



Regional Workshop on the Processing of Spent Ion Exchange Resins,

Hosted by

The Government of Croatia

through the

Fund for Financing the Decommissioning of the Krško Nuclear Power Plant
Zadar, Croatia

18 to 22 March 2024

Ref. No.: ME-RER9164-2300553

Information Sheet

Purpose

The purpose of this event is to discuss and share current approaches and practices on the technologies for processing of spent ion exchange resins in order to produce a stable waste form for disposal.

Working Language(s)

The working language(s) of the event will be English. There will be no interpretation provided. All communications, abstracts and papers must be submitted in this language.

Deadline for Nominations

Nominations received after **9 February 2024** will not be considered.

Project Background

During the normal lifetime of a nuclear facility, potential wet solid waste arises in the form of filtration media, ion exchange resins, concentrates and sludges. Although wet waste may not be a major portion of radioactive waste generation at a nuclear facility, these waste are typical elevated in activity due to concentration of radionuclides and require treatment and/or conditioning prior to disposal.

The use of ion exchange resins is one of the most common and effective treatment methods for the treatment of liquid radioactive effluents. However, spent ion exchange resins are considered to be a problematic waste due to activity and organic content and in many situations, require special approaches and precautions during their conditioning/ pretreatment to meet the acceptance criteria for disposal. The general treatment options for spent ion exchange materials are:

- Destruction of the organic component in the resin to produce an inorganic intermediate product that may or may not be further conditioned for storage and/or disposal;
- Direct immobilization, producing a stable waste form for disposal.

To support Member States in the management of radioactive waste, the IAEA is organising a dedicated workshop on the processing technologies for spent ion exchange resins.

Expected Outputs

As a result of the workshop, the participants will have the knowledge regarding:

- Current technologies for processing of spent ion exchange waste streams;
- Key factors influencing the selection of processing technologies for processing of spent ion exchange resin based on the characteristics of the resin;
- Properties of the final ion exchange resin waste form/package relating to WAC for storage/disposal;
- To review publications more objectively regarding the processing of spent ion exchange resin;
- The planning of new facilities and processes for the processing of spent ion exchange resin.

Scope and Nature

The five-day regional workshop will include lectures, structured discussions and underpinned by exercises designed to practice and reinforce the development and implementation of long-term storage technologies for different types of waste. Examples of contents that are being planned (depending on availability of experts) of the five-day seminar:

— Day 1: General Lectures:

- Structure of anionic and cationic ion exchange resin
- Ion exchanges mechanisms for radionuclides
- General introduction to interlinkage between processing technologies of spent ion exchange, waste form, waste package and WAC for storage

— Day 2: Lectures on conditioning of large volumes of spent ion exchange materials:

- Incineration (e.g., CILVA Belgoprocess, EnergySolutions incinerator at the Bear Creek Facility in Oak Ridge, Cyclife Incinerator at Studsvik Tech Park and Zaporozhye NPP)
- Pyrolysis (e.g., Cyclife Sweden facility at Studsvik Tech Park, Nyköping)
- Fluidized bed steam reforming (e.g., EnergySolutions incinerator at the Bear Creek Facility in Oak Ridge, TN)
- Plasma (e.g. tilting furnace system at Kozloduy Nuclear Power Plant)
- Plasma incinerator-vitrification (SHIVA process France)
- Non-conformity issues, problems detected during operation, drawbacks of the different types of geopolymer processes

— Day 3: Lectures on conditioning of small volumes of spent ion exchange materials

- Cementation (Koeberg NPP)
- Bitumen (Czech)
- Vitrification
- Mecure process
- Immobilized into polymer (e.g. Shin-Kori 3 & 4 (Korea))
- Geopolymer

— Day 4: Lectures on treatment of spent ion exchange materials:

- Hot compaction into High Integrity Container (e.g. Philipsburg NPP)
- Advanced oxidation processes
- Deep evaporation
- Containerization
- Long-term behaviour of waste packages during disposal

— Day 5: Lectures and closing:

- Non-conformity issues, problems detected during operation, drawbacks of the different types processes.
- Practical exercise (participants to select processing technologies for different spent ion exchange resins)
- Final lectures and closing of seminar.

The participants are required to prepare and present the status of their program/project for the management of ion exchange resins. A brief abstract of participants' presentations should be submitted **prior** to the event.

Participation

Participants must be nominated by the competent national authority of the Member State and, most specifically, by the Member States' official counterpart for the project.

Please note that participants will be expected to share information outlining their experience or needs regarding the development and implementation of processing technologies for spent ion exchange resins as part of a radioactive waste management plan.

Participants' Qualification and Experience

The event is targeted at representatives from countries that operate or are involved in the decommissioning of NPPs and/or Research Reactors and should be limited to representatives involved in current or future programs or projects related to the development and implementation of processing technologies for spent ion exchange resins.

Papers and Presentations

The IAEA encourages participants to give presentations outlining their experience or planned activities regarding the planning of storage facilities for different waste packages as part of a radioactive waste management plan, highlighting challenges and issues on the work of their respective institutions that falls under the topics listed above.

Participants who wish to give presentations are requested to submit the presentation electronically to Mr Meyer (W.Meyer@iaea.org) the Scientific Secretary of the event not later than **9 Feb 2024**.

Authors will be notified of the acceptance of their proposed presentations by 4 March 2024.

Application Procedure

Candidates wishing to apply for this event should follow the steps below:

1. Access the InTouch+ home page (<https://intouchplus.iaea.org>) using the candidate's existing Nucleus username and password. If the candidate is not a registered Nucleus user, she/he must create a Nucleus account (<https://websso.iaea.org/IM/UserRegistrationPage.aspx>) before proceeding with the event application process below.
2. On the InTouch + platform, the candidate must:
 - a. Finalize or update her/his personal details, provide sufficient information to establish the required qualifications regarding education, language skills and work experience ('Profile' tab) and upload relevant supporting documents;
 - b. Download and complete the [Designation of Beneficiary and Emergency Contact Form](#), and upload to InTouch+ ('Profile' tab under the personal section) specifying the document

name. If already provided, kindly discard this step; and

- c. Search for the relevant technical cooperation event (EVT2300553) under the 'My Eligible Events' tab, answer the mandatory questions and lastly submit the application to the required authority.

NOTE: Completed applications need to be approved by the relevant national authority, i.e. the National Liaison Office, and submitted to the IAEA through the established official channels by the provided designation deadline.

For additional support on how to apply for an event, please refer to the [InTouch+ Help page](#). Any issues or queries related to InTouch+ can be addressed to InTouchPlus.Contact-Point@iaea.org.

Should online application submission not be possible, candidates may download the nomination form for the meeting from the [IAEA website](#).

NOTE: A medical certificate signed by a registered medical practitioner dated not more than four months prior to starting date of the event must be submitted by candidates when applying for a) events with a duration exceeding one month, and/or b) all candidates over the age of 65 regardless of the event duration.

Administrative and Financial Arrangements

Nominating authorities will be informed in due course of the names of the candidates who have been selected, and will at that time be informed of the procedure to be followed with regard to administrative and financial matters.

Selected participants will receive an allowance from the IAEA sufficient to cover their costs of lodging, daily subsistence and miscellaneous expenses. They will also receive either a round-trip air ticket based on the most direct and economical route between the airport nearest their residence and the airport nearest the duty station through the IAEA's travel agency AX Travel Management, or a travel allowance, or they will be reimbursed travel by car/bus/train in accordance with IAEA rules for non-staff travel.

Disclaimer of Liability

The organizers of the event do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in approving his/her participation, undertakes responsibility for such coverage. Governments would be well advised to take out insurance against these risks.

Note for female participants

Any woman engaged by the IAEA for work or training should notify the IAEA on becoming aware that she is pregnant.

The Board of Governors of the IAEA approved new International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources. The Standards deal specifically with the occupational exposure conditions of female workers by requiring, inter alia, that a female worker should, on becoming aware that she is pregnant, notify her employer in order that her working conditions may be modified, if necessary. This notification shall not be considered a reason to exclude her from work; however, her working conditions, with respect to occupational exposure shall be adapted with a view to ensuring that her embryo or foetus be afforded the same broad level of protection as required for members of the public.

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