

International
Progress Report

IPR-00-31

Äspö Hard Rock Laboratory

Prototype Repository

Project plan

FIKW-CT-2000-00055

Gerhard Persson, Olle Broman
Svensk Kärnbränslehantering AB

December 2000

Svensk Kärnbränslehantering AB

Swedish Nuclear Fuel
and Waste Management Co
Box 5864
SE-102 40 Stockholm Sweden
Tel +46 8 459 84 00
Fax +46 8 661 57 19



**Äspö Hard Rock
Laboratory**

| | |
|----------------------------|-------------------|
| Report no. | No. |
| IPR-00-31 | F63K |
| Author | Date |
| G Persson, O Broman | 2000-12-01 |
| Checked by | Date |
| J-O Dahlström | 2001-03-14 |
| Approved | Date |
| Christer Svemar | 2001-03-14 |

Äspö Hard Rock Laboratory

Prototype Repository

Project plan

FIKW-CT-2000-00055

Gerhard Persson, Olle Broman
Svensk Kärnbränslehantering AB

December 2000

Keywords: Backfill, buffer, canister, chemistry, expansive clay, groundwater, heater, hydration, instrumentation, KSB-3, monitoring, piezometry, pressures, repository, rock, SKB, temperature

This report concerns a study which was conducted for SKB. The conclusions and viewpoints presented in the report are those of the author(s) and do not necessarily coincide with those of the client.



TABLE OF CONTENTS

| | |
|---|----|
| Executive summary | 4 |
| 1 Project Plan - Introduction | |
| 1.1 General..... | 5 |
| 1.2 Project Plan administration..... | 6 |
| 2 Decisions | |
| 2.1 Authority decisions / Acts of law | 8 |
| 2.2 Project decisions | 8 |
| Objective, Scope and Project description | |
| 3.1 Objective | 9 |
| 3.2 Scope | 9 |
| 3.3 Project description and tasks | 9 |
| 3.4 Activity plans..... | 9 |
| 4 Organisation | |
| 4.1 How the project fits in the SKB organisation | 10 |
| 4.2 Project organisation | 11 |
| 4.3 Functional descriptions | 15 |
| 4.4 Authorities | 18 |
| 4.5 Delegation | 18 |
| 5 Resources | |
| 5.1 Personnel resources | 19 |
| 5.2 Equipment, facilities and other physical resources | 19 |
| 6 Planning | |
| 6.1 Time scheduling | 20 |
| 6.2 Resource planning | 21 |
| 6.3 Activity plans | 21 |
| 6.4 Meetings and schedules | 22 |
| 6.5 Interfaces | 22 |
| 7 Project realisation, follow-up and reporting | |
| 7.1 Project reviews | 24 |
| 7.2 Reporting and cost statements | 24 |
| 7.3 Verification | 25 |
| 7.4 Risk analysis | 26 |
| 7.5 Handling of non-conformities, corrective and preventive actions | 26 |
| 8 Quality, environmental and occupational health and safety audits within the project | |
| 8.1 Audit programme | 27 |
| 8.2 Handling of audit results | 28 |
| 9 Maintenance | |
| 9.1 Handling of measuring and monitoring equipment | 29 |
| 9.2 Handling of other equipment | 29 |
| 10 Validation/evaluation | |
| 10.1 Validation against objectives and targets | 30 |
| 10.2 Remarks by interested parties | 30 |
| 10.3 Possible improvements | 30 |
| 10.4 Conclusions | 31 |
| 11 Information | |
| 11.1 General..... | 32 |
| 11.2 Responsibility..... | 32 |
| Annex A Administrative procedures and routines | 33 |
| Annex B Quality Management System | 39 |



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

| | |
|--|----|
| Annex C Environmental Management System | 40 |
| Annex D References | 42 |
| Annex E Schedules and reporting and cost statements..... | 45 |
| Appendix 1 List of activity plans..... | 49 |



EXECUTIVE SUMMARY

The Prototype Repository project at the AEspoe Hard Rock Laboratory (AHRL) is an international, EC-supported activity with the objective to investigate, on a full scale, the integrated performance of engineered barriers and near-field rock of a simulated deep repository in crystalline rock.

The test site is a 65 m long TBM-bored tunnel from which six 1.75 m diameter deposition holes extend downwards to about 8 m depth in accordance with the KBS3 concept. The outer 25 m long part has two holes and is separated from the inner 40 m long one with 4 holes and from the rest of the underground laboratory by stiff and tight plugs.

The deposition holes will contain genuine copper/steel canisters with heaters for simulating the warming caused by the radioactive decay. The canisters will be embedded in dense buffer clay consisting of blocks of compacted bentonite powder, and the tunnel (drift) will be backfilled with clayey soil.

The instrumentation makes it possible to record major processes in the rock, buffer and backfill, like piezometric and porewater pressures, wetting/drying of the buffer and backfill, temperature evolution in the buffer and backfill and surrounding rock, effective and total pressures and displacements in the buffer and backfill and surrounding rock, gas accumulation in the buffer, and chemical and biological processes in the buffer.

Participants in the international co-operation are

| <i>Name of organisation</i> | <i>Acronym</i> | <i>Country</i> |
|--|-----------------------|-----------------------|
| Swedish Nuclear Fuel and Waste Management Co | SKB | Sweden |
| Posiva Oy | POSIVA | Finland |
| Empresa Nacional de Residuos radiactivos, S.A. | ENRESA | Spain |
| Gesellschaft fuer Anlagen- und Reaktorsicherheit | GRS | Germany |
| Bundesanstalt fuer Geowissenschaften und Rohstoffe | BGR | Germany |
| Geoenvironmental Research Centre, Univ. of Cardiff | UWC | UK |
| Japan Nuclear Cycle Development Institute | JNC | Japan |

Assistant contractors

| | | |
|--|---------|---------|
| Asociacion para la Investigacion y Desarrollo Industrial de los Recursos Naturales | AITEMIN | Spain |
| Centre Internacionale de Mètode Numèrics en Enginyeria | CIMNE | Spain |
| Clay Technology | CLAY | Sweden |
| VBB VIAK | VBB | Sweden |
| Geodevelopment | GEO | Sweden |
| VTT Communities and infrastructure | VTT | Finland |



Prototype Repository Project Plan

Reviewed by

Approved by

Date

1 PROJECT PLAN - INTRODUCTION

1.1 General

This Project Plan describes, among others, prerequisites and procedures for the processing of the EC project Prototype Repository at the AEspoe Hard Rock Laboratory (acronym AHRL used hereafter). The plan is in line with SKB's overall management system including Quality and Environmental Management Systems, see structure in Annex B and Annex C. Considering the scope of the project, the requirement on effective control and the consistent actions within the project organisation and in supplier contacts, it is absolutely essential that the guidelines of this Project Plan be followed. Thus, the Project Plan is a quality document for the project Prototype Repository.

The Project Plan concerns all those actively working within the project and also, as appropriate, others, SKB personnel as well as consultants and contractors, who in their activities will benefit from the information generated by the project. It will also concern those working with issues which may be beneficial to the project.

The quality and environmental management shall be integrated in the daily activities. SKB consultants' and contractors' own quality and environmental management systems may be applied, provided they are accepted by SKB, taking SKB's overall Quality and Environmental Management System into consideration. Other participating parties, including their possible consultants and contractors, may apply their own quality and environmental management systems, except for underground work. All underground activities shall be carried out and co-ordinated in accordance with AHRL procedures.

The Prototype Repository Project Manager (hereafter designated Project Manager) is responsible for managing the work in accordance with the Project Plan and also for providing necessary information and training.

Anyone responsible for consultants and contractors is also responsible that the contracted work be performed according to the procedures of the Project Plan.

This Project Plan is in conformance with ISO 9001:1994 (quality assurance) and ISO 14001:1996 (environmental management). It also meets SKB Quality Assurance and Environmental Management System requirements, described separately, see also Annex D.1.

Separate Activity Plans are established for each project activity.



Prototype Repository Project Plan

Reviewed by

Approved by

Date

1.2 Project Plan administration

1.2.1 Responsibility

The Project Manager is responsible for establishing and documenting this Project Plan, including subordinate documents such as Activity Plans.

In its original state and after each revision, the Project Plan is reviewed by the Quality and Environmental Manager and is approved by the Project Manager. The review and approval is verified by signing the first page of each section of the Project Plan.

The Project Administrator is responsible for necessary procedures regarding

- register of distributed copies ,
- updating of distributed copies with revised issues,
- filing of current version, and disposition, including retention in archives, of superseded versions.

Any changes to the responsibilities regarding the Project Plan shall be approved and documented in accordance with the AHRL Manual.

1.2.2 Updating

The Project Manager is responsible that the Project Plan be revised at essential changes to the project prerequisites, when deficiencies in the Quality and Environmental Management System are observed during audits, inspections, etc. The aim is to always give a current picture of the progress within the project.

Changes to the Project Plan shall be done only with consent of the Project Manager. Changes – only the most recent ones – are marked with a vertical bar in the left hand margin. The section is given a new date and new version number. This method implies that all pages in a section be exchanged simultaneously. However, attachments are changed separately from the rest of the section.

Revised sections and attachments are recorded in the Table of contents.

New or amended pages are reviewed and approved in the same manner as the original. One copy of superseded versions is retained by the Project Administrator and marked “not valid” and the revision date.

1.2.3 Distribution

The Project Plan is distributed according to a computerised distribution list. The receivers are responsible that subordinates, including consultants and contractors, are informed about it.



Prototype Repository Project Plan

Reviewed by

Approved by

Date

The distribution of this Project Plan is performed primarily in a controlled manner, i.e. defined receivers of the plan are provided with the original plan and all subsequent amendments for updating. However, this includes subordinate documents only where specifically stated.

Thus, the Project Plan is issued as numbered copies and may also be issued as uncontrolled copies (for information etc.), provided with an indication that they will not be updated. Such uncontrolled Project Plan copies must not be used by personnel employed in the project.

Distribution may be performed electronically or as hard copies. The receiver reviews his/her copy for completeness if a hard copy is used.

1.2.4

Filing and retention

This Project Plan, including all subordinate documents and amendments, shall be filed, retained and dispositioned in accordance with SKB's procedures for quality records.



2 DECISIONS

2.1 Authority decisions / Acts of law

The activities at the AHRL is controlled by various acts of law, ordinances and announcements, see Annex D.

Applicable authority decisions also are listed in Annex D.

2.2 Project decisions

Decision document, dated 30 September 1998 (superseded).

Decision document, dated 28 December 1999 (superseded).

Decision document, dated 25 January 2000. (superseded).

Decision document, dated June 2000.

European Commission Contract, dated 24 August 2000.

Consortium Agreement in force on 24 August 2000



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

3 OBJECTIVES, SCOPE AND PROJECT DESCRIPTION

3.1 Objectives

The project objectives are described in the separate Project Description document, see IPR 00-30.

3.2 Scope

The project scope is described in the separate Project Description document, see IPR 00-30.

3.3 Project description and tasks

Details on the project including projects tasks are given in the separate Project Description document, see IPR 00-30.

3.4 Activity plans

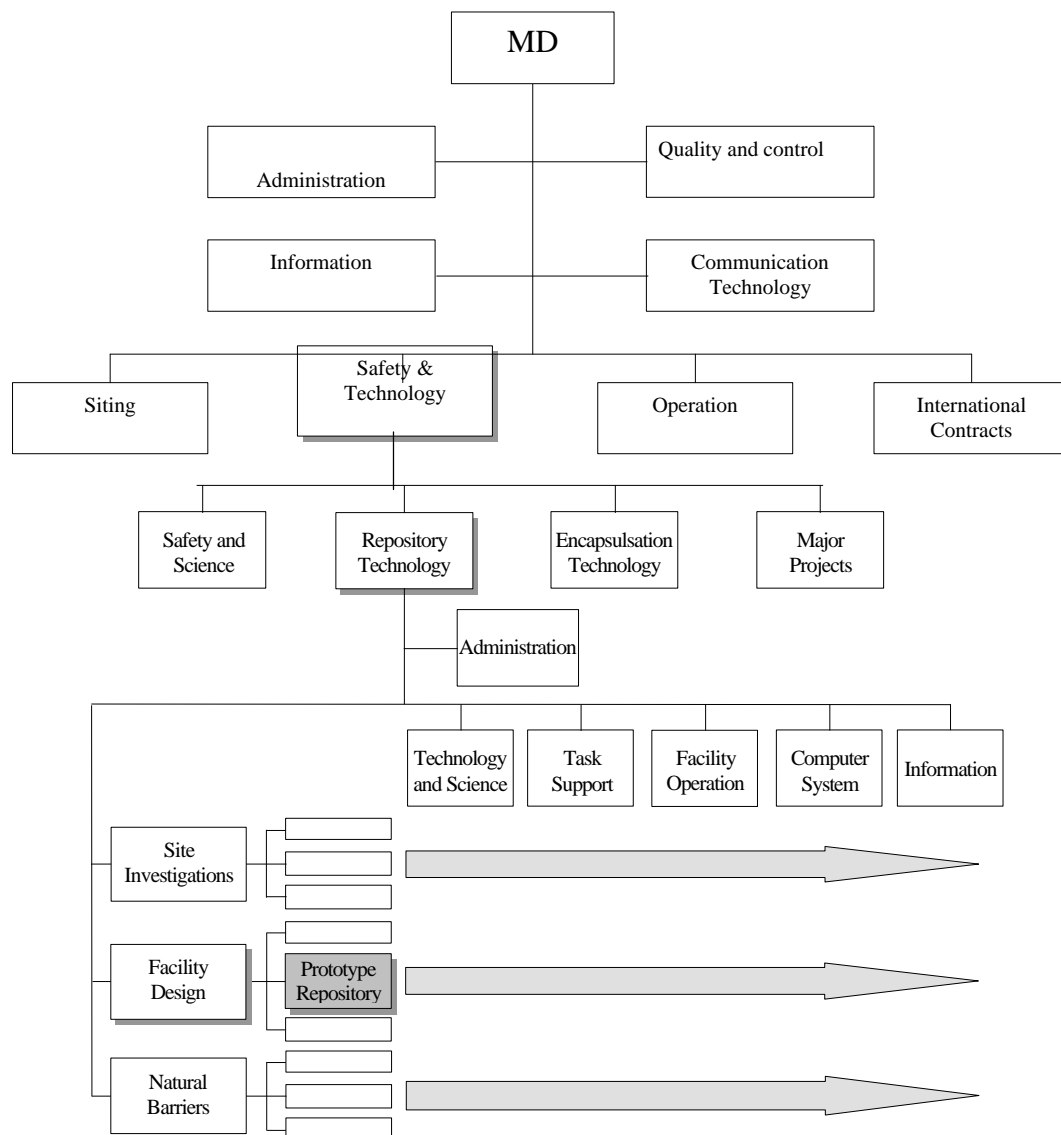
The project activity plans are listed in Appendix 1.



ORGANISATION

4.1 How the project fits in the SKB organisation

How the Prototype Repository project fits in the SKB organisation is illustrated in the figure below:





Prototype Repository Project Plan

Reviewed by

Approved by

Date

Within the R&D framework SKB has decided to realise the project Prototype Repository at the SKB facility AHRL. In the project decision, SKB has defined the boundaries for the realisation of the project. The AHRL is part of the unit Repository Technology within the Safety and Technology department. The Director of Repository Technology thus has assumed the role as Project Owner's representative and is responsible for reporting into the SKB organisation. The unit has a matrix organisation, where the projects are conducted with resources from, among others, the various groups within the unit.

All projects at the AHRL are included in three key processes: Site Investigations, Facility Design and Natural Barriers, see SDTD-102. Each key process has a process owner who co-ordinates the projects within the key process and reports to the Director of Repository Technology. The project Prototype Repository is operated within the key process Facility Design.

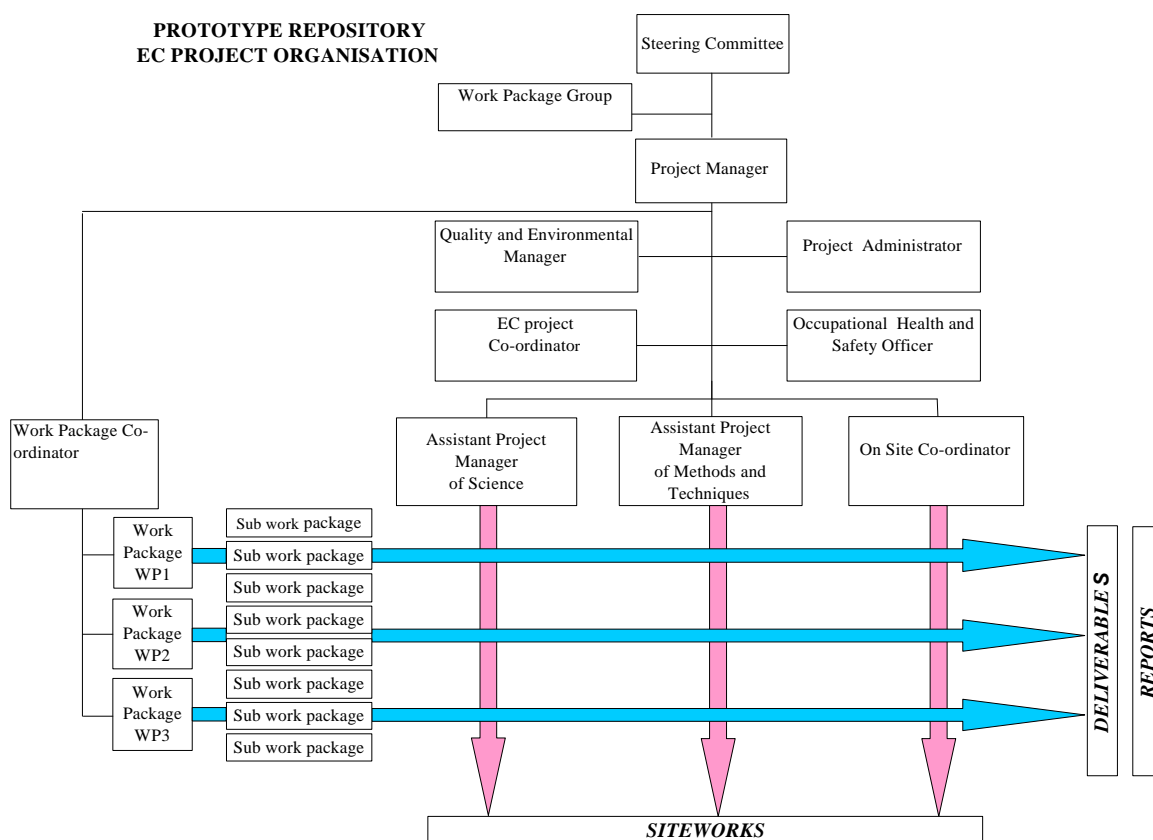
4.2 Project organisation

4.2.1 General

The Prototype Repository project will be performed and reported following the guidelines given in the applicable SKB SD and AHRL SDTD procedures. This implies application of scientific principles and regular reporting at meetings on several levels and current documentation in various report series.

4.2.2 Organisation

The project will be organised in accordance with internal and EC guidelines. The organisation is outlined on the next page:



The consortium

The international consortium consists of thirteen organisations with long and substantial experience of nuclear waste handling as well as planning and designing of final repositories. They are listed in Table 1. The members of the consortium represent different approaches to disposal of highly radioactive waste and have defined roles in the project.

Table 1. Participating parties in the consortium

| No. | Name of organisation | Acronym | Country |
|-----|---|---------|---------|
| 1 | Swedish Nuclear Fuel and Waste Management Co | SKB | Sweden |
| 2 | Posiva Oy | POSIVA | Finland |
| 3 | Empresa Nacional de Residuos radiactivos, S.A. | ENRESA | Spain |
| 4 | Asociacion para la Investigacion y Desarrollo Industrial de los Recursos Naturales. | AITEMIN | Spain |
| 5 | Centre Internacionale de Mètode Numèrics en Enginyeria | CIMNE | Spain |
| 6 | Gesellschaft fuer Anlagen- und Reaktorsicherheit | GRS | Germany |
| 7 | Bundesanstalt fuer Geowissenschaften und Rohstoffe | BGR | Germany |
| 8 | Geoenvironmental Research Centre, Univ. of Cardiff | UWC | UK |
| 9 | Japan Nuclear Cycle Development Institute | JNC | Japan |
| 10 | Geodevelopment | GEO | Sweden |
| 11 | VBB VIAK | VBB | Sweden |
| 12 | Clay Technology | CLAY | Sweden |
| 13 | VTT Communities and infrastructure | VTT | Finland |



Structure

A Project Manager is in charge of the project and is assisted by an EC project Co-ordinator. A Steering Committee and a Work Package Group are established for governing the work, which will be headed and co-ordinated by SKB. The Parties will have to review their own work in the respective work packages and put together and report relevant material in a way that is compatible with the reporting of the other Parties, with SKB having a co-ordinating role. The participants, that also provide the scientific management of the respective work packages, are listed in Table 2, which also shows their engagement in the work packages.

Table 2. Parties of the Prototype Repository project and their engagement in Work Packages

| Organisation | WP1 | WP2 | WP3 | Note |
|---------------------|------------|------------|------------|---------------------------------|
| SKB | X | X | X | Project managing, co-ordination |
| POSIVA | | X | X | |
| ENRESA | X | X | X | |
| AITEMIN | X | X | X | |
| CIMNE | | | X | |
| GRS | X | X | X | |
| BGR | | | X | |
| UWC | | | X | |
| JNC BB | | | X | |
| GEO | X | X | X | Scientific writer |
| VBB | X | X | X | |
| CT | X | X | X | |
| VTT | | | X | |

All activities will be grouped into the following four Work Packages (WP0 has started and is no subject for EC funding):

WP0. Design and construction of canister with heaters, bentonite blocks, backfilling and plugs (engineered barrier systems, EBS)

WP1 Design of instrumentation and manufacturing of sensors.

WP2. Emplacement of bentonite buffer, disposal of canisters with heaters, backfilling of tunnel and construction of plugs.

WP3. Conceptual modelling of the function of EBS and application and development of mathematical for describing important EBS processes and integrated EBS performance.



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

Each work package specifies activities that are split into sub work packages, which in turn are split into tasks. The main structure of this hierarchy appears in appendix form at the end of the Project Description.

Steering committee

The Steering Committee consisting of members representing the Parties will provide technical guidance and be responsible for the management and financial control, through the Project Manager, who also acts as Chair of the committee. The Steering Committee appoints the Chair of the Work Package Group and has the ultimate responsibility for the annual and final reports. The Committee summons meetings and seminars and provides reviewing of written drafts of the reports.

All major decisions concerning the experiments and the reporting will be taken by the Steering Committee, which is also responsible for taking necessary quality and environmental management measures. The Project Manager and the EC project Co-ordinator will, together, be responsible for current preparation of documents forming a basis of the Steering Committee's decision-making and of the flow of communication within the project. Quarterly Reports will be prepared by the Project Manager and the EC Co-ordinator and distributed to all Parties. Financial statements will be made in accordance with EC needs and recommendations.

A meeting frequency of about once per nine months is planned.

Work Package Group

One Work Package Group (WPG) is established for planning, evaluating, discussing and reporting of the EC-related work within WP1, WP2 and WP3. The group consists of the Work Package Leaders and the Work Package Co-ordinator, and is a technical and scientific body supporting the work of the Steering Committee, and reports to the Steering Committee. Parties may add temporary participants to the group in order to cover technical topics of concern.

The meeting frequency is dependent on the activities taking place, indicating a higher frequency during preparation and installation than during monitoring and modelling.



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

4.3 Functional descriptions

Duties, responsibilities and report channels for various staff functions are summarised below.

4.3.1 Process Owner of Facility Design (SKB)

Acts on behalf of the Director of Repository Technology as the Project Owners' representative.

4.3.2 Project Manager

- Managing the project, supervising the execution of work and follow-up the results
- Project time and resource planning
- Keeping within project budget
- Procurement of services, equipment and consumables within given mandates and presenting other items to superiors for their signature
- Achievement of objectives within stated time frames
- Management of personnel engaged in the project.
- Providing engaged personnel and consultants with necessary data and other types of information relevant to the project
- Presenting results in reports and formatting the reports in accordance with AHRL's report template
- Ascertaining that requested quality is obtained in the work and its results
- Co-ordination of execution of QA activities in the project

Reports work results to the Steering Committee and the Process Owner of Facility Design.

4.3.3 Assistant Project Manager of Science

- Planning of scientific investigations in the project
- That good science is considered and applied in the project
- Within the field of scientific topics, achieve stated objectives
- Keeping time schedules and milestones
- Staying within budget
- Supervising the compliance with routines and quality and environmental regulations within the field of scientific topics
- Management of Task Leaders associated with the project in cases where this has been clearly stated by the Project Manager
- Within his/her field of topics administrate fact-finding and prepare necessary documents for purchase, supervise the progress of work during execution, and follow-up delivery of ordered products.

Reports to the Project Manager.



4.3.4 Assistant Project Manager of Methods and Techniques

- Planning of methods and techniques to be applied in the project
- Within his/her field of topics for the project to achieve stated objectives and goals
- Keeping time schedules and milestones
- Staying within budget
- Supervising the compliance with routines and quality and environmental regulations within the field of topics
- Management of Task Leaders associated with the project in cases where this has been clearly stated by the Project Manager
- Within the field of topics administrate fact-finding and prepare necessary documents for purchase, supervise the progress of work during execution, and follow up delivery of ordered products.

Reports to the Project Manager.

4.3.5 On-Site Co-ordinator

- Planning and execution of activities taking place in the AHRL.
- Preparation of necessary documents for purchase of services and materials, and to supervise the execution of the work and the deliverables specified.
- Management of Task Leaders engaged under ground in the AHRL

Reports to the Project Manager.

4.3.6 Task Leader

- Planning and execution of defined task
- Reporting and other means of presenting results in compliance with stated conditions

Reports to the Project Manager, Work Package/Sub Work Package Leader, the Assistant Project Manager or the On-site Co-ordinator according to specific instructions for each task.

4.3.7 Quality and Environmental Manager

- Supervision of compliance with SKB's and project's quality and environmental management standards, including EC part of project

Reports to the Project Manager.

4.3.8 Occupational Health and Safety Officer

- Co-ordination of personnel safety within the Prototype Repository site
- Supervising of compliance with safety regulations

Reports to the Project Manager.



4.3.9

Project Administrator

- Co-ordination of project documentation
- Up-dating of the Project Handbook
- Administration of the project archive
- Distribution of project documents and management of distribution lists
- Co-ordination of time plans and administration of the master plan in AHRL Plan Right
- Co-ordination of project cost information
- Co-ordination/compilation/editing of memos and reports in accordance with AHRL Write Right
- Planning of meetings and administration/compilation of minutes
- Supporting project participants in administrative matters

Reports to the Project Manager.

4.3.10

EC project Co-ordinator

- Co-ordination of technical topics and supervision of technical documentation of the EC project in accordance with the requirements of the Commission, SKB and other participants

Reports to the Project Manager

4.3.11

Work Package Co-ordinator

- Co-ordination of tasks and sub work packages between work packages and their compliance with requirements of SKB and the participants
- Management of reporting and other means of presenting the technical results

Reports to the Project Manager

4.3.12

Work Package Leaders

- Co-ordination of work and results of sub work packages within each work package
- Reporting and other means of presenting results in compliance with stated conditions

Reports to the Work Package Co-ordinator

4.3.13 Sub Work Package Leaders

- Managing the sub work package, supervising the execution of work and follow-up the results
- Project time and resource planning
- Keeping within project budget
- Procurement of services, equipment and consumables within given mandates and presenting other items to superiors for their signature
- Achievement of objectives within stated time frames



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

- Management of personnel engaged in the sub work package
- Providing engaged personnel and consultants with necessary data and other types of information relevant to the sub work package
- Presenting results in reports and formatting the reports in accordance with AHRL's report template
- Ascertaining that requested quality is obtained in the work and its results
- Co-ordination of execution of QA activities in the sub work package

Reports to the Work Package Leader.

4.4 Authorities

For all SKB AHRL personnel authorities are described in the AHRL Manual.

4.5 Delegation

Delegation of authority shall follow SKB's general procedures.



5 RESOURCES

5.1 Personnel resources

5.1.1 The project organisation and staffing

The project organisation is described in the organisation chart, see clause 4.1. The project organisation is staffed with additional resources, including personnel from participating parties, contractors, consultants and the AHRL for the project administration and preparation of experiments, measurements etc.

5.1.2 Competence, education and training

Documentation about competence, education and training is described in the application for funding from EC's Fifth Framework Programme with the title: Prototype Repository– Full scale Testing of the KBS-3 concept for high-level Radioactive Waste, Part C 29 Sept 1999 (Clause C8)

5.2 Equipment, facilities and other physical resources

Equipment, facilities and other physical resources, including handling and maintenance, are described in the Project Description and subordinate documents.

5.2.1 Security

See the AHRL Manual.



6 PLANNING

6.1 Time scheduling

6.1.1 General

For time planning and control of the project there is a system of time schedules. Those parts which are procured externally are normally planned by the concerned contractor.

Time schedules are normally prepared in Gantt format. Activities are to be measurable and to be followed up. Controlling external events or from other time schedules are indicated. The plans are filed in accordance with catalogue structure established at the AHRL, see the AHRL Manual. The AHRL planning application, AHRL Plan Right, which is based on Microsoft Project 4.0, is used as planning tool, see the AHRL Manual. Time planners who are not located at the AHRL receive the software through the Computer System Manager at AHRL.

6.1.2 Particular time schedules

The project master time schedule is prepared by the project administrator and is approved by the Project Manager and comprises the entire project for the total project time period. The points in time for the defined project milestones, including part and stage objectives, are stated here. Controlling events are indicated. The plan details important key events in project decisions, points in time for decisions, and other points in time of importance to the project.

Work Package Group and Work Package time schedules are established by the Project Manager in consultation with the person responsible for the Work Package and with the On-site Co-ordinator for activities (tasks) which can be delimited. They cover the entire or the remaining time for the task. The amount of detail is such that the activities can be followed up and controlled.

Detailed time schedules for a certain part of an task time schedule are established as necessary for planning, follow up and control of important parts, for example, rock drilling activities. The person responsible for the activities is also responsible for establishing the detailed time schedule. For activities concerning the AHRL the time schedule is prepared in consultation with the On-site Co-ordinator. Detailed time schedules may be contractors' time schedules.

Special time schedules are established, as needed, for a certain time period or for a certain part of the project, requiring particular surveillance and control.



Prototype Repository Project Plan

Reviewed by

Approved by

Date

For those parts of the project where no time schedules subordinate to the project time schedule are established, the project time schedule shall be detailed to the extent that follow up and control of the activities are possible.

6.1.3

Approval of time schedules

The project master time schedule is approved by the Project Manager and is confirmed by the Parties through the Steering Committee.

Work Package and Sub Work Package time schedules are approved by the Project Manager.

Detailed time schedules are approved by the Task Leader and are confirmed by the Assistant Project Manager or On-site Co-ordinator.

Special time schedules are approved by the Task Leader and confirmed by the Project Manager unless subject to other agreement.

Revised time schedules shall also be approved and confirmed as described above.

6.2

Resource planning

The purpose of planning the staffing essentially is to ensure that necessary resources for the performance of the activities are available. The engaged personnel shall have qualifications meeting the requirements implied by the objectives of the project. The Project Manager has the overall responsibility for ensuring the availability of necessary personnel and other resources for the performance of the project.

All participating parties are responsible for their own resources. In case of lack of resources the situation shall be reported to the Project Manager.

The plans are prepared in accordance with AHRL Plan Right.

6.3

Activity plans

An Activity Plan is established for each activity under the responsibility of the Project Manager. The Activity Plan may be prepared for a group of activities. The plans are prepared in accordance with an SKB Activity Plan Manual.

In addition to describing how the activity is to be performed, the Manual describes the performance of inspection and testing in order to ensure the achievement of the stated quality, environmental and occupational health and safety requirements.



6.4 Meetings and schedules

6.4.1 General

Various meetings are held within the project with various purposes and participants. Meeting have an important function for information, consultations and decisions. An agenda is distributed timely to the participants prior to the meeting. For each item it should be clearly stated what is to be dealt with, who is reporting on the case, and what is the background material. Minutes are taken from all meetings where all decisions are documented. Each decision implying actions shall indicate the person responsible for the action and a time frame for completion. Remaining items shall be recorded for monitoring.

6.4.2 Project Planning Meetings

The group consists of a core with Project Manager, Assistant Project Managers, On-site Co-ordinator and Project Administrator, which meet with a frequency of about twice per month for planning of the work in the near future. Different Task Leaders are summoned when necessary.

6.4.3 Project Group Meetings

The group consists of the Project Management, Work Package Leaders, Sub Work Package Leaders and Task Leaders, which meet with a frequency of about once per six weeks for discussion on coming work, specially work within next six months.

6.4.4 Project Progress Meetings

The group consists of the Project Management, Work Package Leaders, and representatives from participants in the EC project and EC, which meet in order to discuss progress in the project. Meeting frequency is about once per each nine months.

6.4.5 Work Package Group Meeting

The group consists of the Work Package Leaders and adjointed representative from each principal contractor and meets in conjunction with Project Progress Meetings and when needed because of the Steering Committee directives.

6.4.6 Steering Committee Meeting

The group consists of one representative from each EC Principal and Assistant Contractor with EC as observer and meets in conjunction with Project Progress Meetings.

6.5 Interfaces

The Project Manager consults with the Director Deep Repository Technology about interfaces and feedback of experience from other deep repository projects.



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

Those responsible for Tasks and Work Packages consult to define boundaries and thereby ensure that all activities be attended to. Within Work Packages separate reviews of the possible interfaces between the tasks and activities are performed.



7 PROJECT REALISATION, FOLLOW-UP AND REPORTING

7.1 Project reviews

7.1.1 Preparation of documents

Technical documents including a detailed activity plan will be prepared for each main task before the execution of work. The Task Leaders are responsible for production and quality of the technical documents.

7.1.2 Technical project review

The Project Manager shall ensure that all requirements stated in the decisions, see clause 2, and by the Parties are correctly interpreted and can be implemented and performed within the project, concerning technology including objectives and scope, time and costs. Further, the Steering Committee, aided by the Work Package Group, conducts reviews to ensure that the project is performed in accordance with programme and supplementary directives from the Parties. The Work Package Leaders, Sub Work Package Leaders and Task Leaders ensure that all employed, including suppliers and contractors, know the prerequisites of the project. Project reviews are documented in writing.

7.1.3 Financial control

Each participating party is responsible for their own financial control and documented reporting to SKB. SKB is in turn responsible for the reporting to the EC in accordance with the EC rules and the contract between EC and the participants.

7.2 Reporting and cost statements

7.2.1 Types of reports

Scheduled reports and cost statements are listed in Annex I to the EC Contract as well as their submission deadlines. They consists of the following types

- Scientific reports – delivery of work
- Periodic Scientific and Technical Progress Reports
- Technology Implementation Plan
- Management Progress Reports
- Minutes of Project Progress Meetings
- List of reports and documents
- Periodic Cost Statements

Each participating party is responsible for preparing and retaining their internal documentation and report series and for providing SKB timely with necessary documents for the reporting to the EC. SKB is responsible that the reports listed in Annex E be established for submission.



Prototype Repository Project Plan

Reviewed by

Approved by

Date

7.2.2

Final report

The final report shall cover all the work, objectives, results and conclusions, including a summary of all the latter.

7.2.3

Annual report

The annual report comprises a description of the project activities during the past year. The report shall concentrate on results.

Background material for the annual report is prepared by each Work Package Leader and is compiled by the Project Manager. The annual report is edited centrally and approved by the Parties through the Steering Committee.

7.3

Verification

7.3.1

Methods for verification

An intranet list of applicable instructions pertaining to verification methods will be established.

7.3.2

Verification against requirements

Reports, results from investigations, calculations including those with computer assistance, instructions, measurements, etc., i.e. documents describing results or influencing the activities shall be reviewed prior to final acceptance.

The Steering Committee provides review of the scientific reports (deliverables of work) including the final report. Drafts are submitted by the Project Management to the Prototype Repository Member Home Page, where they can be loaded down, adjusted and reloaded according to the instructions provided by the Project Administrator.

Other documents are reviewed by the separate Sub Work Package Leader or Task Leader according to the manuals and instructions established for the various sub-activities. The Sub Work Package Leader and Task Leader respectively is responsible that the review is performed and adapted to the complexity of the activity. The Sub Work Package Leader and Task Leader respectively verifies the review with his/her signature on checklists or documents associated with the review.

In case the activity is performed by contractors/consultants, their responsible person shall perform an equivalent review.

The Steering Committee via the Chair, Sub Work Package Leader, Task Leader and Co-ordinator respectively approves reports and documents by signing and dating them.



7.4 Risk analysis

7.4.1 Project feasibility

Risk analysis with regard to feasibility is continually made as part of each Activity Plan and approved by the Project Manager during the entire project life span. Nonconformity results are regularly reported to the Project Manager.

7.4.2 Safety issues

Tunnel safety issues are dealt with in the AHRL Manual.

The Manager, Facility Operation AHRL, is responsible for the recording and reporting of personal safety issues in accordance with defined SKB delegation.

7.5 Handling of non-conformities, corrective and preventive actions

7.5.1 Definition of nonconformity

See SKB document SD-006 or equivalent procedure.

7.5.2 Reporting

Reporting of non-conformities follows procedure SD-006 or equivalent.

The documentation shall always indicate in which Activity Plan the original execution is described. The documentation shall be distributed to the same extent as the basic document, always including the SICADA administrator.

7.5.3 Corrective action

Handling of corrective action including follow-up follows procedure SD-006 or equivalent. The Project Manager ensures that the non-conformity is evaluated with regard to, among others, quality, costs, function, reliability. Suggested corrective action shall be approved by the Project Manager.

Major non-conformities which may influence the function according to the established Project Description shall be forwarded to the Steering Committee for decision on possible action.

7.5.4 Preventive action

Preventive actions within the project are treated in accordance with SKB procedure SD-006 or equivalent.



8 QUALITY, ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY AUDITS WITHIN THE PROJECT

8.1 Audit programme

8.1.1 SKB overall internal audits

The SKB overall internal quality, environmental and occupational health and safety audit programme includes audits of the project. They are scheduled, planned, conducted, reported and followed up in accordance with SKB procedure SD-005 or equivalent. The Parties or Steering Committee initiate at least one internal audit of the project each year.

8.1.2 Additional audits internal to the project

In addition to the audits of the project initiated by the Parties or Steering Committee, quality, environmental and occupational health and safety audits may also be performed internally within the project under the responsibility of the Project Manager. A programme for this kind of internal audits, covering at least the next twelve months, is maintained by the Project Manager.

This type of audit is conducted by an audit team comprising at least two persons internal or external to the project with good knowledge of the quality, environmental or occupational health and safety arena, as applicable. A person responsible for a part of an audited project shall not act as team leader for the audit of that part.

Each audit is performed and followed up in accordance with SKB procedure SD-005 or equivalent.

The audit results are submitted to the Steering Committee.

The Steering Committee should conduct annually a review of the audit programme and the audits conducted.

8.1.3 Requirements on auditors

Auditors and audit team leaders are not directly responsible for any activity within the project. Other requirements on auditors as stated in ISO 10011 part 2 apply.



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

8.2 Handling of audit results

Results from internal audits are submitted to the Steering Committee and others as defined in SD-005 or equivalent procedure and include any deficiencies found during the audit requiring corrective action. Responsibility for actions, approved by the Steering Committee, shall be defined as well as a time frame for completion and documented follow-up. The results are also used to provide a background for possible improvements to the project as such or to subsequent activities based on the outcome of the project.



9 MAINTENANCE

9.1 Handling of measuring and monitoring equipment

Checking and calibration of measuring and test equipment

Measuring and monitoring equipment used within the project are handled in accordance with the requirements in SKB procedure SD-017 or equivalent. This includes registration, use, handling, calibration, adjustment etc. Guidance is also available in ISO 10012 part 1.

When new equipment is purchased, the supplier shall provide instruction about necessary calibration devices, including software, as applicable, and how calibration is to be performed. Equipment provided by contractors shall also be calibrated.

Installed equipment shall be checked regularly to determine whether it gives correct information. The check interval is defined with regard to, among others, the instrument environment, the possibility to repeat the measurement, the influence on other results from the measurement outcome, experiences from the dependability of similar instruments.

Performed calibrations and checks are recorded as described in SD-017 or equivalent procedure.

Personnel handling measuring and monitoring equipment are suitably qualified.

9.2 Handling of other equipment

All equipment and facilities are maintained in accordance with internal procedures. Whenever relevant, scheduled preventive maintenance is performed. Performed maintenance is documented as required by procedures.



10 VALIDATION/EVALUATION

10.1 Validation against objectives and targets

Project management and the Steering Committee validate the project against the general project objectives and also against specific targets as stated regarding, for example, quality and environment.

The detailed Project Plan defines occasions when validation is to be performed; this includes a final validation at the project end.

Other functions than the Project Management may participate in the validation process.

The evaluation result shall be documented by the Project Management, and the final evaluation report approved by the Steering Committee in accordance with current document control requirements.

Evaluation within the project may, to some extent, be done during the performance of the activities, to determine whether the stated requirements are ensured. This is realised through site visits and meetings with the AHRL management, including the personnel conducting measurements.

An evaluation may also be done by comparison with other projects performed within similar areas of interest, for example, at the Stripa mine and the FEBEX Project in Switzerland.

10.2 Remarks by interested parties

Validation includes possible remarks related to the project given by external interested parties. Necessary changes are implemented based on relevant remarks.

10.3 Possible improvements

Deficiencies found during validation are always mitigated by suitable corrective actions, i.e. necessary improvements to eliminate the deficiencies and prevent recurrence.

In addition, whenever the validation leads to a suggestion for improvement other than corrective action, but related to the project, such a suggestion is evaluated for feasibility by the Project Management. An improvement is implemented after decision by the Steering Committee when the evaluation indicates a positive outcome.



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

10.4

Conclusions

The Project evaluation report shall include such conclusions that are of value for subsequent considerations or actions related to any final repository of spent nuclear fuel.



11 INFORMATION

11.1 General

From several points of view the AHRL is a facility implying frequent requests for information externally to authorities, industry and the general public as well as internally within the company and its owners.

Information issues have a very high priority at SKB. Quality concepts such as being objective, comprehensible, open and current shall characterise all information delivered by SKB.

It is important that information be deployed about the project during its progression. It is also important that the information is directed to the right people and that they will be able to assimilate it. In the first place the information is communicated through meetings and meeting minutes, and reports in the SKB series of reports.

An information and visit organisation has been instituted at the AHRL to handle the information. This department can support the project via information on the AHRL activities.

See also the SKB Information Policy and Instruction for Visitor Management.

11.2 Responsibility

The Project Manager has an active responsibility that sufficient information is given. Normally there should always be a consultation with the Information Manager at the AHRL. Media contacts should normally be co-ordinated by the Information Manager. On other occasions, for example, at spontaneous direct contacts, the Information Manager shall be kept informed.



Annex A

ADMINISTRATIVE PROCEDURES AND ROUTINES

A.1 Personnel issues

For SKB personnel, please refer to SKB Personnel Manual.

A.2 Purchasing

A.2.1 Purchase strategy

There is a plan for the purchase of instruments etc.

The SKB Purchase Manual SD-016 or equivalent shall be adhered to within the project. The guidelines, list of suppliers, templates and checklists prepared in the manual are intended to support and guide the purchase activities.

All purchasing shall be permeated by quality and environmental requirements in line with the business objectives. Supplier contacts are based on commercial grounds combined with good ethics. All purchasing shall be preceded by written orders. Verbal orders may be issued only exceptionally and only by a Project Manager.

Contractors and consultants as well as vendors of materials and equipment are regarded as suppliers.

A.3 Mail handling

“MAIL” includes:

- letters and packages,
- telefaxes,
- telexes,
- e-mails,
- documents supplied at meetings, provided they are so important that they have to be registered.

Address:

Swedish Nuclear Fuel and Waste Management Co
AHRL
Letter box 300
SE-572 95 Figeholm



Prototype Repository Project Plan

Reviewed by

Approved by

Date

All arriving and departing mail shall be registered according to the procedures in the AHRL Manual. In case the Task Leader is not located at the AHRL he or she shall forward the documents to AHRL.

A.4 Control of paper based documents

A.4.1 Identification and traceability

All documents shall be marked “Prototype Repository”, numbered and designated in accordance with procedures in the AHRL Manual.

The document shall be identified in order for its status to be clearly shown.

All documents shall have the file name and the search way to its storage location on server/PC indicated in the page foot.

A.4.2 Writing rules

All reports and documents are prepared in accordance with the SKB writing rules “Write right”, Microsoft Word Ver 6.0. See the AHRL Manual.

The layout of project-common material shall, as applicable, follow the “SKB Graphical profile”.

Project time schedules are prepared with assistance of the AHRL planning application AHRL Plan Right, which is based on Microsoft Project, see the AHRL Manual.

A.4.3 Reports

Activities performed by or on behalf of the SKB AHRL are, depending on the character of the contents, documented in different SKB report series. The project reports are arranged in those report series.

The project progress is recorded basically in the following kinds of reports:

- International Progress Report (IPR). E.g. planning and status reports.
- International Technical Document (ITD). E.g. instructions and method descriptions.
- Technical Report (TR). E.g. recording of results and conclusions.

The reports are provided with a front page and are numbered in accordance with a procedure in the AHRL Manual. The front page shall carry the SKB logotype and indicate type of report, document number, document name, author and date.

In addition, there are other documents, for example, meeting minutes and quality plans.



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

Other participants may print reports in their own series.

Print originals are submitted to EC in accordance with the contract.



A.4.4 Distribution

Each Task Leader is responsible for all distribution and for the performance of necessary self checks prior to the issuance of the document.

Reports in the various SKB report series are distributed by the SKB line organisation.

A.5 Control of computerised documents

A.5.1 Data collection

Methods/work instructions shall be prepared for the various measurements to be performed. The method documents describe what data are expected and subsequently are to be entered into SICADA. The method documents are indexed in "SKB Method Documentation".

Data collected during characterisation and preparation will be filed in AHRL site data base (SICADA). The data will be accompanied with a description of how it is collected and formatted. Task Leaders are responsible for handling and quality assurance of all data. The responsibility of filing and storing data rests with the Data administrator at the AHRL.

Daily log

When field activities are performed, notes shall be taken in accordance with "Registration and retaining of field notes and raw data/measurement data", see the AHRL Manual.

Numeric modelling

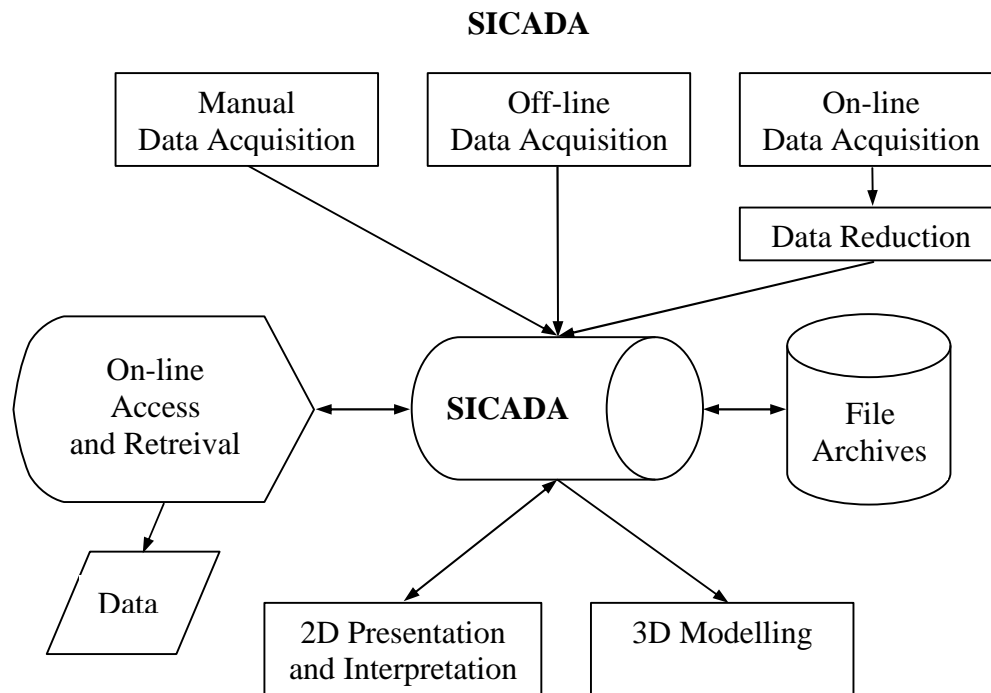
Numeric modelling is an important activity at the AHRL. It is necessary to document the activities in a systematic manner to make future re-modellings possible, and also to use the information in new modellings. The documentation shall be prepared in accordance with a procedure in the AHRL Manual.

A.5.2 Data submittance

Only data contained in SICADA are to be used for interpretation, analysis and modelling, using investigation results. The flow of data in the SICADA system is illustrated in the figure on the next page.

A.5.3 Data backup

All digital documents are saved on a hard disk in a network server, if possible. Backup is performed automatically through the server. In case the computer is not connected to a server, the Task Leader is responsible that backup is performed at least weekly.



A.6 Change control

A.6.1 Description

Change is a planned action implying deviation from the documented prerequisites of the project or from what has been decided and documented concerning time, scope and technical solutions.

A.6.2 Reporting

A Task Leader wishing a change prepares a change proposal, which is presented to the Project Manager for approval. The approved change proposal including annexes, as necessary, are distributed to those concerned. Change proposals are filed by the Project Administrator. The changes are documented and the valid document is identified by a new date and revision status. A changes document is reviewed and approved in the same manner as the original document.

A.6.3 Additional and extra activities

The same procedure as above is applied for additional/extra activities within an order where something unexpected occurs, implying that budget and time frames will be exceeded. Additional and extra activities outside an order is transferred to the SKB Project Owner's representative for further action.

A.7 Filing, retaining and disposition of documents

Filing, retention and disposition of documents are performed in accordance with procedures in the AHRL Manual and applicable SKB procedures.



Annex B

QUALITY MANAGEMENT SYSTEM

B.1 Overview of the Quality Management System

Each participating party is responsible for their own quality management matters. For SKB the following applies:

The SKB Quality Management System is applied throughout the organisation. It meets all applicable requirements in ISO 9001:1994 and is described in general procedures, designated SD-XXX. The procedures are supplemented by manuals with subordinate procedures and instructions, as applicable, specific for various units of the organisation.

B.2 Application to the project

The Quality Management System is applied to the project in all respects where required either by the system description, by regulation or by project itself.

Thus, in addition to the quality documents common within SKB, a number of project specific quality documents will be established, where this Project Plan is a controlling document for all activities within the project Prototype Repository. The Project Plan is part of the overall SKB quality system.

In order to have a complete control of all parts of the project, Activity Plans shall be established as a supplement to the Project Plan with requirements and procedures for the activities within all project areas.



Annex C

ENVIRONMENTAL MANAGEMENT SYSTEM

C.1 Overview of the Environmental Management System

C.1.1 General

Each participating party is responsible for their own environmental management matters. For SKB the following applies:

The SKB environmental management system is applied throughout the organisation. It meets all applicable requirements in ISO 14001:1994 and is described in general procedures, designated SD-032 and SD-052. The procedures are supplemented by manuals with subordinate procedures and instructions, as applicable, specific for various units of the organisation.

SKB has the objective of being an organisation certificated to the environmental management standard ISO 14001. The environmentally controlling documents shall be adapted to this objective. The project shall handle the environmental issues in accordance with the SKB Environmental Management Manual.

C.1.2 Environmental policy

SKB's environmental policy is presented in its entirety in the chapter on policies in SD-032. Consideration about the environment, among others, shall be integrated into all SKB activities.

Environmental aspects shall be taken into account at the design of facilities and selection of technologies as well as at operation and maintenance of facilities.

C.2 Application to the project

The environmental management system is applied to the project in all respects where required either by the system description, by regulation, by project itself or by relevant external interested party.

C.2.1 Planning

A list of environmental aspects has been established and is maintained in consultation with the SKB Environmental Administrator.

Applicable laws and regulations

See Annex D.



Prototype Repository Project Plan

Reviewed by

Approved by

Date

Environmental objectives

A minimum level for the project is to comply with valid environmental laws and regulations.

With established cost limits and functional requirements as a basis, realise the project using following principles:

- The principle of best available technology
- The substitution principle (environmentally hazardous substances shall be exchanged for non-hazardous or less hazardous ones)
- The cautiousness principle
- The re-circulation principle (what is extracted from the nature shall be used and eventually dispositioned without damaging it)

With the list of environmental impacts and the above stated principles as a basis, require contractors to establish an environmental plan for their activities.

C.2.2 Implementation and operation

Structure and responsibility

The Project Manager is responsible that the project be conducted in an environmentally controlled manner in order for the presented environmental objectives and targets to be fulfilled.

Training, awareness and competence

The project staff shall be aware of

- the importance of complying with the environmental policy, the procedures and the requirements of the environmental management system,
- the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance,
- their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements,
- the potential consequences of departure from specified operating procedures.



Annex D

REFERENCES

D.1 References by Section

Section

- 1.1 “Quality systems – Model for quality assurance in design, development, production, installation and servicing” (ISO 9001:1994) and “Environmental management systems – Specification with guidance for use” (ISO 14001:1996)

SKB Procedures SD-XXX, describing SKB Quality Assurance/Management System requirements.

SKB Environmental Management Manual, SD-XXX

- 2.1 Applicable laws, the most important:
- * Naturresurslagen, NRL (SFS 1987:12)
 - * Kärntekniklagen, KTL (SFS 1984:3, ändrad 1992:1536)
 - * Vattenlagen, VL (SFS 1983:291)
 - * Miljöskyddslagen, ML (SFS 1969:387)
 - * Plan- och bygglagen, PBL (SFS 1992:1769)
 - * Naturvårdslagen, NVL (SFS 1991:641)
 - * Lagen om kemiska produkter
 - * Arbetsmiljölagen

Those law requirement concerning the project are available via the SKB Environmental Co-ordinator.

Authority decisions:

Regeringsbeslut enligt naturresurslagen

Vattendomstolens tillstånd enligt vattenlagen

Byggnadsnämndens bygglov enligt plan- och bygglagen

Länsstyrelsen har tillstyrkt mindre borrhings- och sprängningsarbeten

- 2.2 Project Description – IPR 00-30

- 2.3 SKB Finance Manual



D.2 References to reports etc.

1. Dahlström L-O, 1998. Test Plan for the Prototype Repository. AHRL Progress Report HRL-98-24, SKB, Stockholm.
2. Werme L, 1998. Design premises for canister for spent nuclear fuel. SKB Technical Report TR 98-08.
3. Börgesson L, Hernelind J, 1999. Coupled thermo-hydro-mechanical calculations of the water saturation phase of a KBS-3 deposition hole. SKB Technical Report TR-99-41, SKB, Stockholm.
4. Zeng Z, Dahlström L-O, 1999. Finite Element Analyses of mechanical consequences due to the rock excavation and thermal load. SKB IPR 99-16, SKB, Stockholm.
5. Pusch R, Nilsson J, Ramqvist G, 1985. Final Report of the Buffer Mass Test – Volume I: scope, preparative field work, and test arrangement. Stripa Project Technical Report 85-11.
6. Pusch R, Börgesson L, Ramqvist G, 1985. Final Report of the Buffer Mass Test – Volume II: test results. Stripa Project Technical Report 85-12.
7. Pusch R, Nilsson J, Ramqvist G, 1985. Final Report of the Buffer Mass Test – Volume I: scope, preparative field work, and test arrangement. Stripa Project Technical Report 85-11.
8. Pusch R, Börgesson L, Ramqvist G, 1985. Final Report of the Buffer Mass Test – Volume II: test results. Stripa Project Technical Report 85-12.
9. Johannesson L-E, 1999-66. Compaction of full size blocks of bentonite for the KBS-3 concept. SKB Report R-99-66, SKB, Stockholm.
10. Pusch R, 1993. Evolution of models for conversion of smectite to non-expandable minerals. SKB Technical Report TR 93-33, SKB, Stockholm.
11. Werme L, 1998. Design premises for canister for spent nuclear fuel. SKB Technical Report TR 98-08.
12. Ageskog L, Jansson P, 1999. Heat propagation in and around the deep repository. SKB Technical Report TR-99-02, SKB, Stockholm.
13. Ageskog L, Jansson P, 1998. Prototype Repository – Finite element analyses of heat transfer and temperature distribution in buffer and rock, general part & Case No. 1. SKB Progress Report HRL-98-20.



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

14. Jansson P, Koukkanen M, 1999. Prototype Repository – Finite element analyses of heat transfer and temperature distribution in buffer and rock, Case No. 2. SKB International Progress Report SKB IPR-01-07.
15. Sundberg J, Gabrielsson Field measurements of thermal properties of the rocks in the prototype repository at AEHRL. SKB IPR-99-17.
16. SKB, 1999. SR 97, Avfall, förvarsutformning och platser, SKB, Stockholm.



Annex E

SCHEDULE AND DEADLINES FOR REPORTING AND COST STATEMENTS

The following table complies with requirements of the Commission as set forth in the ANNEX I of the Contract as well as requirements of the scientific and technical work to be conducted in the project.

| Report | Contents | Submission time | Comments |
|--|--|-----------------|--|
| <i>Scientific Reports – Deliverables of work</i> | | | |
| D1 | Project work plan | Nov 00 | Delivered in two hard copies for the Commission's approval |
| D2 | Instrumentation of buffer and backfill in Section I | Aug 01 | Ditto |
| D3 | Instrumentation of buffer and backfill in Section II | May 02 | Ditto |
| D4 | Instrumentation for hydraulic measurements in Section I | June 01 | Ditto |
| D5 | Instrumentation for hydraulic measurements in Section II | April 02 | Ditto |
| D6 | Instrumentation for stress, strain and displacement measurements in rock | April 20 | Ditto |
| D7 | Instrumentation for gas and water sampling in buffer and backfill in Section I | Aug 01 | Ditto |
| D8 | Instrumentation for gas and water sampling in buffer and backfill in Section II | May 02 | Ditto |
| D9 | Instrumentation for resistivity measurements in buffer, backfill and rock in Section I | Aug 01 | Ditto |



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

| Report | Contents | Submission time | Comments |
|---------------|--|------------------------|-----------------|
| D10 | Instrumentation for resistivity measurements in buffer, backfill and rock in Section II | April 02 | Ditto |
| D11 | Instrumentation for measurement of canister displacements | April 02 | Ditto |
| D12 | Preparation of deposition holes prior to emplacement of buffer and canisters in Section I | July 01 | Ditto |
| D13 | Preparation of deposition holes prior to emplacement of buffer and canisters in Section II | March 02 | Ditto |
| D14 | Installation of buffer and canisters in Section I | Feb 02 | Ditto |
| D15 | Installation of buffer and canisters in Section II | Sept 02 | Ditto |
| D16 | Backfill and plug installation in Section I | Aug 02 | Ditto |
| D17 | Backfill and plug installation in Section II | Feb 03 | Ditto |
| D18 | Prototype Repository test design and installation | June 03 | Ditto |
| D19 | Sensor data report #1 | March 02 | Ditto |
| D20 | Sensor data report #2 | Sept 02 | Ditto |
| D21 | Sensor data report #3 | March 03 | Ditto |
| D22 | Sensor data report #4 | Sept 03 | Ditto |
| D23 | Sensor data report #5 | Feb 04 | Ditto |
| D24 | Water and gas analysis report #1 | Dec 02 | Ditto |
| D25 | Water and gas analysis report #2 | Sept 03 | Ditto |
| D26 | Water and gas analysis report #3 | Feb 04 | Ditto |



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

| Report | Contents | Submission time | Comments |
|--|---|------------------------|--|
| D27 | Hydraulic test results | Aug 01 | Ditto |
| D28 | THM laboratory tests on buffer and backfill – progress report #1 | Jan 03 | Ditto |
| D29 | THM laboratory tests on buffer and backfill – progress report #2 | Feb 04 | Ditto |
| D30 | THM laboratory tests on rock– progress report #1 | March 03 | Ditto |
| D31 | THM laboratory tests on rock– progress report #2 | Feb 04 | Ditto |
| D32 | Determination of porosity in EDZ | Aug 02 | Ditto |
| D33 | Selection of THMCB models | May 01 | Ditto |
| D34 | Predictive THMCB modelling of buffer, backfill and rock | June 02 | Ditto |
| D35 | Comparison of results from THMCB modelling of buffer, backfill and rock, with measured data from Prototype Repository | Aug 03 | Ditto |
| D36 | Final Report on EC Project | Feb 04 | Ditto |
| <i>Periodic Scientific and Technical Progress Reports (STPR)</i> | | | |
| STPR 1 | Annual report on scientific and technical achievements | Aug 01 | Delivered in two hard copies for the Commission's approval |
| STPR 2 | Mid-term report on scientific and technical achievements | May 02 | Ditto |
| STPR 3 | Annual report on scientific and technical achievements | Feb 03 | Ditto |
| STPR 4 | Ditto | Feb 04 | Ditto |
| <i>Technology Implementation Plans (TIP)</i> | | | |
| TIP 1 (D37) | Preliminary Technology Implementation Plan | Dec 00 | Delivered in two hard copies for the Commission's approval |
| TIP 2 (D38) | Mid-term Technology Implementation Plan | May 02 | Ditto |
| TIP 3 (D39) | Final Technology Implementation Plan | Feb 04 | Ditto |



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

| Report | Contents | Submission time | Comments |
|--|--|------------------------|--|
| <i>Management Progress Reports (MPR)</i> | | | |
| MPR 1 | Periodic presentation of progress in relation to work and time plans | Feb 01 | Submission deadline is 2 months after period being reported. Delivered in two hard copies for the Commission's approval. |
| MPR 2 | Ditto | Aug 01 | Ditto |
| MPR 3 | Ditto | Feb 02 | Ditto |
| MPR 4 | Ditto | Aug 02 | Ditto |
| MPR 5 | Ditto | Feb 03 | Ditto |
| MPR 6 | Ditto | Aug 03 | Ditto |
| MPR 7 | Ditto | Feb 04 | Ditto |
| <i>Minutes of Project Progress Meetings (MPPM)</i> | | | |
| MPPM 1 | Minutes on decisions and action items | Dec 00 | First meeting planned to Sept/Oct. Thereafter approx 9 months interval. Submission deadline is 1 months after meeting. Delivered in one hard copy. |
| MPPM 2-n | Ditto | To be set | Submission deadline is 1 months after meeting. Delivered in one hard copy. |
| List of reports and documents prepared within the project | | | |
| LIST 1 | Mid-term list | May 02 | First submission of list of filed reports. One hard copy delivered at deadline. |
| LIST 2 | Final list | Feb 04 | Final list is delivered together with the last report in two hard copies for the Commission's approval. |
| <i>Periodic Cost Statements (PCS)</i> | | | |
| PCS 1 | Report on incurred costs | Aug 01 | Submission deadline is 2 months after period being reported. Delivered in two hard copies for the Commission's approval. |
| PCS 2 | Ditto | Aug 02 | Ditto |
| PCS 3 | Ditto | Aug 03 | Ditto |
| PCS 4 | Ditto | Feb 04 | Ditto |



**Prototype Repository
Project Plan**

Reviewed by

Approved by

Date

Appendix 1

LIST OF ACTIVITY PLANS

(The list is enclosed in the “open” version of the Project Plan subject to changes whenever changes are due)