

NUKEM History or the Roots of NUKEM



NUKEM History

1 April 1960: **Foundation of NUKEM** (Nuklear-Chemie und -Metallurgie GmbH) as one of the first companies in the nuclear industry in Germany, 150 employees, DM 4 Mill (Euro 2 Mill) equity capital.

Major shareholders: Degussa (52.5%)

Rio Tinto (22.5%)

Metallgesellschaft (15.0%) (after Nov 1960)

Mallinckrodt (10%)

Major activities: research and development of powder process technology, pelletizing and sintering of pellets; production of fuel plates for material test reactors

1962: Construction of a **production** operation for **oxidic fuel** (10 t UO₂/a as pellets; 50 fuel pins/day); number of employees: 250

1963: **Delivery of fuel elements** for the SAPHIR in Würenlingen, Switzerland

NUKEM History (continued)

1964: **Foundation of ALKEM** (Siemens (60%); NUKEM (40%)): Research and development of the MOX processing technology and erection of a MOX fuel production pilot

NUKEM produced first fuel with **coated particles for high-temperature reactors**

NUKEM established department for **reactor physics**

NUKEM organised and carried out **first nuclear transports**

1965: **NUKEM's new shareholder structure**, utility (RWE) became

shareholder: Degussa (45.0%)

RWE (25.0%)

Rio Tinto (18.0%)

Metallgesellschaft (12.0%)

Production capacity of **sintering of UO₂** increased: 200 t UO₂/a

Production capacity of **fuel pin production** increased: 50 t UO₂/a

NUKEM History (continued)

- 1966:** NUKEM enters the **reprocessing business** and acquires one share in the Belgium Eurochemic
- Foundation of the **Transnuklear GmbH** headquartered in Frankfurt
- Shareholders: NUKEM (80.0%)
TNP-Transnucléaire Paris (France) (20.0%)
- 1969:** **Foundation of the Reactor Fuel Element Company** (RBG - Reaktor-Brennelemente Gesellschaft, 1974 renamed into Reaktor-Brennelement Union (RBU)), headquartered in Hanau
- Shareholders: Siemens (60.0%)
NUKEM (40.0%)

NUKEM History (continued)

- 1969:** **Foundation of the NIS-Nuclear-Ingenieur-Service GmbH:** Build-up of know-how and expertise in reactor physics
- 1970:** NUKEM sells **engineering services** the first time; set-up of activities in the environment sector
- 1971:** Foundation of the **Nuclear Fuel Reprocessing Company KEWA** (NUKEM share: 25%)
Commissioning of a production plant for **high-temperature reactor fuel elements**
- 1971-1975:** On behalf of the German government, **purchase of offset material (LEU)** from the US government (total value: DM 600 Mill)

NUKEM History (continued)

- 1972:** **MOX Fuel Fabrication Plant at Hanau** entered production with a **nominal capacity of 25 t HM per year**; the plant was an important part of the German plutonium industry and was run by ALKEM (40% NUKEM; 60% Siemens) until 1988
- Foundation of **HOBEG**, a 100% NUKEM subsidiary, for the production of high-temperature reactor fuel elements
- NUKEM set up departments for process technology and plant engineering
- 1973:** Bulk purchase of **enrichment services from TENEX for RWE** (value: DM 120 Mill)

NUKEM History (continued)

- 1974:** **Foundation of NUKEM-Luxemburg (NULUX)**, initially a 100% NUKEM subsidiary (later with a share of Rio Tinto and Dresdner Bank)
Foundation of NVD, the nuclear insurance service (NUKEM share: 50%)
- 1976:** Foundation of the **German Nuclear Fuel Cycle Association (WKK)**; Co-founder is NUKEM; WKK's chairman is Manfred Stephany, Managing Director of NUKEM
- 1981:** **ALKEM started fabrication of MOX fuel for PWRs**. The first fuel manufactured by new production processes (OCOM and AUPuC) was loaded into the Obrigheim reactor.

NUKEM History (continued)

- 1982:** Foundation of two US subsidiaries:
NUKEM, Inc., dealing with nuclear fuel services in the US
WasteChem, dealing with design, engineering and delivery of radioactive waste treatment facilities
- 1984:** Foundation of **INTER-NUCLEAR** (NUKEM share: 35%), a service company for international waste disposal services
- 1986:** **NUKEM reached 60% of the world market in the fuel element business for material test reactors**; delivery of the first core fuel elements for an Indonesian research reactor. Within this activity, a fuel element production plant and a "hot cells" complex for follow-up examinations of spent nuclear fuel was built in Indonesia.

NUKEM History (continued)

- 1986:** Within a consortium with Siemens/KWU, **NUKEM** got involved in the design and planning of the **pilot reprocessing facility in Wackersdorf** with an annual capacity of 350 t HM.
- 1988:** **Siemens AG** acquired **NUKEM's 40%** stake held in the uranium and MOX fuel element manufacturers **RBU** and **ALKEM**. **Production facilities for material test and research reactor fuel and fuel for high-temperature reactors (HOBEG) were shut down.**
- 1989:** **NUKEM expanded** its business activities on **non-nuclear sectors**, such as solar (photovoltaics), environmental technologies, surface coatings technologies and waste treatment technologies.
Purchase of the US offset material from the German government.

NUKEM History (continued)

- 1992:** **Long-term uranium supply contracts** concluded with Kazakhstan and Uzbekistan, including purchase of existing stocks.
- 1994:** **Applied Solar Energy (ASE) was founded**, headquartered at NUKEM's headquarter in Alzenau. ASE is a joint venture of Daimler-Benz Aerospace AG (DASA, München) and NUKEM, merging the solar activities of both companies.
- DETEC was founded by Siemens AG and NUKEM GmbH** as a joint venture to provide decommissioning services for nuclear facilities and installations by pooling their know-how and activities in this field in this single specialized engineering enterprise.
- Since 1995:** **NUKEM is world's biggest nuclear fuel trader.**

NUKEM History (continued)

- 1996:** NUKEM GmbH acquires a share of **75% of Klöckner Industrie-Anlagen GmbH (INA)**, a general contractor in international construction and engineering. INA's business is in the wood pulp, paper, chemical, industrial and infrastructure sectors. The main regional emphasis of INA's activities are in Eastern Europe, Asia and North America. Some 600 employees are working for the company worldwide.
- 1997:** **NUKEM Nuklear GmbH** was **founded**, headquartered in Alzenau, to ensure dynamic and efficient processes, and a strong global presence.
- UKAEA (UK)** granted an order to a **consortium comprising NUKEM Nuklear**, BNFL and Rolls Royce Nuclear Engineering Services for the dismantling and waste treatment of the **reactor Windscale Pile-1**.
- 1998:** **NUKEM GmbH** became the **sole shareholder of INA**.

NUKEM History (continued)

1999:

NUKEM Nuklear GmbH became a subsidiary of TESSAG Technical Systems and Services AG (TESSAG), Frankfurt.

TESSAG's creation was part of a new initiative by the RWE's Industrial Systems Division to put under one roof both proven service providers and system suppliers for the energy-related industry. NUKEM Nuklear GmbH assumed the role of "lead-company" for the Nuclear Services business unit. Its scope of activities included decommissioning and waste management as well as fuel cycle service. The scope of performance in the field of nuclear technology was supplemented by six international subsidiaries and holdings:

GNB Gesellschaft für Nuklear-Behälter mbH (G)

Assistance Nucleaire S.A. - ANSA

NUKEM Ltd. (UK)

NUKEM Corp. (US)

NUKEM Inc.

NULUX NUKEM Luxembourg GmbH

NUKEM History (continued)

1999 **NUKEM, Cameco and COGEMA** signed a **commercial agreement with Techsnabexport (TENEX)**, the commercial arm of MINATOM, on the purchase of natural uranium derived from Russian HEU.

2000: **NIS Ingenieure (NIS)**, founded in 1969, became a **100% subsidiary of NUKEM Nuklear GmbH**. The NIS product spectrum comprises primarily consulting and related services in the fields of information technology, process data management and operational support for NPPs.

DETEC was merged with NUKEM Nuklear, maintaining the full range of decommissioning and dismantling services.

NUKEM History (continued)

2001: **NUKEM Nuklear GmbH** was renamed **RWE NUKEM GmbH** and TESSAG was renamed RWE Solutions AG.

UK's NUKEM Nuclear Ltd., a subsidiary of NUKEM Nuklear in Germany, **purchased the assets and business of AEA Technology's nuclear engineering activity**. Thus, NUKEM strengthened its worldwide market position in the nuclear services business field.

NUKEM Nuklear signed a cooperation agreement with the **Chinese Beijing Institute of Nuclear Engineering (BINE)** for radioactive waste treatment and the decommissioning of nuclear installations.

NUKEM History (continued)

- 2002:** **RWE NUKEM** took over full responsibility of the dismantling activities of the **Pilot Nuclear Power Plant Kahl (VAK Kahl)** from RWE Power AG. RWE NUKEM carries out the activities as a general contractor and general operator.
Schott took over a 50% share in RWE Solar (former ASE).
- 2004:** Under a joint contract, **TENEX and RWE NUKEM** supplied the **first batch of low-enriched uranium (LEU)** for the **Mexican Laguna Verde NPP**.

NUKEM History (continued)

- 2005:** **RWE NUKEM GmbH and Pebble Bed Modular Reactor (Pty.) Ltd.** (South Africa) **signed a contract for the detail design of the PBMR pilot fuel plant (Pelindaba Fuel Fabrication Facility)** for the Pebble Bed Modular Reactor (PBMR) ("Koeberg-3") project in South Africa. The facility will be built to qualify the fuel manufacturing process and to deliver the first core for Koeberg-3.
- RWE** sells all its shares in **RWE Schott Solar to Schott** in Mainz.

NUKEM History (continued)

2006: **Advent International**, the global private equity group, **acquired the RWE Solutions Group**, comprising SAG, **RWE NUKEM**, RWE Industrie-Loesungen (former INA), RWE Space Solar Power and Lahmeyer International.

NUKEM International GmbH (Alzenau) as the holding company of the NUKEM group was founded. The NUKEM group has been restructured. NUKEM GmbH continues to offer products and services in the nuclear fuel cycle. This includes the fuel trading for power and research reactors as well as the isotope business.

NUKEM History (continued)

- 2006** Business activities in the areas of **decommissioning, management of radioactive waste, engineering and consulting** are handled by **NUKEM Technologies GmbH**. NUKEM Technologies GmbH is a 100% subsidiary of NUKEM GmbH. NUKEM GmbH also held the shares of NUKEM group's international subsidiaries in the USA, UK and Luxemburg.
- 2007:** **Sales of NUKEM group subsidiaries:** NUKEM Ltd. to Freyssinet SAS, a 100% subsidiary of VINCI Construction, NUKEM Corp. to EnergySolutions (US), NIS Ingenieure and Assistance Nucleaire S.A. (ANSA) to Siempelkamp (Germany).