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## Advances in conditioning of low and intermediate nuclear waste

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Radioactive waste with widely varying characteristics is generated from the operation and maintenance of nuclear reactors, nuclear fuel cycle facilities, research facilities and medical facilities and the through the use of radioisotopes in industrial applications. The waste needs to be treated and conditioned as necessary to provide wasteforms acceptable for safe storage and disposal. Conditioning of radioactive waste is an important step to prepare waste for long-term storage or disposal and includes the following processes:

- Immobilization which may or may not also provide volume reduction, including (a) Low temperature processes and (b) Thermal processes;
- Containerization for (a) Transport, (b) Storage, and (c) Disposal;
- Overpacking of primary containers (a) Prior to disposal and (b) In a disposal facility as part of disposal process.

Conditioning consists of operations that produce a waste package suitable for handling, transportation, storage and/or disposal and may be performed for a variety of reasons including standardization of practices and/or wasteforms, technical requirements for waste stability in relation to a repository design or safety case, technical requirements related to waste transportation, societal preferences, regulatory preferences, etc. This report aims to give an overview of recent advances in conditioning of low and intermediate nuclear waste.

### Summary

The report is based on IAEA Handbook "Conditioning of Low- and Intermediate-Level Liquid, Solidified and Solid Waste" which is one of eight IAEA handbooks intended to provide guidance for evaluating and implementing various characterisation and radioactive waste processing and storage technologies before final disposal – see e.g. the recently published Handbook on Treatment of Gaseous Waste [1].

1. Treatment of Radioactive Gaseous Waste. IAEA-TECDOC-1744, IAEA, Vienna (2014).

**Primary author(s) :** Prof. OJOVAN, Michael (International Atomic Energy Agency)

**Co-author(s) :** Dr GARAMSZEGHY, Miklos (Mike) (Nuclear Waste Management Organization, Canada); Dr ROBBINS, Rebecca (International Atomic Energy Agency)

**Presenter(s) :** Prof. OJOVAN, Michael (International Atomic Energy Agency); Dr GARAMSZEGHY, Miklos (Mike) (Nuclear Waste Management Organization, Canada)

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