EUROPEAN COMMISSION

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DOPAS

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D7.5 Project description for the EC FP7 project compendium

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Dissemination Level		
PU	Public	x
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the partners of the DOPAS project	
CO	Confidential, only for partners of the DOPAS project	

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ABSTRACT:

This Deliverable will be published within Volume IV synthesis brochure of Euratom fission projects selected from the 2012 and 2013 later and includes proposed text from DOPAS project and pictures to be used in brochure.

RESPONSIBLE:

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REVIEW/OTHER COMMENTS:

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APPROVED FOR SUBMISSION:

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EUROPEAN COMMISSION

European Research Area

PROJECT PRESENTATION (PP)

DOPAS
Full-Scale Demonstration Of Plugs And Seals

Contract (grant agreement) number: 323273

Author(s):
Johanna Hansen
Marjatta Palmu

Date of issue of this report: 30/09/2013

EURATOM

Introductory paragraph (3-5 lines)

The DOPAS full-scale demonstration project aims to improve the adequacy and consistency regarding industrial feasibility of plugs and seals to be used in disposal facilities in different geological environments. The data and modelling results from five plug and seal demonstration experiments will be compiled and reported within DOPAS and achieved knowledge and experiences are shared in dissemination events.

1. Nature and scope of the project (5-10 lines)

Fourteen nuclear waste management organisations and research institutes from eight European countries are participating in a technology development project for assessing tunnel plugging and sealing systems in geological disposal facilities for radioactive waste - the DOPAS project ("Full-Scale **D**emonstration **O**f **P**lugs **A**nd **S**eals"). Five demonstration experiments will be partially or wholly implemented during the DOPAS project:

- Full-scale seal (FSS) by Andra and Nagra above surface in Saint-Dizier in France,
- Experimental pressure sealing plug (EPSP) by Rawra, CTU and UJV in underground Josef Gallery in Czech republic
- Deposition tunnel dome plug (DOMPLU) by SKB and Posiva in Äspö Hard Rock Laboratory in Sweden
- Deposition tunnel wedge plug (POPLU) by Posiva, VTT, BTECH and SKB in underground rock characterisation facility ONKALO (future spent fuel repository), Finland
- Shaft seal (ELSA) by DBE TECH and GRS in Germany.

Full-scale plugs and seals demonstrations require planning and coordination of development, construction, research needed for implementation, test and laboratory work in different scales, monitoring activities and assessment of performance in long-term. The studied concepts will be developed in the DOPAS's five thematic scientific/technological work packages, which each integrate the results of the individual experiments. Therefore the consortium is compiled from the waste management organisations and they are supported by private or public research facilities, which have wide experience in long term safety research, engineered barrier development and laboratory services related to the nuclear waste disposal. The impetus to the joint European collaboration project comes from the Strategic Research Agenda of the Implementing Geological Disposal of Radioactive Waste - Technology Platform (IGD-TP).

2. Activities (10-15 lines)

Repository plugs serve as mechanically isolating different parts of the repository from each other, or serve in isolating the waste packages from water and prevent the possible migration of radionuclides by serving low conductivity conditions with absorbing materials. Further some plugs will have the role as a hydraulic seal to prevent the groundwater flow through the excavated access to the repository. Depending on the host rock geology, the purpose of the plug, and the long term function of the plug, there are different requirements and reference designs that are site specific. The plugs and seals will be used in a nuclear facility that set common challenges for developing the design basis, creating the plans, showing the compliance with the requirements and assessing the long term behaviour with other barrier components and with the host rock. The implementation of plugs requires technology development and DOPAS project will show the industrial feasibility for plug and seal production.

3. Expected results (15-20 lines)

The successful implementation of a repository programme relies on both the technical aspects of a sound safety strategy, and scientific and engineering excellence as well as on the social aspects like stakeholder acceptance and confidence. Demonstration experiments performed in underground research facilities are a key element in demonstrating feasibility of engineered barrier systems (EBS), plugs and seals being an integral and important subsystem of EBS. The analysis and knowledge dissemination of the state-of-the-art of such repository components will increase the overall possibility for implementing geological disposal facilities in Europe. The experiences from the demonstrations successful or not contribute towards the construction and operation of future repositories:

- Safe and feasible construction of plugs in tunnels;
- Manufacturing qualified and approved plugs and seals components for repository use;
- Industrial and efficient installation of plugs and seals;
- Enforcement of accurate control methods for evaluating results versus design basis and
- Verification of design compliance to design basis

4. Societal impact (10-15 lines)

The DOPAS is practical demonstration experiment project, which one target is to increase public confidence by informing about the safety of geological disposal, the importance of demonstrating full scale plugs and seals for the safety, and the state of the art and practical implementation of such demonstration work. Other waste management organisations can be expected to benefit by getting strategies how to proceed from design basis phase into the implementation phase. Within DOPAS project the full scale experiments serves not only the technical benefits, but also works as a tool for dissemination. The experiment sites are popular among several stakeholder groups and for example the yearly amount of visitors at Äspö hard Rock laboratory is over 5 000 persons, at Josef Underground gallery over 1 000 persons and at Olkiluoto site over 19 000 persons. Target groups are also reached via public website http://www.posiva.fi/dopas and Beneficiaries' public websites and via DOPAS training workshop and DOPAS seminar and presenting DOPAS progress widely in scientific and technical conferences.

5. Information about important public events (0-5 lines)

DOPAS project will organise an international plugs and seals training workshop in Autumn 2015, which is meant for younger scientists within and outside the DOPAS consortium. The training workshop will include lot of practical exercises for increasing the understanding of multidisciplinary thinking in waste management and disposal implementation. Therefore the applicants for training workshop may present various research areas.

An international topical seminar on plugging and sealing technology for geological disposal of radioactive waste will be organised in the end of DOPAS project period (around middle of 2016), where the results of DOPAS project are distributed within whole scientific community but also within waste management organisations. The full fledged seminar is organised together with IGD-TP.

Project information

Website address: http://www.posiva.fi/dopas

Project type (funding instrument): Collaborative Project

Project start date: 01/09/2012
Duration: 48 months

Total budget: EUR 15 744 518.30
EC contribution: EUR 8 700 000

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Partner number	**Partner full name**	**Short name**	**Country code** (2-letter ISO code*)
1	POSIVA OY	POSIVA	FI
2	AGENCE NATIONALE POUR LA GESTION DES DECHETS RADIOACTIFS	ANDRA	FR
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6	NUCLEAR DECOMMISSIONING AUTHORITY - NDA	NDA	UK

7	RADIOACTIVE WASTE REPOSITORY AUTHORITY	RAWRA	CZ
8	SVENSK KARNBRANSLEHANTERING AB	SKB	SE
9	CESKE VYSOKE UCENI TECHNICKE V PRAZE	CTU	CZ
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* List of country codes: http://publications.europa.eu/code/en/en-5000500.htm#ia5.

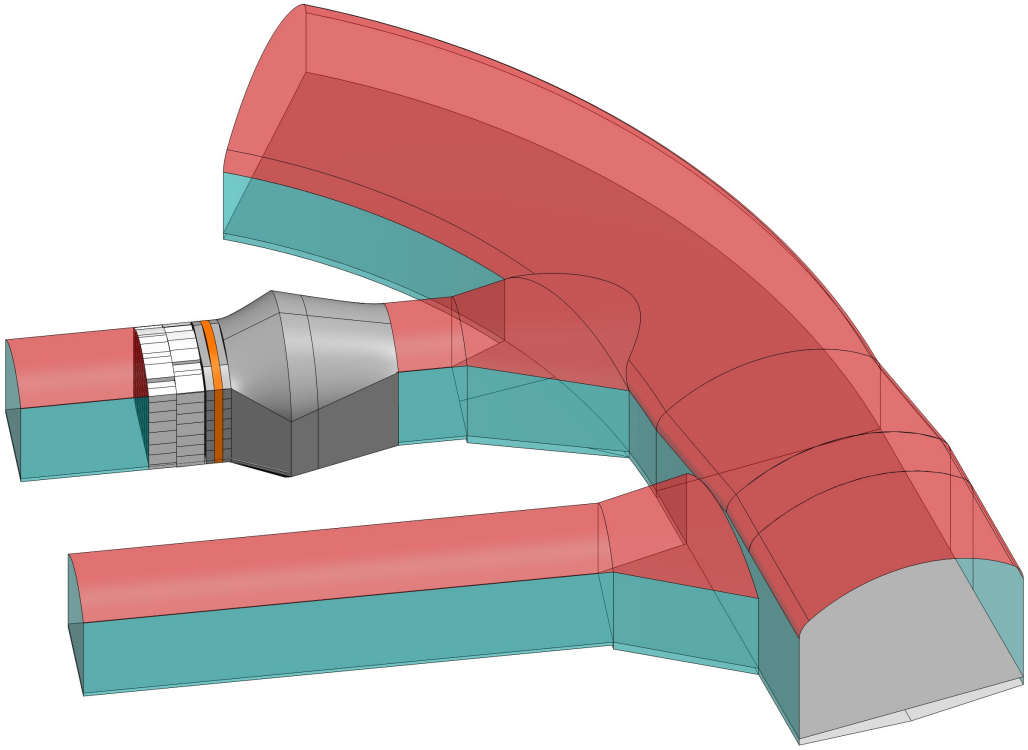
Appendix 1. Pictures proposed for Volume IV synthesis

brochure of Euratom fission projects (30.9.2013)

Picture 1. Full-scale text box constructed are ready for FSS Experiment (Photo: Andra)

Appendix 1. Pictures proposed for Volume IV synthesis

brochure of Euratom fission projects (30.9.2013)



Picture 2. POPLU Experiment location in ONKALO demonstration area (Figure: Posiva)

Picture 3. DOPAS Management team in Prague, June 2013. (Photo: CTU)