

INNOVATIVE SUPER COMPACTION SYSTEM

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INTRODUCTION

In 1996 Siemens Power Division KWU received from Preußen Elektra, a German utility, the order to engineer and supply a mobile and modular designed advanced high pressure compaction system.

Beside the design principles and the realisation of the project this paper presents also the operation experience in the NPP Würgassen.

The chosen way in the NPP Würgassen is:

- Sorting of the solid waste and fill it into canisters
- Storage of the canisters in a storage module
- Compacting of the canisters in the super compaction system
- Measuring of the compacted pallets
- Packing of the compacted pallets into 55 gal drums
- Storage of the 55 gal drums in an intermetiade storage
- Transport of the 55 gal drums to the final repository.

In addition to the above described mode it is also possible to use a pre-compactor which is available. This pre-compactor can compact containers which are larger in diameter as the regular size (diameter) of a container to be compacted. After reducing the diameter to the regular size the previous oversized container can be super compacted as a regular container.

DESIGN BASIS

Due to the customer requirements the following design basis had to be considered:

- Modular construction for:
 - Compaction module
 - Hydraulic- and electrical module
 - Drum storage
 - Measuring station
 - Drum filling station
- The single modules have to be installed in transportable containers
- Design pressure for the super compactor 4000 Mg.

REALISATION OF THE PROJECT

The super compaction system was engineered and build based on:

- Siemens experience gained over 30 years in the radwaste field
- Consideration of specific nuclear aspects
- Separation of radioactive and non-radioactive areas

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- Simple function
- Separation of compaction and auxiliary systems
 - easy and good decontamination
 - easy access
 - easy maintenance
 - simple function
- Modular design
- Closed system
- Stationary or mobile design
- Short distances
- Adaptability to special customer request.

Beside the before mentioned aspects the customer required a multiple purpose control system for variable adjustment of all process parameters like pressure, time, distances etc. to treat all different waste.

The super compaction system may mainly consists in accordance with customers request of the following modules:

- Drum storage
- Pre-compactor
- Super compactor
- Central robot
- Measuring unit
- Packaging unit.

Since summer 1997 the super compactor system is in active operation in the NPP Würgassen.

OPERATION EXPERIENCE

After the operator training the super compactor system is being operated by NPP Würgassen staff.

The average compaction capacity is 10 drums per hour.

The volume reduction is depending from the waste 3 to 8.

Up to now approx. 4000 drums are compacted.

The waste is a type of mixed waste and is continuously compacted and consist of the following composition:

- metals (pipes, metal sheets, valves)
- burnable waste (textiles, cleaning material)
- not burnable waste
- plastics
- concrete, wood.

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Optimisation is done for compaction of mixed waste by adjusting the compaction parameters as well as the ratio of the different waste types in the compaction canisters.