

# Removal of the Outer Shell of the Reactor Building at the Nuclear Power Test Plant Kahl (Germany)



BAUEREnvironmentGroup

Starting operation in 1960, the nuclear power test plant in Kahl was the first nuclear power plant in Germany. 25 years later the plant was decommissioned. During the step-by-step dismantling process that started in 1988 new techniques for the dismantling of nuclear power plants were developed and tested.

BAUER Environment Group developed an innovative dismantling concept for the removal of the outer concrete shell of the reactor building, which had been decontaminated previously. The concept planned the segmentation of the concrete dome by hydraulic cutting and pressing.

## Remediation site

The reactor dome was enclosed by buildings of different heights, which had to be left undamaged. The dismantling concept was verified statically and approved by the supervisory authority.

## Results

The reactor building was 26 m high with an outer diameter of 15 m. Beneath the 0.7 m thick concrete shell a 5 cm thick



The dismantling concept developed by BAUER Environment group planned the segmentation of the concrete dome by hydraulic cutting and pressing. The segments, weighing 50 tonnes each, were lifted down with the aid of a truck crane.

insulation layer of fibreglass and bitumen-impregnated boards enclosed the containment consisting of a 2 cm thick steel shell.

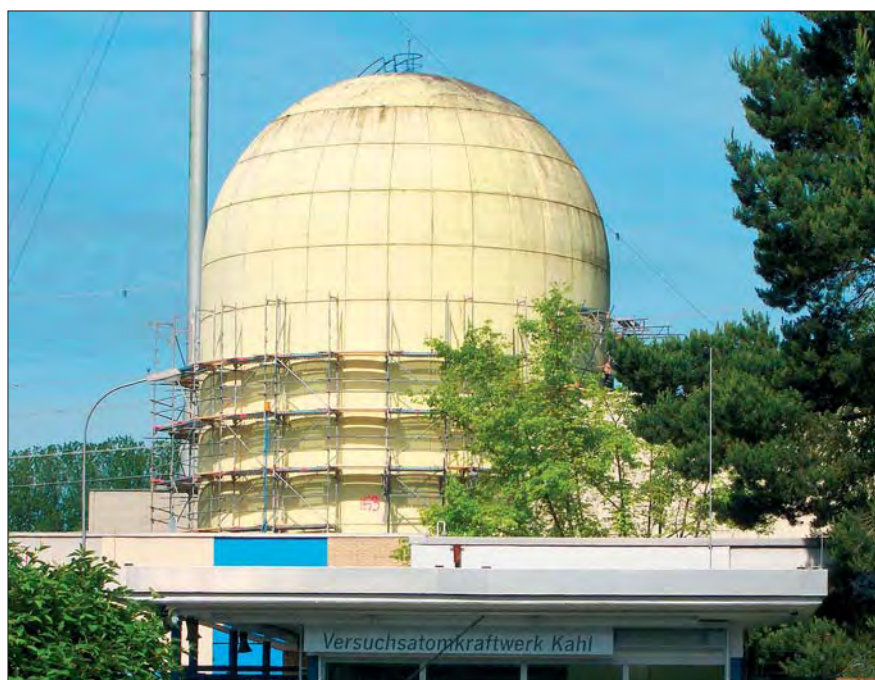
For the segmental dismantling of the concrete shell a self-supporting scaffolding was put up and fastened to the

reactor dome. From there, the cutting and pressing works were performed. As the dismantling progressed, the scaffolding was removed step-by-step.

By way of hydraulic cutting and pressing the concrete shell was broken down into segments, each weighing up to 50 tonnes and measuring approximately 4 x 6 metres.

The water produced during the cutting process was collected and directed to a treatment plant where the concrete sludge was removed. Afterwards, the treated water was checked for radioactive contamination and having passed the limits released to the sewer system.

With the aid of a truck crane of 500 tonnes lifting capacity, the segments were lifted down from the reactor dome. On the ground, the segments were bisected again using hydraulic presses. A fork-lift truck transported the segments still weighing 25 tonnes to the crushing plant. The crushed material was deposited on a stock-pile. To make sure that the concrete wasn't contaminated, the radioactivity of the crushed material was controlled permanently. After the completion of the dismantling



The self-supporting scaffolding was fastened to the outer shell of the reactor building. As the dismantling progressed, the scaffolding was removed step-by-step.



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works, the material will be used to re-fill the excavations.

Subsequent to the removal of the concrete segments the subjacent insulation layer was eliminated. Since fibreglass is anticipated to be a carcinogen the work men had to wear dust masks and protective clothing.

In the sections where neighbouring buildings adjoined to the reactor dome neither the concrete shell nor the insulation layer were removed. The resulting gaps were sealed professionally in order to avoid rainwater infiltration into the intermediate layer.

To assure that the workmen were not exposed to increased radiation, they were provided with radiation protection dosimeters over the whole project period.

**Client:**

RWE NUKEM GmbH, Alzenau

**Scope of Works:**

Preparation of the dismantling concept, removal of the outer concrete shell

**Contract Period:**

May till August 2005



A fork-lift truck transported the bisected segments still weighing 25 tonnes to the crushing plant. After the completion of the dismantling works, the crushed material will be used to re-fill the excavations.