IAEA
International Atomic Energy Agency
Atoms for Peace

The Abdus Salam International Centre for Theoretical Physics

INFORMATION SHEET

Virtual ICTP/ IAEA International School on Radioactive Waste Package Performance Testing

Virtual: 2 November 2021 to 19 November 2021

Ref. No.: EVT1905456

A. Background

The International Atomic Energy Agency (IAEA) organises jointly with the Abdus Salam International Centre for Theoretical Physics (ICTP) a Joint IAEA-ICTP International School on radioactive waste cementation.

Nuclear energy is a reliable solution to a finite energy supply from fossil fuels and climate change. All Member States (MSs) that benefit from the peaceful uses of nuclear energy have some amounts of radioactive waste to manage in a way that it does not present a burden to future generations. Nuclear waste management is a core issue for sustainable development and long-term viability where immobilization of nuclear waste using durable waste forms plays a key role aiming to ensure a high degree of safety during storage, transportation and waste disposal.

The most practical approach to obtain a better understanding of the durability of waste packages earmarked for disposal is to focus on performance testing of the wasteform itself, its compatibility with the waste container, and the influence of proposed geochemical disposal conditions. Since the wasteform is considered the primary barrier for radionuclide release, the focus is on wasteform properties. This is particularly the case for novel waste forms devised to improve the encapsulation of waste streams, where performance testing is necessary to approximate long term lifetimes.

While it is recognised that short-term waste package performance testing does not accurately define long-term durability, waste package performance testing results provide a first indication of relative waste package performance and are therefore included in many repository waste acceptance criteria.

The proposed International School on Radioactive Waste Package Performance Testing will be based on successful implementation of IAEA Coordinated Research Project on Behaviours of Cementitious Materials in Long Term Storage and Disposal held in 2007-2010 (IAEA TECDOC-1701), EU document

on Definition of a recommended scientific scope of leaching experiments and harmonised leaching parameters (FP7/2007-2013 under grant agreement no. 604779, the CAST project).

The school is devoted to technological and scientific bases for nuclear waste cementation. Specific topical areas within the scope include (for instance):

Specific topical areas within the scope of this workshop includes:

- In dept description of international wasteform quality control protocols with illustrated examples (for instance water content, penetration, viscosity, leaching test, differential thermal analysis (DTA), flammability, radiolysis and radiation durability)
- In dept description of international waste container quality controls with illustrated examples (for instance mechanical tests, corrosion and radiation resistance properties)
- International protocols regarding long-term durability determination of total waste package (for instance leaching, mechanical strength, transportation requirements, radiation durability and geochemical durability)
- Wasteform-waste container compatibility
- New testing protocol developments

B. Objectives

The purpose of this virtual school is to transit information from lecturers to participants related to scientific basis underpinning Waste Package Performance Testing for nuclear waste storage/disposal and will promote scientific exchange of current advances among experts.

C. Expected Outcomes

This virtual school will assist experts from nuclear energy research, materials science, and waste management to better understand and appreciate the wide range and full potential of Radioactive Waste Package Performance Testing available. Participants will become acquainted with their international peers and will have a unique opportunity to establish links for their mutual support. Knowledge transfer will be facilitated between individuals from developed and developing countries, and can be used to develop further the internationally sponsored development of nuclear waste packages for disposal.

D. Role of the Lectures at virtual school

This virtual school is a new method for the transferring of knowledge as the COVID-19 pandemic situation restricts participants to travel to Trieste. The entire school will be managed and delivered remotely and will occur over a significantly longer time frame (approximately 4 weeks rather than the traditional five day conventional in-person lecturing). The virtual school will rely on both planned and ad hoc video or audio conference calls in addition to individual home-based assignments based on case studies. It is envisaged that the overall time commitment required of the lecturers during this extended period will be approximately the same as that required for a conventional five -day school in Trieste. The virtual lecturing of the

school will be solely through the use Cisco WebEx, Microsoft Teams, SharePoint and similar tools.

E. Timeline

Please see the programme here: http://indico.ictp.it/event/9656/other-view?view=ictptimetable

Monday, 22 November 2020- Thursday 24 November 2021
Participants to finalize "answer sheets at home" to qualify for certificate of attendance

Thursday 25 November - Friday, 26 November 2021
Participants forward "answer sheets" to W.Meyer@iaea.org to qualify for certificate of attendance

F. Collaboration Tools

This project will make extensive use of online collaboration tools. The Agency will setup a SharePoint site for the project; which will be closed and access will be granted only by request to the Scientific Secretary. The SharePoint site will serve as the document repository for all documents. In addition to typical documents (MS Word, Excel, etc.), the site will also house a number of "How To" videos produced by the Agency to help facilitate telecommunications issues and videos regarding the background and aim of this project. The SharePoint site will also use a message board function to allow participants to post questions about specific topics.

Access to the Microsoft Teams platform will be arranged for all of the participants. This platform is easy to use for 1-on-1 and small group chats, typically scheduled on an Ad Hoc basis by the participants. Larger meetings, if needed, will be done via the WebEx platform (the Agency will facilitate this).

The SharePoint site can be found at: link to share point or through IPN

Familiarisation and training on the tools to be used will be provided, in advance, upon request to Ms. Marina Tolstenkova M.Tolstenkova@iaea.org