



IAEA

International Atomic Energy Agency

Atoms for Peace and Development

Technical Meeting on the Challenges and Opportunities in Reprocessed Uranium Fuels: Fabrication and Performance Assessment

IAEA Headquarters, Vienna, Austria

and virtual participation via Cisco Webex

20–24 November 2023

Ref. No.: EVT2205074

Information Sheet

Introduction

The long-term sustainability of nuclear power will depend on, among several factors, an adequate supply of uranium resources that can be delivered to the marketplace at competitive prices. The global uranium demand is expected to continue to increase in the next several decades to meet large population needs, particularly in developing countries. Secondary supplies of uranium are not the major component of world supplies; however, in given today market and economic conditions with the depressed market price for uranium and other factors, such as interruptions in production due to the Covid-19 pandemic, primary uranium production has been declining and the latest forecasts (Red Book 2022) should indicate that there will be an increasing deficit in natural uranium supply. According to “The Nuclear Fuel Report: Expanded Summary – Global Scenarios for Demand and Supply Availability 2019-2040 “(World Nuclear Association, 2020), as early as 2038 primary production is forecasted to decline even further because of an overall decreased uranium global production capacity, placing further focus on secondary supplies for uranium. An understanding and assessment of reprocessed uranium, as a part of the secondary supply of uranium is thus a necessary and important aspect of providing assurance of uranium supply to IAEA Member States.

Meanwhile, there is an increasing interest in Member States, worldwide, and a significant progress made by several Member States to develop advanced and innovative fuels technologies from regenerated

materials to minimize both the environmental impacts and the waste, where the reuse of valuable nuclear material plays a crucial role. Since reprocessed uranium (RepU) contains residual U-235, it could be used, after suitable processing, as fresh fuel in reactors for energy generation, for any type of reactors. The recycling of RepU as fuel reduces the overall environmental impact of the entire fuel cycle.

To support Member States in using reprocessed uranium, the IAEA published in 2007 a TECDOC entitled “Management of Reprocessed Uranium: Current Status and Future Prospects” (IAEA-TECDOC-1529), which provides an overview of facilities, inventories and recycling programmes in pertinent countries and focuses on management overview, without technical details. Later, the IAEA published in 2009 the Nuclear Energy Series No. NF-T-4.4 on “Use of Reprocessed Uranium: Challenges and Options”, which reviews the technical and economic issues of storing, handling, converting, processing, transporting reprocessed uranium, and the fabrication, in core fuel performance and spent fuel management of fuel based on RepU.

In response to the evolving situation of RepU and to highlight the challenges faced by the industry and the options currently available or being explored, the IAEA is organizing this Technical Meeting on the Challenges and Opportunities in Reprocessed Uranium Fuels: Fabrication and Performance Assessment.

Objectives

The purpose of the event is to facilitate the exchange of up-to-date information on the current situation and future trends of reprocessed uranium fuel technologies for operating and innovative power reactors.

Target Audience

The event is intended for participants from research organizations, nuclear fuel design organizations, nuclear power plants and fuel cycle facilities’ operators, regulatory bodies, technical support organizations, universities, and other organizations engaged in reprocessed uranium management (front end, fuel fabrication technologies, loading into the reactor and behaviour of RepU fuels, management of spent Enriched Reprocessed Uranium (ERU) fuel), as appropriate.

Participants should be actively involved in the subject of the event and have considerable experience of the relevant activities.

Working Language(s)

English.

Expected Outputs

The event will provide the basis for preparing an IAEA TECDOC on the “Challenges and Opportunities in Reprocessed Uranium Fuels” compiling papers/presentations and discussions of the event, and recommendations for future IAEA activities in these areas.

Structure

This event will comprise six main technical sessions as follows:

1. Status, opportunities, and challenges of RepU fuel technologies (including national policies related to RepU, inventories and future arising of RepU).
2. Stages in implementation of different options of RepU fuel management.
3. Loading into the reactor and behaviour of RepU (including irradiation behaviour and performance assessment of RepU fuels).
4. Management of spent ERU fuel.
5. Market and economics of RepU.
6. RepU recycling contribution into SDGs.

Each technical session will include a group discussion on specific issues related to the subject items of the session.

Topics

In addition to presentations by the IAEA representatives on the work of the IAEA in this area, the meeting will include presentations by the participants focusing on the current situation in MSs and future trends of RepU fuel technologies, including inventories and future arising of RepU, opportunities and challenges of using RepU, in front end fuel cycle areas (i.e., all the technological steps before and during fuel fabrication, irradiation in deferent types of reactors, irradiation behaviour and performance assessment of repU fuels) as well as on back-end steps (management of spent ERU fuel).

The meeting will address, inter alia, the following topics:

- National policies related to RepU, inventories and future arising of RepU.
- Factors affecting use of RepU.
- Challenges of management and using RepU.
- RepU front end fuel cycle technologies:
 - Management and storage
 - Transportation of RepU (in any forms)
 - Re-enrichment (purification, conversion, blending, etc).
- Fuel fabrication with RepU.
- Direct recycle.

- Loading into the reactors (including LWRs, PHWR, RBMK, etc.).
- Irradiation behaviour and performance assessment of RepU fuels.
- Increasing of Proliferation Resistant of Uranium by using RepU.
- The possibility of multi-recycling of RepU and the consequences on the reactor core management, fuel cycle facilities and infrastructure.
- Management of spent ERU fuel (storage, transportation, reprocessing).
- Market and economics of RepU.
- RepU recycling contribution into SDGs (to reduce CO₂ emission, to reduce volume of the nuclear waste, natural resource preservation).

Participation and Registration

All persons wishing to participate in the event have to be designated by an IAEA Member State or should be members of organizations that have been invited to attend.

In order to be designated by an IAEA Member State, participants are requested to send the **Participation Form (Form A)** to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) for onward transmission to the IAEA by **15 August 2023**. Participants who are members of an organization invited to attend are requested to send the **Participation Form (Form A)** through their organization to the IAEA by the above deadline.

Selected participants will be informed in due course on the procedures to be followed with regard to administrative and financial matters.

Participants are hereby informed that the personal data they submit will be processed in line with the [Agency's Personal Data and Privacy Policy](#) and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required.

Papers and Presentations

The IAEA encourages participants to give presentations on the work of their respective institutions that falls under the topics listed above. Approximately 30 minutes will be allotted for each presentation, including floor discussion.

Participants who wish to give presentations are requested to submit an abstract of their work. The abstract will be reviewed as part of the selection process for presentations. The abstract should be in A4 page format, should be **more than one page and no more than three pages**. It should be sent electronically to **Ms Anzhelika KHAPERSKAIA**, the Scientific Secretary of the event (see contact details below), not later than **15 August 2023**. Authors will be notified of the acceptance of their proposed presentations by **15 September 2023**.

In addition, participants have to submit the presentation slides together with the **Form for Submission of a Paper (Form B)** to their competent national authority (e.g., Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or their organization for onward transmission to the IAEA not later than **15 October 2023**.

Expenditures and Grants

No registration fee is charged to participants.

The IAEA is generally not in a position to bear the travel and other costs of participants in the event. The IAEA has, however, limited funds at its disposal to help meet the cost of attendance of certain participants. Upon specific request, such assistance may be offered to normally one participant per country, provided that, in the IAEA's view, the participant will make an important contribution to the event.

The application for financial support should be made using the **Grant Application Form (Form C)**, which has to be stamped, signed and submitted by the competent national authority to the IAEA together with the **Participation Form (Form A)** by **15 August 2023**.

Venue

The event will be held at the Vienna International Centre (VIC), where the IAEA's Headquarters are located. Participants must make their own travel and accommodation arrangements.

General information on the VIC and other practical details, such as a list of hotels offering a reduced rate for IAEA participants, are listed on the following IAEA web page:

www.iaea.org/events.

Participants are advised to arrive at Checkpoint 1/Gate 1 of the VIC one hour before the start of the event on the first day in order to allow for timely registration. Participants will need to present an official photo identification document in order to be admitted to the VIC premises.

Visas

Participants who require a visa to enter Austria should submit the necessary application to the nearest diplomatic or consular representative of Austria at least four weeks before they travel to Austria. Since Austria is a Schengen State, persons requiring a visa will have to apply for a Schengen visa. In States where Austria has no diplomatic mission, visas can be obtained from the consular authority of a Schengen Partner State representing Austria in the country in question.

IAEA Contacts

Scientific Secretary:

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Department of Nuclear Energy

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Administrative Secretary:

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Subsequent correspondence on scientific matters should be sent to the Scientific Secretary/Secretaries and correspondence on other matters related to the event to the Administrative Secretary.

Participation Form

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To be completed by the participant and sent to the competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA, or National Atomic Energy Authority) of his/her country for subsequent transmission to the International Atomic Energy Agency (IAEA) either by email to: Official.Mail@iaea.org or by fax to: +43 1 26007 (no hard copies needed). Please also send a copy by email to the Scientific Secretary A.Khaperskaia@iaea.org and to the Administrative Secretary S.Abu-Toameh@iaea.org

Deadline for receipt by IAEA through official channels: 15 August 2023

Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms
Institution:		
Full address:		
Tel. (Fax):		
Email:		
Nationality:	Representing following Member State/non-Member State/entity or invited organization:	
If/as applicable:		
Do you intend to submit a paper?		Yes <input type="checkbox"/> No <input type="checkbox"/>
Title:		
I plan to attend virtually:		Yes <input type="checkbox"/> No <input type="checkbox"/>

Participants are hereby informed that the personal data they submit will be processed in line with the [Agency's Personal Data and Privacy Policy](#) and is collected solely for the purpose(s) of reviewing and assessing the application and to complete logistical arrangements where required. The IAEA may also use the contact details of Applicants to inform them of the IAEA's scientific and technical publications, or the latest employment opportunities and current open vacancies at the IAEA. These secondary purposes are consistent with the IAEA's mandate.

Form for Submission of a Paper

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Title of the paper:		
Family name(s) and first name(s) of all author(s) (same as in passport(s):	Scientific establishment(s) in which the work has been carried out	City/Country
1.		
2.		
3.		
Family name(s) and first name(s) of author presenting the paper (same as in passport):	Mr/Ms:	
Mailing address:		
Tel. (Fax):		
Email:		
I plan to attend virtually: Yes <input type="checkbox"/> No <input type="checkbox"/>		

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- that the material submitted to the IAEA does not contain any libellous or other unlawful statements and does not contain any materials that violate any personal or proprietary rights of any person or entity.

Date:

Signature of main author:

Grant Application Form

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Family name(s): (same as in passport)	First name(s): (same as in passport)	Mr/Ms:
Mailing address:	Tel.:	
	Fax:	
	Email:	
Date of birth (yy/mm/dd):	Nationality:	
I plan to attend virtually:	Yes <input type="checkbox"/> No <input type="checkbox"/>	

1. Education (post-secondary):

Name and place of institution	Field of study	Diploma or Degree	Years attended from to	

2. Recent employment record (starting with your present post):

Name and place of employer/ organization	Title of your position	Type of work	Years worked from to	

3. Description of work performed over the last three years:

4. Institute's/Member State's programme in field of event:

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Date: **Signature of applicant:** _____

Date: **Name, signature and stamp of Ministry of Foreign Affairs, Permanent Mission
to the IAEA or National Atomic Energy Authority** _____