

INTERNATIONAL ATOMIC ENERGY AGENCY

WAGRAMERSTRASSE 5, P.O. BOX 100, A-1400 VIENNA, AUSTRIA
FACSIMILE: (+43 1) 26007, TELEPHONE: (+43 1) 2600

- SADRWMS -

**The International Project
on**

**SAFETY ASSESSMENT DRIVING RADIOACTIVE
WASTE MANAGEMENT SOLUTIONS**

**First Plenary Meeting
November 2004**

Chairman's Report

The safety of radioactive waste management and disposal facilities can be evaluated by using safety assessment methodology. In this context safety assessment means evaluation of the actual and potential hazards to human health and the environment associated with the natural evolution of a radioactive waste management facility over time, and with events, both deliberate and accidental, which could affect its integrity. By means of such analysis it is possible to identify the strengths and weaknesses in the overall safety of such facilities and as necessary to develop actions to improve their status.

It is important that safety assessments are carried out in a traceable, transparent and consistent way in order to provide an assurance to stakeholders (such as governments, regulatory authorities, the general public and technical/scientific personnel) that the facility has been or will be sited, designed, constructed, operated and closed in such a manner that will provide a high level of assurance that human health and the environment is protected over the necessary long timescales.

The International Project on Safety Assessment Driving Radioactive Waste Management Solutions (SADRWMS) is designed to examine the application of safety assessment methodology to predisposal waste management practices and facilities including waste storage, and will complement the experience gained with the Agency project “Improvement of Long-term Safety Assessment Methodologies for Near Surface Disposal Facilities” (ISAM) which was completed in 2000, and the current CRP “Application of Safety Assessment Methodologies for Near Surface Disposal Facilities” (ASAM) whose purpose is to investigate practical application of safety assessment methodologies to a range of near surface radioactive waste disposal facilities. The SADRWMS project will encompass all types of radioactive waste including disused sources, small volumes, operational waste and spent fuel, legacy and decommissioning waste, and large volume NORM residues.

Safety assessments for various types of predisposal facilities have been carried out for many years now, but there have not been any international efforts to compare the techniques and methods applied in such assessments. Nor has consideration been given to how the results of these assessments are interpreted and used in decision making on design development or modification, safety upgrades, periodic safety assessment or licensing activities. The need for approaches to predisposal safety assessment being compared internationally and programmes investigated to develop international harmonisation has been recognised at a number of international forums in recent years, particularly the December 2002 Conference on Issues and Trends in Radioactive Waste Management.

Of particular relevance and importance in this context is the application of safety assessment to the storage of radioactive waste. Due to the delays experienced in many countries in developing waste disposal facilities, waste has to be stored for increasingly longer periods. Some countries are also considering extended storage as

an alternative to disposal. This issue was debated at the 2000 Cordoba Conference, where the sustainability of such an option was seriously questioned, and resulted in the issue being featured in the Waste Safety Action Plan (2003). The IAEA Secretariat has held a number of meetings to explore and debate this issue widely and an international position paper has been published on the subject. To a large extent the paper recognises that indefinite storage is not a sustainable option, while acknowledging that storage is a necessary phase in safely managing most types of radioactive waste. It is clear that safety assessment of predisposal management activities needs appropriate and valid methodologies. Security concerns expressed over long-term surface storage were evident during the various discussions on the topic and again the need was emphasised to address physical security threats within the overall safety assessment process.

The draft Safety Guide DS284 (*“Safety Assessment for Nuclear and Radiation Facilities Other Than Reactors and Waste Repositories”*) provides guidance on performing a safety assessment for facilities and activities associated with the management of radioactive waste prior to disposal. Under the Joint Convention, such a safety assessment will be required for all new facilities prior to implementation. DS284 has evolved to cover a wide variety of facilities, including environmental restoration & radioactive waste stores. The guide emphasises the importance of ensuring that the extent and complexity of the safety assessment is commensurate with the nature of the activity or facility and its attendant risk.

The first SADRWMS technical meeting was held in May 2003. This meeting mapped out the project with the objective of developing and harmonising approaches to safety assessment of activities and facilities for management of radioactive waste prior to disposal, with the *aim of driving forward towards disposal solutions*.

Specifically, the SADRWMS Project aims to develop practical advice for those performing or reviewing safety assessments in predisposal management and storage of radioactive waste (operators, regulators and other specialists). A detailed description of the scope, objectives, content and work programme proposed for SADRWMS is found in the Project Report. A generic flow-chart is being developed as a tool to guide the application of safety assessment to all aspects of predisposal radioactive waste management. Participants are encouraged to join and contribute actively to several of the anticipated five working groups.

The project is open to professionals working in the field of safety assessment and predisposal management and storage of radioactive waste. The first plenary meeting for SADRWMS was held in Vienna from 22 to 26 November 2004.

Organisation

The organisation structure of SADRWMS is presented in the Figure.

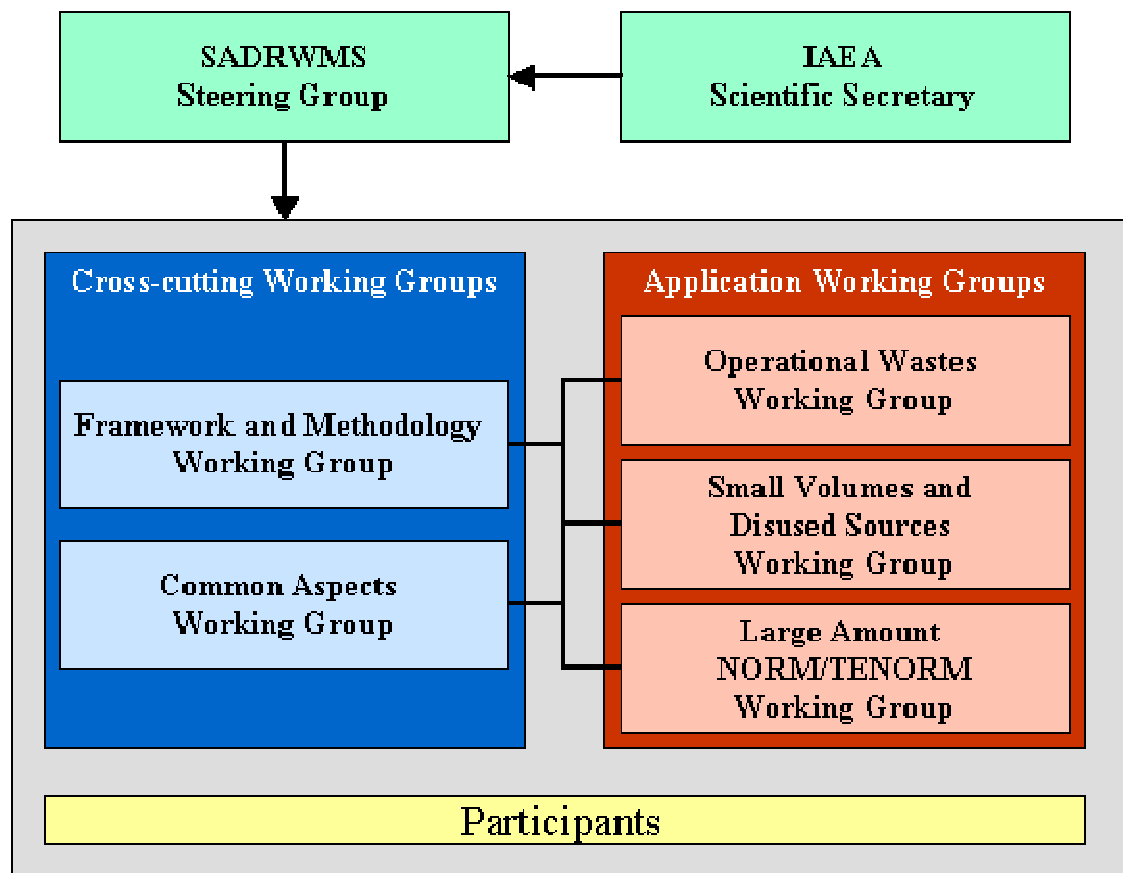


Figure: Organisational Structure of the SADRWMS Project

Participants

Farid Asgharizadeh (Iran), Rodolfo Avila (Sweden), Peter Burrows (UK), Milena Christoskova (Bulgaria), Mario Dionisi (Italy), Chris Fisher (UK), Reinaldo Gil Castillo (Cuba), Wolfgang Goldammer (Germany), Andrey Guskov (Russia), Phil Hallington (UK), Vasiliki Kamenopoulou (Greece), Sandor Kapita'ny (Hungary), Ladislav Konecny (Slovakia), Peter Lietava (Czech Rep.), Vladimir Lokner (Croatia), Marcela Medici (Argentina), Masahiro Munakata (Japan), Balint Nos (Hungary), Pham Quang Minh (Vietnam), Valdas Ragaisis (Lithuania), Jagos Raicevic (Serbia&Montenegro), Kanwar Raj (India), Azucena Sanhueza – Mir (Chile), Alexander Smetnik (Russia), Isabel Steyn (Sth Africa), Michel De Valkeneer (Belgium), Geoff Williams (Australia), Nadja Zeleznik (Slovenia), Luis Jova (IAEA), Phil Metcalf (IAEA).

Program

The First Plenary Meeting of the SADRWMS International Project opened on Monday 22 November 2004 with presentations of relevant Agency programmes and reports, plus an inspirational outline of the SADRWMS project by Phil Hallington.

This was followed by brief presentations of current radioactive waste management issues in each of the represented countries.

Participants then nominated to participate in one each of the Cross-Cutting Working Groups and the Application Working Groups, and chair and deputy chair-persons were elected for each working group. The membership of each group, the chair-persons and the group secretary are listed in the document “SADRWMS – The International Project on Safety Assessment Driving Radioactive Waste Management Solutions - Scope, Objectives, Content and Work Programme (Version 3.0, December 2004)”.

Then followed a free-flowing discussion of the SADRWMS project, particularly focussed on the role of the Framework and Methodology Working Group (FMWG) in setting the direction for the other working groups. Aspects of the project that needed addressing early-on were the rationale – to answer the questions what, why and how to move forward with the project? The FMWG was tasked to develop the common safety assessment issues into a framework, and to consolidate the common steps in a master flowchart. The framework (or “route map”) is to identify which decisions need to be made, rather than being a decision-making flowchart.

The role of the Common Aspects Working Group will be to harmonise efforts in all the application working groups and to provide consistent guidance in common elements of the framework as actual case studies are conducted.

It was recognised that the Project will evolve and that it was not possible or desirable at this early stage to pin down the details; what is required is that participants can see that the working groups are moving forward. The practical nature of the SADRWMS outcomes was emphasised in the statement that the Project is about solving radioactive waste management problems, and the place of safety assessment in that process. Safety assessment must provide confidence in going forward in solving radioactive waste management problems.

The need for separate guidance for regulatory review of safety assessment was recognised, and may result in a separate report. The final reporting structure for the SADRWMS Project will probably entail a summary report, together with a report on the work of the methodology and common aspects working groups, and either a combined report or three individual reports on the work of the application working groups.

The need was generally recognised for the adoption of a graded and proportionate approach to safety assessment, increasing in scope, detail and rigor according to the complexity and hazard of the facility or activity. An important difference between

SADRWMS and ISAM to be taken into account in planning the work is that the disposal facilities considered by ISAM generally only require passive surveillance to ensure an adequate level of security, whereas SADRWMS facilities will require active human surveillance.

An important aspect in the work of each of the three Application Working Groups will be the identification of several relevant test cases to which the safety assessment methodology being developed can be applied, and to document practical lessons learnt from these real case studies.

Some details of the preliminary work performed by each of the working groups are presented below.

Framework and Methodology Working Group

The objective of this working group is to develop a framework for the overall processes of predisposal waste management, which allows for the identification of required safety assessments. Furthermore, methodologies for conducting these safety assessments will be derived using existing approaches. The actual execution of safety assessments is outside the scope of this working group.

The methodology working group will develop guidelines for the application of existing safety assessment methodologies and the identification of what is needed in the way of safety justification. The emphasis will lie on waste orientated activities, not considering aspects such as political considerations, engineering aspects, etc. The framework proposed, as well as the safety assessment guidelines will be tested by three application working groups.

The main steps in developing the overall framework and the guidance on the safety assessment methodologies are:

- Production of a flow chart covering all predisposal phases of radioactive waste management;
- Identification of main safety issues for each step;
- Identification of criteria applicable to each step;
- Identification of where safety assessments are necessary;
- Identification of which safety assessment approach should be used.

The working group discussed the flow chart for the overall framework and produced a draft version which was submitted to all SADRWMS participants during the meeting.

Common Aspects Working Group

The overall objective of the working group is to identify common aspects of predisposal radioactive waste management and to develop guidance on the application of safety assessments to these waste management facilities. The working group will consider a range of facilities, from very small and simple to very complex, in order to identify the common aspects.

The working group will produce guidelines for the application groups as far as the identified common aspects are concerned. This framework is intended to facilitate the activities of the application groups and to avoid duplications of work within these groups.

The outcome should also enable the application groups to decide on the level of assessment needed for different types of waste and practices (taking into consideration the level of detail of the overall project).

A further objective of the working group is to create and then manage the learning processes via the internet for the SADRWMS platform. This should support the exchange of information and of worked examples where the methodology has been applied.

The working group discussed the structure of the overall project report to be developed. A basic structure was proposed.

Operational Wastes Working Group

The Operational Waste Working Group will consider the management of operational waste including legacy wastes, decommissioning waste and spent fuel. The methodology, framework, common aspects and flow charts provided by the crosscutting groups, together with existing safety assessments, will form the basis of the work for this working group.

The Working Group will test the applicability of the provided methodology, framework and common aspects from the crosscutting groups as well as the flow charts. This will contribute to the development of a harmonized common approach for the safety assessment of the predisposal management of the various categories of operational waste.

Through the use of specific case studies, the application of the methodology developed by the crosscutting groups will be demonstrated. Emphasis will be on a proportionate and effective application, which facilitates safety of the operation staff, the facility and the environment as stipulated by the regulations.

A key purpose of this work is to ensure that relevant pre-disposal waste management facilities are designed, constructed, commissioned and operated to meet the safety objectives. The potential need for upgrading safety of existing facilities will be specifically addressed.

Small Volumes and Disused Sources Working Group

The working group will consider the predisposal management of waste originated from hospitals, industry and research. This includes also waste from research reactors (excluding spent fuel). Disused and orphan sources will be also considered, independent of their origin.

The objective of this working group is to test and validate the framework and guidelines developed in the crosscutting working groups for the specific types of waste within the scope of this group. The working group will provide feedback to the two crosscutting groups, including suggestions for modification of the framework and guidelines produced. A technical report will be delivered with results of the validation of the framework and the results of application in test cases.

During the working group meeting the following parameters were identified as relevant for the identification of wastes defining the scope of required safety assessment activities:

- Waste generator;
- Waste type;
- Waste description;
- Mass;
- Volume;
- Radioisotopes;
- Activity concentration;
- Chemical composition;
- Dose rate.

Large Amount NORM/TENORM Working Group

The Large Amount NORM/TENORM Application Working Group will only consider the management of NORM/TENORM waste. The framework and flow charts provided by the crosscutting groups, and body of safety assessment methodology as modified by the crosscutting groups, together with existing safety assessments, will form the basis of the work for this working group.

The Working Group will test the applicability of the provided methodology and framework from the crosscutting groups as well as the flow charts (See Appendix A) to large amount NORM/TENORM waste. The working group will also attempt to provide a straightforward, harmonised method to deal with the management activities of NORM/TENORM waste, and guidance on all aspects of safety assessment relevant specifically to the management of large volume waste.

In its work, the working group will utilize existing safety assessments, and only to the extent necessary and possible conducts new safety assessments for NORM/TENORM.

Geoff Williams