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# BACKGROUND INFORMATION

## Partner country

Republic of North Macedonia

## Contracting authority

Faculty of Mechanical Engineering of Ss Cyril and Methodius University in Skopje,

Republic of North Macedonia

## Country background

North Macedonia is a candidate country for EU membership expecting commencement of membership negotiations. The negotiation process of the Republic of North Macedonia for EU membership will signify completion of the approximation process to the European Union, adoption of its benefits and values as well as complete adaptation of the Macedonian institutions towards functioning to that of the Union institutions. The negotiations will also signify establishing grounds and preparation for a successful functioning of the Republic of North Macedonia as a Union Member State.

The IPA Cross-Border Cooperation Programme Greece - Republic of North Macedonia (hereinafter: CBC Programme) was adopted for the Programming Period 2014-2020 and intends to ensure a better co-ordination of programmes and activities among Greece as a Member State and the Republic of North Macedonia as a neighbouring candidate country. Its global objective is to promote and protect the environmental resources of the area. The programme has two priorities, and the second one is the enhance the environmental resources and cultural heritage of the programme area. The main objective of the project are minimization of traffic accidents, improving safe border crossing, promoting energy efficiency towards green transport and pollution with hazardous materials as a part of European Union and the national energy targets for 2020 and contribute to the global effort to confront the climate change.

## Current situation in the sector

The core idea of the project came about after major concerns of the international community and mainly the European one on dirty bomb creation (which combines radioactive material with conventional explosives) by terrorist groups. This has become more prominent after horrific attacks in Brussels and reports revealing that terrorists have been working to acquire radioactive materials to create so-called dirty bomb. These radioactive materials are mainly orphan sources. That means a radioactive source which has been abandoned, lost, misplaced, stolen or otherwise transferred without regulatory control.

The Republic of Greece has installed radiation portal monitors since 2004 in the borders with in order to prevent such kind of actions while The Republic of North Macedonia on the other side has portable radiation detectors.

Problems arise due to lack of collaboration between both countries and the result is delay of cargos and in some cases of people in the cross-border area. It is well known that one of the main problems in transportations is the trafficking of radioactive materials, especially illicit trafficking and ways of detection and localization of radioactive sources. Several efforts have been done to improve the safety and security of transportation of radioactive and other hazardous materials that may pose a significant risk to individuals, society and the environment. Despite these efforts several incidents are being observed annually, especially during the transboundary movement of goods.

There are many different scenarios concerning movement of hazardous materials.

The most dangerous scenario is the illicit trafficking of these materials. This includes both the willful illegal movement of radioactive-hazardous materials across international borders and the accidental ones, where transporters are unaware of what they are carrying. In this case the discovery of these materials from the authorities is critical in order to prevent more dangerous situations like the building of a “dirty bomb” by terrorist groups.

The second scenario has to do with the legal movement of the above materials. In this case the risk of an accident and the consequent radiological pollution or the radioactive exposure of the individuals involved in the accident is essential and critical to be estimated and handled.

The project is relevant to the programme area as it deals with safe border crossing and improvement-upgrade of existing infrastructure for radiation detection in Greece-North Macedonia border area. It will improve the communication and the joint actions between the two countries, especially on emergency response actions. Common actions will be taken and this will speed the control in cross border area.

## Related programmes and other donor activities

The Council of the European Union, in a recent Council Directive 2011/70/EURATOM tries to establish a Community framework for the responsible and safe management of spent fuel and radioactive waste like orphan sources the current project deals with.

Moreover, EU and IAEA implement Joint actions, inter alia, about radiation portal monitors, security and safety of transportation of radioactive materials since 2005. The three interested areas are (i) States’ legislative and regulatory infrastructure related to nuclear and other radioactive material to enable the country to fulfil its national and international obligations; (ii) Nuclear security measures for nuclear and other radioactive material in use, storage and transport and their related facilities; (iii) States’ capabilities for dealing with nuclear and radioactive material out of control of national regulatory control.

# OBJECTIVE, PURPOSE & EXPECTED RESULTS

## Overall objective

The project deals with green transportation and one of the challenges is to minimize any risks of accidents and pollution with hazardous materials. Non-experts in the radiological field, such as front line officers, will be familiarized with radiation detection, radiation hazards, and measuring and relaying technical information obtained from instruments for subsequent analysis by the scientific experts. This complexity and the need for optimized use of radiation measurement equipment obviously call for thorough training of the front line officer and the other competent authorities relative to their roles in the State’s national nuclear security plan.

The overall objectives of the project of which this contract will be a part are as follows:

a) Discovery and identification of radioactive materials.

b) Location of dangerous points of the roadway and vehicles’ condition.

c) Investigation of radiological risk after a traffic accident.

d) Establishment of common emergency response protocols for both countries

e) Training of the stakeholders customs; border police; drivers; engineers etc

## Purpose

The purposes of this contract are to carry out the specific activities to assist the project implementation on quality control of the computational Grid for data analysis of radiological measurement and simulations, promotion of the results on identification vulnerable areas for traffic accident, creating risk-combined study with measurement to minimize traffic accident.

## Results to be achieved by the contractor

The main results to be achieved under this Contract are:

* Report on the quality control of the computational Grid;
* Report for identified vulnerable areas for traffic accident (vulnerability analysis);
* Report for recommendation to minimize traffic accident (risk analysis);

# ASSUMPTIONS & RISKS

## Assumptions underlying the project

The project STRASS was designed by partners that have a long history of collaboration, namely ATEI, EEAE and AUTH on radiological measurements and simulation, ATEI and Faculty of Mechanical Engineering (MF) on accident risk estimation whilst PRD has experience on pollution dispersion and emergency response.

The following assumptions can be made in order to reduce the risks related to delay or non-realization of the activities, subject to this Terms of Reference:

* Full cooperation between the Contracting Authority and the Contractor in view to fulfil the tasks on time, in quality required and within the budget limitation;
* Strong collaboration and knowledge exchange between project partners;
* The Contracting Authority will ensure timely and complete access to the relevant documents, other information and staff related to projects;
* Clear understanding of the contract purpose and tasks on behalf of the Contractor;

## Risks

The following risks can be foreseen for this contract:

* Eventual changes to the work plan and/or disruption of information flow between project partners;

# SCOPE OF THE WORK

## General

### Description of the assignment

### The scope of the contract can be described by the foreseen activities of the contractors:

* Preform massive-scale and complex computing to ensure quality control of the computational Grid;
* Certain dangerous points of the roadway should be located. These are points where car/vehicles accidents are most probable due to various reasons, like land sliding, weather conditions, road condition, vehicle condition etc. Vehicles used to transport dangerous or hazardous goods should be considered. Safe Vehicles Conditions (SVC) of the transported trucks (TIR) should be identify;
* Estimate traffic accident risk causing a radiological incident. Different types of traffic accidents should be considered like fire, split of liquid radioactive source etc and estimations about the pollution, dispersion and exposure of people involved in the accident should be performed;
* Estimate radiological risks and perform dose rate calculations;
* Estimate probable pollution of the environment;
* Suggestions on how to handle all these situations minimizing the risks for people involved;

### Geographical area to be covered

### Republic North Macedonia and Republic of Greece.

### Target groups

The main groups targeted by the project activities are: Customs; border police; drivers; active citizens aware of hazardous materials transportations and health risks; public health advocacy groups; local communities that will be protected from dispersion of pollution after an accident and finally engineers involved in all stages of transportation.

## Specific work

The following tasks should be undertaken in order to achieve the contract results:

Task 1 (defined as deliverable D3.5.2 in the project)

• quality control of the computational grid;

Task 2 (defined as deliverable D4.5.2 in the project)

• to identify differing road network vulnerability;

• to depict points in the cross-border area vulnerable for accident;

• to propose practises that will minimize accident risks;

Task 3 (defined as deliverable D4.5.3 in the project)

• to estimate accident risks of hazardous load using set of triples *s* (scenario), *p* (probability) and *c* (consequences);

• to propose practises like defensive driving that will minimize accident risks;

* to establish recommendation to minimize traffic accident and pollution with hazardous materials;

**Note:** The areas targeted by the contract activities are the E-75 roadway from Thessaloniki in Greece till Veles in North Macedonia. Focus will be given on the border area where radiation portal monitors are installed and radiation checks are being performed by both countries.

## Project management

### Responsible body

The effective management of the project will be ensured by the Contracting Authority. The project manager Prof. Dame Dimitrovski will be in charge for the overall coordination.

The Contractor is fully responsible for the quality and timely delivery of the project results, according to the contractual provisions. In this sense, the Contractor shall ensure that the reports are delivered in time and the executed activities are in line with the ToR and the regulatory framework requirements.

### Management structure

The Contracting Authority is responsible for conducting the current tender procedure, signing the service contract and carrying out the overall management and control on the contract implementation. The Contractor is fully responsible for the quality and timely delivery of the contract results. In this respect, the Contractor shall ensure that the reports are delivered on time and the executed activities are in line with the current Terms of Reference and the regulatory framework requirements.

### Facilities to be provided by the contracting authority and/or other parties

The Contractor should ensure the equipment and the provision of working space needed to fulfil the services assigned to it. No facilities or equipment will be provided by the Contracting Authority.

# LOGISTICS AND TIMING

## Location

Faculty of Mechanical Engineering Skopje, The Republic of North Macedonia

## Start date & period of implementation of tasks

The intended start date is the date of sighing the Contract and the period of implementation of the contract will be until 15th of July 2021. Please see Articles 19.1 and 19.2 of the special conditions for the actual start date and period of implementation.

The successful contractor should ensure and monitor the website is accessible for at least 3 years after closing of the project.

# REQUIREMENTS

## Staff

Note that civil servants and other staff of the public administration of the partner country, or of international/regional organisations based in the country, shall only be approved to work as experts if well justified. The justification should be submitted with the tender and shall include information on the added value the expert will bring as well as proof that the expert is seconded or on personal leave.

### Key experts

Key experts are foreseen and defined and they must submit CVs and signed Statements of Exclusivity and Availability.

All experts who have a crucial role in implementing the contract are referred to as key experts. The profiles of the key experts for this contract are as follows:

Qualifications and skills

• Preferable to hold a PhD in technical sciences (mechanical engineering)

• Fluent in Macedonian and English language

General professional experience

• Minimum 12 years of professional experience in the field of mechanical engineering, advantage will have candidates with more than that.

Specific professional experience

In order to be able to realize tasks 1-3, the candidate(s) has to have a demonstrated expertise in all of the areas of interest of this tender. The candidate has to have an experience as a team leader or a key expert in minimum 5 national/international projects. The candidate has published at least 10 publications in the field of interest of this tender.

All experts must be independent and free from conflicts of interest in the responsibilities they take on.

### Other experts, support staff & backstopping

## No other experts are foreseen

## Office accommodation

Office accommodation for each staff working on the contract is to be provided by The Contractor.

## Facilities to be provided by the contractor

The contractor shall ensure that experts are adequately supported and equipped. In particular it must ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities. It must also transfer funds as necessary to support their work under the contract and to ensure that its employees are paid regularly and in a timely fashion.

## Equipment

**No** equipment is to be purchased on behalf of the contracting authority / partner country as part of this service contract or transferred to the contracting authority / partner country at the end of this contract. Any equipment related to this contract which is to be acquired by the partner country must be purchased by means of a separate supply tender procedure.

# REPORTS

## Reporting requirements

The Contractor will submit the following reports in English language:

* **Draft final report** shall be submitted no later than 5 days after the end of the period of implementation of each Task.
* **Final report** with the same specifications as each draft final report, incorporating any comments received from the parties on the draft report. The deadline for sending the final report is 5 days after receipt of comments on the draft final report. This report should provide conclusions and clear evidences on the implementation of all requested services. The final report must be provided along with the corresponding invoice.

The reports provided by the Contractor should be prepared in English language and submitted in the following copies:

* 1 (one) electronic version.

## Submission and approval of reports

The report referred to above must be submitted to the project manager identified in the contract. The project manager is responsible for approving the reports.

# MONITORING AND EVALUATION

## Definition of indicators

The successful implementation of the contract will be assessed on the base of the following indicators of achievement:

• Reports submitted by the Contractor and approved by the Contracting Authority according the timetable given below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Task No. / Deliverable No.** | **Start/Finish date** | **Report/date and activities** | **Max budget in Euro** |
| Task 1 / D3.5.2 | April 2021 / July 2021 | Not later than 1th of July 2021 | 3.000,00 |
| Task 2 / D4.5.1 | April 2020 / July 2020 | Not later than 1th of July 2021 | 4.000,00 |
| Task 3 /D4.5.3 | April 2020 / July 2020 | Not later than 1th of July 2021 | 4.500,00 |

## Special requirements

Not applicable.