

The Disposal of Large Components Strategies

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An Overview of the Disposal of Large Components

During the decommissioning of nuclear power plants large metallic components like steam generators or reactor pressure vessels are playing a relevant role.

Depending on their radiological properties a disposal or a recycling is possible.

To fulfill the requirements of the intended products, different strategies are used.

These strategies are following the basic conditions like the radiological protection or the site situation.

A relevant aspect is the possible clearance of the waste material which can be achieved after decay storage if necessary.

Based on these conditions different strategies are resulting.

Some of these strategies are already used in practice.



Strategies for the Disposal of Large Components

Large components can be dismantled on site with the objective of a final storage – this is the trivial way.

Other strategies are pursuing the goal of clearance of at least a part of the large components,

This can typically be achieved by treatment of the fragmented or entire large components, eventually including decay storage before or after fragmenting.

We have accompanied several of these decommissioning procedures and we will show some examples.

A: in situ treatment – **cut and dispose**

B: transport to an external treatment facility – **pack and go**

C: transport to an interim storage on site and treatment after decay – **pack and wait**



A: Cut and Dispose

Example NPP Gundremmingen:

The steam generators were filled with water, frozen and cut in situ by a band saw.

Advantage: The pieces could be treated directly on site, no transport of heavy parts was necessary.

Disadvantage: The cut of the steam generators needs a time of several years. This caused delays in other dismantling works.



Steam generator of the nuclear power plant Stade (KKS, Germany).
They are transported to Studvik Radwaste (Sweden) for further
treatment: dismantling, melting and clearance of a large part –
„Pack and Go“



KKS steam generator on its way for shipping to sweden.
Experts of TÜV Nord SysTec (arrow) are inspecting the loading



B: Pack and Go

Advantage: The large components are leaving the plant at an early stage. The place can be used for the dismantling of other parts. The decommissioning will be accelerated by more than a year. Expert knowledge at the external treatment facility is used (do not invent everything twice!).

Disadvantage: The transport has to be planned very carefully and is cost intensive.

Removing of the reactor pressure vessel of the nuclear power plant Rheinsberg (KKR, Germany). It is transported to the interim storage Nord (Lubmin / Germany) for further treatment



KKR reactor pressure vessel on the railway



Decay storage of several reactor pressure vessels and steam generators in the interim storage Nord (Lubmin / Germany) – an example for „**pack and wait**“ with the aim of clearance of these components after cutting but without melting



C: Pack and Wait

Advantages: Decay storage reduces the activity => clearance without decontamination or melting is possible;
no transport on public roads, if interim storage is on site

Disadvantage: If the values for clearance will change (i.d. lower values), the planned decay time will be too short for a benefit.
This strategy is very sensitive for changes in clearance regulations during the decay time.