



2nd CALL FOR PROPOSALS

OPERA-PG-COV013

OPERA-PG-COV013
Ewoud Verhoef, Erika Neeft
11-May-12
COVRA N.V.

Contents

Second call for proposals	1
OPERA	1
Objective	1
Research topics	1
Proposals and selection (Assessment procedure)	1
How to submit?	2
The budget and deadlines	2
Evaluation criteria	3
Work package 1.....	4
WP1.2. Political requirement and societal expectations	4
Work package 2.....	5
WP2.2 Repository design in rock salt	5
Work package 4.....	6
WP4.1 Geology and geohydrological behaviour of the geosphere.....	6
WP4.2 Geohydrological boundary conditions for the near-field.....	6
Work package 5.....	7
WP5.1. Geochemical behaviour of EBS	7
WP5.2 Properties, evolution and interactions of Boom Clay.....	7
Work package 6.....	8
WP6.1 Radionuclide migration in Boom Clay	8
WP6.2. Radionuclide migration in the rock formations surrounding the host rock.....	8
WP6.3. Radionuclide migration and uptake in the biosphere.....	8
Work package 7.....	9
WP7.2 Performance Assessment model development and parameterization	9

Second call for proposals

OPERA

Radioactive substances and ionizing radiation are used in medicine, industry, agriculture, research, education and electricity production. This generates radioactive waste. In the Netherlands, this waste is collected, treated and stored by COVRA (Centrale Organisatie Voor Radioactief Afval). After interim storage for a period of at least 100 years radioactive waste is intended for disposal. There is a world-wide scientific and technical consensus that geological disposal represents the safest long-term option for radioactive waste.

Geological disposal is emplacement of radioactive waste in deep underground formations. The goal of geological disposal is long-term isolation of radioactive waste from our living environment in order to avoid exposure of future generations to ionising radiation from the waste. OPERA (OnderzoeksProgramma Eindberging Radioactief Afval) is the Dutch research programme on geological disposal of radioactive waste and will be running for five years.

Objective

The programme has a primary aim to develop initial, conditional safety cases for repositories in Zechstein rocksalt and Boom Clay formations. A safety case is a collection of arguments in support of the long-term safety of a repository. A safety case comprises the findings of a safety assessment at a given stage of repository development, and a statement of confidence in these findings. It should also acknowledge the existence of any unresolved issues and provide guidance for work to resolve these issues in future development stages.

Research topics

As for disposal in salt formations more information is available, the focus of the research will be mostly on disposal in clay formations. The research topics are described in the OPERA Research Plan, OPERA-PG-COV004. The tasks described in the plan reflect the components in the initial, conditional safety case. Starting point for execution of the tasks is the use of existing national and international literature and transfer of the information to the generic repository in the Netherlands. Only where necessary, literature survey and comparison should be complemented by experimental research. The research is divided into seven work packages composed of several self-sustained tasks. Descriptions of the research topics for this call are listed below.

Proposals and selection (Assessment procedure)

Only completed applications forms will be assessed by the OPERA Programme Directorate. Assessment procedure starts after confirmation of correct submission of the proposal.

The OPERA Programme Directorate can decide to consult one or more independent experts. For the first call, these experts were, amongst others, Neil Chapman and Charles McCombie from MCM Consulting. Advice from these experts will also be used for the assessment of research proposals for this call.

OPERA Programme Directorate recommends that applicants anticipate the evaluation criteria in the research proposal. In the assessment of proposals, cooperation is an important criterion. Preferably, where possible, existing knowledge from the Belgian research programme should be used in the proposals and where needed, translated to the Dutch situation. Additional research should aim to complement or develop the available knowledge. Subcontracting is allowed to cover the execution of a limited part of the proposed work in the research proposal, whereby "limited" means a part less than 25% of

the work to be performed by the respective organisation that wishes to subcontract part of its work. It should be indicated why it has been chosen to subcontract this work in the proposal.

The directorate aims to make a decision on granting, partly granting or rejecting the proposal within 10-12 weeks after the submission deadline. A detailed explanation of this decision will be provided. After granting of a proposal, the OPERA programme directorate may ask for clarifications and revision of the proposal. Acceptance of the research proposal takes place by undersigning project contracts between COVRA N.V. and the organisation(s) performing the research.

How to submit?

Research proposals for one or more of the tasks listed for this call can be submitted using the application form. These tasks are a selection from the OPERA Research Plan. For management of tasks in this call, it is advised to limit the amount of tasks to a single work package in the OPERA Research Plan. The application form can be downloaded at <http://www.covra.nl/infocentre/opera-info>. Here also more information on the research programme can be found including the research plan.

The completed application form should (in .pdf as well as .doc format) be directed to ewoud.verhoef@covra.nl with a carbon copy to erika.neeft@covra.nl with "OPERA - research proposal second call" in the subject of your e-mail. A printed version of the completed application form should be send to:

Ewoud Verhoef
Subject OPERA - Research proposal
P.O. Box 202
4380 AE Vlissingen

The budget and deadlines

For this call, a research budget of € 3.6 million is available. This budget is expected to be paid in years since several tasks have an expected duration of more than one year. The expected duration and an indication of project costs that can be requested from OPERA are given per topic below. Depending on the provided arguments, deviation of this indication is allowed. Especially for research performed in the seventh EU framework program, additional budget is reserved within OPERA^A. An invitation for submitting research proposals for the optional tasks in this Research Plan and/or yet undefined tasks but appear to be necessary for the Safety Case may be planned after two years.

Date of publication: 15 May 2012

Deadline of submission: 15 July 2012

Annual Budget for research: 1.5 million Euros;

Financed by: Dutch electricity producing company (EPZ)
Dutch Ministry of Economic affairs, Agriculture and Innovation (EL&I)

Allocated by: Central Organisation for Radioactive Waste (COVRA)

Period: 2011-2016

^A As indicated in the OPERA Meerjarenplan, a financial contribution for research projects performed in the Euratom framework programme is possible. A total budget of 1 million Euros is foreseen to co-finance research which potential outcomes can be used to assess the long-term safety of a repository for radioactive waste in the Netherlands. As OPERA runs until 7 July 2016, it is strongly advised to submit such proposals at least one year before this date.

Evaluation criteria

The resources should provide confidence that the proposed research can be realized and that the proposed budget can be financed by means of advances. Criteria that are evaluated are:

- supplied financial data & personnel statistics
- quality of the consortium / research group as a whole (including complementarity, balance (staff/expertise) and equipment
- the positioning of this proposal
 - in terms of ongoing initiatives
 - in terms of knowledge dissemination

The available mark for evaluating the resources ranges from 0 to 5.

The research proposal should provide confidence that the proposed research and budget are necessary. Additionally, it should provide confidence that the proposed research will be executed in time, will be excellently performed and that the resulting reports can be (partly) read by an audience from multiple disciplines. Criteria that are evaluated are:

- description of the available knowledge
- soundness of concept, suggested methods and techniques and quality of objectives
- appropriateness of management structure and procedures
- appropriateness of the allocation and justification of the resources to be committed (staff, equipment)
- description of the proposed contribution to the OPERA Safety Case
- use of language in the summaries

The available mark for evaluating the quality of the proposal ranges from 0 to 10.

In case several research proposals are filled in for the same task(s), the research proposal with the highest score in marks becomes the preferred option of the OPERA Programme Directorate. The proposed contribution to the OPERA Safety Case will be a key criterion for the evaluation.

Work package 1

In work package 1, Safety case context, six tasks are defined. In this work package, the principles and boundary conditions for the safety case are determined. These principles and boundary conditions are determined by the inventory of waste, the political conditions, legal demands and societal expectations concerning the reference values (that are the assessment criteria for comparison with the calculated safety and performance indicators) as well as the involvement of stakeholders. A political condition for disposal of radioactive waste is for example its retrievability. How outcomes of the safety case can effectively be communicated to stakeholders and the public is also investigated in this work package. In this call, applicants are invited to send a research proposal containing the following task in this work package.

WP1.2. Political requirement and societal expectations

Task 1.2.3 Retrievability and staged closure in the OPERA Research Plan

Expected duration: 3 years

Indication of the required budget: 150000 euro

Boundary condition: the proposal should contain recommendations for the institutional control of the prolonged retrievability of the waste, include international comparison and be consistent with Dutch policy. The most recent description of radioactive waste policy can be found in the 4th National report of the Netherlands published in September 2011. In this report, it is described how the Netherlands meet the obligations of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste management.

Work package 2

In work package 2, Safety Case, three tasks are defined. This work package constitutes the framework of the research within OPERA. In this call, applicants are invited to send a research proposal containing one or two of the following two tasks.

WP2.2 Repository design in rock salt

Task 2.2.1. Evaluation of current knowledge for building the Safety Case in the OPERA
Research plan

Expected duration: 3 years

Indication of the required budget: 100000 Euros

Work package 4

In work package 4, Geology and geohydrology, four tasks are defined. Possible evolutions of relevant geological and geohydrological properties in the host formation (Boom Clay) and aquifers surrounding the host formation are described. Also geological, geomechanical and geohydrological boundary conditions for the use of Boom Clay for hosting radioactive waste are described. In this call, applicants are invited to send a research proposal containing one or two tasks in this work package.

WP4.1 Geology and geohydrological behaviour of the geosphere

Task 4.1.2 Future evolution of the geological and geohydrological properties of the geosphere in the OPERA research plan

Expected duration: 2 years

Indication of the required budget: 100000 Euros

WP4.2 Geohydrological boundary conditions for the near-field

Task 4.2.1 Definition of the boundary conditions for the near-field model in the OPERA research plan

Expected duration: 2 years

Indication of the required budget: 150000 Euros

Work package 5

In work package 5, Geochemistry and geomechanics, eight tasks are defined. All aspects related to the natural evolution of the host rock Boom Clay and potential interactions of this host rock with the materials introduced to it are investigated. In this call, applicants are invited to send a research proposal containing one up to all seven tasks in this work package.

WP5.1 Geochemical behaviour of EBS

Task 5.1.1 HLW waste matrix corrosion processes in the OPERA research plan

Expected duration: 3 years

Indication of the required budget: 75000 Euros

Task 5.1.2 LLW/ILW degradation processes and products in the OPERA research plan

Expected duration: 3 years

Indication of the required budget: 125000 Euros

Task 5.1.3 Metal corrosion processes in the OPERA research plan

Expected duration: 2 years

Indication of the required budget: 75000 Euros

Task 5.1.4 Cementitious material degradation in the OPERA research plan

Expected duration: 2 years

Indication of the required budget: 75000 Euros

(Task 5.1.5 Microbiological effects on the EBS and Boom Clay in the OPERA research plan)

Expected duration: 2 years

Indication of the required budget: 75000 Euros

WP5.2 Properties, evolution and interactions of Boom Clay

Task 5.2.2 Geochemical interactions in Boom Clay in the OPERA research plan

Expected duration: 3 years

Indication of the required budget: 250000 Euros

Task 5.2.3 Geomechanical properties and thermo-hydro-mechanical evolution of Boom Clay in the OPERA research plan

Expected duration: 3.5 years

Indication of the required budget: 350000 Euros

Boundary condition: the (argumentation for the method to obtain) geomechanical properties that are representative for a repository in the Netherlands should explicitly be taken into account.

Work package 6

In work package 6, Migration of radionuclides, nine tasks are defined. Relevant processes with which the migration of radionuclides can be described from the host formation (Boom Clay) to the geosphere (containing aquifers) and reaching the biosphere via the geosphere are investigated in this work package. In this call, applicants are invited to send a research proposal containing the containing one up to all eight tasks in this work package.

WP6.1 Radionuclide migration in Boom Clay

Task 6.1.2 Modelling of sorption processes in the OPERA research plan

Expected duration: 3 years

Indication of the required budget: 150000 Euros

Task 6.1.3 Modelling of diffusion processes in the OPERA research plan

Expected duration: 2 years

Indication of the required budget: 150000 Euros

Task 6.1.4 Mobility and presence of colloid particles in the OPERA research plan

Expected duration: 3 years

Indication of the required budget: 150000 Euros

Task 6.1.5 Non-diffusion related transport processes of solutes in Boom Clay in the OPERA research plan

Expected duration: 2 years

Indication of the required budget: 100000 Euros

Task 6.1.6 Gas migration in the EBS and in Boom Clay in the OPERA research plan

Expected duration: 3 years

Indication of the required budget: 200000 Euros

Suggestion: usage of information provided by the seventh EURATOM framework project Fate or Repository Gases (FORGE); available at www.forgeproject.org

WP6.2. Radionuclide migration in the rock formations surrounding the host rock

Task 6.2.1 Modelling approach for hydraulic transport processes in the OPERA research plan

Expected duration: 2 years

Indication of the required budget: 100000 Euros

Task 6.2.2 Modelling for radionuclide migration in the OPERA research plan

Expected duration: 3 years

Indication of the required budget: 100000 Euros

WP6.3. Radionuclide migration and uptake in the biosphere

Task 6.3.1 Modelling approach for transport & uptake processes in the OPERA research plan

Expected duration: 3 years

Indication of the required budget: 100000 Euros

Work package 7

In work package 7, Scenario development and Performance Assessment, ten tasks are defined. All methods and instruments that are required for the safety assessments in the Safety Case are defined, developed and documented. For these safety assessments, scenarios need to be identified and represented. Like any safety assessment, the risk needs to be defined. The risk is here the harmful exposure of ionising radiation. A use of compartments in the geosphere like aquifers is, amongst others, required to determine this risk. As described in foreign research programmes like the Belgian one, it is highly unrealistic to forecast the use of aquifers for the next 10.000 years. The calculation in chance in exceeding a reference value for exposure of ionising radiation assuming a use of aquifers is therefore not robust. Performance indicators can be calculated for compartments of the repository system for example the flux of radionuclides from the host formation to the surrounding aquifers. The risk for future habitants is not calculated with such an indicator. A performance indicator is however more robust for the period in time that the exposure of radiation emitted by radioactive waste is dangerous for humans. In this call, applicants are invited to send a research proposal containing one task or more tasks for the following four tasks.

WP7.2 Performance Assessment model development and parameterization

Task 7.2.2 Performance Assessment model for radionuclide migration in the rock formations surrounding the host rock in the OPERA research plan

Expected duration: 3 years
Indication of the required budget: 100000 Euros

Task 7.2.3 Performance Assessment model for radionuclide migration and uptake in the biosphere in the OPERA research plan

Expected duration: 3 years
Indication of the required budget: 100000 Euros

Task 7.2.4 Integrated modelling environment for safety assessment in the OPERA research plan

Expected duration: 3.5 years
Indication of the required budget: 100000 Euros

Task 7.2.5 Parameterization of Performance Assessment models in the OPERA research plan

Expected duration: 3.5 years
Indication of the required budget: 250000 Euros

OPERA

Meer informatie:

Postadres
Postbus 202
4380 AE
Vlissingen

T 0113-616 666
F 0113-616 650
E info@covra.nl

www.covra.nl

