with the date on which the assignment will take effect. The assignment shall not give rise to any right of the Contractor to propose a Contractor variation notice.

28.4 The Contractor hereby agrees to the re-assignment of this Contract to the Commission in case of termination, for any reason, of the EGNOS Service Provider contract.

29. Contract variations

29.1 Variation proposed by the Commission

29.1.1 The Commission may propose variations to the Contract. If the Commission proposes a variation, it must issue a Commission variation notice to the Contractor setting out the proposed variation in sufficient detail to enable the Contractor to issue a variation proposal in accordance with article 29.1.2 of the Contract.

29.1.2 The Contractor shall provide the Commission with the variation proposal within [40] days of receipt of the Commission variation notice. The variation proposal shall:

a) address the technical and management aspects related to the variation;
b) provide a calculation of the estimated change to the Contract price under article 18 of the Contract, using the same cost-breakdown provided with the Contractor's tender;
c) provide detailed justifications of any estimated changed to the Contract price; and
d) include the opinion of the Contractor on the impact the proposed variation has on the provision of Service.

29.1.3 The Contractor shall be entitled to recover from the Commission its reasonable costs in preparing the variation proposal, subject to it providing the Commission with sufficient evidence of such costs with the variation proposal.

29.1.4 As soon as practicable after the Commission has received the variation proposal, the Parties shall discuss the Contract variation. If the Contract variation is agreed on, the Contract shall be amended in accordance with article 40 of the Contract.

29.2 Variations proposed by the Contractor variation

29.2.1 The Contractor may propose variations to the Contract. If the Contractor proposes a change to the Contract, it must issue a Contractor variation notice to the Commission.

29.2.2 The Contractor variation notice shall include a variation proposal containing all the specified elements described under article 29.1.2 of the Contract.

29.2.3 As soon as practicable after receiving the Contractor variation notice, the Commission may:

a) reject the Contractor variation notice in its entirety; or
b) open discussions with the Contractor on the Contractor variation notice in view of agreeing on a Contract variation.

29.2.4 If the Contract variation is agreed on, the Contract shall be amended in accordance with article 40 of the Contract.

29.2.5 The Contract price can be increased only through amendment of the Contract in accordance with article 40 of the Contract.

30. Termination for Contractor default

30.1 The Commission may terminate the Contract in the following circumstances:

a) where the Commission has evidence or seriously suspects the Contractor or any related entity or person of professional misconduct;

b) where the Commission has evidence or seriously suspects the Contractor or any related entity or person of fraud, corruption, involvement in a criminal organisation or any other illegal activity detrimental to the Communities' financial interests;

c) where the Commission has evidence or seriously suspects the Contractor or any related entity or person of substantial errors, irregularities or fraud in the award procedure related to the procurement activities or in the performance of the Contract;

d) where the Contractor is in breach of his obligations under article 17 of the Contract;

e) where a change in the Contractor's legal, financial, technical or organisational situation could, in the Commission's opinion, have a significant effect on the performance of the Contract;

f) where the Contractor is unable, through his own fault, to obtain any permit or licence required for performance of the Contract;

h) where the Contractor, after receiving formal notice in writing to comply, specifying the nature of the alleged failure, and after being given the opportunity to remedy the failure within a reasonable period following receipt of the formal notice, remains in serious breach of his contractual obligations;

i) where other cases occur that give rise to Contractor default as defined in the Contract.

30.2 Prior to termination under point a), b), c) or g), the Contractor shall be given the opportunity to submit his observations.

30.3 Termination shall take effect on the date on which a registered letter with acknowledgment of receipt terminating the Contract is received by the Contractor, or on any other date indicated in the letter of termination.

31. Consequences of termination for Contractor default

31.1 If the Commission terminates the Contract in accordance with article 30 of the Contract and without prejudice to any other measures provided for in the Contract, the Contractor shall waive any claim for consequential damages, including any loss of anticipated profits for uncompleted work. On receipt of the letter terminating the Contract, the Contractor shall take all appropriate measures to minimise costs, prevent damage, and cancel or reduce his commitments. He shall draw up reports related to the

tasks executed up to the date on which termination takes effect, within a period not exceeding sixty days from that date.

31.2 The Commission may claim compensation for any damage suffered and recover any sums paid to the Contractor under the Contract. The Commission will also be entitled to off-set any outstanding amount to be paid to the Contractor at the time of termination pursuant to this Contract with the amount of the damage caused by the Contractor default.

31.3 On termination of the Contract, the Commission may engage any other contractor to complete the Service. The Commission shall be entitled to claim from the Contractor all extra costs incurred in making good and completing the Service, without prejudice to any other rights or guarantees it has under the Contract.

32. Termination for force majeure

32.1 In case of force majeure, notified in accordance with article 26.2 of the Contract, either Party may terminate the Contract, where performance thereof cannot be ensured for a period corresponding to at least to [60] days.

32.2 No claim for compensation shall be brought by one Party against the other for the damage suffered out of termination for force majeure.

33. Substantial errors, irregularities and fraud attributable to the Contractor

Where, after the award of the Contract, the award procedure or the performance of the Contract prove to have been subject to substantial errors, irregularities or fraud, and where such errors, irregularities or fraud are attributable to the Contractor, the Commission may refuse to make payments, may recover amounts already paid or may terminate all the contracts concluded with the Contractor, in proportion to the seriousness of the errors, irregularities of fraud.

34. Termination for Commission default

34.1 The Contractor may terminate the Contract for Commission default if the Commission breaches its obligations under this Contract, materially and substantially frustrating or rendering it impossible for the Contractor to perform his obligations under this Contract for a continuous period of [two] months.

34.2 If the Contractor wishes to terminate the Contract on the basis of article 34.1 of the Contract, he must serve a termination notice on the Commission within [15] days of becoming aware of the occurrence of such event. The termination notice must specify the event which has occurred entitling the Contractor to terminate.

34.3 The Contract will terminate [20] days after the date the Commission receives the termination notice, unless the Commission rectifies the event of default within [15] days of receipt of the termination notice.

34.4 On termination of the Contract under this article, the Contractor shall only be entitled to payment corresponding to the Contract price minus the savings of the Contractor. In this context, savings shall mean all the costs that the Contractor did not incur or could avoid due to the fact that the Contract was terminated before the Expiry Date.

34.5 Upon receipt by the Commission of the termination notice, the Contractor shall take all appropriate measures to minimise costs, prevent damage, and cancel or reduce his commitments. He shall draw up the documents related to the tasks executed up to the date on which termination takes effect, within a period not exceeding sixty days from that date.

34.6 Subject to any mandatory provisions of law, the compensation payable under this article shall be the sole remedy of the Contractor against the Commission on termination of the Contract for Commission default.

35. Suspension of the Contract

Without prejudice to the Commission's right to terminate the Contract, the Commission may at any time and for any reason suspend the provision of Service under the Contract or any part thereof. Suspension shall take effect on the day the Contractor receives notification by registered letter with acknowledgment of receipt or equivalent, or at a later date where the notification so provides. The Commission may at any time following suspension give notice to the Contractor to resume the provision of Service suspended. The Contractor shall not be entitled to claim compensation on account of suspension of the Contract or of part thereof.

36. Commission voluntary termination

36.1 Without prejudice to article 36.3 of the Contract, the Commission may, of its own volition and without being required to pay compensation, terminate the Contract by serving a termination notice on the Contractor.

36.2 The Contract will terminate [20] days after the Contractor received the termination notice.

36.3 On termination of the Contract under this article, the Contractor shall only be entitled to payment corresponding to the Contract price minus the savings of the Contractor. In this context, savings shall mean all the costs that the Contractor did not incur or could avoid due to the fact that the Contract was terminated before the Expiry Date.

36.4 Subject to any mandatory provision of law, the compensation payable under this article shall be the sole remedy of the Contractor against the Commission on termination of the Contract for Commission voluntary termination.

36.5 On receipt of the termination notice, the Contractor shall take all appropriate measures to minimise costs, prevent damage, and cancel or reduce his commitments. He shall draw up the documents related to the tasks executed up to the date on which termination takes effect, within a period not exceeding [60] days from that date.

37. Entry into force and duration

37.1 This Contract shall enter into force upon the Effective Date and remain in force until the Expiry Date.

37.2 The duration of this Contract shall be extended after the Expiry Date for a maximum duration of 13 years starting from the Operation Start Date, subject to the availability of Community funds allocated to the EGNOS service provision.

38. Checks and audits

38.1 Pursuant to article 142 of the Financial Regulation, the European Court of Auditors shall be empowered to audit the documents held by the natural or legal persons receiving payments from the budget of the European Communities from the Effective Date up to five years after payment of the balance.

38.2 The Commission or an outside body of its choice shall have the same rights as the European Court of Auditors for the purpose of checks and audits limited to compliance with contractual obligations from the Effective Date up to five years after payment of the balance.

38.3 In addition, the European Anti Fraud Office may carry out on-the-spot checks and inspections in accordance with Council Regulation (Euratom, EC) No 2185/96 and Parliament and Council Regulation (EC) No 1073/1999 from the Effective Date up to five years after payment of the balance.

39. Access to site and information

39.1 The Contractor shall ensure that the Commission and any persons appointed by the Commission shall, upon reasonable prior notice, be granted access to the ground station and to the Contractor premises and to the Contractor's subcontractors premises but not so as to interfere adversely with the Contractor's obligation under this Contract. The purpose of the visit can be general inspections, attending tests or conduct investigation or any other purpose the Commission may deem appropriate.

39.2 The Commission shall have the access rights referred to under article 39.1 of the Contract without prior notice in an emergency situation.

39.3 The Commission shall ensure that the Commission's representative or other persons appointed by the Commission visiting such premises comply with the applicable security and safety requirements, rules and regulations in force from time to time on those premises. The Contractor and his subcontractors shall provide the Commission's representative or other persons appointed by the Commission with the requirements, rules and regulations prior to their entering those premises and/or display them at those premises.

39.4 The Contractor shall ensure full visibility and access to all the information, data and documents related to the Contract and its execution. The Contractor has no right to withhold any information and data in relation to the Contract and its execution.

39.5 If the Commission needs information in relation to the Contract subject and its execution, it shall request in writing to the Contractor the information needed and, if possible, the documents it wants to have.

39.6 The Contractor shall reply to the Commission in writing within [20] days, providing the information and the documents requested by the Commission.

40. Amendments

Any amendment to the Contract shall be the subject of a written agreement concluded by the Parties. An oral agreement shall not be binding on the Parties.

41. General administrative provisions

Any communication relating to the Contract shall be made in writing and shall bear the Contract number. Ordinary mail shall be deemed to have been received by the Commission on the date on which it is registered by the department responsible indicated below. Communications shall be sent to the following addresses:

Commission:

European Commission
Directorate-General [complete]
[Directorate [complete]]
[Unit [complete]]
[Postcode and city]

Contractor:

Mr/Mrs/Ms [complete]
[Function]
[Company name]
[Official address in full]

42. Applicable law

The Contract shall be governed by Community law, complemented, where necessary, by the national substantive law of [France][10] without reference to its conflict of laws provisions.

43. Jurisdiction and dispute resolution

43.1 During the existence of any dispute under this Contract, or the pending nature of any legal proceeding in respect of such dispute, the Contractor shall comply with his obligations at all times, unless otherwise stipulated in this Contract.

43.2 Mutual Discussion

43.2.1 The Parties shall attempt in good faith to negotiate a settlement to any dispute between the Parties arising out of or in connection with the Contract within [45] days of either Party notifying the other Party of the dispute.

43.2.2 Nothing in this dispute resolution procedure shall prevent the Parties from seeking from the court of the competent jurisdiction an injunctive relief or mandatory injunction.

43.3 Alternative Dispute Resolution

43.3.1 If the dispute cannot be resolved by the Parties pursuant to article 43.2.1 of the Contract, the Parties agree to submit the matter to settlement proceedings under the ADR Rules. If the dispute has not been settled pursuant to the ADR Rules within 45 days following the filing of a request for alternative dispute resolution or within such other period as the Parties may agree in writing, such dispute shall be finally settled under the Arbitration Rules by three arbitrators appointed in accordance with the said Arbitration Rules.

43.3.2 The European Court of First Instance shall have sole jurisdiction for any dispute arising out of or in connection with the present Contract that is not referable to arbitration in accordance to the applicable law under article 42 of the Contract.

43.3.3 The proceedings under article 43 of the Contract shall be conducted in the English language.

Done in the two copies, one for each Party, in the English language.

SIGNATURES

For the Contractor, For Commission,

[10] Following the ESP Contract

[/forename/surname/function]

signature[s]: _____

Done at [Brussels], [date]

[forename/surname/function]

signature[s]:_____

Done at [Brussels], [date]

Schedule 1

List of Applicable Documents to the Contract

1. EGNOS GEO Transponder Replenishment: Technical Specifications
2. Technical Specifications AD 1: EGNOS SIS Specifications from SARPS - This document shall be purchased from ICAO.
3. Technical Specifications AD 2: EGNOS NLES-Hosting Site IRD – EGN-ATMG-AIV-DRD204/0002, Issue 3, Rev. D.
4. Technical Specifications AD3: Annex A – NLES-Hosting Site IRD – EGN-ASPI-NLES-DRD204/0001, Issue 1, Rev. E
5. Technical Specifications AD4: DCN to Annex A of the NLES Hosting Site IRD: Migration to Inmarsat 4 – Ref: 200344641N
6. Contractor's tender
7. Lists of meetings, reviews and of deliverables
8. All deliverables produced during the course of the Contract which are for Approval

7. Lists of meetings, reviews and of deliverables

A) List of meetings and reviews

#	Name	Purpose	Frequency	Review Type	Proposed Location
R1	Kick-Off Meeting (KOM)	Review of the Project Management Plan.	Once	Mandatory	Contractor's premises
R2	Requirements Review (GEO-RR)	Review of the EGNOS GEO transponder Service Requirements (not required if Contractor is proposing the lease of an existing in-orbit SBAS payload).	One per EGNOS GEO transponder Service	Mandatory	Authority's Premises
R3	Critical Design Review (GEO-CDR)	Review of the EGNOS GEO Transponder Design (not required if Contractor is proposing the lease of an existing in-orbit SBAS payload).	One per EGNOS GEO transponder Service	Optional	Authority's Premises
R4	Acceptance Review (GEO-AR)	Acceptance of EGNOS GEO Transponder following integration tests and validation (not required if Contractor is proposing the lease of an existing in-orbit SBAS payload).	One per EGNOS GEO transponder Service	Optional	Contractor's Premises or Payload Manufacturer Premises
R5	In-orbit Test Review (GEO-ITR)	Acceptance of the EGNOS GEO Transponder in-orbit performances. In case the Contractor is proposing the lease of an existing in-orbit SBAS payload, ITR test report shall be provided and the Authority may request to replay a subset of the tests.	One per EGNOS GEO transponder Service	Mandatory	Contractor's Premises
R6	NLES Acceptance Review (NLES-GEO-AR)	Acceptance of the 2 NLES after integration of RF subsystem and site preparation	One per EGNOS GEO transponder Service	Mandatory	Contractor's Premises
R7	EGNOS GEO Transponder Service Qualification Review (QR)	Acceptance and qualification of the end-to-end operation of the EGNOS GEO transponder Service (this includes the NLES qualification)	One per EGNOS GEO transponder Service	Mandatory	Contractor's Premises
R8	Coordination Meeting	Review of operations performances, payload health status…	Yearly	Mandatory	Authority's premises

B) List of deliverables

#	Document Name	Description	Document Type	Document Delivery
D1	EGNOS GEO Transponder Project Management Plan	The Project Management Plan (PMP) identifies how the project will be executed	For Approval	Draft at proposal level Updates at KOM Updates as appropriate
D2	EGNOS GEO Transponder Service Requirements Document	This document shall synthesize the requirements for the complete EGNOS GEO Transponder Service. This includes the payload requirements but also the NLES interface requirements (RF interface, interface with NLES equipment)	For Approval	Requirements Review
D3	EGNOS Transponder Service SoC	This document shall provide a complete Statement of Compliance to the technical requirements for the EGNOS GEO Transponder Service provided in the applicable document n. 5	For Approval	Draft at Proposal Level Update at the Requirements Review Update at the In-Orbit Test Review
D4	EGNOS GEO Transponder Architecture and Design Document	This document shall describe the complete architecture of the proposed transponder for the EGNOS GEO Transponder Service and its integration on the satellite.	For Information	Critical Design Review
D5	EGNOS GEO Transponder Acceptance Tests Definition Document	This document shall describe the set of tests that will be performed for the validation of the EGNOS payload. This document shall not be provided in case the proposed SBAS payload for the EGNOS Geo Transponder Service is already operating in orbit.	For Information	Critical Design Review
D6	EGNOS GEO Transponder Acceptance Tests Results Document	This document shall provide the results to the tests defined for the validation of the EGNOS payload. This document	For Information	Acceptance Review

		shall not be provided in case the proposed SBAS payload for the EGNOS Geo Transponder Service is already operating in orbit		
D7	EGNOS GEO Transponder In-Orbit Tests Definition Document	This document shall describe the set of tests that will be performed for the validation of the EGNOS payload in orbit. In case the Contractor is proposing the lease of an SBAS payload already operating in orbit, this document shall be required by the Kick-Off Meeting.	For Information	Acceptance Review Or Kick-off meeting (if applicable)
D8	EGNOS GEO Transponder In-Orbit Test Results Document	This document shall provide the results to the tests defined for the validation of the EGNOS payload in orbit. In case the Contractor is proposing the lease of an SBAS payload already operating in orbit, this document shall be required by the Kick-Off Meeting.	For Approval	In-Orbit Test Review Or Kick-off meeting (if applicable)
D9	EGNOS GEO Transponder Service Regulatory document	This document shall provide evidence of: - ITU filings for the use of the downlink and uplink frequencies - PRN registration to the GPSW	For Approval	In-Orbit Test Review
D10	EGNOS GEO Transponder Service Tests Document	This document shall describe the set of tests that will be performed for the validation of the EGNOS GEO Transponder Service (combined system validation NLES + GEO).	For Information	In-Orbit Test Review
D11	EGNOS GEO Transponder Service Acceptance Tests Results Document	This document shall provide the results to the tests defined for the validation of the EGNOS Geo Transponder Service acceptance.	For Approval	EGNOS GEO Transponder Service Qualification Review
D12	EGNOS GEO	This document shall	For Review	EGNOS GEO

	Transponder Service Ground/Space Interface Document	describe the interface requirements to be met by the ground segment in order to access to the GEO Transponder		Transponder Service Qualification Review
D13	NLES Implementation Architecture Document	This document shall describe how the 2 NLES associated to each EGNOS GEO transponder will be implemented (site hosting, architecture, interface description, RF subsystem implementation…)	For Information	Requirements Review
D14	NLES RF Part List Document	This document shall provide the complete list of RF parts that shall be procured for NLES RF subsystem.	For Information	Requirements Review
D15	NLES Station Implementation Plan	The implementation plan shall describe the different steps the Contractor intends to follow to achieve the integration and acceptance of the complete NLES station.	For Information	Requirements Review
D16	NLES Integration and Test Report	This document shall provide a complete report on the NLES integration activities at the Contractor selected sites.	For Approval	NLES Acceptance Review (Draft) EGNOS GEO Transponder Service Qualification Review (Final Issue)
D17	EGNOS GEO Transponder Service Status Report (EGSSR)	This report shall contain a description of the status of the EGNOS GEO Transponder Service. This shall include heath status of the payload and the satellite, achieved performances over the year, causes of unavailability, status of the NLES operations.	For Information	Monthly (from start of operations)
D18	EGNOS GEO Transponder Service Progress Report (EGSPR)	The progress report shall present an overview of the project progress, project risks, schedule, and presenting the status of each WP described in the Contractor's Tender.	For Information	Every 3 months

D20	Minutes of Meeting		For Review	At each Meeting
D21	Risk Management Plan	This Plan identifies how the Contractor will monitor the risk of the project.	For Approval	Draft at proposal level Updates at KOM Updates every 3 months