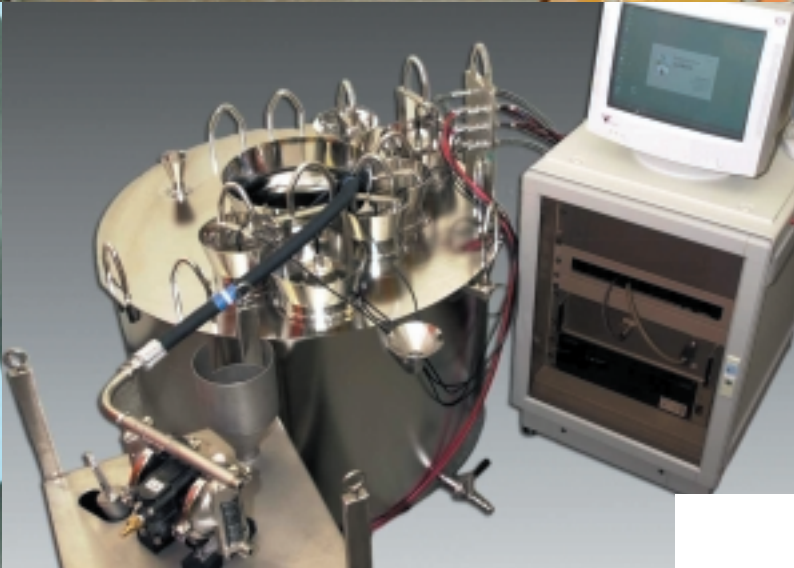
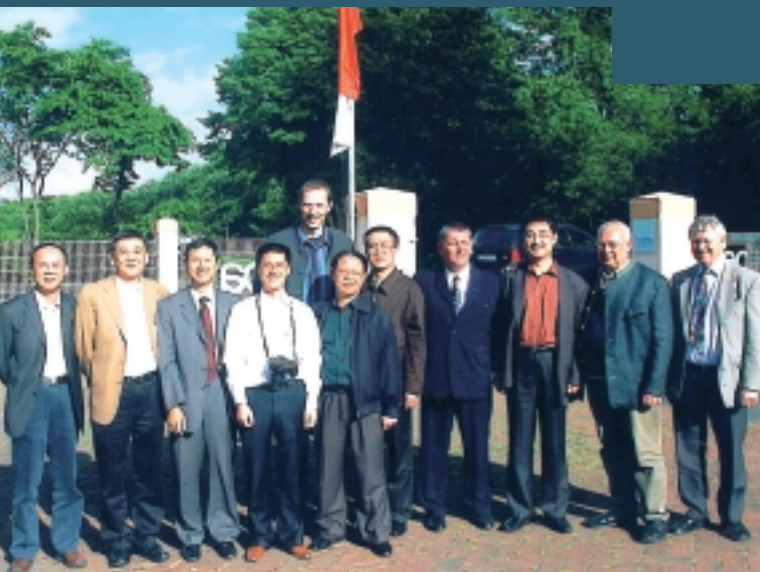




Your Expert for Nuclear Services in China





All around the globe, the nuclear industry is facing tremendous challenges, including the revival of nuclear energy as a "clean" energy, managing the availability of expert services but also in the same time dismantling of nuclear installation of the first generation. All this is even more true in the nuclear industry of China. With a growth program in nuclear energy that can be seen as the most ambitious one in the world, a large number of new reactors are planned to be built in China in the next decades. In the same time the growing volume of produced radioactive waste requires the development and implementation of waste management policies that will support further growth and will not lead to bottlenecks in the available radwaste management infrastructure in the future. Also first nuclear facilities have reached the end of their lifetime and are approaching their dismantling phase. Considering the strategic importance the new build program has, radioactive waste management and decommissioning solutions must be created with high industrial efficiency.

As one of the leading nuclear service providers for radwaste management and decommissioning, NUKEM Group is well positioned to cooperate with the organizations of the Chinese nuclear industry to solve the challenges of today. Through our permanent representative office in Beijing, NUKEM Group has successfully performed several projects in close cooperation with the various involved Chinese organizations and is offering today a broad range of solutions and technologies based on our global experience.

Fuel Cycle Services

Since more than ten years, NUKEM's Fuel Cycle Services has established strong ties to the Chinese nuclear industry. Being one of the worldwide leading suppliers of nuclear fuel it is in a privileged position to provide its various services to the Chinese nuclear power plants. Through the Chinese Nuclear Energy Industry Corporation several contracts for the supply of natural uranium concentrates, the purchase of enriched uranium product and enriched Lithium-7 have already been concluded.



Through its intensive trading and brokerage activities, NUKEM is constantly in touch with the situation on the nuclear fuel market.

Our tailor-made services include:

- Spot-, medium-, and longterm contracts for the supply of
 - Natural uranium concentrates
 - Enriched uranium in form of uranium hexafluoride, and oxide
 - Conversion and enrichment services
 - Transport, storage, and contract management support
 - Financing and exchange transactions at all levels of the nuclear fuel cycle
 - Stable Isotopes for the nuclear industry (Li-7,DZO,B-10,D2O).

Proven Cementation Facilities

Cementation is one of the most commonly used methods for conditioning radioactive wastes. It provides a cost-effective solution for encapsulation of various kinds of radioactive waste into a solid, safe form suitable for long term storage.

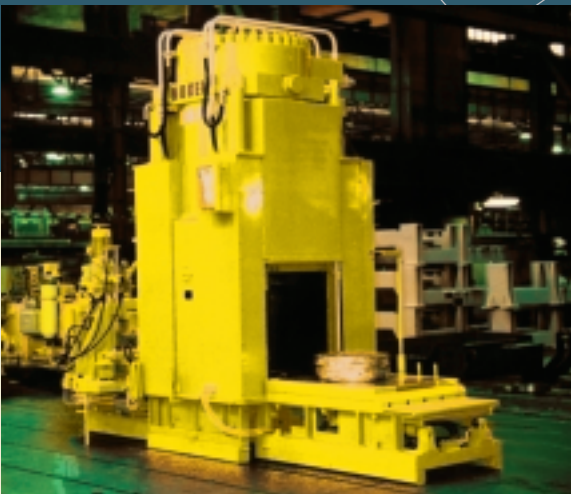
Within the last years, NUKEM has supplied several In-Drum cementation facilities to Chinese customers, such as Qinshan I Nuclear Power Plant, the Nuclear Power Institute China NPIC and the China Institute of Atomic Energy CIAE.

Monitoring Systems and Their Applications

In the nuclear industry a wide range of monitoring systems for completely different applications are required. Over the years NUKEM has developed several monitoring systems for various applications, based on its experience in the fields of radioactive waste management and decommissioning of nuclear facilities. These monitoring systems cover the full range of application from radiation protection to radioactive waste characterization and cover nearly every monitoring task in the nuclear fuel cycle.

In 2003, NUKEM has supplied a Drum Monitoring System for the characterization of 200 liter waste packages for the Qinshan I Nuclear Power Plant. For the Lanzou Nuclear Fuel Complex, LNFC, a Monitoring system for the determination of residual fissile material in fuel hulls, a Can Monitoring System "CAMOS" was supplied in 2002.





Compaction Technology to Reduce Radioactive Waste Volume

Low level dry active waste is one of the main waste streams generated from the operation of nuclear power plants or other nuclear facilities. Waste of this type is usually collected in drums or other containers. In order to save storage space and costs, it has to be treated prior to disposal. Compaction can reduce the overall volume of drums containing solid radioactive material and the technology is well proven.

In 2001, NUKEM successfully supplied a 2000 t High Force Compactor to the China Institute of Atomic Energy, Beijing.

Pyrolysis of Low Level Organic Radioactive Waste

For the treatment of organic radioactive waste, generated in nuclear facilities, i.e. nuclear power stations, or research centers, the thermal treatment by means of pyrolysis is one of the most effective processes for the volume reduction of such waste. The pyrolysis process as the preferred treatment provides several advantages; especially due to the fact that the operating temperature of the pyrolysis process is much lower than that required for the incineration, the transformation of the phosphoric oxides, produced by the decomposition of TBP into a stable inorganic phosphate occurs very efficiently.

In 2005, NUKEM has been awarded a contract for the design and delivery of a pyrolysis reactor to Sichuan Environmental Protection and Development Corporation (plant 821) in Guangyuan, Sichuan Province.



Radwaste Treatment Facilities for Commercial Nuclear Power Plants

Based on our broad international experience for the design and supply of integrated radioactive waste treatment facilities NUKEM has designed and delivered a liquid radioactive waste treatment system for the solidification of liquid radioactive waste generated during the operation of the Tianwan NPP. Each unit is equipped with an identical solidification system for the treatment of approx. 100 m³/year of low active evaporator concentrates as well as low and medium active ion exchange resins. The facility supplied by NUKEM includes beside the solidification system all container handling devices, final drum characterization systems and everything else that is necessary for the safe operation of a nuclear waste treatment facility. The final waste package is a reinforced concrete cask, suitable for transportation and subsequent interim storage or final disposal.

Incineration Facilities

With more than seven installed and operating incineration facilities, NUKEM has an outstanding track record in designing and supplying incineration facilities to the nuclear industry. Offering volume reduction factor of up to 99 % (depending on the feed material), Incineration represents today the most reliable and efficient waste treatment technology. Furthermore, the secondary waste (ash and scrubbing solution as liquid or granulated) is not burnable anymore and has a very good thermal stability. NUKEM offers incinerator designs with 50 kg/h or 100 kg/h throughput that can deal with both solid and liquid radioactive wastes. With its ambitious program on new reactors, China will soon have sites where the number of operating reactors reaches the critical mass and incineration will become an ecological and economical treatment option for the operators of the sites.



Design Services and Technical Assistance for Fuel Element Plants

In the course of the world wide increasing demand on energy, especially in the emerging nations, for power generation the High Temperature Reactor Technology (HTR-Technology) supplementary to the new generation of Light Water Reactors is being taken more and more under serious consideration. The HTR Technology is especially considered due to its unique safety features, based on the modular design and the relatively small reactor core. The high temperature level opens the opportunity to produce Hydrogen and to substitute fossil fuels for process heat generation under avoidance of CO₂ emission. Besides the modular reactor design and the small dimensioned reactor core design itself, the major safety features of the HTR Technology are based on the fuel element as such. The development of the HTR fuel element in Germany has been systematically performed by NUKEM in the 1970s and 1980s. Based on such past performance experience and in combination with its current responsibility as process engineer for the PBMR Fuel plant project in South Africa, NUKEM today is highly qualified and capable to offer a wide spectrum of services in the field of HTR Fuel Technology, reaching from technical consultancy, conceptual design to basic and detail engineering up to the supply of key process equipment and even the turn key supply of complete fuel production processes.



Technical Assistance and Consulting

Based on our more than 40 years of experience in the design and management of nuclear installations our international experienced team of experts also works as consultants to various organizations of the nuclear industry. From safety assessments over concept and feasibility studies to cost evaluations and procurement services, our experts are trained and experienced to offer state-of-the-art advice.

Long History of Cooperation as the Basis for the Future

NUKEM is now engaged in the Chinese nuclear market for about ten years and with its permanent liaison office in central Beijing the interface between the experts of the head office and the Chinese client organizations can be optimized. Several projects have already been delivered to the satisfaction of the customers and the list of clients and business partners is long. It includes such prominent names as CNNC, CIAE, CAEP, BINE, INET, QNPC, CGNPC, JNPC, CNEIC, CNPDC, SNPC, SNERDI and others.



NUKEM Technologies GmbH

Industriestrasse 13
63755 Alzenau, Germany
P +49 (0)6023 9107
F +49 (0)6023 911188
E info@nukem.de
I www.nukemgroup.com

Beijing Representative Office

CITIC International Building, Suite 26-A, 19 Jianwai Dajie,
Beijing 100004, P.R. of China
P +86 10 65127330
F +86 10 65004932