CONNECT

with peer networks and resource hubs
INTRODUCTION

Welcome to CONNECT

The IAEA CONNECT platform is an easy-to-use online environment that hosts a wide range of IAEA’s professional networks. Its main objectives are to promote capacity building, facilitate collaboration and sharing of information and experience, both within and among the several networks and their members in the nuclear field.

The IAEA networks public sites on CONNECT can be accessed by anyone while the members-only areas are targeted at professionals in their related fields, all at no cost to the participants.

Through CONNECT, the professional networks provide their members with a centralized resource hub. These resources can include reference publications, information on relevant events, active projects and working groups, members’ contributed content, draft publications and similar.

Some of the substantial benefits provided by the networks are:

- Access to experts;
- Cost free access to training materials and courses, including e-learning modules;
- Access to materials presented at IAEA workshops, training courses, group scientific visits and similar (for network members only);
- Access to shared experiences and lessons learned, as well as good practices (for network members only); and
- Collaborative development of guidance documents, procedures and training materials (for network members only).

The IAEA CONNECT platform is a project supported through the IAEA Technical Cooperation Programme with additional funding from the European Commission. It can be accessed on: https://connect.iaea.org

CONNECT and the networks’ public sites are open to all. Access to a particular network’s “members-only” area is available upon admission to that network.
Spent Nuclear Fuel Composition

The typical composition of a fresh and spent standard LWR fuel element after irradiation is shown in this figure:

- **235U**
  - Composition of fresh fuel: 3% (15 kg)
  - Composition of spent fuel: 1% (5 kg)
- **238U**
  - Composition of fresh fuel: 97% (485 kg)
  - Composition of spent fuel: 95% (475 kg)
- **Pu**
  - 1% (5 kg)
- **MAs**
  - 0.1% (0.5 kg)
- **FPs**
  - 3% (15 kg)

33 GWd/T(HM) burnup and 3 years of cooling time
E-Learning

E-learning materials, hosted by the IAEA Online Learning platform (CLP4Net) and accessible through CONNECT, can be used either separately or as part of a curriculum. Some materials are available in languages other than English.

The following modules are currently available:

**Spent Fuel and Radioactive Waste Management, Decommissioning and Environmental Remediation Curricula:**
- Policies, strategies and prerequisites
- Safety case development
- Fundamentals of spent fuel management
- Disused sealed radioactive sources
- Fundamentals of radioactive waste disposal
- Near surface disposal
- Borehole disposal
- Geological disposal
- Preparation for decommissioning
- Decommissioning implementation
- Fundamentals of environmental remediation
- Planning for environmental remediation

**Research Reactor Information Hub:**
- Strategic planning for national nuclear institutions
- Neutron activation analysis
- Nuclear Analytical Techniques for Forensic Science

**Human Resource Development Hub:**
- Human resource development
- Systematic approach to training
- Nuclear leadership development
- Stakeholder involvement
- Human performance
Delayed neutron data are essential for reactor kinetics and safety where excessively large uncertainties in the data used in reactor calculations lead to costly conservatism in the design and operation of reactor control systems. They are also necessary for non-invasive monitoring of nuclear reactors and for nuclear science in general.

The IAEA beta-Delayed Neutron Emission Network (bDN) is a coordinated effort to create a reference database for beta-delayed neutron emission that contains both compiled and recommended data for delayed neutron precursors and time dependent group parameters. Our platform also accommodates data for calculating the decay heat produced by neutron irradiated fissile fuel and related actinides after reactor shutdown and the antineutrino energy spectrum and flux emitted by the reactor cores. The database is available to the user community to enhance Member States knowledge in the fields of nuclear energy, safeguards, spent fuel and waste management, and nuclear sciences.

https://connect.iaea.org/bDN
The IAEA Nuclear Energy Capacity Building Hub (CBH) is a “one-stop shop” for information sharing, capacity building and networking on key topics associated with human resource development. Designed for countries with operating or expanding nuclear power programmes as well as newcomer countries, CBH has over 350 registered users.

The Hub consists of five different portals:

- HRD and workforce planning
- Nuclear training and SAT
- Nuclear leadership development
- Stakeholder involvement
- Human performance

All portals include:

- Communities of practice
- E-publishing
- Links to relevant e-learning
- IAEA topical documents
- Meetings

https://connect.iaea.org/CBH
The IAEA Coordination Group for Uranium Legacy Sites (CGULS) promotes cooperation among Member States affected by uranium legacy sites and national and international organizations that support efforts to remediate these sites.

The IAEA assists Member States in the development of regulatory frameworks, and in capacity building activities for regulatory bodies and operators of the uranium legacy sites. Currently CGULS project facilitates the application of IAEA safety standards and international good practices in remediation projects conducted in Kazakhstan, Kyrgyzstan, Tajikistan, Ukraine and Uzbekistan. CGULS facilitates information exchange, coordination and optimization of resources in work to reduce risks to people and the environment.

CGULS comprises the IAEA, the European Commission, the Commonwealth of Independent States and the European Bank for Reconstruction and Development. Germany, Norway, France and Belgium as well as other Member States support the Group.

The CGULS website is available in English and Russian.

http://connect.iaea.org/CGULS
The IAEA International Low Level Waste Disposal Network (DISPONET) was established to increase efficiency in sharing international experience in the application of proven practices for disposal of low and very low level radioactive waste. Its objectives are:

- To facilitate sharing and exchange knowledge and experience amongst organizations with advanced designs and disposal facilities in operation.
- In pursuit of good practices, identifying and treating improper past practices and assuring the long term knowledge management in support of post closure safety and monitoring of facilities.
- To organize training and demonstration activities with a regional or thematic focus providing hands-on, user-oriented experience and advising on proven technologies.
- To create a forum where expert advice and technical guidance on activities in the area of disposal of very low level and low level radioactive waste are exchanged.

http://connect.iaea.org/DISPONET
The IAEA receives many requests for assistance and advice for the safe management of disused sealed radioactive source (DSRS). Some assistance can be addressed by already available information. With the establishment of the IAEA Disused Sealed Radioactive Sources Network (DSRS Net), this information will be readily accessible and provide immediate answers to operators, regulators and service providers in Member States on issues on DSRS management. With the objective of scaling up safe and secure DSRS management practices worldwide, DSRS Net implements an effective match up of the demand for assistance and advice with the supply of pertinent information.

DSRS Net is an effective tool for sharing practical experience, knowledge and international developments in the field of management of DSRS as experience has shown that effective interactions between countries and organizations contribute to better conditions for safe management of DSRS.

http://connect.iaea.org/DSRS
The IAEA Network of Environmental Management and Remediation (ENVIRONET) promotes the adoption of good practices in environmental management and remediation (also dealing with norm related issues), providing a platform for exchanging experience, constructing partnerships, developing training materials and implementing targeted projects aimed at providing practical guidance to member states to deal with specific issues.

ENVIRONET’s objectives are to:

- Coordinate support to organizations in Member States to make available the relevant skills, knowledge, managerial approaches and expertise, related to environmental management remediation of contaminated sites and facilities and management of norm residues and wastes.

- Offer a broad and diversified range of capacity building mechanisms including training and demonstration activities with a regional or thematic focus providing hands-on, user-oriented experience and disseminating proven technologies.

- Promote cooperation with other networks and research consortia with a view on disseminating the accumulated knowledge and experience amongst organizations with less advanced environmental management and remediation programmes.

- Provide a forum in which experts’ advice and technical guidance may be provided.

http://connect.iaea.org/ENVIRONET
The IAEA International Decommissioning Network (IDN) was established by the IAEA in 2007 to provide a forum for collaboration and interaction among individuals involved in the decommissioning of nuclear facilities, including government officials and persons employed by facility owners, implementing organizations, regulatory agencies, waste management organizations and research entities. The network also represents an important stakeholder group with which the IAEA Secretariat interacts on topical issues affecting the planning, implementation and oversight of decommissioning programmes.

Network activities include supporting IAEA international collaborative projects on issues concerned with the planning and implementation of decommissioning projects, together with providing support for IAEA training and capacity building activities. The network participants also contribute to a Wiki-based information collection and sharing platform, the IDN Wiki.

An IDN Annual Forum is organized each year to facilitate direct exchange of information between practitioners and to promote good practice, e.g. on the regulatory and safety aspects, use of technologies, human resource considerations, project and contract management, and the management of radioactive waste from decommissioning.

http://connect.iaea.org/IDN
Prior to disposal, the radioactive waste usually goes through several steps such as pre-treatment, treatment, conditioning and storage with characterization utilised within the entire cycle of radioactive waste. Predisposal management encompasses all these steps that collectively cover the activities from waste generation up to final disposal.

The IAEA International Predisposal Network (IPN) is a forum for the sharing of practical experience and international developments on radioactive waste management activities before disposal.

The IPN has been established to increase efficiency in sharing international experience in the application of proven, quality assured practices for the predisposal management of radioactive waste including used nuclear fuel declared as waste.

The IAEA intends to support Member States either currently engaged in or seeking to develop predisposal technologies through their inclusion in the IPN to cooperate and coordinate relevant actions, training and technical advances.
The safe management and disposal of radioactive waste, in part, relies upon its accurate and quality assured characterization by non-destructive and destructive methods, and determination of its radionuclide inventory, chemical and physical properties. Relevant procedures, standards and laboratory practices have been developed and are in use in expert laboratories in some Member States. The IAEA has established International Network of Laboratories for Nuclear Waste Characterization (LABONET) 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.

LABONET is aimed at supporting Member States in characterization of radioactive waste, by facilitating access to relevant skills, knowledge, management practices, approaches and expertise. It has expanded range of regional and interregional training and with a thematic focus, providing hands-on, user oriented experience and disseminating proven procedures and technology.

http://connect.iaea.org/LABONET
The IAEA Management System Network of Excellence (MSN) is aimed at facilitating and encouraging enhanced cooperation and the exchange of knowledge and experience on management systems and safety culture in the nuclear industry and related disciplines throughout the world. The following are the key features MSN provides to members:

- An overview of important meetings related to management systems, quality assurance and quality control, and nuclear supply chain and procurement;
- Discussion forums on both common and special topics;
- Expert search function; find the person who can help you with your problems;
- Library of documents, presentations, videos, software tools, glossaries, and other resources;
- E-learning: nuclear education and training, on demand video, and archived presentations and seminars;
- Resources, including calendar of meetings and events, training courses, webinars, and online meeting workspaces.

http://connect.iaea.org/MSN
Nuclear knowledge management is a key factor to ensure that nuclear organizations maintain necessary competence and organizational ability over the long term to operate safely, efficiently and sustainably. The ultimate goal of the IAEA International Network on Nuclear Knowledge Management (NKM) Network is to serve as an international forum to increase the understanding and application of nuclear knowledge management practices.

Its objectives:

- Build professional relationships and a community of practice (CoP) among knowledge management specialists and subject matter experts in nuclear organizations;
- Facilitate, share and transfer nuclear knowledge management expertise, good practices, and experience through online forums, shared resources, common initiatives and meetings;
- Engage Member States in nuclear knowledge management programmes and promote the establishment of knowledge management networks; and
- Facilitate collaboration in the area of knowledge management, and addressing knowledge management throughout the life cycle of nuclear facilities.

http://connect.iaea.org/NKM
The IAEA Networking Nuclear Education (NNE) Community of Practice brings together professionals from academia, governments and nuclear industry around nuclear education matters. This network promotes regional and interregional cooperation on nuclear education and training by enabling its members to share educational experience and resources, benefit from a common space to discuss policies and strategies for nuclear education and training, and share best practices and lessons learned.

Through this platform members can review latest progress and trends, identify common issues and discuss possible synergetic solutions.

The portal also serves as a communication tool for the regional IAEA-fostered educational networks Africa Regional Cooperative Agreement for Research Development and Training (AFRA-NEST), Asian Network for Education in Nuclear Technology (ANENT), Latin American Network for Education in Nuclear Technology (LANENT) and STAR-NET operating in different regions, for updates on regional programmes and common initiatives.

http://connect.iaea.org/NNE
Research Reactor Information Hub

The purpose of the IAEA Research Reactor Information Hub (RRIH) is to provide Member States with the pertinent, up to date information about planning, building, operating and utilizing research reactors. Among the information provided on the RRIH are the Research Reactor Database, that contains information on the characteristics and utilization of the world’s research reactors; the Research Reactor Ageing Database, covering reports on ageing -related issues and their resolution; and the Research Reactor Material Properties Database, that comprises reports on the properties of irradiated research reactor structural materials.

http://connect.iaea.org/RRIH
The IAEA International Working Forum on Regulatory Supervision of Legacy Sites (RSLS) is aimed at improving the short and long term safety of radiologically contaminated legacy sites. It is intended for regulatory bodies, technical support organizations and those managing legacy sites.

The Forum promotes effective and efficient regulatory supervision of legacy site management, consistent with the IAEA safety standards and good international practices.

The Forum facilitates collection, collation and exchange of information related to legacy sites and fosters mutual support among participating regulators and operators of legacy sites. It supports the sharing of lessons from legacy site management with those managing operating sites to avoid creation of additional legacy sites.

The Forum holds technical meetings, workshops and demonstration events. Additionally, it periodically establishes Working Groups to address legacy site safety topics such as enhancing the regulatory framework, safety and environmental impact assessments and professional development for regulators.

http://connect.iaea.org/RSLS
The IAEA Spent Fuel Management (SFM) Network facilitates the exchange of information, communication and cooperation amongst professionals from IAEA Member States on the management of spent fuel and enhances the sharing of experiences and lessons learned. Its scope covers spent fuel management activities from its discharge from the reactor core until its disposition either as spent fuel or high level waste from reprocessing, recycling and innovative fuel cycles.

It serves as a tool to promote the IAEA activities among Member States and encourage their participation and interest in them; disseminate and share the results of IAEA ongoing activities; enhance the sharing of experience and lessons learned among Member States (i.e. helping countries address spent fuel management requirements in the development phase of their nuclear power programmes); and train young professionals in this field.

http://connect.iaea.org/SFM
Uranium is the primary fuel for nuclear reactors and must be managed properly, in a safe and sustainable manner. Typical annual production of natural uranium world-wide has been between 55,000 and 65,000 tons of uranium metal.

The overall objective of the IAEA Uranium Production Cycle (UPC) Network is to enhance Member States’ knowledge and information sharing in the fields of exploration, discovery and assessment of resources; mining and processing; technology selection and testing; prefeasibility and feasibility studies; construction and operation of mining processing facilities; and the appropriate closure of uranium production sites where the resource has been depleted. All these areas must be based on best practices and aim for a minimal adverse impact on environment and society and bring benefits to local and national societies and economies.
The IAEA Underground Research Facilities Network for Geological Disposal (URF Network) establishes a community of practice and learning for geological disposal. It provides its members with a platform to access and share best practices in developing, evaluating and implementing geological disposal solutions. It also emphasizes the role and use of URFs to support geological disposal implementation.

URF Network is open to organizations with specific responsibilities related to establishing, developing, providing the scientific and technical basis for, and implementing deep geological disposal projects. The IAEA coordinates and facilitates the activities of the URF Network and, otherwise, acts as Scientific Secretariat to the URF Network, including maintaining records of its activities and publishing these records on its site under the CONNECT platform.

http://connect.iaea.org/URF
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Working together towards reaching these goals:

The CONNECT project is supported through the IAEA Technical Cooperation Programme with additional funding from the European Commission.

For more information visit http://connect.iaea.org