

# International Conference on Radioactive Waste Management: Solutions for a Sustainable Future (CN-294)



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## Overall optimization of radioactive waste processing and disposal for problematic waste management

Japan Atomic Energy Agency (JAEA) has stored much of its waste generated from R&D activities related to nuclear science and technology. A part of these wastes contains compressed waste without prior radiological, chemical or physical characterization assessed, as well as mixed waste containing lead and mercury with little information about its contents.

Such problematic wastes have been manually unpacked and segregated to separate combustibles and hazardous materials for final disposal and these pretreatment efforts are very time consuming and costly. Additionally, since radionuclide composition of problematic wastes is complex and variable, the wastes are planned for homogenization through plasma melting and destructive radiological analysis is considered as a method for its radioactivity characterization. Such characterization efforts are also very time consuming and costly.

In order to optimize the processing and disposal of problematic wastes, a method to balance the processing work and disposal facility robustness was studied. This makes sense as JAEA is not only a waste generator but also the implementation body for the near-surface disposal project.

Regarding the separation of combustibles, total volume of the combustibles will be evaluated using non-destructive inspection technique such as high-energy X-ray CT and the waste that does not comply with the waste acceptance criteria should be mixed with low combustible material waste in order to satisfy the waste acceptance criteria on a disposal facility average. Regarding the separation of hazardous materials, they will be identified using records and nondestructive inspection. The waste identified as hazardous will be unpacked and segregated. Based on preliminary inspection of about 1,000 drums, only 10 % of stored drums contain hazardous materials and need segregation. Regarding radiological characterization, the establishment of a conservative scaling factor method and non-destructive gamma-ray measurement can eliminate the need of plasma melting.

It was estimated that processing throughput of compressed waste should be increased about 5 times more than present method by applying the countermeasures.

### Do you wish to participate as a Young Professional?

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