Plan of Concrete decontamination plant construction of Practical size

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1. Introduction

Over to go of all walls from a dismantled nuclear institution was radioactive contaminated concrete over 70% of whole waste. Advanced countries have realized the importance of waste processing. Nuclear institutions store a large amount of radioactive contaminated concrete in internal waste storage.

Since dismantling of nuclear facilities, disassemble atomic waste and aggregate in concrete. The concrete waste disposal costs to get rid of radioactive waste storage can be reduce, if the disconnected aggregate dispose under the standard concentration of self-processing.

If the Processing technology that was introduced to thermal tech from crushing tech was decontaminated uranium contaminated concrete, concrete waste disposal costs was expected to reduce by 50%. Uranium contaminated concrete waste has planned construction to practical size plant that aggregate through the thermal crushing tech could decontaminate based on the demonstration experiment.

2. Methods and Results

2.1 Concrete thermal crushing tech

Decontamination technology of uranium contaminated concrete is by heat treatment at 400℃. It was divided fine powder and aggregate. After thermal crushing, aggregate through sieving could recyclable and self-processing. Because of concentration of radioactive was low-level. Fine powder was investigated through experiment that concentration was high. After particles of high concentration are reduced low-level concentration through washing and voltaic equipment, it will plan self-processing.

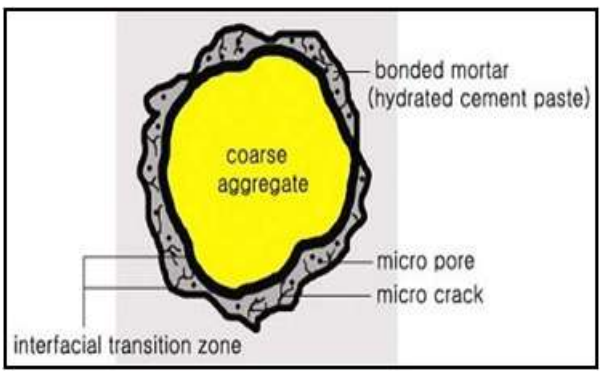

Fig. 1. Radionuclide Distribution in Concrete

2.2 Chemical washing decontamination tech

Uranium contaminated concrete was washing tech at a rate of 5ml of 1M-HNO_3 acid per 1g of fine powder and aggregate. Washing was conducted using a stirrer for two hours. The washing solution was exchanged, and additional stirring commenced for two more hours. The contaminated concrete and washing solution was placid in a chemical container

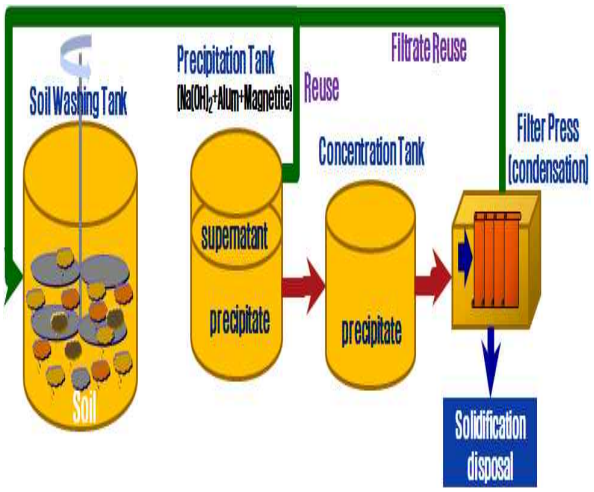

Fig. 2. Chemical Soil Washing Processing

2.3 Construction of concrete decontamination plant

Construction of concrete decontamination plant should be design to dispose of one drum a day. The main part of construction was concrete crushing equipment, thermal crushing equipment, sieving equipment and etc. This equipment needs simple plant processing in order to use. Therefore, the following Fig. 3 will plan in order to plant construction by schematic. Thermal crushing equipment is produced more than 100L. Concrete crushing is more occurred dust. So connection between devices was linked for flowing pipes. Installation will be expected to avoid dust formation. In the future is scheduled introduction by automation system that time and safety was constructed high plant.

2.4 Results and Discussion

Preparatory experiment was conducted to equipment construction of concrete. Aggregate considered possibility that self-processing handle only washing.

Fine powder was considered good that handle introduction of other processes and radioactive waste storage.

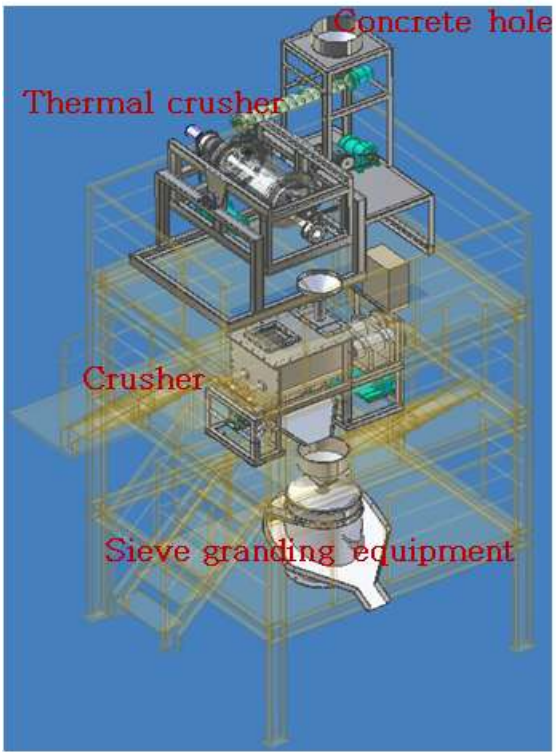

Fig. 3. Schematic of Concrete Plant

3. Conclusions

Concrete decontamination plant construction was considered practicable self-processing over 50% through demonstration. Decontamination plant is the main gold that concrete waste was constructed handling over 50 drums annual. And automation system introduction that contraction of time and safety increase by annual throughput, is expected to reduce effectively waste disposal costs.

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