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Decontaminating Cesium-Contaminated Soil(Non-Acid)

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This technology recovers the environment by decontaminating radioactive cesium from the soil contaminated from a nuclear power plant accident. This method produces minimum waste by restoring most of the soil back to the environment through the process of separation and classification of micro-soil cesium from the soil. It can be applied to the nuclear decommissioning when decontaminating the plant site.

Description

● Background

- The Fukushima Nuclear Disaster produced cesium-contaminated soile all over the Fukushima area, Japan, the contaminated soil is being collected and stored temporarily for decontamination.
- Landfill to keep and dispose these contaminated soil is not spacious enough. A technology to reduce a large amount of waste is needed. In addition, the same technology can be useful to decontaminate the soile when dicommissioning the nuclear power plant.

● Purpose and Necessity

- Soil decontamination technology for a large amount of contaminated soil is required in preparation for national radiation disaster accidents
- Decontamination technology of the contaminated soil at the nuclear dismantling site is needed according to the domestic nuclear dismantling market visualization

● Technology Principle

- Technology principle for the decontamination of contaminated soil : Cesium, radioactive material, is absorbed with soil and the majority is associated with micro-soil having the feature of not dissolving in the water.

Pilot equipment of decontaminating a contaminated soil

Considering this feature, by physical method, separate micro-soil as well as micro soil, plus the big particle-size one, from the original one to remove only contaminated micro-soil. Therefore, restore uncontaminated soil for the environment by this technology.

● System Configuration

- Soil pre-treatment process
  - Screen and wet debris separator to remove organics such as a large gravel, a tree roots in soil, etc.
  - Separation of contaminated soil and non-contaminated soil
- First separation and decontamination of soil : Separation of fine grains by stirring and friction in the wet condition after separating by a certain grain size for soil decontamination
- Secondary separation process: Separation by particle size using a wet vibration screen
- Third separation process: Separation of fine particles and final particle size by hydro-cyclone
- Waste liquid treatment process: Separation of fine particles from the waste-water mixed with fine particles for waste treatment and waste liquid recycling for the process water

● Service Range

- Pre-treatment and decontamination of the soil contaminated with cesium
- Pre-treatment and decontamination of the contaminated soil in the nuclear dismantling site
  ※ Radionuclide investigation and decontamination verification test for NPP site soil

* Domestic clearance level : Cs-134, 137 (0.1Bq/g less)

Distinctiveness

● Characteristics

- Easy reuse of waste solution and minimization of waste by non-acid decontamination method during the soil decontamination
- Capability for large amount of contaminated soil

● Benefits

- About 80% polluted soil restoration for the environment(general soil basis)
- Reduction of the radioactive waste disposal cost according to the waste volume reduction

Experience

- N/A

Deliverables

- Design and construction of decontamination equipment for the contaminated soil
- Decontamination services for the contaminated soil
- Report regarding to the decontamination services for the contaminated soil

< Major equipment >

< Super Screen >

< Log washer >

< Vibrating Screen >

< Hydro Cyclone >

Soil Pre-treatment	Primary particle separation & decon	Secondary particle separation	Third particle separation	Waste liquid treatment
• Remove gravel and organic matter • Non- contaminated soil separation	• Wet agitation and washing • Primary particle size separation	• Wet vibration screen • Secondary particle size separation	• Hydro cyclone • Third particle separation	• Adsorption sedimentation agent • Recycling of waste liquid

Decontaminating process of the contaminated soil

Technology Readiness Level (TRL)

Field demonatration of Prototype

Business Model

Technology Transfer
Licensing
Joint Search
Service Execution
Others