

This document discusses the formation of a network of laboratory-based centres of expertise involved with the characterisation (by non-destructive and destructive testing) of low and intermediate level radioactive wastes. These laboratories or facilities contribute to the safe management of radioactive waste, as part of the nuclear fuel cycle and other nuclear activities, and management and clean-up of the environment.

Background

The safe management and disposal of radioactive waste is, in part, reliant upon the accurate and quality assured characterization by non-destructive and destructive methods, and determination of the radionuclide inventory. Relevant procedures, standards and laboratory practices have been developed and refined over the years in expert laboratories in those member states with mature nuclear operating facilities and laboratories.

However, a number of Member States with less developed programmes do not have such facilities and laboratories. For these countries, achieving satisfactory characterization programmes is a complex technical challenge requiring both intellectual and financial resources.

The IAEA is proposing to focus its support for low and intermediate level waste characterization via a forum (Network) for a prompt, open and efficient transfer and exchange of knowledge gained through learning from the experience of others. The Agency wishes to support organizations, either currently engaged in or seeking to develop, such characterization programmes, through their inclusion in a network to co-operate and co-ordinate relevant actions, training and technical advances.

Exchange of information and best practice in the operation of characterization laboratories is expected to underpin both public and regulatory confidence that radioactive wastes are being securely managed and responsibly stored and disposed.

The network will be non-commercial in developing its activities and will focus its attention on proven practices and successful implementation. The network will build world class research and characterization activities both nationally and internationally by partnering with Member States and supporting the developing world.

Name

International Network of Laboratories/Specialists involved in radioactive waste characterization activities, LABONET

Objectives

The Network is being established to increase efficiency in sharing international experience in the application of proven, quality assured practices for the characterization of low and intermediate level radioactive waste and waste packages and to accelerate risk reduction and cleanup of the environmental legacy. In particular the IAEA intends to:

- Support organizations or Member States with less advanced nuclear programmes for characterization of radioactive waste, by making available the relevant skills, knowledge, management practices and approaches and expertise from Member States with mature operating nuclear facilities and characterization laboratories.
- Develop an expanded range of training and demonstration activities with a regional or thematic focus providing hands-on, user-oriented experience and disseminating proven analytical procedures.
- Facilitate sharing and exchange of knowledge and experience amongst organizations with characterization facilities in operation, in pursuit of good practices, identifying and treating improper past practices and assuring the longer term knowledge management in support of a good knowledge of the wastes to be managed; and
- Create a forum in which experts' advice and technical guidance may be provided on the Agency's programme in the area of waste management.

Scope

In line with accepted and recommended policies, strategies and methodologies, LABONET aims to disseminate and continue to develop expertise in radioactive waste and waste package characterization. It aims to stimulate best practice and share lessons learned. Being an interactive network it aims at the timely sharing of such expertise.

Participation

- Partners (Facilitators/donors): Laboratories and facilities that have a demonstrated mature expertise in low and intermediate level waste characterization, facilities suitable for demonstration and/or training and a willingness to share their experience through LABONET, will be identified as "LABONET Partners" and recognized by the Agency as "Centres of Excellence" in radioactive waste characterization.
- Participants: Laboratories and facilities that have responsibility for the characterization of low and intermediate level waste and waste packages, are actively engaged in planning or implementation of radioactive waste support laboratories, and who are willing to participate in the activities of LABONET will be identified as "LABONET Participants".

Activities & Methods of Work

Activities:

- Hosting by Partners of training courses
- Organization and delivery of relevant workshops

- Establishments of a website to facilitate a Community of Practice for characterization laboratories
 - Database of procedures, standards, etc.
 - Contacts
 - Interactive exchange of information
- Define and coordinate staff exchanges and missions to Partner member locations
- Provide qualified peers amongst the Partners and Participants of LABONET to support IAEA efforts on peer reviews and technical support
- Define and coordinate funded research projects, i.e. IAEA Coordinated Research Projects (CRPs)

A tentative list of topics to support the above activities are listed in the Appendix under “Tentative Topics for Discussion at the Inaugural LABONET Meeting”

Methods of Work (implementation of LABONET activities):

- Facilitation of LABONET goals will be based on a programme of activities determined and approved by Members. An inaugural meeting will be held to define the initial programme. Thereafter, achievements of the objectives and fulfilment of the programme will be periodically reviewed and the charter updated.
- Plenary meetings or sessions will be organized for specific Partners and Participants as means of developing LABONET goals. This advisory committee, representative of LABONET, shall be formed by the IAEA; it shall meet as required.
- The IAEA will provide the administrative and secretariat services required by LABONET, including meeting facilities in Vienna, maintenance of records and distribution of documents. The IAEA will provide the services of a Scientific Secretary from within the Waste Technology Section.
- The Secretariat will provide a system for the recording of meetings and other LABONET interactions.
- The establishment of a website to provide continuity of personnel interaction between meetings and facilitate training and exchange of good practices. The website will provide a forum for exchange of ideas and information. As well, a number of other practical objectives may be served by the website, such as to highlight upcoming events, facilitate on-line publication of technical and visual information, and promote individual contacts and their interests.
- Where a characterization laboratory has a demonstrated excellence in a particular topic it may be nominated to lead for LABONET on work in that

topical area. This will enhance both visibility and credibility of their activities promoting their proven technologies.

- Specialist groups may be formed under the aegis of LABONET. These may cover topics or facility types of common interest. Where appropriate, CRPs or specific working groups may be formed to pursue these topics.
- LABONET will take advantage of the approaches used and experience gained within the on going WTS Networks on geological disposal, remediation, decommissioning and low level waste disposal.

Funding

The approach and experience of the four existing IAEA Waste Technology Section (WTS) Networks funding mechanisms will be used, i.e. IAEA Regular Budget and Technical Cooperation (TC) funding will be appropriately combined.

Tentative Schedule for Launching LABONET

Consultancy meeting to prepare the final Terms of References (May 2009)

Official IAEA letter to be sent to potential Members (To be determined in 2009)

Presentation of LABONET to the Member States and the media (flyer)

Creation of Website.

Inauguration meeting in Vienna to formally launch LABONET in conjunction with both Partners and Participants (September 2010)

APPENDIX

Pre-Inaugural LABONET Meeting Preparation

IAEA and selected consultants will inform the meeting attendees on the creation, and proposed vision and scope of LABONET to include:

- Introduction containing a brief explanation of the LABONET background and purpose (Terms of Reference (TOR) as an enclosure)
- Explanation/definition of Partner or Participant members
- Identification of pertinent Member State characterization laboratory responding entities (address...contact person)
- Types of appropriate nuclear support facilities and characterization laboratories managed by the respondent Member States (planned or operated)
- Typical activities already performed relevant to LABONET objectives/scope.

Attending Member State representatives to LABONET are requested to prepare in advance of the meeting a briefing (short, concise electronic presentation, e.g. PowerPoint presentation) covering the following topics:

- Description of radioactive waste programmes currently on-going or planned

- Description of interim storage or disposal sites that have been proposed, selected, or are in operation
- Description of interim storage or disposal site performance assessments which have been planned or completed
- Have appropriate waste acceptance criteria (WAC) been developed to meet the site performance assessment bounds?
- What radioactive facilities and characterization laboratories are in place to handle and characterize raw waste, treated waste, waste form(s), and waste packages? If none, are there appropriate existing facilities or laboratories available that could be upgraded to meet this need?
- What non-destructive and destructive testing capabilities, equipment, procedures, standards, etc. are in place to determine if the waste acceptance criteria performance measurements are met?
 - Please provide a list of procedures, practices, standards, etc. used in your nuclear facilities and laboratories along with measurement equipment.
 - Measurements will include chemical, radiochemical, physical, mechanical, and thermal properties methods.

Preferred Approaches (Potential activities to accomplish LABONET goals)

Providing training

- Distribute training activities equally among Members - plan activities and each Member involvement
- Provide group activities (course, workshop, seminar) - plan training activities in accord with Member's capacity and with respect the IAEA preferences
- Share cost - major part born by the IAEA (TC projects)
- Members to provide in-kind contribution through:
 - Hosting a training course, a fellowship or a workshop,
 - Offering an expert as lecturer or review team member,
 - Presenting a demonstration, etc.

Creating Guides:

- Select relevant topic
- Agree upon and develop standard guidance documents
- Develop training syllabuses
- Coordination/publishing through the IAEA

Formulating Proved Practices (high level statements):

- Exchange information on practices used
- Agree on joint activities
- Cooperate in formulating proved practices
- Develop "position document/statement"
- Coordination/publishing through the IAEA

Benefits

a. IAEA

- Promote international cooperation of characterization laboratories

- Network will provide an expanded group of experts to address technical issues raised by Member States, i.e. optimal use of limited resources (financial, human)

b. Partners

- Learn from experience of other Member States (proven strategies, practices, standards, lessons learned)
- Capture and preserve nuclear material characterization knowledge base for training and education purposes
- Through network, reduce duplication of efforts, share potential solutions to joint problems/issues, and synergistic brainstorming to seek solutions to new problems, i.e. minimize time and cost
- Access to facilities, equipment, and expertise that may not be readily available
- Quicker dissemination of novel techniques and technologies from commercial, national, and research laboratories
- Demonstration of good stewardship and global citizenship in reaching out to help member states with less developed programs
- Will provide for mentoring opportunities for Partner countries

c. Participants

- Training and education of scientists and engineers for countries with less developed nuclear programs
- Gain knowledge and experience from Partner members in areas of characterization facilities, practices, standards, and equipment
- Participate in a network forum which provides efficient and timely solutions to problems
- Access to Partner member characterization laboratories for hands-on, user-oriented training on equipment using proven consensus procedures and standards
- Learn from experience of Partner members (proven strategies, practices, standards, lessons learned)
- Efficient use of limited resources (cost, schedule, human)

Tentative Topics for Discussion at the Inaugural LABONET Meeting

This list to be discussed and prioritized at the Inaugural Meeting

- **Training**
 - Development of a database of physical, chemical and radiochemical methods and testing protocols
 - Training services
- **Workshops**
 - Definition and delivery of technical exchanges, including (regional) workshops/seminars
- **LABONET Website**
 - How to optimise network interaction and information sharing by modern methods of communication.
 - Website and interactive ‘community of practice’. Open access and member access pages.
- **Staff Exchanges**

- Staff exchanges – an opportunity for personal and personnel development through Fellowships.
- Technical liaisons (other IAEA networks, ENTRAP, academia, private sector suppliers)
- Working level interactions in Member organizations (partner-partner, partner-participant, participant-participant)
- **Peer Reviewers/Technical Support**
 - Fingerprinting waste streams (Comparison of methods, commonalities)
 - Development of draft standard proposals (formalize in conjunction with Standards Development Organizations, e.g. ISO, ASTM International)
 - New methods (Efficiency, accuracy, speed of result, turnaround times)
 - Quality Assurance, Quality Control and Accreditation. Sharing experience.
 - Control monitoring of used sources, orphan material and material from emergencies.
 - Free release monitoring
 - Very low level waste substances of low activity determination.
 - Measurement issues regarding naturally occurring radioactive material and its technically enhanced material (NORM and TENORM, uranium mining and milling)
 - Suitably qualified and experienced personnel and expert missions
- **Funded Research Projects**
 - Definition of projects (CRPs)
 - Interlaboratory Comparisons (Proficiency tests, “round robins”)
- **Other Topics**
 - Sampling techniques and protocols for homogeneous and heterogeneous raw wastes, treated wastes, waste forms and packages.
 - Total measurement uncertainties
 - Actual analytical needs (number of samples, sampling frequency, etc) to support compliance with waste acceptance criteria
 - Mobile laboratories – design and implementation
 - Equipment exchange