Nuclear technology
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Safety without compromise

We offer services that cover the entire life cycle of nuclear facilities. We plan and design, supply and install turnkey process engineering plants and systems in nuclear power stations and research facilities at home and abroad. We perform maintenance and inspection work and retrofitting measures.

Our core expertise also includes the post-operational phase and dismantling nuclear facilities, and the design and supply of plants for the conditioning and disposal of radioactive waste.

In major European projects such as CERN and the ITER project, the design solutions of our engineers and scientists help to translate top research results into industrial scale.
Our solutions and sites

Expertise and experience

The Kraftanlagen Group draws on a wealth of experience acquired in more than 90 years’ successful activity in energy and plant engineering. From the outset, Kraftanlagen Heidelberg was involved in the construction of nuclear facilities and nuclear power plants in Germany and its neighbouring countries.

We are an important plant construction company and a reliable partner of the nuclear industry. Furthermore, our services are in demand in national and international research centres. We were a pioneer in radiation protection and service, and in the disposal, treatment, conditioning and disposal of waste.

The Kraftanlagen Group is a versatile partner for industry and energy management. Our customers receive single source solutions from us, which cover the entire life cycle of plant technology. In nuclear technology our services cover the following range:

- Laying pipe systems, installing plants and components
- Construction site supervision
- Quality monitoring
- Functional and system tests
- Training courses and instruction
- Documentation
- Operation
- Maintenance and inspection
- Periodic testing/in-service inspections
- Radiation protection
- Welder training
- Retrofitting
- Plant shutdown and decommissioning
- Post-operational phase
- Dismantling
- Decontamination
- Disposal
Dismantling and disposal technology

We stand for quality, on-schedule delivery and economic efficiency

One of the greatest challenges of Germany’s “turn in energy policy” is the exit from nuclear power. The Kraftanlagen Group offers solutions for the post-operational phase, dismantling and disposal of nuclear facilities.

According to the Federal Government’s resolution in 2011 to phase out nuclear power, the power reactors in Germany will be shut down and dismantled gradually. Furthermore, prototype and research reactors, and nuclear fuel supply and disposal facilities will also be shut down and dismantled for age and availability reasons.

Dismantling with leading expertise

We are a reliable partner in the dismantling planning with services such as drawing up approval documents, concepts and studies. We are represented with our own expert personnel at many sites in which dismantling projects will be implemented. Our engineering consultancies and our own workshops on site carry out the work with qualified in-house personnel. We are extremely familiar with nuclear standards and are significantly involved in the dismantling of power reactors and research facilities. We use tried and tested methods, some with tools developed in-house, for the dismantling.

Waste treatment and disposal

We develop and build plants for treating radioactive waste and operate conditioning plants. For many years we have been one of the leading companies in the planning and design, supply, installation and operation of waste treatment plants. These include plants for compacting radioactive waste, cementation plants and decontamination and incineration plants. Another focus of our work is the planning and design, and supply of plants for the handling, sorting and filling radioactive residual materials.

Kraftanlagen supplied a scrap press shears machine for the disposal of 150 decommissioned nuclear submarines of the Russian Northern Fleet near Murmansk.

Obrigheim nuclear power plant

Dismantling of the Obrigheim nuclear power plant began in 2004. Kraftanlagen Heidelberg has been involved in the plant shutdown, decommissioning and dismantling from the very outset. The picture shows the progress of the dismantling in the fuel pool, in which the installations have already been largely dismantled and the preparatory measures for dismantling the pool structure have started.
Research facilities

Tools for science

Within the scope of cooperations our highly qualified scientists and engineers draw up solutions in all kinds of different science disciplines for many national and international research centres.

The range extends from designing new system components, checking the bases of calculations through to the use of international codes and standards. Two examples: For the currently largest international development project ITER, the nuclear fusion reactor under construction since 2007, we are working in Southern France on plants for recovering tritium. After founding a branch in Manosque, our scientists work directly with the ITER teams on site, calculate and model components, organise international design reviews and provide system engineering support services.

For the European nuclear research centre CERN, we have designed a plant for the disposal of radioactive waste and assembled the mechanical equipment, among other things a metal press-cutting plant and dust collection and filter systems. This also includes equipment for the thermal cutting of large, solid waste components.

As an important partner of European nuclear research, we have been providing energy services for CERN for many years, including the large hadron collider (LHC).

ITER: Tritium recycling

Kraftanlagen drew up two concepts for ITER for the recovery of tritium and then designed appropriate plants. A follow-up order included the detailed design of a plant for the collection and removal of tritium from the contaminated service water. Tritium is recovered in the plant and is then reused in the fuel cycle of the ITER.

Metal press-cutting plant for CERN.
Engineering and calculation

Complex planning and design, static and dynamic structural analyses

We carry out extensive conceptual, basic and detail design work. For this we use our many years of experience in the planning, design and operation of systems and components, combined with our expertise in matters concerning technical strength and flow analyses. The high safety requirements in nuclear plant construction require particular care in the analysis of systems, components and support structures. In addition to the stresses from the plant’s intended operation, abnormal operating states, accidents and failures must be examined, especially unsteady and dynamic processes.

We draw up overall concepts, building layouts, installation and arrangement planning, pipe designs, planning and design for hot cells and remote handling technology. For process engineering tasks we design systems and components, draw up P&ID flow charts, component and load lists, technical descriptions and instructions.

We analyse issues extending beyond the mechanics of solids such as temperature problems, pressure losses and transient processes in pipe systems and three-dimensional flow processes by means of CFD.

In addition to secure support and fixing of plant components such as pipe systems and the components of steel scaffolds, platforms and building structures through to the foundation, the functional safety and service reliability of plants also requires investigations into the strength, fatigue and residual life of mechanical structures. We use state-of-the-art calculation methods for this and prepared checkable documentation. All calculations are based on national and international standards and fulfil the requirements of quality management systems to EN ISO 9001 and KTA 1401, AVS D 100/50.

Our services at a glance

- Dimensioning of components
- Static and dynamic structural analyses
- Thermal calculations
- Pressure surge and pressure loss calculations and 1-D network analyses
- Solid state simulation and CFD analyses
- Fatigue and residual life analyses
- Cause and damage analyses

Drawing up a 3D model and analysis of the pipe systems using the Rohr2 (Sigma) calculation program. Fluid dynamics and structural mechanics investigation for the optimisation of a combined helium fitting. Pipe calculation to FDBR and bracket calculation to DIN 18800 for the complete plant.
Power plant technology

Always close to our customers

We plan and design, supply and install process and mechanical engineering plants and systems in nuclear power stations at home and abroad. We carry out maintenance and inspection work and retrofitting measures.

Our power plant engineering employees are specialists in plant and pipe construction. The engineers and technicians of the Kraftanlagen Group have many years of experience in the planning and design, supply, installation and commissioning of high-quality pipe systems and complex plants.

The power plant engineering services package also includes the supply of components, maintenance and servicing of pipe systems and all work that arises within the scope of nuclear power plant inspections.

The highly-qualified Kraftanlagen employees deployed in our customers’ locations know each plant in detail and provide services precisely tailored to the on-site requirements.

Evaporation plant, Obrigheim nuclear power plant

The task involved the evaporation of wastewater that arises during shutdown and dismantling. This required a plant based on the latest energy saving technology. A complete plant adapted to the dismantling operation with an evaporator capacity of 350 l/h and downstream system components is used. Kraftanlagen undertook the complete project for the customer, EnBW, including the concept, planning, design and calculations and component production and installation.
Radiation protection

Reliably safe

We have held the permit according to § 15 of the German Radiation Protection Regulations for decades and have qualified and experienced radiation protection personnel. We perform radiation protection engineering dose rate and shielding calculations.

We draw up waste declaration documents, taking into consideration the preliminary repository acceptance conditions.

Whether radiation protection concepts and measurements, the management of dosimetry, determination and balancing of radioactive emissions or the transport of fuel elements – our radiation protection specialists are held in high esteem by our customers.

We are represented in the radiation protection and decontamination training and examination commission of Aachen chamber of industry and commerce.

Our radiation protection services:

- Practical radiation protection
- Planning and implementation of engineering change projects
- Advice and support during approval procedures
- Radiological calculations
- Studies and radiation protection concepts
- Planning intervention sequences
- Working on standards
- Radiation protection instruction
- Radiation protection training

Radiation protection for EnBW Kernkraft GmbH

Framework agreement for radiation protection services in commercial operation and in dismantling for Philippsburg, Neckarwestheim and Obrigheim nuclear power plants. Our services include: Planning, monitoring, radiation protection tasks for fuel element transport, metrology, gamma spectrometry and clearance measurement technology. Our employees also monitor air locks, interim storage facilities, transport preparation areas and radioactive transport.

The operators of nuclear facilities rely on the expertise of our radiation protection personnel.

On-site dose rate measurement with portable measuring device
Product ranges of the Kraftanlagen Group

Energy and power plant technology
Decentralised power generation
Underground piping systems
**Nuclear technology**
Industrial plants
Utility services
Fire protection
Engineering
Fabrication
Welding and testing technology

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