

Modification of the Decontamination Facility at the Krümmel NPP - 13451

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INTRODUCTION

In February 2009, Siempelkamp Nukleartechnik GmbH was awarded the contract for the design, manufacture, delivery and construction of a new Decontamination Facility in the controlled area for Krümmel NPP.

The new decontamination equipment has been installed according to the state of art of Krümmel NPP. The existing space required the following modification, retrofitting and reconstruction works:

Demounting of the existing installation

- To create space for the new facility it was necessary to dismantle the old facility. The concrete walls and ceilings were cut into sizes of no more than 400 kg for ease of handling. This enabled decontamination so largest possible amount could be released for recycling. All steel parts were cut into sizes fitting for iron-barred boxes, respecting the requirement to render the parts decontaminable and releasable.



Fig. 1



Fig. 2

Reconstructing a decontamination facility

- Dry blasting box
Reconstruction of a decontamination box with separate air lock as access area for the decontamination of components and assemblies was conducted using pressurized air with abrasives (glass beads or steel shots). The walls were equipped with sound protection, the inner walls were welded gap-free to prevent the emergence of interstices and were equipped with changeable wear and tear curtains.



Fig. 3

- Abrasive processing
The abrasive processing unit was positioned underneath the dry blasting box adjacent to the two discharge hoppers. A switch has been installed for the separation of the glass beads and the steel shot. The glass beads are directed into a 200l drum for the disposal. The steel shot was cleaned using a separator. The cleaned steel shot was routed via transportation devices to the storage container, making it available for further blasting operations.



Fig. 4

- High pressure water decontamination box
A decontamination box with separate air lock as access area for the decontamination of components and assemblies using high pressure water technology was provided by new construction. Water pressures between 160bar and 800bar can be selected. The inner walls are welded gap-free and all rough edges are rounded off. All wetted parts are steel grade 1.4301 or higher.

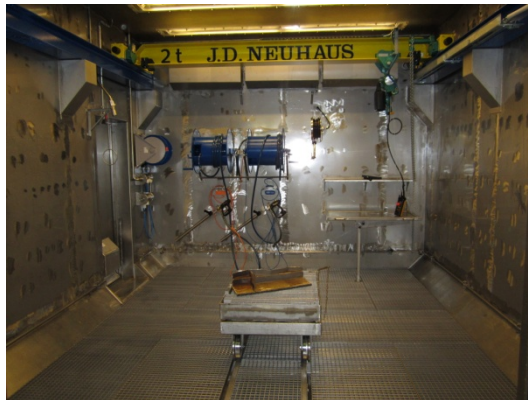


Fig. 5

- Wet blasting box
In an extension to the high pressure water decontamination box, 2 ultrasonic ponds and one washing station for small components as provide by new construction. A long pond with 3.25m length for the decontamination of large components (e.g. turbine blades, pump rotors, driving rods) was installed. For the handling heavy components, a 2t crane was installed.



Fig. 6

- Effluents

New construction of a mechanical effluent treatment facility including oil separator was connected to the existing effluent storage tank provided by the customer.



Fig. 7

- Exhaust air systems

One exhaust air filtration system is provided for each decontamination box, with the following requirements. The exhaust air is sent back to the room (recirculated air system).

- Dry blasting box including raw separator with dust collection in 200 l drum, filter for suspended particles
- High pressure water decontamination box and wet area with water separator, pre-separator, filter for suspended particles



Fig. 8

- Steel platform +12.85m
Installation of a steel platform at building height +12.85 above the decontamination boxes + 8.50m for the erection of the high pressure water facilities, the recirculating air filter system, the air compressor and the respiratory air supply unit. The aforementioned components are placed on the steel platform and have been encased in a sound-lowering and accessible manner.



Fig. 9



Fig. 10

- E&C technology
New construction of the entire E&C technology for the TU system including modification of the supply lines from the switch gear. All devices are to be operated automatically.



Fig. 11



Fig. 12

- Exterior view of the decontamination facility
Dry blasting box, high pressure water decontamination box and wet area are designed to guarantee a unitary “exterior view” of the decontamination facility.

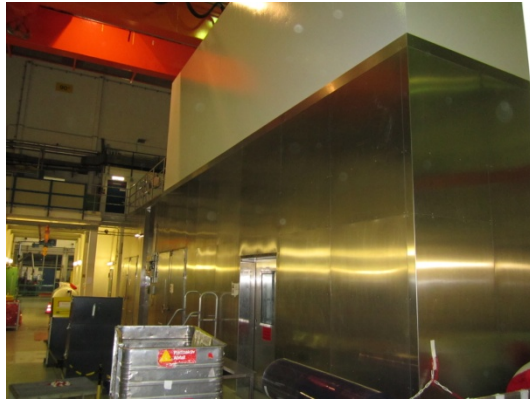
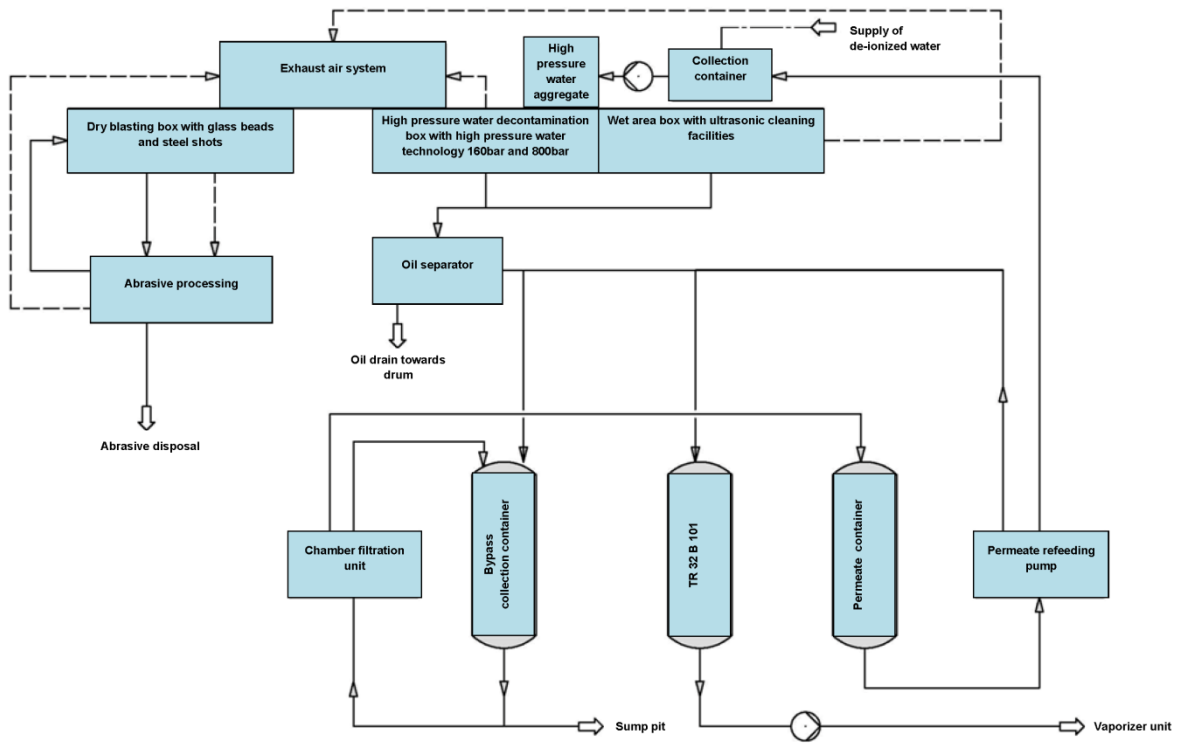


Fig. 13



Process flowsheet decontamination facility Krümmel NPP

Fig. 14