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DETAILED PROJECT PLAN

Update 09/2011

Large Underground Concept Experiments "LUCOEX"

Work Package 5: KBS-3V Emplacement tests in ONKALO (EMP)

Contents

1. General information	5
2. Definitions	5
3. Objectives	5
3.1. Technical development objectives	5
3.2. Objectives related to occupational safety	6
3.3. Objectives related to schedule	6
3.4. Budget objectives	6
4. Work plan	6
4.1. Task 5.1 Detailed WP planning	6
4.1.1. <i>Description of the task</i>	6
4.1.2. <i>Resources /participating organisations and persons</i>	7
4.1.3. <i>Schedule</i>	7
4.1.4. <i>Deliverables</i>	7
4.1.5. <i>Milestones</i>	7
4.2. Task 5.2 Demonstration of buffer components emplacement	7
4.2.1. <i>Description of the task</i>	7
4.2.2. <i>Sub-task 5.2.1 Development of the tool for filling the gap between the buffer and host rock</i>	9
4.2.3. <i>Sub-task 5.2.2. Buffer emplacement testing</i>	10
4.2.4. <i>Resources /participating organisations and persons</i>	10
4.2.5. <i>Schedule</i>	10
4.2.6. <i>Deliverables</i>	10
4.2.7. <i>Milestones</i>	11
4.3. Task 5.3 Quality assurance and problem handling	11
4.3.1. <i>Description of the task</i>	11
4.3.2. <i>Objectives of the task</i>	12
4.3.3. <i>Sub-task 5.3.1. Development of the quality requirements and quality assurance methods</i>	12
4.3.4. <i>Sub-task 5.3.2. Development of the quality assurance equipment</i>	12
4.3.5. <i>Sub-task 5.3.3. Development of problem handling methods</i>	12
4.3.6. <i>Resources /participating organisations and persons</i>	12
4.3.7. <i>Schedule</i>	12
4.3.8. <i>Deliverables</i>	13
4.3.9. <i>Milestones</i>	13
4.4. Task 5.4 Final reporting of WP5	14
4.4.1. <i>Description of the task</i>	14
4.4.2. <i>Resources /participating organisations and persons</i>	14
4.4.3. <i>Schedule</i>	14
4.4.4. <i>Deliverables</i>	15
4.4.5. <i>Milestones</i>	15
4.5. Task 5.5 Integration and dissemination	15
4.5.1. <i>Description of the task</i>	15
4.5.2. <i>Sub-task 5.5.1. Integration</i>	15
4.5.3. <i>Sub-task 5.5.2. Dissemination</i>	16
4.5.4. <i>Resources / participating organisations and persons</i>	16
4.5.5. <i>Schedule</i>	16
4.5.6. <i>Deliverables</i>	16
4.5.7. <i>Milestones</i>	18
5. Constraints and connections	18
5.1. Risks and constraints	18

5.2. Connections	20
5.3. IPRs and patents	20
6. Work package organization	21
7. Financial control	21
7.1. Budget	21
7.2. Budget review and reporting.....	22

1. General information

The overall objective of the LUCOEX project (FP7 EURATOM) Work Package 5 *KBS-3V Emplacement tests in ONKALO (EMP)* is to develop and demonstrate the full-scale bentonite buffer emplacement process in ONKALO with the needed quality assurance and problem handling procedures. The Work Package (“WP”) will concentrate on developing the emplacement, quality assurance and problem handling methods, take initiatives towards wider dissemination of the developed methods information, and implement researcher exchange/staff secondment.

The Work Package implementation consists of the following parts:

- Task 5.1 Detailed WP planning
- Task 5.2 Demonstration of buffer component emplacement
- Task 5.3 Quality assurance and problem handling
- Task 5.4 Final reporting
- Task 5.5 Integration and dissemination

These parts form the WP’s Work Breakdown Structure.

The WP5 will be implemented from 1st January 2011 until 31st December 2014.

2. Definitions

This project plan concerns the work package 5 of the Large Underground Concept Experiments “LUCOEX” project (FP7 EURATOM) coordinated by SKB (Sweden). The lead beneficiary of the WP5 is Posiva Oy (hereinafter “Posiva”) (Finland) and it is meant for the use of Posiva and the project partners, and the project dissemination activities. The project will be implemented in collaboration with a consortium of international participants (also referred to as “partners” in this document):

- SVENSK KÄRNBRÄNSLEHANTERING AB (“SKB”) (Sweden)
- AGENCE NATIONALE POUR LA GESTION DES DECHETS RADIOACTIFS (“ANDRA”) (France)
- NATIONALE GENOSSENSCHAFT FÜR DIE LAGERUNG RADIOAKTIVER ABFÄLLE (“Nagra”)(Switzerland)

This Project Plan describes the objectives, activities and expected results of the WP5 and its links to other WPs in LUCOEX and in general, and the implementation methods and activities.

3. Objectives

3.1. Technical development objectives

The technical development objectives of the WP5 are to:

- Develop and demonstrate emplacement of full scale bentonite buffer to deposition holes.
- Develop quality assurance methods.
- Develop problem handling during installation.

3.2. Objectives related to occupational safety

The WP5 objective is to provide and maintain safe and health-full working conditions for the working personnel. The working conditions shall be free of any hazards causing or are likely to cause death or serious physical harm to employees, and by comply with the European legislation and its respective national occupational safety and health regulations and acts.

3.3. Objectives related to schedule

The objective is to realize the Work package respecting the initial schedule agreed with the consortium. The WP was started 1st January 2011 and will be terminated 48 months later, 31st December 2014.

The WP schedule is presented in the Gantt chart annexed to this Project plan as Annex 1.

3.4. Budget objectives

The WP implementation aims at respecting the budget framework of total 2.256.154 €.

4. Work plan

4.1. Task 5.1 Detailed WP planning

4.1.1. Description of the task

The work package 5 will be started with task 5.1, detailed planning of the WP contents. All the items on the activity list will be discussed in detail and described in the project plan document. The project plan will be updated during project. Posiva will invite the other project partners to provide expertise to the project plan during the source information phase of Task 5.2.

Objectives of the task

- To create a detailed project plan for the WP 5 activities

Activities

The task will include the following activities:

- Creation of the detailed project plan document for WP5, including, amongst others, descriptions of:
 - WP5 objectives
 - Activities
 - Resources to be used

- Milestones
- Deliverables
- Risks / constraints
- Connections to other WPs
- Project plan document commentary round with the other LUCOEX partners in three times: 4/2011, 9/2011 and 4/2012.
- Posiva will provide the other project partners possibilities to contribute to the project plan during the source information phase of Task 5.2.

4.1.2. Resources /participating organisations and persons

- Man months allocated: total 1 MM
- Lead beneficiary: Posiva (total 1 man month)
 - Persons: Keijo Haapala, Tiina Jalonen

4.1.3. Schedule

- January 2011 – March 2011 (project months 1-3), updates 09/2011 and 04/2012

4.1.4. Deliverables

D 5.1 Detailed project plan

- Contents: The document describes, amongst others, the WP5 activities, resources to be used, milestones, deliverables, risks / constraints and connections to other WPs.
- Lead beneficiary: Posiva
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 1
- Delivery date: 3/2011

4.1.5. Milestones

MS 48: Detailed project plan ready

- Lead beneficiary: Posiva
- Month: 3/11
- Method of verification: Plan document created

4.2. Task 5.2 Demonstration of buffer components emplacement

4.2.1. Description of the task

The emplacement will be demonstrated in ONKALO. Two whole-scale deposition holes with about 10 m distance will be available for the demonstrations. The main aim is to test the feasibility of the emplacement method. In the first tests concrete blocks will be used because the bentonite blocks do not tolerate the repeated test emplacements needed. Full scale bentonite blocks will be used in the final tests. Also a dummy “canister” will be emplaced but installation of buffer blocks is the main issue. The emplacement tolerances and accuracies are studied for finding suitable methods and equipment for the installation control.

The emplacement methods of the bentonite blocks will be developed so that it will be possible to carry out the emplacement with the needed speed and accuracy. In the initial project plan the main idea was that full set transfer vehicle would be used. However, the feasibility study carried out showed that the safest and least time-consuming option would be a separate deposition vehicle where the installation machinery, with the lift with automatics are assembled and separate "shuttle" which would be able to transport the bentonite blocks and pellets to installation machine. Installation machinery will position itself on top of the deposition hole and lower the bentonite elements and pellets transported by the shuttle to the hole. The shuttle will transport one bentonite block and pellet container. Driving of the shuttle will be executed with the interim driving vehicle.

For ensuring the correct understanding of the deposition circumstances, a "dummy" canister will be emplaced with the deposition vehicle, although the canister installation development is not included in the scope of this project. However, only with canister installation it is possible to reach the full understanding of the buffer installation and of the impacts of tolerances and other factors on it.

Objectives of the task

- To develop the buffer block emplacement automatics
- To develop further the suction lifter
- To develop the emplacement machinery positioning methods
- To develop the tool for filling the gap between the buffer and host rock

Activities

Development of the buffer block emplacement automatics

The buffer block installation automatics and remote controlling of the machinery will be developed so that the required tolerances and uncertainty factors and installation safety aspects are taken into account.

Realisation:

- Development of the remote controlling to the emplacement machinery, like electrical lifts, suction lifter and positioning instruments. Remote control is needed especially for the installation of bentonite blocks closest to the deposition hole top because of radiation.
- Development of the steering automatics so that the blocks can be emplaced with highest possible accuracy and speed.

The first installations testing automatics will be realized in indoor premises. At this stage, the deposition vehicle can be replaced by a bridge crane.

When the automatics are functioning and the emplacement is working fluently, it is possible to begin the testing in ONKALO, where also the interim transportation vehicle will be used. At the event of emplacing the buffer blocks also a canister has to be installed by using the interim equipment.

Development of the suction lifter

In the original project plan the intention was to develop the suction lifter manufactured at earlier stages further and equip that with installation and positioning automatics. However, in the first feasibility study of the buffer emplacement method it turned out that for reaching the highest possible accuracy on alignment of the bentonite block and the suction lifter, the suction lifters should be integrated into the containers where the buffer blocks are transported to the deposition hole. In the solution the most important surface in the block, the top surface, like the entire block, is protected all the way to the deposition hole and the risky alignment phase is realized in the bentonite block manufactory. This integrated suction lifter - container solution would also facilitate reaching the target emplacement time 120 minutes as no extra time is required for alignment of the lifter and block on the deposition tunnel.

Also the gap filling instrument in the form of a container for the bentonite pellets can be integrated into the container – suction lifter structure.

The container-lifters can be used for several times, they only have to be inspected, cleaned and corrected before the installation of a new block.

Realisation:

- An integrated container – suction lifter system will be developed
- The suction lifters will be developed so that the grip of the suction cups on bentonite can be improved for continuous use
- Development of the vacuum system's functioning and reliability.

Development of the emplacement machinery positioning methods

The positioning methods of the emplacement machinery will be developed so that the buffer blocks can be emplaced accurately so that the deposition tunnel forms and other restricting factors are taken into account.

After the preliminary design of positioning methods it was decided that the positioning will be realized on the basis of reference points marked in the deposition tunnel. Depending on the technique, two or three reference points will be needed. The positioning equipment will be installed into the full set deposition vehicle.

Realisation:

- A wireless positioning method, with which the deposition vehicle can be placed correctly above the deposition hole and reach the required emplacement tolerances ± 2 mm, will be developed based on a reference points in the deposition tunnel.
- The positioning instrument will be tested in indoor premises.
- The positioning instrument will be developed so that its functioning in demanding and humid conditions can be guaranteed.
- The positioning instrument control system will be developed so that it can be used by remote controlling when needed.

4.2.2. Sub-task 5.2.1 Development of the tool for filling the gap between the buffer and host rock

The gap between the buffer blocks and the deposition hole wall will be filled with bentonite pellets after the buffer block emplacement. The pellet storage will be constructed on top of the container –

lifter and the filling tool will form an integral part of the container. An accurate amount of pellets needed to achieve the targeted bentonite density can be calculated already before installation and the right amount of pellets can be measured in manufactory. The pellet storage and the integrated gap filling tool will be developed and tested.

Realisation:

- The method and tool for filling the gap between the bentonite blocks and host rock with bentonite blocks will be developed. A pellet storage integrated into the container – lifter will be used as a starting point. At the method development work, the realization of filling in different phases of the block emplacement will be studied. In the tool development, the studies will focus on the tool's suitability for the developed method.
- Reliability study of gap filling method will be carried out.

4.2.3. Sub-task 5.2.2. Buffer emplacement testing

The emplacement of buffer blocks and filling of gap between the buffer blocks and the wall of the deposition hole with container – lifters with integrated pellet storage will be tested in ONKALO.

Realisation:

- The emplacement of buffer blocks by using designed automatics
- The testing of gap filling equipment jointly with the block emplacement equipment

4.2.4. Resources /participating organisations and persons

- Man months allocated: total 17 MM
- Lead beneficiary: Posiva (total 17 man months)
 - Persons: Tiina Jalonen, Keijo Haapala, Pasi Rantamäki, Kimmo Kemppainen, Timo Seppälä, Lilli Mäkelä, Jere Lahdenperä, Antti Mustonen.
- Other beneficiaries

4.2.5. Schedule

- January 2011 – February 2014 (project months 1-38)

4.2.6. Deliverables

D 5.2 Buffer Emplacement Test

- Contents: The document is a working report that presents buffer emplacement demonstrations in ONKALO
- Lead beneficiary: Posiva
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 5
- Delivery date: 12/2013

D 5.3 Memo on the designing the gap filling tool

- Contents: Description of the gap filling tool design process
- Lead beneficiary: Posiva

- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 0,5
- Delivery date: 9/2012

D 5.4 Memo on the buffer emplacement testing

- Contents: Description of the buffer emplacement testing
- Lead beneficiary: Posiva
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 0,5
- Delivery date: 9/2013

4.2.7. Milestones

MS 53: Design of gap filling tool ready

- Lead beneficiary: Posiva
- Month: 9/2012
- Method of verification: Gap filling tool design completed and documented

MS 54: The design and construction of the needed equipment finalized

- Lead beneficiary: Posiva
- Month: 6/2013
- Method of verification: The equipment are ready for tests

MS 55: Testing realized with bentonite blocks in ONKALO completed

- Lead beneficiary: Posiva
- Month: 9/2013
- Method of verification: The bentonite block emplacement realized according to the set objectives

4.3. Task 5.3 Quality assurance and problem handling

4.3.1. Description of the task

The installation process of the buffer will be carefully planned, tested and reported to develop quality assurance procedures to ensure the overall quality of buffer during the disposal process.

4.3.2. Objectives of the task

- To develop the quality requirements and quality assurance methods for the emplacement and gap filling work
- To develop problem handling methods
- To develop quality assurance equipment

4.3.3. Sub-task 5.3.1. Development of the quality requirements and quality assurance methods

The emplacement work and gap filling quality requirements will be defined. For this part, a description on the quality assurance will be elaborated and the needed quality assurance methods defined.

4.3.4. Sub-task 5.3.2. Development of the quality assurance equipment

The quality assurance equipment / control equipment needed for the control procedures will be designed and tested for the emplacement work and gap filling. The equipment will be developed jointly with developing the emplacement and gap filling equipment.

4.3.5. Sub-task 5.3.3. Development of problem handling methods

The problem handling methods for the management and restoration of broken buffer blocks, gap filling and other exceptional situations will be developed.

A process description is also needed for the handling of different problems and fault situations, which might happen during emplacement. At the event of emplacement, a bentonite block can fall and damage the structures, bentonite blocks or canister already placed in the deposition hole. The worst situation occurs when water runs to the deposition hole before the tunnel has been sealed. In an extreme case the emplaced buffer blocks and canisters have to be removed from the deposition hole. For this situations there has to be readiness to remove damaged parts from the deposition hole.

Realisation:

- Developing methods for the removal of damaged parts so that the other already emplaced parts are not damaged.
- In addition to the bentonite blocks at emplacement humidity, also removal of the bentonite blocks that have reacted with water has to be made possible.

4.3.6. Resources /participating organisations and persons

- Man months allocated: total 17 MM
- Lead beneficiary: Posiva (total 17 man months)
 - Persons: Tiina Jalonen, Keijo Haapala, Pasi Rantamäki, Kimmo Kemppainen, Timo Seppälä, Lilli Mäkelä, Jere lahdenperä, Antti Mustonen

4.3.7. Schedule

- January 2011- February 2014 (project months 1-38)

4.3.8. Deliverables

D 5.5 Quality assurance and problem handling during buffer emplacement

- Contents: Working report that presents quality assurance methods and problem handling during buffer emplacement
- Lead beneficiary: Posiva
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 5
- Delivery date: 2/2014

D 5.6 Definition of the WP5 emplacement process phases and their quality requirements

- Contents: Description of the buffer emplacement testing
- Lead beneficiary: Posiva
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 1
- Delivery date: 12/2011

D 5.7 Memo on development of quality assurance tools

- Contents: Description of the quality assurance tool development
- Lead beneficiary: Posiva
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 1
- Delivery date: 12/2013

D 5.8 Plans for solving the emplacement problem situations

- Contents: Memo describing the plans for solving emplacement problem situations
- Lead beneficiary: Posiva
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 1
- Delivery date: 12/2013

4.3.9. Milestones

MS 49: The emplacement problem situations mapped

- Lead beneficiary: Posiva
- Month: 05/2011
- Method of verification: The problem mapping documentation completed

MS 51: The emplacement process phases and their quality requirements defined

- Lead beneficiary: Posiva
- Month: 11/2011
- Method of verification: Definition of process phases and quality requirements completed

MS 52: Plans for solving the emplacement problem situations finalised

- Lead beneficiary: Posiva
- Month: 1/2012
- Method of verification: The plans for solving the emplacement problems ready.

MS 56: Development of quality assurance tools ready

- Lead beneficiary: Posiva
- Month: 11/2013
- Method of verification: The workability of quality tools functioning according to the set objectives

MS 57: The report of WP5 quality assurance and problem handling during buffer installation ready

- Lead beneficiary: Posiva
- Month: 2/2014
- Method of verification: Report created

4.4. Task 5.4 Final reporting of WP5

4.4.1. Description of the task

This task addresses the compilation of all WP 5 results in a final WP report.

Objectives of the task

- To create a comprehensive final report on the WP5 activities

Activities

The WP will include the following activities:

- Creation of the final report on the basis of the material produced during the project

4.4.2. Resources /participating organisations and persons

- Man months allocated: total 4 MM
- Lead beneficiary: Posiva (total 4 man months)
 - Persons: Tiina Jalonen, Keijo Haapala, Pasi Rantamäki, Kimmo Kemppainen, Lilli Mäkelä, Jere lahtenperä, Antti Mustonen

4.4.3. Schedule

- December 2014 (project month 48)

4.4.4. Deliverables

D 5.9 Final report of WP5

- Contents: Report describing the activities implemented in the WP5
- Lead beneficiary: Posiva
- Nature: Report
- Publicity level: Public
- Estimated indicative person months: 6
- Delivery date: 12/2014

4.4.5. Milestones

MS 58: WP5 final report ready

- Lead beneficiary: Posiva
- Month: 12/2014
- Method of verification: WP5 final report published

4.5. Task 5.5 Integration and dissemination

4.5.1. Description of the task

This task is linked with WP1 and the planning and up-dating of plans are carried through by Task 1.1 “Integrated planning and outcome analysis”

Objectives of the task

- To exchange experiences and good practices with the project partners
- To realize researcher exchange / staff secondment activities
- To realize expert reviews on the project plan, results, demonstrations and reports
- To disseminate information on the project to different stakeholders

4.5.2. Sub-task 5.5.1. Integration

Active exchange of experiences and good practices between the project partners will be carried out during the work package duration. Experts will present advice of other participants on the WP5 test plan.

Researcher exchange / staff secondment activities will be organised between Posiva and other participants especially in connection with the demonstrations. Important project meetings will be held public with other participants in order to share information and brainstorm the solution jointly. The project partners will be offered the possibility to send their researchers to participate in the WP5 activities.

Internal and external experts will be invited to perform reviews on the WP5 project plan, interim results, demonstrations and final report.

4.5.3. Sub-task 5.5.2. Dissemination

Information about the developments related to this Work Package will be disseminated to different stakeholder and interest groups by the following activities:

- Documentary film. A 30-minute documentary film about the buffer components emplacement will be created. The documentary will be presented on the Posiva and the project web sites. Public viewings will be organised at different events like fairs and conferences participated.
- Emplacement demonstrations for authorities. Demonstrations that authorities will be invited to follow will be organised 3 times during the work package duration. Planned demonstration events: the buffer block emplacement tests at indoor premises; emplacement demonstration with quality control demonstration in ONKALO; problem handling demonstration in ONKALO.
- Newsletter. A one-page newsletter with information on the work package activities' progress will be composed in Finnish and in English and delivered to relevant national and local stakeholders / interest groups once a year.
- Dissemination on websites. The work package will produce information to be published on the project's (i.e. the website developed under WP1) and Posiva's websites.

Posiva's communications department will be used to support the project personnel with the dissemination activities.

4.5.4. Resources / participating organisations and persons

- Man months allocated: total 4 MM
- Lead beneficiary: Posiva (total 4 man months)
 - Persons: Tiina Jalonen, Keijo Haapala, Pasi Rantamäki
- Other beneficiaries:
 - SKB (total 3 man months)
 - ANDRA (total 1 man month)
 - Nagra (total 1 man month)

4.5.5. Schedule

- January 2011 – December 2014 (project months 1-48)

4.5.6. Deliverables

D 5.10 Plan on WP5 integration and dissemination

- Contents: Description of the integration and dissemination activities to be realized in WP5
- Lead beneficiary: Posiva
- Other participants:
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 0,5
- Delivery date: 5/2011. Delivered.

D 5.11 Project expert review report

- Contents: Report on the project reviews performed by external and internal experts during the project
- Lead beneficiary: Posiva
- Other participants:
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 1,7
- Delivery date: 12/2014

D 5.12, D 5.13, D 5.14 Interim report on the project reviews

- Contents: Brief yearly interim reports on the project reviews performed by external and internal experts
- Lead beneficiary: Posiva
- Other participants:
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 0,1 man months /report
- Delivery dates (total 3 reports during the project): 12/2011, 12/2012, 12/2013

D 5.15, D 5.16, D 5.17 WP5 Newsletter Posiva

- Contents: Newsletter on the WP5 activities, targeted at different stakeholder groups
- Lead beneficiary: Posiva
- Nature: Other
- Publicity level: Public
- Estimated indicative man months: 0,3 man months /report
- Delivery dates (total 3 newsletters during the project): 12/2011, 12/2012, 12/2013

D 5.18, D 5.19 Paper for professional journal

- Contents: Paper on the WP5 implementation to be published in a professional journal
- Lead beneficiary: Posiva
- Other participants:
- Nature: Report
- Publicity level: Public
- Estimated indicative man months: 0,1 man months /report
- Delivery dates (total 3 reports during the project): 12/2012, 12/2014

D 5.20 Documentary film on buffer installation demos

- Contents: Documentary film created on the realized demonstrations
- Lead beneficiary: Posiva
- Other participants:
- Nature: Other
- Publicity level: Public
- Estimated indicative man months: 2,5
- Delivery date: 4/2014

4.5.7. Milestones

MS 50: Plan of WP5 integration and dissemination ready

- Lead beneficiary: Posiva
- Month: 5/2011
- Method of verification: Plan created and finalised

5. Constraints and connections

5.1. Risks and constraints

Risks and constraints of this project have been divided into 5 different categories: 1) Operational risks, 2) Organisational risks, 3) Economical risks, 4) Quality risks and 5) External risks. Risks have been evaluated from 1-5, where 1 indicates low relevance and 5 high relevance to the achieving the objectives of the project.

In the tables below the risks are shown in descending order of importance by category.

1) Operational risks

Operational risks	Risk	Probability	Risk sum	Consequence	Mitigating actions
Delays in critical activities	4	2	64	Overall delay of activities	Critical path and resource monitoring, reprioritisation if needed
Technical challenges in developing technologies	4	3	144	Needed solutions not identified or no ability to realize them Delays Problems in critical tests	Knowledgeable subcontractors Sufficient testing before starting equipment manufacturing.
Unexpected results	4	2	64	Need for rethinking of parts or whole concepts tested	Careful background studies before implementation Strong r&d work management
Insufficient communication between project partners	2	3	36	Integration objectives not achieved Narrow views on the r&d work	Sound management structure with regular project reviews

Underestimated resource needs	4	3	144	Delays in activities Increased costs	Identified reserve resource pool
Unclear roles and responsibilities	3	2	36	Failures in reaching the set objectives	Produce and communicate clear roles and responsibilities matrix

2) Organisational risks

Organisational risks	Risk	Prob.	Risk sum	Consequence	Mitigating actions
Insufficient technical knowledge	43	2	36	Failures in reaching the set objectives	Knowledgeable staff, subcontractors and partners
Insufficient resources	4	3	144	Delays in activities Increased costs	Reprioritisation resources if needed

3) Economic risks

Economic risks	Risk	Prob.	Risk sum	Consequence	Mitigating actions
Component price fluctuations and delays in delivery time	3	3	81	Delays in activities Increased costs	Price contingency included in budget Procurement of components realized on time
Personnel cost fluctuations	3	1	9	Increased costs	Price contingency included in budget

4) Quality risks

Quality risks	Risk	Prob.	Risk sum	Consequence	Mitigating actions
Risk management and mitigation	2	2	16	Risk realisation	Issue management with follow up procedures
Changes in requirements or data basis in a late stage of work	4	4	256	Delays in activities	Careful monitoring and early reactions to any indications of changes Careful planning of the basic requirements and definitions

Insignificant communication	4	2	64	Delays in activities Problems with quality of work	Communication plan agreed and assigned to change management
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5) External risks

External risks	Risk	Prob.	Risk sum	Consequence	Mitigating actions
Changes in legislations	3	2	36	Delays in activities Changes in the project partner position	Follow up of legislation changes, action plan created if needed

5.2. Connections

The project is connected to the following LUCOEX work packages and Posiva's development initiatives:

- LUCOEX WP 1 Integration and dissemination
- LUCOEX WP 4 KBS-3H Block manufacturing and installation.
- LUCOEX WP 6 Coordination
- LUCOEX WP 2 FE Mont Terri Installation of buffer
- ONKALO project / Posiva: Posiva is drilling and blasting and excavating an underground facility, Onkalo, for the nuclear waste final disposal. The work was started in 2004.
- KapRe (canister deposition hole drilling) project / Posiva: Posiva has established KapRe Demo project for developing and demonstrating the drilling of the final disposal holes in Onkalo. The project aim is to develop the method and equipment for drilling the holes and demonstrate the results in Onkalo.
- Rock Suitability Criteria (RSC) – programme / Posiva: Posiva has established the RSC-II programme for developing practical criteria to be used for several purposes in repository design and implementation. RSC programme outlines the development work for the years 2007-2012 and RSC II covers the activities from autumn 2009 until end of 2012.
- Development of canister installation vehicle.
- Design of bentonite buffer.
- Design of deposition tunnel backfill.

5.3. IPRs and patents

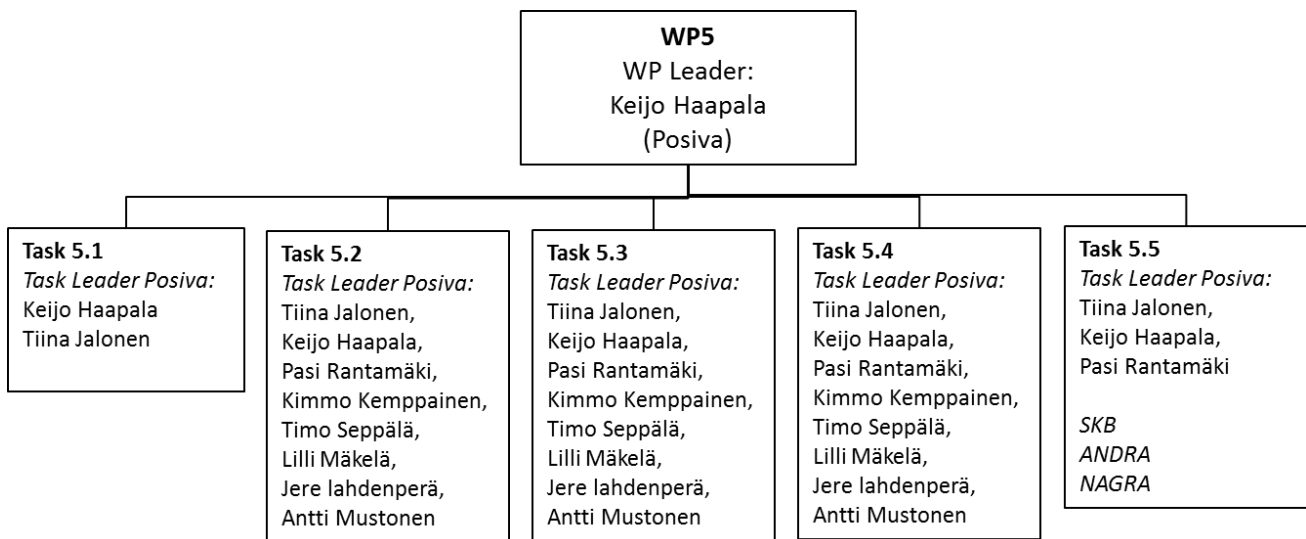
The IPR (Intellectual Property Rights) has been agreed with the Consortium participants before the project start. The agreement defines the rights to the existing and during the project discovered inventions, patents, methods, diagrams, knowledge, experience and findings developed and recommended.

6. Work package organization

The WP will be led by WP Leader under the supervision of the LUCOEX project Steering Committee and Project Manager. The operational issues in the work packages will be handled by Management Group that consists of the Work Package Leaders.

WP Leader

The WP Leader in WP5 is Keijo Haapala. Mr Haapala represents Posiva in the WP and is responsible for that all project participants and stakeholders are aware of the WP5 progress and will have the overall responsibility for the day-to-day management and coordination of the WP.



7. Financial control

7.1. Budget

The total budget of the WP5 is 2.256.154 € (requested EC contribution 875.534 €).

The work package participants' representatives will be responsible for preparing cost estimates for the tasks to be included in their organisations' budgets.

The costs of the work carried out for the WP5 are budgeted for and controlled as a part of the LUCOEX project budgets and financial control of the respective partners.

The contracts with suppliers and subcontractors are prepared by the project partners' representatives for the respective tasks. The contracts are made and their implementation is controlled according to the partners' own quality management systems.

7.2. Budget review and reporting

Budget review and reporting will be done according to the project partners' practices and instructions by the Steering Committee, and provisions presented in the Consortium Agreement.