CALL FOR TENDERS

N° MOVE/C2/2014-269

Provision of services towards the development of a public European environmental model suite for aviation

(Open Procedure)

TENDER SPECIFICATIONS
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INFORMATION ON TENDERING

1.1. Participation

Participation in this tender procedure is open on equal terms to all natural and legal persons coming within the scope of the Treaties and to all natural and legal persons in a third country which has a special agreement with the Union in the field of public procurement on the conditions laid down in that agreement. Where the Multilateral Agreement on Government Procurement concluded within the WTO applies, the participation to the call for tender is also open to nationals of the countries that have ratified this Agreement, on the conditions it lays down.

1.2. Contractual conditions

The tenderer should bear in mind the provisions of the draft contract which specifies the rights and obligations of the contractor, particularly those on payments, performance of the contract, confidentiality, and checks and audits.

1.3. Joint tenders

A joint tender is a situation where a tender is submitted by a group of economic operators (consortium). Joint tenders may include subcontractors in addition to the joint tenderers.

In case of joint tender, all economic operators in a joint tender assume joint and several liability towards the Contracting Authority for the performance of the contract as a whole.

These economic operators shall designate one of them to act as leader with full authority to bind the grouping or the consortium and each of its members. It shall be responsible for the receipt and processing of payments for members of the grouping, for managing the service administration and for coordination. The composition and constitution of the grouping or consortium, and the allocation of the scope of tasks amongst the members, shall not be altered without the prior written consent of the Commission.

The tenderers should indicate in their offer whether the partnership takes the form of:

a) a new or existing legal entity which will sign the contract with the Commission in case of award

or

b) a group of partners not constituting a new legal entity, who via a power of attorney, signed by an authorised representative of each partner (except the lead partner), designate one of the partners as lead partner, and mandate him as lead contractor to sign the contract with the Commission in case of award.

1.4. Subcontracting

Subcontracting is permitted in the tender but the contractor will retain full liability towards the Contracting Authority for performance of the contract as a whole.

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See [http://www.wto.org/english/tratop_E/gproc_e/gp_gpa_e.htm](http://www.wto.org/english/tratop_E/gproc_e/gp_gpa_e.htm)
Tenderers must give an indication of the part of the services and proportion of the contract that they intend to subcontract.

Tenderers are required to identify subcontractors whose share of the contract is above 20%.

During contract execution, the change of any subcontractor identified in the tender will be subject to prior written approval of the Contracting Authority.

1.5. Content of the tender

The tenders must be presented as follows:

Part A: Identification of the tenderer (see section 1.6)

Part B: Evidence for exclusion criteria (see section 2.2)

Part C: Evidence for selection criteria (see section 2.3)

Part D: Technical offer (see section 2.5)

Part E: Financial offer (see section 2.6)

Part F: Power of attorney (for consortia only)

1.6. Identification of the tenderer: legal capacity and status

- The tenderer's identification form in Annex 1 shall be filled in and signed by:
  - The tenderer (including any member of a consortium or grouping)
  - subcontractor(s) whose share of the work represent more than 20% of the contract).

- In order to prove their legal capacity and their status, all tenderers (including any member of a consortium of grouping) must provide a signed Legal Entity Form with its supporting evidence. The form is available on: http://ec.europa.eu/budget/contracts_grants/info_contracts/legal_entities/legal_entities_en.cfm

Tenderers that are already registered in the Contracting Authority’s accounting system (i.e. they have already been direct contractors) must provide the form but are not obliged to provide the supporting evidence.

- If it has not been included with the Legal Entity Form, tenderers must provide the following information

  - For legal persons, a legible copy of the notice of appointment of the persons authorised to represent the tenderer in dealings with third parties and in legal proceedings, or a copy of the publication of such appointment if the legislation which applies to the legal entity concerned requires such publication. Any delegation of this authorisation to another representative not indicated in the official appointment must be evidenced.
  - For natural persons, where applicable, a proof of registration on a professional or trade register or any other official document showing the registration number.

- The tenderer (only the leader in case of joint tender) must provide a Financial Identification Form and supporting documents. The form is available on: http://ec.europa.eu/budget/contracts_grants/info_contracts/index_en.cfm
2.1. Evaluation steps

The evaluation is based on the information provided in the submitted tender. It takes place in three steps:

1. Verification of non-exclusion of tenderers on the basis of the exclusion criteria
2. Selection of tenderers on the basis of selection criteria
3. Evaluation of tenders on the basis of the award criteria (technical and financial evaluation)

Only tenders meeting the requirements of one step will pass on to the next step.

2.2. Exclusion criteria

All tenderers shall provide a declaration on their honour (see Annex 2), duly signed and dated by an authorised representative, stating that they are not in one of the situations of exclusion listed in the Annex 2.

The declaration on honour is also required for identified subcontractors whose intended share of the contract is above 20%.

The successful tenderer shall provide the documents mentioned as supporting evidence in Annex 2 before signature of the contract and within a deadline given by the contracting authority. This requirement applies to all members of the consortium in case of joint tender. In case of doubt on this declaration on the honour, the contracting authority may also request the evidence for subcontractors whose intended share of the contract is above 20%.

2.3. Selection criteria

Tenderers must be in a stable financial position and prove their economic, financial, technical and professional capacity to carry out the work subject to this call for tender.

The tenderer may rely on the capacities of other entities, regardless of the legal nature of the links which it has with them. It must in that case prove to the Contracting Authority that it will have at its disposal the resources necessary for performance of the contract, for example by producing an undertaking on the part of those entities to place those resources at its disposal.

Economic and financial capacity criteria and evidence

In order to prove their economic and financial capacity, the tenderer (in case of a joint tender the combined capacity of all tenderers and identified subcontractors) must comply with the following criteria:

- The annual turnover of the last two financial years is above € 1 000 000.

The following evidence shall be provided:

- Copy of the profit & loss account for the last two years for which accounts have been closed,
- Failing that, appropriate statements from bank.

If, for some exceptional reason which the Contracting Authority considers justified, a tenderer is unable to provide one or other of the above documents, he or she may prove his or her economic and financial capacity by any other document which the Contracting Authority considers appropriate. In any case, the Contracting Authority must at least be notified of the exceptional reason and its justification in the tender. The Commission reserves the right to request any other document enabling it to verify the tenderer's economic and financial capacity.

**Technical and professional capacity criteria and evidence**

**a. Criteria relating to tenderers**

The tenderer (in case of a joint tender the combined capacity of all tenderers and identified subcontractors) must comply with the following essential criteria:

(a) Proven experience in the field of aviation environmental protection with at least 3 projects successfully delivered;
(b) Confirmed experience in the field of aircraft noise, and preferably in helicopter noise modelling, with at least 1 project successfully delivered in this area with a budget exceeding 50 000 €;
(c) Confirmed experience in the field of aircraft engine emissions measurements, with at least 1 project successfully delivered in this area during the last three years with a minimum budget of 100 000 €;
(d) Recognised and sustained expertise in the development of numerical models and collection of experimental data;
(e) Proficiency in the handling of conceptual and methodological assignments, including drafting of reports and recommendations in the English language.

**b. Criteria relating to the team delivering the service**

The team delivering the service should include, as a minimum, the following profiles:

<table>
<thead>
<tr>
<th>Expertise</th>
<th>Required Qualifications</th>
<th>Relevant Working Experience (minimum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Manager</td>
<td>Project management experience in projects of similar size and complexity, including: overseeing project delivery, assuring an adequate planning and quality control of the delivered service, management of risks and client co-ordination. Demonstrable experience of management of multi-disciplinary teams of at least 5 people.</td>
<td>3 years</td>
</tr>
<tr>
<td>Expert in aviation emission model development</td>
<td>B. Sc. degree</td>
<td>2 years</td>
</tr>
<tr>
<td>Expert in the measurement of engine emissions</td>
<td>B. Sc. degree or equivalent</td>
<td>3 years</td>
</tr>
<tr>
<td>Expert in aircraft, preferably helicopter, noise model development</td>
<td>B. Sc. degree</td>
<td>2 years</td>
</tr>
<tr>
<td>Expert in measurement of aircraft, preferably helicopter, noise</td>
<td>B. Sc. degree or equivalent in aeronautics, physics or acoustics.</td>
<td>3 years</td>
</tr>
</tbody>
</table>
All members of the team shall have a working command of English.

c. Evidence

The following evidence should be provided to demonstrate fulfilment of the referred to above criteria:

- List of relevant services provided in the past three years, with recipients, public or private, dates and budgets. Those services that are considered as most significant as a demonstration of the expertise of the tenderer for the performance of the assignment in this tender shall be duly accompanied by certificates of satisfactory execution, stating that they have been carried out in a professional manner and have been fully completed;

- The Curriculum Vitae (CV) of all the individuals who will provide the service for this tender, including the management staff, stating their professional qualifications and working experience, together with the indication of the intended role in the delivery of the service. As a matter of preference, these CV should be presented in accordance to the Commission Recommendation on a common European format for curricula vitae, published in OJ L79 of 22 March, p 66.

2.4. Award criteria

The tender will be awarded according to the best-value-for-money procedure. The quality of the tender will be evaluated based on the merits of its scientific/technical, implementation and managerial approaches, through a quantified evaluation grid – with a total number of score points of 100 and an obligation of reaching minimum partial thresholds - established on the basis of the following criteria:

(a) Quality of the proposed methodology: (total of 70 points – required to reach a minimum threshold of 60% of the total)

This includes the assessment of both the scientific and technical excellence of the overall approach proposed for fulfilment of the assignments included in this tender and the aptitude of the tenderer to successfully deliver those assignments. The following sub-criteria will be used in such an assessment:

- Approaches proposed for the performance of the different tasks (20 points – minimum threshold: 50%): encompasses the assessment of the soundness and effectiveness of the concepts and the thoroughness of the approaches selected to tackle the tasks included in this tender.

- Capability for the performance of the data collection and modelling tasks (25 points – minimum threshold: 50%): relates to the capability demonstrated by the tenderer for collecting the required experimental data and for developing and validating the new numerical modelling techniques which are part of this tender in the proposed timeframe, taking due account of the perceived risks and the proposed risk mitigation measures.

- Access to the relevant data measurement and sampling facilities (25 points – minimum threshold: 50%): evaluates the aptitude of the tenderer to access in due time the measurement and sampling facilities that are required for the performance of the test campaigns foreseen under the contract, taking due account of the perceived risks and the proposed risk mitigation measures.

(b) Organisation of the work: (total of 20 points – required to reach a minimum threshold of 60% of the total)
This relates to the quality and effectiveness of the proposed work plan. It will assess notably the adequacy of the time planning for the individual tasks and for the project as a whole, the overall allocation resources and the breakdown of these resources amongst the different work streams.

Particular emphasis will be given to the assessment of the roles and responsibilities assumed by the different parties within the delivery team (in case of joint tenders, including subcontractors if applicable) in the fulfilment of specific aspects of the work set against their demonstrated expertise and qualifications. The tender shall provide the relevant information to enable such an assessment – cf. notably details on the allocation of time and resources and the rationale behind this allocation, justifying appropriateness of the allocation and justification of the resources to be committed (staff, equipment …)

(c) **Project management, including quality assurance and risk management:** (total of 10 points – required to reach a minimum threshold of 60% of the total)

This item addresses the appropriateness of the management structure and relevant procedures – notably those for quality assurance and risk management. The project management structure, the quality system and a risk management plan shall be detailed in the tender. These shall be tailored to the tasks at hand as generic proposals will lead to low scores.

Special emphasis will be given to the procedures that are to be put in place for ensuring the scientific and technical quality of the deliverables and of their presentation – e.g. peer reviews, language quality checks. The risk management plan shall include an indication of the perceived risks – notably those that may hamper the fulfilment of the terms of the contract or may entail a lack of continuity of service - as well as an outline of the potential measures that are devised for their mitigation.

Tenders must score at least 60% in each individual criterion (50% for each of the stated sub-criterion), and reach a mark above 70% in total. Tenders that do not reach the minimum quality thresholds will be rejected.

Upon quality evaluation, the tenders are ranked - using the formula below – on the basis of their value-for-money ratios. In the latter, quality and price are given a weight of, respectively, 60 and 40.

**Score for tender**

\[
\text{Score for tender } x = \frac{\text{total quality score for award criteria for tender } x}{100} \text{ multiplied by 60} + \frac{\text{cheapest price}}{\text{price of tender } x} \text{ multiplied by 40}
\]

### 2.5. Technical offer

The technical offer must cover the full scope and the specific tasks described in the technical specification and provide all the information that is required for application of the award criteria. Offers deviating from the requirements or not covering all requirements may be excluded on the basis of non-conformity with the tender specifications. Excluded offers will not be evaluated.
2.6. Financial offer

The price of the offer must be quoted in euro. Tenderers from countries outside the euro zone have to quote their prices in euro. The price quoted may not be revised in line with exchange rate movements. It is for the tenderer to assume the risks or the benefits deriving from any variation.

Prices must be quoted free of all duties, taxes and other charges, including VAT, as the European Union is exempt from such charges under Articles 3 and 4 of the Protocol on the privileges and immunities of the European Union. The amount of VAT may be shown separately.

The quoted price must be a fixed amount which includes all relevant charges (including travel and subsistence); a breakdown of the quoted price on a per task basis must be specified. Travel and subsistence expenses are not refundable separately.

Indicative price: The maximum total amount for the contract considering its maximum duration will not exceed 2.000.000 euros (in words: two million euros).

TECHNICAL SPECIFICATIONS

I. Background

The Flight path 2050 strategic research and innovation agenda is organised around 5 challenges. Challenge 3 addresses environmental protection and energy supply. One of its goals is to ensure European leadership in the establishment of global environmental standards, notably those being developed by ICAO's Committee for Aviation Environmental Protection (CAEP). The latter have reached various several maturity levels, but an extended effort of data collection has been identified as a key issue for the elaboration of future more advanced, model-based standards.

ICAO standards are being implemented both into European Regulations and European Directives. The European environmental noise directive is an example of the latter. Full implementation will require notably more specificity in the modelling approaches, such as that could be provided by a dedicated helicopter model.

In order to support both its participation on ICAO's CAEP and the development of its environmental policies, Europe requires access to a comprehensive source of the relevant information – including a complete and publicly accessible set of databases, methodologies and models. Despite the considerable extent and value of the relevant information currently available, a number of gaps still exists that limit its fitness-for-purpose. In particular, these address issues such as the complementarity existing between the different modelling approaches, the full characterisation of the data sets for their application as well as the potential extensions and modifications that will be required to tackle forthcoming ICAO standards dealing with new application areas such as alternative fuels. There remains a need for a mapping of the existing models, characterising their capabilities and performance, to ensure that Europe can maximise the use of such a legacy whilst identifying emerging needs.

A preliminary review identified two areas where urgent work is required: non-volatile Particulate Matter (nvPM) and Helicopter’s noise modelling. The new nvPM standard requires a significant worldwide effort in data collection from aircraft engines. Test campaigns are being presently conducted focusing on the current ICAO’s CAEP priority – cf. gathering of nvPM data from turbofan engines with rated thrust greater than 26.7 kN. However, these test campaigns are still insufficient to provide the full set of data required for the establishment of the new nvPM standard. As the scope of ICAO's CAEP PM activity...
extends to all aircraft engines, this will imply additional test campaigns on other aircraft engine categories need to take place in the future. This will further compound the data deficit that we are already experiencing today.

To support in full the monitoring activities required by the European Environmental Noise Directive (END) as well as ICAO noise standard setting, an adequate noise modelling capability that encompasses all types of aircraft is required. However, the international guidance to model aircraft noise - such as ICAO Doc 9911, ECAC Doc 29 - is limited to fixed-wing aircraft, thus not covering helicopter noise albeit helicopter operations being within the scope of the END. Defining a more specific noise modelling methodology for helicopters is therefore a high priority for Europe.

Finally, the application of these novel modelling techniques for the performance of local, regional or European environmental impact assessments, implies the development of appropriate guidance material supporting their utilisation.

II General Objectives

Overall, this action is aimed at structuring and enhancing the set of available aviation environmental models in a dual perspective: (i) strengthening the support to EU policy makers in the development and implementation of relevant EU policies – including e.g. the performance of comprehensive environmental impact assessments in the scope of EU’s current and forthcoming environmental regulations; (ii) heightening the European profile in the framework of international discussions, such as those held in ICAO’s CAEP on establishment of the future international aviation environmental standards – notably those for engine non-volatile Particulate Matter and for helicopter noise.

III Specific Objectives

The main specific objectives of this action are threefold:

- to provide a mapping of the current European capability regarding aviation environmental modelling, including the elicitation of a reference set of models, a full characterisation of the capabilities, breath of application and performance as well as of data requirements for the models in the set, the identification of the envelope of their applicability and complementarity and the highlight of potential gaps that might limit their fitness-for-purpose or performance;
- to acquire a deeper insight on the environmental phenomenology, in particular via experimental testing. In this context, a test campaign for measurement of particulate matter from turbofan engines with rated thrust greater than 26.7 kN shall be performed, whose aim will be eventually to support the development of the future ICAO’s CAEP nvPM standard;
- to develop and validate a numerical model for noise emission in helicopter operations, that complements the set of existing aircraft noise models. The work is to address the relevant modelling, numerical and computational aspects leading to the development of a validated prototype software, including any required ancillary tools such as databases for data repository and GUI for user interaction and visualisation support. The software is to be compliant in scope and documentation to recognised best-practice software development standards – e.g. ISO/IEC 12207, PSS-05 (ESA) or equivalent.

IV Technical Tasks

For fulfilment of the above referred to objectives is to evolve on the basis of a step-wise approach under five distinct headings or technical tasks, established as follows:
Task 1: Mapping of a complete and open suite of European models for aviation

This task will aim at performing a critical assessment of the current European modelling capability for environmental protection in aviation set against the overall requirements of current and forthcoming EU policies and regulations. This will entail, notably the fulfilment of the following sub-tasks:

- To carry out an inventory of existing European models as well as other ancillary tools – e.g. databases, reference datasets – taking as core reference the information provided by the following sources: FP7 TEAM_Play tool suite; repositories held by the European Commission, EASA and EUROCONTROL. Albeit the inventory being centred on noise and emissions, it shall give due consideration to the impact of aspects such as:
  - Fleet and traffic evolution
  - Aircraft technological improvements
  - Operational improvements
  - Use of alternative fuels
  - Economic other relevant policy-related considerations

enabling a fair perspective of future needs and how they will feedback to prevailing modelling requirements.

- To elaborate a mapping of the results of this inventory using an appropriate methodology that enables the identification of links existing between models and other supporting ancillary tools. The aim will be to ascertain the envelope of their applicability as well as their capability to efficiently and effectively operate in a co-operative manner within an integrated toolset, via appropriate interfacing.

- Based on the previous results, to highlight the potential gaps requiring filling – e.g. in terms of novel or improved modelling techniques, needs for additional reference datasets for model operation or validation purposes, potential hybrid techniques – towards enabling a European tool suite that is functionally fit-for-purpose while delivering the required levels of efficiency and cost-effectiveness.

The outcome of Task 1 will consist of the results of the inventory together with a mapping portraying the current European capability on environmental modelling in aviation, including the identification of gap-filling elements and measures that are deemed necessary towards enabling the creation of a European integrated, open modelling toolset facility.

Task 2: Data collection

Subtask 2.1: Collection of nPm emissions data in aircraft engines

Purpose
To carry out a test campaign aimed at measurement of nvPM in aircraft engines whose goal is primarily towards filling the relevant gaps identified in Task 1. As a minimum, this shall include the measurement of nvPM in 2 engines of rated thrust power greater than 26.7 kN. The selected engines must be either current production or prototype units for which either data has not yet been provided to ICAO or for which ICAO requires the realisation of multiple tests.

The set of tests to be performed shall span the envelope of thrust conditions designated by ICAO/CAEP/WG3 PMTG. The contractor shall use its own SAE AIR624-compliant sampling and measurement system facilities with tests adhering at least to ICAO/CAEP/WG3 PMTG-defined quality level 2. Where possible, appropriate consideration shall be given to the sensitivity assessment linked with variations in fuel composition.

Test Procedures

The test campaigns shall be conducted in accordance to SAE AIR6241 entitled “Procedure for continuous sampling and Measurement of Non Volatile Particle Emissions from Aircraft Turbine engines”. Any potential refinements to the measurement procedure defined in the SAE E-31 Committee shall be taken into account.

In order to gain insight on the variability of the measurements, sensitivity tests shall be conducted using the contractor’s and the EASA’s sampling and measurement systems in parallel. For this purpose the contractor is expected to put into place an adequate planning and the necessary coordination measures to facilitate such parallel measurements to take place. Any conflicts of interest hampering or preventing the latter shall be properly justified.

Prior to the start of the test campaign the contractor shall submit to the Contracting Authority a document detailing the test rigs – including the measurement system - that will be used in the performance of this work together with a full description of the relevant test procedures – including aspects such as instrument calibration, signal filtering, data sampling, data measurement and data processing techniques, and reference to any specific measurement, data processing and quality control standards that it deems necessary to fully qualify the measurement process and the techniques to be used therein. These documents are hereafter to be included within Deliverables 2.1.1 and 2.1.2, respectively, for engines 1 and 2.

Fees for the Control Tests to be carried out by EASA

The tenderer will have to foresee in his offer a specific amount to cover the running costs for the use of the EASA’s sampling and measurement system. Such running costs shall include the renting of the Mass instrument using the Laser-Induced Incandescence (LII) methodology by EASA as well as the costs for consumables, calibration, operations, transportation, insurance and qualified-staff entailed by the operation of the EASA’s facility during the foreseen parallel tests.

Utilisation of the test results in the framework of ICAO/CAEP/WG3 PMTG

One of the specific goals for this task will be to contribute to the nvPM data collection activity performed under the aegis of ICAO/CAEP/WG3 PMTG. Henceforth, the test results shall conform to the reporting guidelines released by the latter.

The ICAO/CAEP/WG3 PMTG data table without confidential/proprietary data shall be included as part of the deliverables of this contract. The confidential/proprietary data sets shall be made available exclusively to the Certifying Authority (EASA). This data will be forwarded subsequently to
ICAO/CAEP/WG3 PMTG under a confidentially agreement to be established within the proceedings of the latter organisation.

**Subtask 2.2: Data collection for modelling of helicopter noise**

This task aims at the collection of helicopter noise and performance data for its utilisation in the framework of subsequent modelling and software development activities to be carried out, respectively, in Task 3.2 and Task 4. The data collection shall encompass a set of different helicopter types that is representative of the fleet operating in Europe. The rationale underpinning the selection of such set of representative helicopter types shall be properly justified.

The data collection shall comprise measurement of trajectories (4D position along with other relevant flight parameters) and correlated noise levels (at least Sound Exposure Levels (SEL) and maximum noise level (LAmax)) for the set of helicopter types mentioned above. The test shall span representative in-use conditions in a performance based and technically neutral manner.

**Test Procedures**

The test campaigns shall be conducted on the basis of the requirements catered for in the following documents:

- ICAO Convention, Annex 16, Volume 1, amendment 10, Attachment H (“Guidelines for obtaining helicopter noise data for land-use planning purposes”)
- ICAO Doc 9501 (Environmental Technical Manual), Volume 1, first edition 2010, Chapter 8 (“Guidelines on flight test windows and adjustment of land-use planning noise data measured in accordance with attachment H to Annex 16, Volume 1”)

In advance to the test campaign the contractor shall submit to the Contracting Authority a document with a full description of the relevant test procedures – including aspects such the measurement chain, instrument calibration, signal filtering, data sampling, data measurement and data processing techniques, and reference to any specific measurement, data processing and quality control standards that it deems necessary to fully qualify the measurement process and the techniques to be used therein. This document is hereafter referred to as Deliverable 2.2.1.

**Task 3: Development of novel modelling methodologies**

**Subtask 3.1: State of the art in cruise nvPM modelling**

There is currently no official guidance on how to derive cruise nvPM emissions from LTO (Landing and Take-Off) emission indices, like those existing for NOx, HC or CO emissions (cf. Boeing Fuel Flow Method, DLR method, etc.). With the objective of filling such a gap, this task is to perform a review of the state-of-the-art of the current methodologies for calculation of cruise nvPM. The aim will be to perform an assessment of their inherent strengths and weaknesses as a tool for supporting future global nvPM inventories. Potential gaps and necessary improvements to individual methodologies shall be identified and duly documented. Based on these analyses, recommendation on a preferred "as-is" or upgraded methodology shall be prepared.

**Subtask 3.2: Helicopter noise modelling methodology**

The purpose of this task is to develop a suitable methodology to model noise emissions of helicopter operations. In terms of complexity and sophistication the new approach shall match the techniques used in the current international guidance on aircraft noise modelling (ICAO Doc 9911, ECAC Doc 29).
The proposed interim approach in the Environmental Noise Directive (END) is to handle helicopters as a fixed-wing aircraft. Although this assumption has been considered to be acceptable when used at macroscopic level, it lacks in robustness when applied to the assessment of airport noise or other urban noise. A more robust modelling method, better accounting for the specific noise characteristics of helicopters, is therefore required.

The new helicopter noise modelling methodology shall replicate with a high fidelity the noise of a given helicopter type. It shall be adaptable to take into account a mixed fleet of helicopters, focusing initially on those helicopter types that are representative of typical operations carried out in Europe. The methodology shall account for the required trade-offs between modelling accuracy and data availability, along with appropriate usability criteria enabling its practical application.

The work to be carry out within this task shall take into consideration the outcome and progress of past and current projects or working groups dealing with helicopter noise, including:

- The FP6 FRIENDCOPTER project and more specifically the Helicopter Environmental Noise Analysis (HELENA) model;
- The Clean Sky JTI;
- US/FAA’s Integrated Noise Model (INM7.0) and Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER);
- The ECAC/ANCAT AIRMOD group.

**Task 4: Development of a software prototype for modelling of helicopter noise**

Task 4 will implement the modelling methodology developed in Task 3.2 in a software prototype. The latter shall allow the calculation of noise levels – at least for SEL and LAmx - on a grid of ground points for a given input helicopter 4D trajectory (along with other relevant flight parameters). Any required ancillary components such as databases for data repository and GUI for user interaction and visualisation support are to be included in the development.

The prototype – along with the implemented modelling methodology - will be validated set against both the noise data measurements collected in Task 2.2 and a set of representative test cases using different models or modelling techniques and other relevant experimental data sets, if available.

The development of the software – both in terms of function and form as well as in supporting services such as documentation - shall adhere to recognised best-practice software development standards – e.g. ISO/IEC 12207, PSS-05 (ESA) or equivalent. Appropriate consideration shall be given to both functional and non-functional requirements, with the latter referring to constraints that are to be imposed on the design or implementation - such as performance engineering requirements, quality standards, or design constraints. The coding language shall adhere to the set of standardised languages commonly used in high performance scientific computing (e.g. C++, C-Sharp, FORTRAN 95/2003, Java, etc.).

**Task 5: Recommendations**

Based on a critical analysis of the results of the previous tasks, a roadmap for delivery of an open European environmental modelling toolset shall be prepared as an integrating part of the final report. The former shall include recommendations regarding the whole development cycle from concept-through-to-delivery, notably relating to the development of the toolset components and the architecture concept for their co-operative integration, the governance scheme to underpin public ownership and the business and management models that are to be used to maintain and update this facility and to enable user support both within and outside Europe.
V Management and Coordination

The aim is to ensure an efficient and effective implementation of the work covered by the contract. The contractor shall demonstrate a pro-active attitude towards ensuring appropriate management and coordination of the contract, and shall include in its tender a range of quantitative targets to facilitate an efficient and effective monitoring of the contract's delivery.

The breakdown of resource allocation – notably the effort of research staff – has to be balanced and reflect the scope and complexity of the different tasks. With this in view, the table below provides an indicative weighting of the effort that is expected to be allocated for the performance of the latter.

<table>
<thead>
<tr>
<th>Task #</th>
<th>Effort (% of total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>2</td>
<td>55%</td>
</tr>
<tr>
<td>3</td>
<td>35%</td>
</tr>
<tr>
<td>4</td>
<td>8%</td>
</tr>
<tr>
<td>5</td>
<td>1%</td>
</tr>
</tbody>
</table>

The contractor is expected to follow an integrated management approach, including regular reporting to the Contracting Authority for monitoring purposes. It is essential for the management of the contract to ensure a strong coordination between the different parties within the consortium, between the consortium as a whole, the Contracting Authority and any support network that may be created to assist with the implementation of the contract.

Particular attention shall be given to the management of risks, notably those that might arise from unforeseen events, and to their mitigation. In the project management plan, the contractor shall include a risk management plan, foreseeing perceived risks, estimating impacts and outlining possible mitigation measures. The contractor shall be responsible for the quality control of the outputs of the contract – cf. draft and released deliverables, software tools, contract management aids, working documents - before their final submission to the Contracting Authority.

An outline of the management plan, including quality assurance and risk management, and an indication how it will fulfil these essential requirements shall be included in the tender.

VI Input by the Contracting Authority

The Commission will provide the following set of information to the successful tenderer:

- The MITG list of existing EU aviation environmental models
- The TEAM_Play deliverables (which are publicly accessible)
- The CAEP's needs regarding nvPM data
VII Reporting and Deliverables

VII.1 Reporting

A progress report of the work shall be submitted quarterly to the Contracting Authority from the date of signature of the contract. It shall include for each active task an evaluation of progress, the indication of the resources spent versus those planned (cf. man/days, other resources, on an absolute and percentage basis), the reference to potential work-related issues or risks that had been identified and may impact on the outcome or on the planning of the contract, as well as an indication of new tasks to be started. Each report must equally include an up-to-date version of the risk management register.

A draft final report shall be submitted to the Contracting Authority, at the latest, 22 months after the date of signature of the contract. The draft final report shall include:

- an overview of the work performed, including a critical analysis of the main outcomes;
- the concatenation of D1 to D3 reports (see table below);
- a set of conclusions and recommendations;
- a publishable executive summary of 6 pages maximum; and
- an abstract of no more than 200 words.

The Contracting Authority will have 30 days to provide the contractor with its potential comments on the draft final report. The contractor will have an additional 30 days to implement any additions or corrections evolving from such comments into a final released version of the report.

VII.2 Deliverables

The contractor shall provide the following set of deliverables:

<table>
<thead>
<tr>
<th>Deliverable #</th>
<th>Item Type</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Report</td>
<td>Results of the inventory together with a mapping portraying the current European capability in environmental modelling in aviation, including the identification of gap-filling elements and measures that are deemed necessary towards enabling the creation of a European integrated, open environment modelling toolset.</td>
</tr>
<tr>
<td>D2.1.1</td>
<td>Report</td>
<td>Test preparation for nvPM data collection (Engine 1). Document detailing the test rigs – including the measurement system - that will be used in the performance of this work together with a full description of the relevant test procedures – including aspects such as instrument calibration, signal filtering, data sampling, data measurement and data processing techniques, and reference to any specific measurement, data processing and quality control standards that it deems necessary to fully qualify the measurement process and the techniques to be used therein. Results of the control tests performed jointly by the contractor and EASA.</td>
</tr>
<tr>
<td>D2.1.2</td>
<td>Report</td>
<td>Test preparation for nvPM data collection (Engine 2). Document</td>
</tr>
</tbody>
</table>
detailing the test rigs – including the measurement system - that will be used in the performance of this work together with a full description of the relevant test procedures – including aspects such as instrument calibration, signal filtering, data sampling, data measurement and data processing techniques, and reference to any specific measurement, data processing and quality control standards that it deems necessary to fully qualify the measurement process and the techniques to be used therein. Results of the control tests performed jointly by the contractor and EASA.

D2.1.3 Report The nvPM data collection for the turbofan engine 1, including
- a description of the test campaigns and of their results,
detailed conclusions, the data collected in the table format as defined by ICAO CAEP WG3 PMTG and
- a draft working paper for ICAO CAEP WG3 PMTG on the results of this task

D2.1.4 Report The nvPM data collection for the turbofan engine 2, including
- a description of the test campaigns and of their results,
detailed conclusions, the data collected in the table format as defined by ICAO CAEP WG3 PMTG and
- a draft working paper for ICAO CAEP WG3 PMTG on the results of this task

D2.2.1 Report Preparation of tests for helicopter noise data collection. Document with a full description of the relevant test procedures – including aspects such the measurement chain, instrument calibration, signal filtering, data sampling, data measurement and data processing techniques, and reference to any specific measurement, data processing and quality control standards that it deems necessary to fully qualify the measurement process and the techniques to be used therein.

D2.2.2 Report The helicopter noise data collection
- a set of helicopter noise and performance data (table format)
- a set of helicopter 4D trajectories - along with other relevant flight parameters - and associated noise levels (table format)

D3.1 Report The cruise nvPM modelling report, including a review of the state-of-the-art of the current methods for calculation of cruise nvPM, an assessment of their inherent strengths and weaknesses, and recommendations on a preferred methodology.

D3.2 Report A validated helicopter noise calculation method. This shall consist of a detailed description of the method (scientific basis and assumptions, breadth of applicability, numerical aspects down to the algorithm description level, together with characterisation of the prediction accuracy, robustness and cost-effectiveness of
the numerical model), along with the results of the model validation.

<table>
<thead>
<tr>
<th>D4</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The software prototype of helicopter noise model (the executable(s), the commented source code and the technical documentation (user guide, installation guide, software specification and architecture documents).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Report</th>
<th>Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>- an overview of the work performed, including a critical analysis of the main outcomes;</td>
<td></td>
</tr>
<tr>
<td>- the concatenation of D1 to D3 reports;</td>
<td></td>
</tr>
<tr>
<td>- a publishable executive summary of 6 pages max;</td>
<td></td>
</tr>
<tr>
<td>- a set of conclusions and recommendations; and,</td>
<td></td>
</tr>
<tr>
<td>- an abstract of no more than 200 words.</td>
<td></td>
</tr>
</tbody>
</table>

The final report and the deliverables D1 to D3 must be written in English and provided to the Contracting Authority in five paper copies as well as on a digital support (MS Word doc/docx format).

The datasets in D2 shall be provided in MS Excel format. Deliverable D4 shall include the software code in source format. Any executable libraries required for the use of the software shall be appended in a suitable format to enable further software integration and evolution.

VIII Planning of the Work
The duration of the tasks shall not exceed 24 months. This period is calculated in calendar days.

Execution of the tasks begins after the date on which the contract enters into force.

In principle, the deadlines set out below cannot be extended. The contractor is deemed solely responsible for delays occasioned by subcontractors or other third parties (except for rare cases of force majeure which are to be properly justified). Adequate resources and appropriate organisation of the work including management of potential delays should be put in place and reflected in the work-plan in the form of a GANT chart.

IX Monitoring of the Contract by the Contracting Authority
The monitoring of the contract by the Contracting Authority – that will be represented by an EC Project Manager who is to serve as contact point during the whole duration of the contract - will adhere to the following procedural outline:

A kick off meeting will take place in Brussels at the latest 10 working days following the date of signature of the contract, in order to settle any outstanding detail regarding the scope of the services to be provided, including the reports to be delivered.

Specific technical meetings shall be organised to define the procedure for checking the conformity/compliance of the nvPM measurement system(s) and any detailed outstanding issues of the data collection method.

A review meeting will take place in Brussels at least 10 working days prior to the date scheduled for the formal submission of each individual deliverable. The meeting will aim at the presentation and discussion of the main results included therein. The venue may be changed, by common agreement between the contractor and the EC Project Manager, to any other location judged most suitable to fit the purpose of the presentation of the work results.
Teleconferences shall be organised as deemed necessary by the EC Project Manager or the contractor to address specific issues of the contract.

Following the submission of the draft final report, a final review meeting will be organised in Brussels to discuss potential comments and observations from the Contracting Authority. The timing for this meeting will be jointly agreed between the EC Project Manager and the contractor.

X Planning of the Deliverables
The interim and final deliverables shall be provided according to the following planning, which is synchronised with the interim payments.

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Deliverable #</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6</td>
<td>D1: design of a publicly accessible aviation environmental tool suite report.</td>
</tr>
<tr>
<td></td>
<td>D3.1: The cruise nvPM modelling report.</td>
</tr>
<tr>
<td>M15</td>
<td>D2.1.1: Test preparation for nvPM data collection (Engine 1)</td>
</tr>
<tr>
<td></td>
<td>D2.1.3: The nvPM data collection report for the turbofan engine 1.</td>
</tr>
<tr>
<td></td>
<td>D2.2.1: Preparation of tests for helicopter noise data collection.</td>
</tr>
</tbody>
</table>
|          | D2.2.2 interim: The helicopter noise data collection report  
|          | • 2 sets of significantly different helicopter noise data for validation of the prediction model. |
|          | D3.2 interim: A validated helicopter noise calculation method  
|          | • Detailed helicopter noise calculation method description (first version - not validated). |
| M22      | D2.1.2: Test preparation for nvPM data collection (Engine 2). |
|          | D2.1.4: The nvPM data collection report for the turbofan engine 2. |
|          | D2.2.2 final: The helicopter noise data collection report  
|          | • Full deliverable. |
|          | D3.2 final: A validated helicopter noise calculation method  
|          | • Full deliverable. |
|          | D4: The software prototype of helicopter noise model. |
|          | Draft final report. |
| M24      | Final report. |
The contractor shall submit the final report to the Commission, at the latest, 24 months after the signature of the contract.

XI Intellectual Property Rights
Any results or rights, including copyright and other intellectual or industrial property rights, obtained in performance of the contract, shall be owned solely by the Union.

The tenderer must ensure that the services to be provided are not subject to any restrictions deriving from intellectual property rights of third parties.

XII Place of Work
The work shall be performed on the contractor’s premises, with exception of the engine tests for which access to manufacturer’s facilities must have been obtained by the tenderer.

XIII Performance and Quality Requirements
The tasks shall be performed in accordance to the planning included herein and shall meet all requirements in terms of content, quality and adherence to relevant standards as specified under each individual task.

CONTENT, STRUCTURE AND GRAPHIC REQUIREMENTS OF THE FINAL DELIVERABLES

All studies produced for the European Commission and Executive Agencies shall conform to the corporate visual identity of the European Commission by applying the graphic rules set out in the European Commission's Visual Identity Manual, including its logo.

The Commission is committed to making online information as accessible as possible to the largest possible number of users including those with visual, auditory, cognitive or physical disabilities, and those not having the latest technologies. The Commission supports the Web Content Accessibility Guidelines 2.0 of the W3C.

For full details on Commission policy on accessibility for information providers, see: http://ec.europa.eu/ipg/standards/accessibility/index_en.htm

Pdf versions of studies destined for online publication should respect W3C guidelines for accessible pdf documents. See: http://www.w3.org/WAI/

4.1. Content

All reports shall be drafted in English and be proof-read by a native speaker or someone with equivalent skills.

4.1.1. Final report

The final report shall include:

- an overview of the work performed, including a critical analysis of the main outcomes;
- a concatenation of the released D1, D2 and D3 reports;

2 The Visual Identity Manual of the European Commission is available upon request. Requests should be made to the following e-mail address: comm-visual-identity@ec.europa.eu
- a publishable executive summary (6 pages maximum);
- a list of conclusions and recommendations; and
- an abstract of no more than 200 words.

In addition, the report shall include the following standard disclaimer:

“The information and views set out in this [report/study/article/publication…] are those of the author(s) and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this study. Neither the Commission nor any person acting on the Commission’s behalf may be held responsible for the use which may be made of the information contained therein.”

as well as specific identifiers on the cover page that will be provided by the Contracting Authority.

The tenderer must ensure that the results of the services provided are not subject to any restrictions deriving from intellectual property rights of third parties.

1. ANNEXES

   1. Tenderer’s Identification Form
   2. Declaration related to the exclusion criteria and absence of conflict of interest
   3. Power of Attorney (mandate in case of joint tender)
ANNEX 1

IDENTIFICATION OF THE TENDERER

(Each service provider, including any member of a consortium or grouping and subcontractor(s) whose share of the work is more than 20% of the contract must complete and sign this identification form)

Call for tender MOVE/C2/2014-269

<table>
<thead>
<tr>
<th>Identity</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Name of the tenderer</td>
<td></td>
</tr>
<tr>
<td>Legal status of the tenderer</td>
<td></td>
</tr>
<tr>
<td>Date of registration</td>
<td></td>
</tr>
<tr>
<td>Country of registration</td>
<td></td>
</tr>
<tr>
<td>Registration number</td>
<td></td>
</tr>
<tr>
<td>VAT number</td>
<td></td>
</tr>
<tr>
<td>Description of statutory social security cover (at the level of the Member State of origin) and non-statutory cover (supplementary professional indemnity insurance)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of registered office of tenderer</td>
<td></td>
</tr>
<tr>
<td>Where appropriate, administrative address of tenderer for the purposes of this invitation to tender</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact Person</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Surname:</td>
<td></td>
</tr>
<tr>
<td>First name:</td>
<td></td>
</tr>
<tr>
<td>Title (e.g. Dr, Mr, Ms):</td>
<td></td>
</tr>
<tr>
<td>Position (e.g. manager):</td>
<td></td>
</tr>
<tr>
<td>Telephone number:</td>
<td></td>
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<tr>
<td>Fax number:</td>
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</table>

3 For natural persons
<table>
<thead>
<tr>
<th>E-mail address:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal Representatives</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Names and function of legal representatives</strong> and of other representatives of the tenderer who are authorised to sign contracts with third parties</td>
<td></td>
</tr>
<tr>
<td><strong>Declaration by an authorised representative of the organisation</strong></td>
<td></td>
</tr>
<tr>
<td>I, the undersigned, certify that the information given in this tender is correct and that the tender is valid.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surname:</th>
<th>First name:</th>
<th>Signature:</th>
</tr>
</thead>
</table>

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4 This person must be included in the list of legal representatives; otherwise the signature on the tender will be invalidated.
ANNEX 2

Declaration of honour on exclusion criteria and absence of conflict of interest

(Complete or delete the parts in grey italics in parenthese)
[Choose options for parts in grey between square brackets]

The undersigned (insert name of the signatory of this form):

☐ in [his][her] own name (for a natural person)

or

☐ representing the following legal person: (only if the economic operator is a legal person)

full official name:

official legal form:

full official address:

VAT registration number:

➢ declares that [the above-mentioned legal person][he][she] is not in one of the following situations:

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

b) has been convicted of an offence concerning professional conduct by a judgment of a competent authority of a Member State which has the force of res judicata;

c) has been guilty of grave professional misconduct proven by any means which the contracting authorities can justify including by decisions of the European Investment Bank and international organisations;

d) is not in compliance with all its obligations relating to the payment of social security contributions and the payment of taxes in accordance with the legal provisions of the country in which it is established, with those of the country of the contracting authority and those of the country where the contract is to be performed;

e) has been the subject of a judgement which has the force of res judicata for fraud, corruption, involvement in a criminal organisation, money laundering or any other illegal activity, where such activity is detrimental to the Union's financial interests;

f) is a subject of an administrative penalty for being guilty of misrepresentation in supplying the information required by the contracting authority as a condition of participation in a procurement procedure or failing to supply this information, or having been declared to be in serious breach of its obligations under contracts covered by the Union's budget.

➢ (Only for legal persons other than Member States and local authorities, otherwise delete)

declares that the natural persons with power of representation, decision-making or control over the above-mentioned legal entity are not in the situations referred to in b) and e) above;

➢ declares that [the above-mentioned legal person][he][she]:

5 This covers the company directors, members of the management or supervisory bodies, and cases where one natural person holds a majority of shares.
g) has no 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 affinity, family, emotional life or any other shared interest;

h) will inform the contracting authority, without delay, of any situation considered a conflict of interest or which could give rise to a conflict of interest;

i) has not granted and will not grant, has not sought and will not seek, has not attempted and will not attempt to obtain, and has not accepted and will not accept any advantage, financial or in kind, to or from any party whatsoever, where such advantage constitutes an illegal practice or involves corruption, either directly or indirectly, inasmuch as it is an incentive or reward relating to award of the contract;

j) provided accurate, sincere and complete information to the contracting authority within the context of this procurement procedure;

- acknowledges that [the above-mentioned legal person][he][she] may be subject to administrative and financial penalties^6 if any of the declarations or information provided prove to be false.

In case of award of contract, the following evidence shall be provided upon request and within the time limit set by the contracting authority:

For situations described in (a), (b) and (e), production of a recent extract from the judicial record is required or, failing that, a recent equivalent document issued by a judicial or administrative authority in the country of origin or provenance showing that those requirements are satisfied. Where the tenderer is a legal person and the national legislation of the country in which the tenderer is established does not allow the provision of such documents for legal persons, the documents should be provided for natural persons, such as the company directors or any person with powers of representation, decision making or control in relation to the tenderer.

For the situation described in point (d) above, recent certificates or letters issued by the competent authorities of the State concerned are required. These documents must provide evidence covering all taxes and social security contributions for which the tenderer is liable, including for example, VAT, income tax (natural persons only), company tax (legal persons only) and social security contributions.

For any of the situations (a), (b), (d) or (e), where any document described in two paragraphs above is not 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.

If the tenderer is a legal person, information on the natural persons with power of representation, decision making or control over the legal person shall be provided only upon request by the contracting authority.

Full name                      Date                      Signature

ANNEX 3

POWER OF ATTORNEY

mandating one of the partners in a joint tender as lead partner and lead contractor

The undersigned:
- Signatory (Name, Function, Company, Registered address, VAT Number)

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

HEREBY AGREES TO THE FOLLOWING:

1) To submit a tender as a partner in the group of partners constituted by Company 1, Company 2, Company N, and led by Company X, in accordance with the conditions specified in the tender specifications and the terms specified in the tender to which this power of attorney is attached.

2) If the European Commission awards the Contract to the group of partners constituted by Company 1, Company 2, Company N, and led by Company X on the basis of the joint tender to which this power of attorney is attached, all the partners shall be co-signatories of the Contract in accordance with the following conditions:
   (a) All partners shall be jointly and severally liable towards the European Commission for the performance of the Contract.
   (b) All partners shall comply with the terms and conditions of the Contract and ensure the proper delivery of their respective share of the services and/or supplies subject to the Contract.

1) Payments by the European Commission related to the services and/or supplies subject to the Contract shall be made through the lead partner’s bank account: [Provide details on bank, address, account number].

2) The partners grant to the lead partner all the necessary powers to act on their behalf in the submission of the tender and conclusion of the Contract, including:
   (a) The lead partner shall submit the tender on behalf of the group of partners.
   (b) The lead partner shall sign any contractual documents — including the Contract, and Amendments thereto — and issue any invoices related to the Services on behalf of the group of partners.
   (c) The lead partner shall act as a single contact point with the European Commission in the delivery of the services and/or supplies subject to the Contract. It shall co-ordinate the delivery of the services and/or supplies by the group of partners to the European Commission, and shall see to a proper administration of the Contract.

Any modification to the present power of attorney shall be subject to the European Commission’s express approval. This power of attorney shall expire when all the contractual obligations of the group of partners towards the European Commission for the delivery of the services and/or supplies subject to the Contract have ceased to exist. The parties cannot terminate it before that date without the Commission’s consent.

Signed in …………………………… on [dd/mm/yyyy]

Place and date:

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

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7 To be filled in and signed by each of the partners in a joint tender, except the lead partner;