

KNF-
WASTE-06

High Intensity Focused Ultrasound for Decontamination of Complex Metal Wastes

RADIATION
TECHNOLOGY
SECTION

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High Intensity Focused Ultrasound (HIFU) is a technology to safely and effectively decontaminate metal wastes of various shapes from nuclear power plants and nuclear fuel fabrication facilities.

Description

* Background

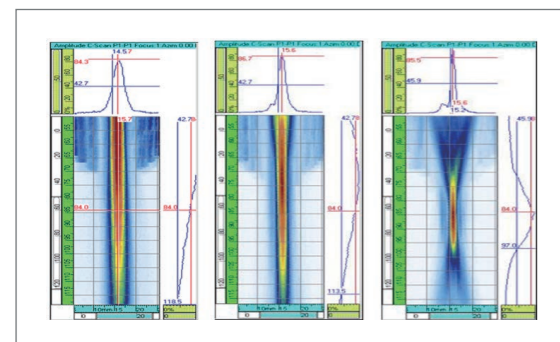
- As metal wastes that existing methods (molten salt, conventional ultrasound) cannot decontaminate are increasingly generated, developing a technology to treat them is required.

* Purpose

- To develop a technology that can effectively and safely decontaminate metal wastes contaminated with uranium of various sizes
- To develop a technology that can decontaminate metal wastes up to the level of self-disposal and quickly decontaminate them over a wide range of areas

* Contents

- HIFU technology can decontaminate complex metal wastes.

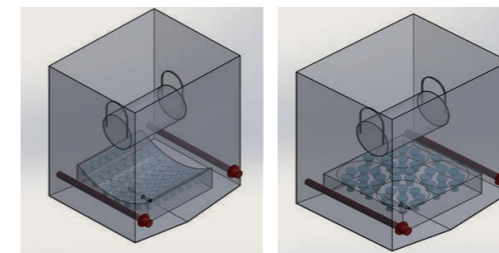


< Performance verification using
beam simulation >



< Fabrication of hemispherical oscillator >

- The technology has a 3-step decontamination system (50, 100, 200 kHz)
 - * Low frequency(for large particles) → Area-focused high frequency(for small particles) → Point-focused high frequency(for fine particles)



< HIFU system schematic diagram >

- It is effective in decontaminating highly contaminated complex metal wastes such as pipes, bolts and nuts, components of the motor etc.



< Before
decontamination >

< After
decontamination >

Distinctiveness

* Characteristics

- It is possible to decontaminate metal wastes up to the level of self-disposal.
- It is possible to decontaminate fine particles with more than 100 times stronger energy than conventional ultrasonic technology.

* Benefits

- It can be applied immediately to the decontamination of complex metal wastes generated in large quantities during the operation of nuclear power plants.
- Metal wastes that conventional methods cannot decontaminate can be decontaminated by HIFU technology.

Experience

- The HIFU devices will be operated from the first half of 2023

Deliverables

- Design and production of the HIFU devices

TECHNOLOGY READINESS LEVEL(TRL)

- Prototype validation in relevant environment

BUSINESS MODEL

Technology Transfer

Licensing

Joint search

Service Execution

Others