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# icOND

International Conference on  
Nuclear Decommissioning

3<sup>rd</sup>  
Edition



# BOOK *of* ABSTRACTS

October 2014

Organizer



in cooperation with





## IMPRESSUM IMPRINT



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## HINTERGRUND

Die internationale Konferenz thematisiert die Stilllegung und den Rückbau kerntechnischer Anlagen. Der inhaltliche Fokus der Veranstaltung liegt auf Strategien und der Projektplanung im Rückbau. Weitere Themengebiete sind die rechtlichen Rahmenbedingungen in Deutschland, die Umsetzung von atomrechtlichen Genehmigungsverfahren, Change und Human Resources Management, Erfahrungen bei der Umsetzung von Rückbauprojekten, wirtschaftliche Optimierungsansätze sowie Waste Management und Endlagerung.

## BACKGROUND

The decommissioning of nuclear power plants, particularly power reactors, pose high demands regarding planning and authorization to all parties involved. In the ongoing decade several nuclear power plants will be shut down due to their limited operating life and political decisions, not only in Europe but also worldwide. With regard to these circumstances, there is a need for optimized decommissioning strategies, which have to be well coordinated. The focus of this conference is set on the legal framework in Germany. It also compares the degree of the decommissioning task with other countries.

Apart from authorization and financial planning, change management plays an important role in the transition period from a nuclear power plant to a decommissioning project. The disposal of radioactive waste, which will be decisive for future decommissioning projects, is an additional topic that will be covered by the conference.

## ZIELGRUPPE

Die Konferenz richtet sich an Betreiber von kerntechnischen Anlagen, die Verantwortung für die Projektsteuerung und die Reststoffentsorgung von Rückbauprojekten haben. Weitere Zielgruppen sind Unternehmen, die mit der Planung und der Durchführung von Rückbauprojekten beauftragt sind. Es werden Behörden und Sachverständigenorganisationen adressiert, die in Genehmigungs- sowie Aufsichtsverfahren und in die Begutachtungen eingebunden sind.

Ausgehend von Fachvorträgen diskutieren die Teilnehmer/-innen praxisnah die Herausforderungen des Rückbaus sowie optimale Planungsvarianten für individuelle Rückbaufgaben.

## AUDIENCE

The conference addresses operators of nuclear plants as well as people from companies, who are working on the planning, implementation and supervision of decommissioning projects. Authorities and technical experts, who are concerned with the approval and supervision procedure are invited. Furthermore we address research institutions, which are responsible for the dismantling of research reactors and resulting radioactive waste.

The conference will link people to discuss the challenges of the decommissioning of nuclear facilities.





## RÜCKBLICK

## ICOND 2013

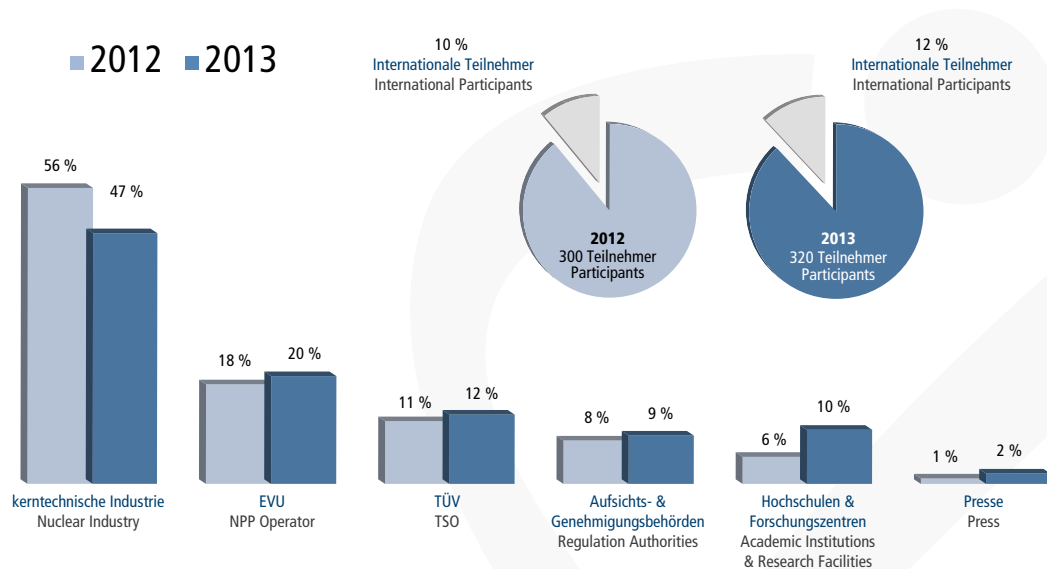
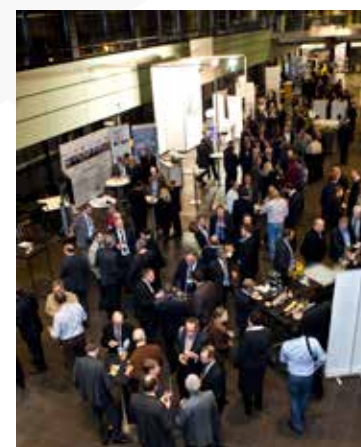
## REVIEW

Die ICOND 2013 wurde gemeinsam mit dem TÜV Rheinland im Eurogress Aachen durchgeführt. Über 300 Teilnehmer – vor allem Vertreter der Rückbauindustrie und der Energieversorger – diskutierten die aktuellen Herausforderungen des von der Bundesregierung beschlossenen Ausstiegs aus der Kernenergie bis zum Jahr 2022.

Die Referenten/-innen stellten auf der Konferenz ihr Expertenwissen sowie Best-Practice-Lösungen in Sachen Rückbau zur Diskussion. Themenschwerpunkte waren Stilllegungsstrategien und Projektmanagement. Hierbei wurde insbesondere auf die Frage eingegangen: Welche Kernkompetenzen empfiehlt es sich als Betreiber beizubehalten und welches Tätigkeitsspektrum sollte aus ökonomischen Gesichtspunkten durch Service-Dienstleister oder die Zulieferindustrie abgedeckt werden?

The ICOND 2013 was carried out in cooperation with the TÜV Rheinland at the Eurogress Aachen congress centre. Over 300 participants - mainly representatives of the nuclear industry and utilities - discussed the current challenges of the nuclear power plant decommissioning caused by the phase out concept of the federal government.

The speakers presented at the conference their expertise and best practice solutions and encouraged so discussions with the audience. The topics included decommissioning strategies and project management. In particular this addressed the question: What core competencies are recommended to hold by the utilities and which range of activities should be covered, from an economic point of view, by the service or supplier industry?



iC&ND  
PROGRAMME





## MONTAG MONDAY October 27<sup>th</sup> 2014 PRE-CONFERENCE WORKSHOP

**13:15 Welcome**  
Dr. John Kettler – Aachen Institute for Nuclear Training

### Status and Framework

**13:30 Decommissioning of German Nuclear Power Plants**  
Dr. Gero Schönwaßer – TÜV Rheinland Industrie Service

**14:00 Nuclear Waste Management in Germany**  
Dr. John Kettler – Aachen Institute for Nuclear Training

**14:30 Access to the German Market - Options & Strategies**  
Prof. Dr. Bruno Thomaske – RWTH Aachen

**15:00 Decommissioning of Small Medical, Industrial and Research Facilities: International Guidance & Perspectives**  
Dr. Michele Laraia – formerly IAEA

**15:30 Coffee Break**

### Decommissioning Technologies

**16:00 Decontaminaton of Philippsburg Unit I**  
Marc Brenneisen – Westinghouse Electric Germany

**16:20 Underwater Cutting and Handling Tools Including Necessary Water Treatment Technologies**  
Claude Maack – Gradel

**16:40 Automated Systems for Decontamination by High Pressure Water Jetting**  
Rainer Bardtenschlager – RST

**17:00 Microwave Drying of LLW Simulates**  
Hans Windsheimer – Linn High Therm

**17:20 In-Situ Gamma Spectrometry for the Release of Radioactive Materials**  
Siegfried Krüger – Technisches Ingenieurbüro Krüger

## DIENSTAG TUESDAY October 28<sup>th</sup> 2014 ICOND

**10:00 Anmeldung Registration**

**12:00 Imbiss Quick Lunch**

**13:00 Begrüßung Welcome**  
Dr. John Kettler – Aachen Institute for Nuclear Training

**13:15 Keynote: Motivationserhalt trotz Personalabbau – Erfahrung aus dem Bergbau**  
**Keynote: Motivation Despite Cutback in Staff – Experience from the Mining**  
Peter Schrimpf – RAG

### Erfahrungen & Perspektiven beim Rückbau Experiences & Perspectives in Decommissioning

**13:45 Freigabe und Entsorgung von KKW-Bauschutt – Probleme und Lösungen**  
**Release and Disposal of NPP Construction Waste – Problems and Solutions**  
Frank Ambos – sat. Kerntechnik

- 14:15 Rückbau kerntechnischer Anlagen in Belgien**  
**D&D Experience in Belgium**  
 Guido Mulier – Tecubel
- 14:45 Erfahrungen bei der Zerlegung von Reaktordruckbehältern und Core-Bauteilen sowie deren Entsorgungsplanung**  
**Reactor Vessel, Vessel Internals and Operational Waste Segmentation Experiences**  
 Per Lundén – Westinghouse Electric Sweden
- 15:15 Kaffeepause** Coffee Break
- 16:00 Trockenbeladung von MOSAIK®-Behältern mit Hochdosis-Abfällen**  
**Dry Loading of MOSAIK®-Casks with High-Dose-Rate Waste**  
 Daniel Scharf – E.ON Anlagenservice
- 16:30 Wissenschaftliche Unterstützung für die Stilllegung kerntechnischer Anlagen in Frankreich**  
**Scientific Support for Nuclear Decommissioning in France**  
 Christophe Béhar – Commissariat à l'énergie atomique et aux énergies alternatives (CEA)
- 17:00 - 18:00 Podiumsdiskussion: Zukünftige Herausforderungen beim Rückbau kerntechnischer Anlagen**  
**Panel Discussion: Future Challenges for Nuclear Decommissioning**  
 Teilnehmer:  
 Jörg Gmeinbauer – AMEC  
 Guido Mulier – Tecubel  
 Per Lundén – Westinghouse Electric Sweden
- 19:00 Abendveranstaltung**  
**Social Event**

MITTWOCH WEDNESDAY

October 29<sup>th</sup> 2014

## Genehmigungsverfahren & juristische Aspekte

### Licensing & Legal Aspects

- 09:00 Stiftungsrechtliche Grundlagen und atomrechtliche Konsequenzen**  
**Fundamentals of the Foundation Model and Consequences According to the Atomic Law**  
 Dr. Markus Schewe, Dr. Stefan Wiesendahl – Kümmerlein, Rechtsanwälte & Notare
- 09:45 Aktuelle Rechtsentwicklungen im Zusammenhang mit der geordneten Beendigung der Kernenergienutzung - Stilllegungsverfahren im Zusammenhang mit der Energiewende**  
**Current Tasks in Law in Relation to the Nuclear Phase-Out - Decommissioning Procedures in the Context of the Energy Transition**  
 Dr. Marc Ruttloff – Anwaltssozietät Gleiss Lutz
- 10:15 Kaffeepause** Coffee Break
- 10:45 Öffentlichkeitsbeteiligung: Ein Meilenstein im Genehmigungsverfahren für den Rückbau**  
**Public Participation: A Milestone in the Approval Process for the Decommissioning**  
 Prof. Dr. Bruno Thomauske – RWTH Aachen
- 11:15 Umweltverträglichkeitsprüfung für die Stilllegung kerntechnischer Anlagen in Europa**  
**Environmental Impact Assessment for Decommissioning of Nuclear Power Plants in Europe**  
 Prof. Dr. Behrooz Bazargan Sabet – Bureau de Recherches Géologiques et Minières (BRGM)





**11:45** **Stand der Klageverfahren – Moratorium, Laufzeitverkürzung, Kernbrennstoffsteuer**  
**Status of the Claims – Moratorium, Phase-Out, Nuclear Fuel Tax**  
 Siegfried de Witt – DE WITT Rechtsanwaltsgesellschaft

**12:15** **Mittagspause** Lunch

**Strategien & Rückbaumanagement**  
**Strategies & Decommissioning Management**

**13:00** **Management beim Rückbau von Forschungsreaktoren**  
**Decommissioning Management of Research Reactors**  
 N.N.

**13:30** **Risikomanagement in Stilllegungsprojekten - Das IAEO-Projekt DRiMa**  
**Decommissioning Risk Management – The IAEA-Project DRiMa**  
 Dr. Jörg Kaulard – TÜV Rheinland Industrie Service

**14:00** **Nahtstellen zwischen Nachbetrieb und Rückbau: Effektiver Einsatz eigener Kompetenzen**  
**Interface between Post-Operational Phase and Decommissioning: Effective Use of own Expertise**  
 Dr. Bernhard Leidinger – plenum Management Consulting

**14:30** **Change Management im Rückbau**  
**Change Management in Nuclear Decommissioning**  
 Karl Wasinger – AREVA / N.N. – RWE Power

**15:00** **Kaffeepause** Coffee Break

**15:30** **Altersstruktur und Fluktuation - Konsequenzen für die Personalstrategie**  
**Aging Structure in Companies and Fluctuation – Consequences for a HR-Strategy**  
 Dr. Roland Geschwill – Denkwerkstatt für Manager

**16:00** **Strategien & Analysebedarf für Rückbauprojekte**  
**Analytical Needs & Strategies Dedicated to Support Decommissioning Operations**  
 Florence Goutelard – CEA, Laboratory for Analytical Support to Operator

**16:30** **Erfahrungen und Perspektiven beim Einsatz von hochselektiven Ionenaustauschern bei der Stilllegung von Fukushima Daiichi**  
**Experiences and Prospects with the Use of highly Selective Ion Exchange for the Decommissioning of Fukushima Daiichi**  
 Esko Tusa - Fortum Power & Heat

**Wirtschaftliche Optimierungspotenziale**  
**Economic Optimisation Potentials**

**17:00** **Kaffeepause** Coffee Break

**17:30** **Identifizierung der Kostentreiber für die Stilllegung kerntechnischer Anlagen**  
**Identification of Cost Drivers for Decommissioning of Nuclear Facilities**  
 Alastair Laird – Project Time & Cost International

**18:00** **Strategisches Management am Beispiel des Konsortiums zum Rückbauprojekt Sellafield**  
**Strategic Decommissioning Management – Sellafield PBO, a Case Study**  
 Jörg Gmeinbauer – AMEC

**18:30** **Concept of Programmisation: Kostenreduktion & Wissenstransfer bei Rückbauprojekten**  
**Concept of Programmisation: Cost Reduction & Knowledge Transfer in Decommissioning Projects**  
 Andrew Davies – EnergySolutions EU

**19:00** **Ausklang des Tages**  
**Get Together**





# DONNERSTAG THURSDAY October 30<sup>th</sup> 2014

## Entsorgung & Endlagerung radioaktiver Abfälle Waste Management & Final Disposal

- 09:00 Konditionierung von Metallschrott  
Off-Site Treatment of Scrap Metal**  
Boris Westervinter – GNS Gesellschaft für Nuklear-Service  
Barry Moloney – EnergySolutions EU
- 09:30 Entsorgung der russischen Atom-U-Boote  
Dismantling of Russian Nuclear Powered Submarines**  
Detlef Mietann – Energiewerke Nord
- 10:00 Freigaberegelungen in der neuen  
EU-Strahlenschutzgrundnorm  
Regulations for Release in the new EU Basic Safety Standards  
for Radiation Protection**  
Dr. Markus Trautmannsheimer – Bayerisches Staatsministerium  
für Umwelt und Verbraucherschutz
- 10:30 Kaffeepause Coffee Break**
- 11:15 Grenz- und Richtwerte in den neuen Strahlenschutz-  
Grundnormen und ihre Umsetzung in die StrISchV  
Limits and Thresholds in the new Basic Safety Standards and  
their Transposition in the new Radiation Protection Ordinance**  
Dr. Stefan Thierfeldt – Brenk Systemplanung
- 11:45 Zulassung konradgängiger Stahlblechcontainer und deren  
Einsatzbereiche  
Approval of Steel Casks for the Disposal in KONRAD and their  
Fields of Application**  
Hartmut Grunau – Eisenwerk Bassum

- 12:15 Genehmigungsstatus der CASTOR®-Behälter & Beladeplanung  
Approval Status of the CASTOR®-Casks & Fuel-Loading Schedule**  
Konrad Dreesen – GNS Gesellschaft für Nuklear-Service

- 12:45 - Podiumsdiskussion:  
13:45 Engpässe in der nuklearen Entsorgung?  
Panel Discussion: Bottlenecks in Nuclear Waste Management?**  
Teilnehmer:  
Iris Graffunder – Energiewerke Nord  
Prof. Dr. Bruno Thomauske – RWTH Aachen  
Dr. Markus Trautmannsheimer – StMUV

- 13:45 Schlussworte  
Final Statement and Outlook**  
Prof. Dr. Bruno Thomauske – RWTH Aachen

- 14:00 Imbiss zum Ausklang der Veranstaltung  
Lunchtime Snack to Conclude the Event**



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AINT

**AUSTELLUNG EXHIBITION** **iCOND**



AINT Aachen Institute for Nuclear Training

Aug. Alborn

amec

BSI BALTIC SCIENTIFIC INSTRUMENTS

BS Brenk Systemplanung

ENVINET

Farncon Nuclear Applications GmbH

Fortum

GRUPPE G+H ISOLIERUNG

GIS Gesellschaft für integrierte Systemplanung mbH

GRADEL

Kvantz

MIRION TECHNOLOGIES

NEGLANT

NRG

nse international

NUKEM Technologies

NUC TEC SOLUTIONS GMBH

OMEXOM POWER & GRID

ORTEC®

Radwise

SEA

TIK Technisches Ingenieurbüro Krüger

TÜVRheinland® Genau. Richtig.

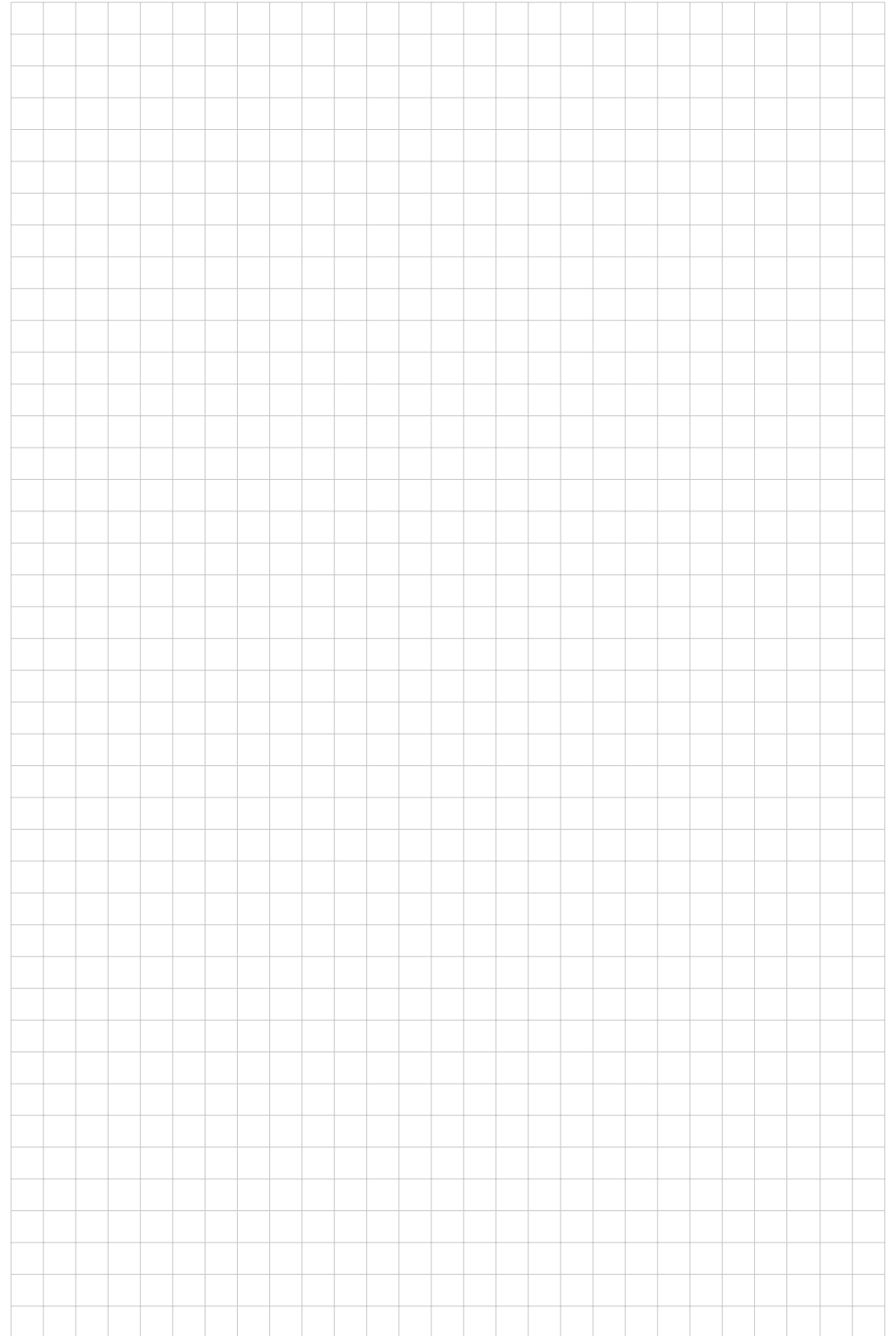
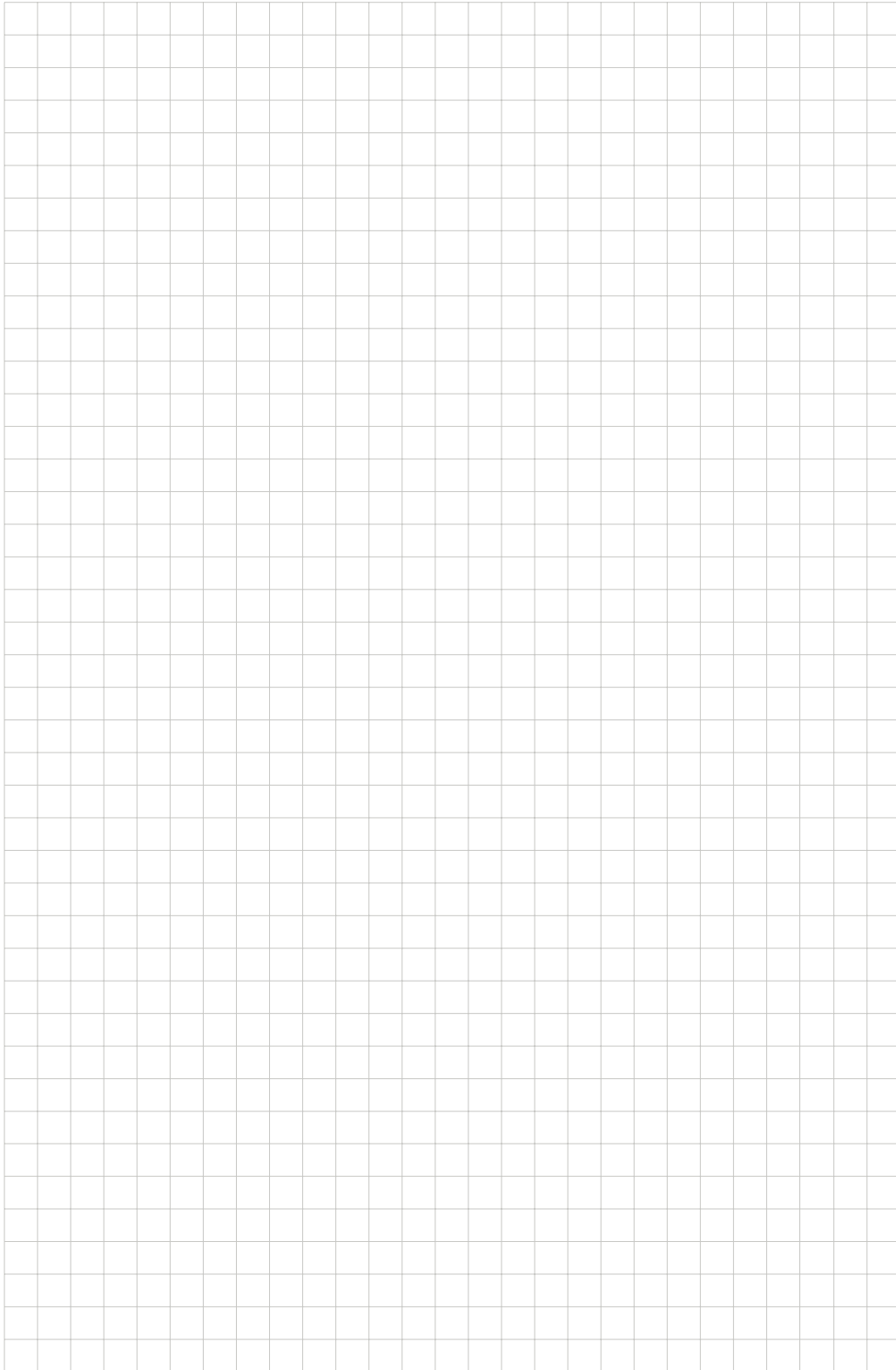
UniTech Services Group

PROGRAMME

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iC&ND

ABSTRACTS



MONDAY 13:30

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SPEAKER

SPEAKER

MONDAY 14:00

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Decommissioning of German Nuclear Power Plants

ABSTRACT TITLE

ABSTRACT TITLE

Nuclear Waste Management in Germany

The presentation „Decommissioning of German Nuclear Power Plants“ provides an introduction into the unique German situation regarding decommissioning. The talk mainly addresses four issues:

- It will briefly summarize the history of nuclear power in Germany showing the different reactor concepts (PWR, WWER, BWR, HTR, Fast breeder and many research reactors) built in Germany. This portfolio of different reactor types is the basis for the broad experience in decommissioning of nearly all types of NPPs. Another important issue is the political development regarding nuclear power, which is crucial for the understanding of the phase out decision of the Government and the unique situation in Germany.

- The second part gives an overview over the present status of decommissioning in Germany regarding nuclear power plants and final repositories. It is shown that 19 commercial and experimental NPPs had been shut down and have been decommissioned. The challenging situation of the final repositories which has also influence on concrete decommissioning projects is also mentioned.

- The third part describes the main liabilities and provisions of the industry and the public sector.

- The presentation will end with the discussion of the main challenges like the transition of staff from operation to dismantling or the situation of service providers.

In Germany, stringent official regulations govern the handling and final storage of radioactive waste. For this reason, the Federal Government has opted for final storage of radioactive waste in deep geological formations. At present the Konrad Repository, close to the city Salzgitter, will be rebuilt as a final disposal for waste with negligible heat generation (LLW). The start of operation is scheduled not before the year 2023. Radioactive waste with negligible heat generation originates from the operation and decommissioning of nuclear power plants, the medical sector or from research establishments. The requirements of the planning approval decision to build up the Konrad Repository, published on the 22th of May 2002, obligate the waste producer to consider the limits for chemotoxic substances and to document the waste content in addition to the radiotoxicity. The Lower Saxony Water Management, Coastal Defence and Nature Conservation Agency (NLWKN) has set strict requirements regarding water-polluting substances as part of the radioactive waste.

Therefore it is necessary to characterize the waste composition and to define nuclide as well as substance vectors.

Waste producers in Germany are divided in private (i.e. utilities) and public (i.e. research centres) institutions. The GNS Gesellschaft für Nuklear-Service is the general contractor for the private sector, whereas Energiewerke Nord (EWN) is a federal state owned company, which is responsible for the decommissioning of research reactors as well as nuclear power stations in eastern Germany. The political process for the final disposal of heat generating waste (HLW) has been restarted in 2013 by the enacting of a new law. Initiated by the Federal Government, a commission was established in 2014 to review this law until the end of next year. The speaker will give a thematic overview of the classification of radioactive waste and the conditioning paths for different waste streams. Furthermore he will set out the various institutions and their tasks.



- Legend for nuclear power plant status: Nuclear power plant in operation (9), Revoked authorization to operate after the 13th amendment of the Atomic Energy Act (8), Decommissioned nuclear power plant (13), Nuclear power plant decommissioned to greenfield (3\*), Research facility with waste treatment plants (2), Waste treatment facilities(2), Central interim storage site (4), Repository (1 Exploration, 2 Terminated storage, 3 Construction)

\*1)HDR: SWR, 25 MWth, 1969-1971
VAK: SWR, 16 MWth, 1990-1995, 2008
KKN: DRR, 106 MWth, 1972-1974, 1995



VGB PowerTech e.V. 2012



MONDAY 14:30

Prof. Dr. Bruno Thomaske

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SPEAKER

SPEAKER

MONDAY 15:00

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### Access to the German Market - Options & Strategies

After the Fukushima event, Germany has decided to phase out nuclear power end of 2022 at the latest. This decision was supported by a clear majority in the German Parliament and was also accepted by the upper house of the German parliament.

This decision reversed the decision taken in 2010, to extend the operating lives of Germany's 17 nuclear power plants, which was itself a reversal of the decision made in 2000/2002 to phase out nuclear power by around 2020. As a consequence 8 of the 17 remaining nuclear power plants had been shut down immediately in 2011.

Some of the German utilities have experience with the decommissioning and dismantling of nuclear power plants. The new task is that all of the utilities now have to plan the decommissioning of the whole reactor fleet (portfolio planning). Since there might

exist shortages in experienced personnel and in specialized companies this can be of interest for foreign companies. German utilities might be interested to have competition in this area because the cost factor is of increasing importance.

The main focus of the talk is to show which prerequisites a foreign company has to fulfill in order to enter the German market. The second part will show strategies to become a competitive customer in this market.



### ABSTRACT TITLE

### ABSTRACT TITLE

### Decommissioning of Small Medical, Industrial and Research Facilities: International Guidance and Perspectives

The decommissioning of nuclear installations such as zero-power reactors and critical assemblies, radiodiagnostic and radiotherapy hospital departments or laboratories, factories using radioactive material, etc., is often wrongly viewed as a trivial activity that can be implemented when and how needed with no serious planning. Under these assumptions, even minimum safety requirements and contingencies may go neglected in decommissioning, resulting in extra costs, delays, loss of historical memory, and, possibly, safety issues such as rainwater or groundwater in-leakage, deterioration of containment barriers, or the theft/loss of radiation sources. It is well known that „orphan“ sources (which can be viewed as resulting

from improperly managed decommissioning) have already caused many fatalities worldwide.

This presentation provides basic guidance and 'how-to' hints and tips in the selection and implementation of decommissioning strategies/techniques for small nuclear facilities, especially within institutions with limited resources.

It is intended mostly for facility operators with little or no experience in radioactive waste management and nuclear decommissioning.







MONDAY 16:00

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SPEAKER

SPEAKER

MONDAY 16:20

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### Decontamination of Philippsburg Unit 1

Westinghouse was contracted to plan and perform the decontamination of the reactor water clean-up system (TC-System) and the reactor pressure vessel including the steam dryer and water separator (RPV).

Planning of the decontamination started with a study in April 2012. A major milestone was completed end of March 2013 with the submittal of the documents to the authority. In October 2013 the setup of the equipment on site began. After receiving the permit the decontamination process started on November 11th, 2013.

Due to the different levels of contamination within the TC-System and different decontamination goals for the TC-System (minimum decontamination factor of 15) and the RPV (metallic blank surface and smearable decontamination below 200 Bq/cm<sup>2</sup>) Westinghouse and KKP decided to use a multi-step / multi-process approach.

The decontamination of the TC-System was done separately from the RPV to prevent low contaminated areas from being re-contaminated by higher

level areas. Also, the TC-System was separated into two parts representing higher contamination levels and lower contamination levels. For the decontamination of the TC-System Westinghouse's NITROX-E chemical process as well as the DfD process were applied. The RPV was also split into two parts: the lower part without steam dryer and water separator and followed by the complete RPV including the internals. For the RPV only Westinghouse's NITROX-E process was applied.

For both systems, TC-System and RPV, Westinghouse utilized its newly built and CE-certified European Decontamination System (EDS). The EDS is a modular skid based system consisting of several pumps, ion exchange columns, heaters, and coolers which are interconnected with special hoses and/or piping to meet the customer's expectation and specifications with regard to the decontamination.

After successful completion of the decontamination the final survey showed an average DF of 89 for the TC-System, exceeding customer requirements and expectations.



### ABSTRACT TITLE

### ABSTRACT TITLE

### Underwater Cutting and Handling Tools Including Necessary Water Treatment Technologies

Gradel has 50 years of experience in developing and manufacturing of maintenance equipments for nuclear power plants. The company has known a strong growth in the past years and has reached a turnover of 13,5 M€ with a total staff of 105.

Customer References:  
AREVA, EDF, E.ON, ENBW, RWE, VATTENFALL, WESTINGHOUSE, PAKS

Concept rules which drive our developments:  
- dose minimisation for operators by doing main maintenance underwater  
- volume and cost reduction of waste and consumables  
- craneless working

Products:  
- Underwater Vacuum cleaners for heavy duty tasks adapted to dismantling purposes  
- Underwater centrifugal separator for fine particles for waste volume minimisation  
- Underwater object traps, suction nozzles, swimming tools and handling tubes, transport casks for filters  
- Remote controlled trolleys for cleaning beyond fuel racks, or for cleaning pool walls  
- Underwater cutting shears from 20 to 100 tons

- Underwater diamond wire saw cutting installations for dismantling of large components
- Shielding for Gamma and neutrons
- personalized equipments.....

Certifications:  
ISO 9001:2008, KTA 1401, EN 1090-1:2009, CEFRI ISO 14001:2004 and OHSAS 18001:2007 planned for 2015

Engineering:  
The full integrated engineering office with a staff of 20 engineers and technicians is well familiar with the specific features of the nuclear environment and specifications (KTA or others). Large expertise for underwater cleaning, filtering and handling equipments. Standardised products or key-turned solutions are our daily business.

Workshop:  
Manufacturing is realized in house in our own workshop. Parts from 10 gr to 10 tons.

Welding: TIG and MIG-MAG  
Assembly and handling: up to 20 tons

After Sales services:  
A staff of 18 experienced engineers and technicians is certified for working in controlled areas.



PROGRAMME

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AiNT

PROGRAMME

ABSTRACTS

PROFILES

AiNT



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SPEAKER

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Automated Systems for Decontamination by High Pressure Water Jetting

During decommissioning of nuclear power stations decontamination of low and medium active waste allows for reduction of costs plus leads to less exposition of involved personal.

Well known companies that are already doing decommissioning of nuclear power stations use mainly four methods of decontamination: electrolytic decontamination, chemic decontamination, dry blasting, and high pressure water jetting. General idea of the decontamination is the free release measuring of the parts which are then no longer regarded as radioactive in a legal sense.

High pressure water treatment has been found to be an ideal measurement for cleaning or decoating of contaminated parts. The advantage is that in comparison to other mechanic cleaning methods there is much less formation of dust and the cleaning medium water can be circulated and filtered, no new waste is generated.

The cleaning process can either be done manually under full protection of the worker for low active waste or fully automatically by a robot in case of higher radiation, e.g. working with medium active waste.

The cleaning process is done in a special handling cabin with appropriate systems for inlet of contaminated parts plus outlet of cleaned parts as well as special ventilation equipment allowing for adequate visibility, filtration and dehumidification. The construction and all surfaces of the system are designed to minimise built-up and accumulation of any particles.

Very recently a test system has been delivered for the fully automatic, remotely controlled decontamination of steam generator pipes using high pressure water up to 3,000 bar. First tests with this system have shown promising results. The water used for the high pressure cleaning process is collected and transported through a water recovery station binding the radioactive particles in special filters.



ABSTRACT TITLE

ABSTRACT TITLE

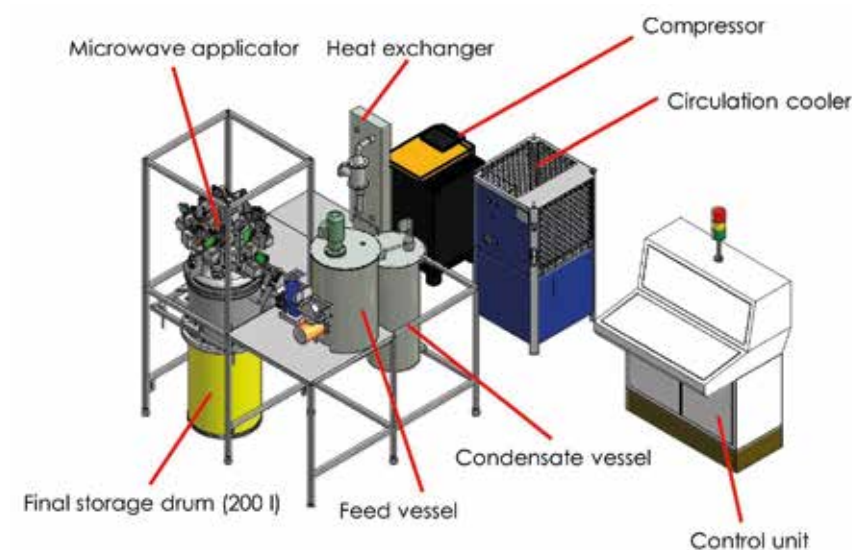
Microwave Drying of LLW Simulates

The results of a feasibility study on microwave drying of inactive Low Level Waste (LLW) compositions are presented. A variety of organic as well as inorganic materials and compounds, like detergents, ion-exchange resins and concrete sludges, were mixed according to recipes mimicking typical average waste compositions during revision and dismantling of nuclear power plants.

During experiments by using off-the-shelf equipment for continuous microwave drying, the drying behaviour was studied by differential scaling. Final humidities were determined by thermogravimetric scaling at 105 °C on representative sample materials. It was found that the majority of sample compositions was able to attain residual humidities < 1 wt.-% easily, where in some cases residual humidities as low as 0.1 wt.-% can be attained.

Selected waste compositions were then processed by applying the Microwave-In-Drum-Drying (MIDD) technique, where liquid waste is continuously fed into the final repository cask, e.g. of 200 l volume, and where microwave drying with drying rates of up to 4 l/h is applied readily inside the cask. For concrete sludge-based LLW simulates, residual humidities close to 1 wt.-% were found, indicating the feasibility of the MIDD technology for this type of waste after minor process adjustments. For detergent-containing LLW simulates, local formation of hotspots, and, hence, thermal decomposition, was observed in some cases, indicating the need for careful temperature and process control.

The feasibility of the MIDD technique for other applications, e. g. for volume reduction of aqueous media, is discussed as well.







TUESDAY 13:15

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SPEAKER

SPEAKER

TUESDAY 14:15

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### Motivation Despite Cutback in Staff - Experience from the Mining

### ABSTRACT TITLE

### ABSTRACT TITLE

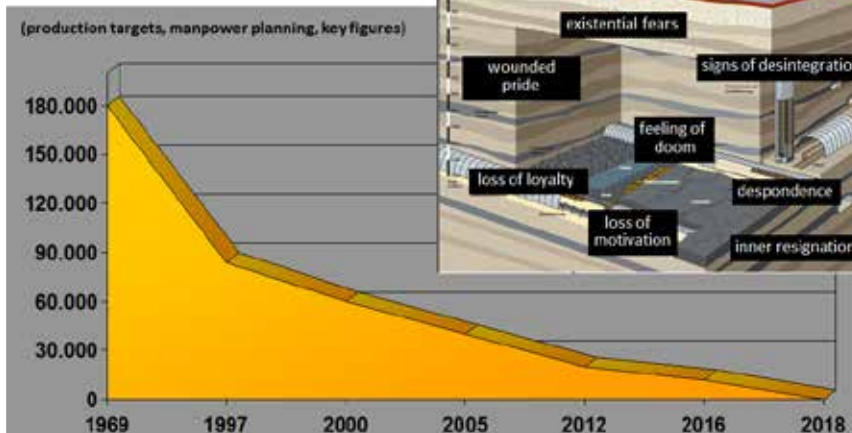
### D&D Experience in Belgium

Coal mining in Germany will come to an end in 2018. As a result, the RAG Aktiengesellschaft is facing the biggest challenge in the history of the company. Never before has a German company been tasked with closing down an entire industrial sector. The task requires cutting personnel in a way that is socially responsible, without producing redundancies due to business operations. At the same time, however, there remains the entrepreneurial challenge of guaranteeing the domestic supply of coal until the end of 2018. Achieving these goals is based on a company-wide framework, the Strategy 2020, which outlines clear foci in ten fields of action.

A central factor in implementing these strategic decisions is the retaining of staff motivation. Signs of disintegration, losses of loyalty and motivation, or existential fears in the workforce need to be identified and addressed in a timely manner. We began developing feedback tools early on to interview managers and employees about organization and leadership, analyze their results, and implement necessary adjustments where appropriate. We also rely on instruments of know-how transfer, professional and leadership development, and process streamlining through our lean processing method. Using these tools, we subject ourselves to regular internal quality audits.

The presentation outlines the strategic decisions that were made in close cooperation with social partners in the areas of human resource planning and development, corporate and labor organization to develop this strategy.

As a result, we can continue to rely on a motivated workforce, despite the phasing out of the industry.



Today, strict legislation and environmental concern call for extremely careful maintenance and clean operation of all nuclear plants. Globally, governments and authorities are looking to nuclear plant operators, nuclear research and medical centers to ensure that their facilities meet the highest levels of compliance and safety throughout their operational life-cycle. The same philosophy is applied after the life-cycle of the installations and this during phase out periods, rehabilitation and decommissioning periods.

In many cases, decontamination and dismantling go hand in hand (D&D). Skills and knowledge in both areas are a useful benefit. Various disassembly, cut and demolition techniques can be used for the dismantling of anything from the smallest, difficult to access components to a complete line or circuit such as production equipment, ventilation ducts, laboratories, concrete constructions, heat exchangers etc.

Preparatory studies and hands-on practical solutions are mandatory in performing highly specialized projects in D&D and facility rehabilitation and help to minimize risks and to resolve problems of accidental or accumulated contamination. Often the removal or replacement of ageing or contaminated components is necessary.

Practical experience and constant contact with the nuclear industry gives a valuable firsthand understanding of what is appropriate for the needs in a project.

Two Belgian projects will be explained more in detail. First the Dismantling of the MOX factory Belgonucleaire in Dessel and the second one is the Rehabilitation of Nuclear buildings at the FBFCi (AREVA) site in Dessel.



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## SPEAKER

## SPEAKER

## Daniel Scharf

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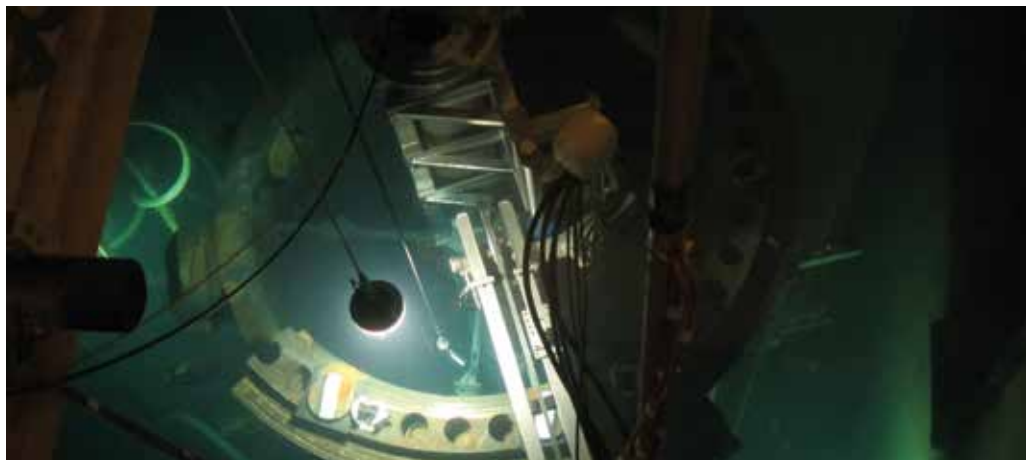
## Reactor Vessel, Vessel Internals and Operational Waste Segmentation Experiences

The mechanical segmentation technology that is currently in use by Westinghouse was initially developed for Nordic BWR reactor internals replacements. The system is based on clean, safe, reliable and proven techniques. All segmentation work is performed with mechanical under water cutting. A project in accordance with this process must be thoroughly planned together with the customer. The radiation level of the internals and complexity of the site work has to be foreseen. All procedures and tools have to be tested and qualified using mock-ups and considering environmental factors before the site work starts.

The Westinghouse site work includes preparations, handling and segmentation of the internals in accordance with procedures and cutting plans, packaging of the cut pieces in containers according to a prepared detailed packaging and a waste disposal plan including handling and internal transport of the containers in the reactor hall. The campaign normally also includes cleaning and restoring the pool environment to the initial condition.

Recent segmentation projects have been performed with mechanical cutting. The complexity of the work requires tools well designed for on-site maintenance, high performance and reliability. At José Cabrera NPP in Spain, the scope was to cut and package the reactor vessel internals and operational waste. The flexibility of the equipment proved to be critical to success. The project was finalized after the last container was loaded in November 2013. During phase 2 of the project cutting of the RPV head has been completed, the RPV was lifted from its initial position to the position where the cutting is now ongoing.

Experiences from the Nordic NPPs as well as the José Cabrera segmentation have proved that the mechanical cutting method is clean, safe and reliable for dismantling reactor internals, reactor vessels and operational waste.



## ABSTRACT TITLE

## ABSTRACT TITLE

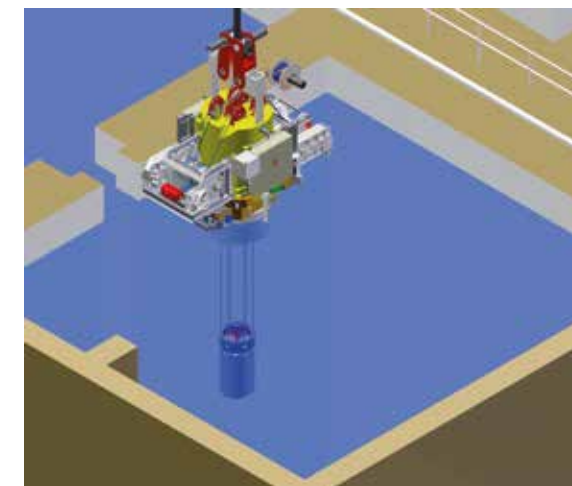
## Dry loading of MOSAIK® Casks with High-Dose-Rate Waste by Means of a Shielded Transport Device

State of the art is the under water loading of high-dose-rate waste into MOSAIK®-casks, which leads to a significant effort for decontamination, draining and drying of the MOSAIK®-casks and, as a result, to a significant radiation dose for the personnel as well as to significant handling costs. In order to reduce the radiation dose for the personnel and the handling costs, Isar 1 NPP plans to perform the loading of high-dose-rate waste into MOSAIK®-casks by means of a shielded transport device in the future and charged E.ON Anlagenservice GmbH with the detailed planning and delivery of the required equipment.

The new loading procedure using a shielded transport device leads to the loss of the decontamination and draining steps and a significant reduction of the drying step, as the MOSAIK®-casks do not have to be lifted into the reactor pool anymore. The main steps of the new „dry“ loading procedure can be described as follows:

The shielding device is attached to the crane, positioned above the reactor pool surface and lowered into the water with its dipping cylinder. The hoist driven gripping device is lowered into the pool, grips the waste baskets remotely controlled and lifts them into the shielding device. After a sufficient dripping time, the bottom of the shielding device is closed and the shielding device is driven to the shielded loading station, where the dipping cylinder is detached.

Having positioned the shielding device above the loading station, the bottom of the shielding device is opened and the waste basket is lowered and placed into the MOSAIK®-cask. After the retrieval of the gripper, the shielding slider is closed and the shielding device is removed and parked. The lid is positioned above the MOSAIK®-cask by means of its sliding device, the shielding slider is opened and the lid is positioned on the MOSAIK®-cask. The screws of the lid are placed using the shielding of the loading station, the loaded MOSAIK®-cask is removed and a new one is placed.





TUESDAY 16:30

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SPEAKER

SPEAKER

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### Scientific Support for Nuclear Decommissioning in France

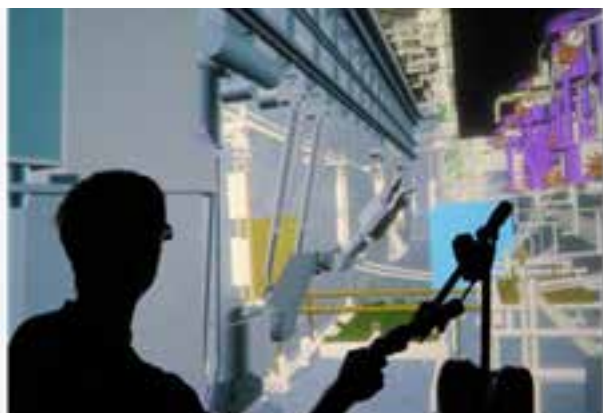
Since its creation in 1945, the French Atomic Energy and Alternative Energies Commission has carried out research programs on civil use of nuclear. CEA/Nuclear Energy Division (NED) has set up and managed various types of installations from research (accelerators, reactors, laboratories) to industry (power reactor, processing facilities). There are currently tens of facilities which are closed down, awaiting dismantling, or in the process of being dismantled by NED. The diversity of the projects reflects the early history of nuclear energy, and requires a wide range of techniques for dismantling and for managing the resulting materials and radioactive waste.

CEA's Nuclear Energy Division has huge expertise in dismantling projects, not only as the owner of numerous facilities, but also in the methodologies and skills necessary to complete the work.

Associated with these dismantling operations, we have been developing for many years a large R&D program in this field. It is a major challenge to improve safety, to protect workers, and to reduce the duration and the cost of dismantling operations. CEA's Nuclear Energy Division conducts these R&D programs to develop the techniques and tools necessary to carry out these operations: robotic and cutting tools, nuclear measurements, 3D simulation, treatment and characterization of liquid and solid radioactive waste. Some of these developments have already been used on industrial D&D projects outside.

Today, the challenge is to optimize even more the dismantling strategies and scenarios, in accordance with the defined end state.

CEA is convinced that management of the nuclear facilities end-of-life is a key issue for public acceptance.



### ABSTRACT TITLE

### ABSTRACT TITLE

### Fundamentals of the Foundation Model and Consequences According to the Atomic Law

The nuclear power plant operators have to bear the costs associated with the closure and the decommissioning of the German nuclear power plants as well as the costs for the disposal of nuclear waste. For that purpose, the operators had and have to build up sufficient reserves for the decommissioning phase, in particular for the closure, the removal and the disposal of nuclear waste (including nuclear fuel elements) until final storage. According to a April 2014 statement of the German government, these reserves at the end of 2013 amounted to approximately 36 billion Euro.

Changing this system is discussed every so often. Last in May 2014, a public debate started dealing with the so called trust model („Stiftungsmodell“). The press published deliberations of several operators to transfer their entire nuclear business to the Federal Republic of Germany. Under this deliberation the current nuclear power plant operations, as well as closure obligations including the removal and nuclear waste disposal liabilities would

be contributed to trust. Further, also the reserves should be „transferred“ to the trust. RAG-Foundation (RAG-Stiftung) - which will assume the financial obligations in connection with Germany's closure of underground coal mining activities - sometimes is cited as a role model.

We will cover elements of German trust law and atomic energy law regarding such deliberations. In trust law e.g. it can be debated whether the trust should be established under public or - as in the case of RAG-Foundation - under private law. In this context we will set out the major differences between those two options with a view towards the trust's formation and operation. In the public law part we will notably address issues arising from individual licensing requirements for nuclear power plants and focus on questions concerning reliability (Zuverlässigkeit), requisite qualification (Fachkunde) and organizational structures (personelle Betriebsorganisation).

**KÜMMERLEIN**  
RECHTSANWÄLTE & NOTARE

| Expertise in all areas of business law |                               |                   |
|--|-------------------------------|-------------------|
| Commercial law and contracts           | Public and administrative law |                   |
| Corporate law                          | Dispute resolution            | Environmental law |
| Trust and foundation law               | International cooperation     | Nuclear power law |

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AiNT



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Current Tasks in Law in Relation to the Nuclear Phase-Out - Decommissioning Procedures in the Context of the Energy Transition

The energy transition has brought many changes to the legal framework for nuclear energy use. These legal developments affect not only operation of nuclear power stations and issues of interim storage and final disposal. According to the German Atomic Energy Act's existing provisions, the authorizations to operate the last nuclear power stations will expire at the end of 2022. Other nuclear power stations have been successively closing down since 2011, and closures should continue until 2022.

This means that a large number of decommissioning procedures are being currently carried out and will be carried out in the next few years. In turn, a large number of legal issues have arisen as part of these decommissioning procedures, some of them familiar, some of them arising only as a result of the energy transition. The presentation explores selected legal issues in this area.

ABSTRACT TITLE

ABSTRACT TITLE

Public Participation: A Milestone in the Approval Process for the Decommissioning

As a consequence of the law to phase out the peaceful use of nuclear energy in Germany in the year 2011, the gradual completion of the nuclear power plant operation was determined by the end of the year 2022. Seventeen nuclear power plants were in operation before Fukushima in 2011, at which eight were directly affected by the German political decision to phase out. These plants had to shut down immediately and are now under decommissioning. The decommissioning of nuclear power plants requires a license, which also includes a public participation process. This process is performed on the basis of documents, which are prepared in accordance to the Nuclear Licensing Procedure Ordinance (in German AtVfV). The state regulation authority leads this process, in which applicants as well as objectors are involved. In addition, the

technical experts (i.e. TSO) as well as involved authorities are invited to the appointment.

The presentation will deal with the legal basis of the public participation process, the role of the various parties and gives an insight into the structure and sequence organization of a public hearing. This includes the interaction of negotiation management, applicants and objectors.

An introduction to the management of the organizational important infrastructure, which is necessary for the provision of essential information during the appointment, will be given. Furthermore the author will give instructions with regard to the preparation of the meeting, with the focus on the treatment of objections.







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**SPEAKER**

**SPEAKER**



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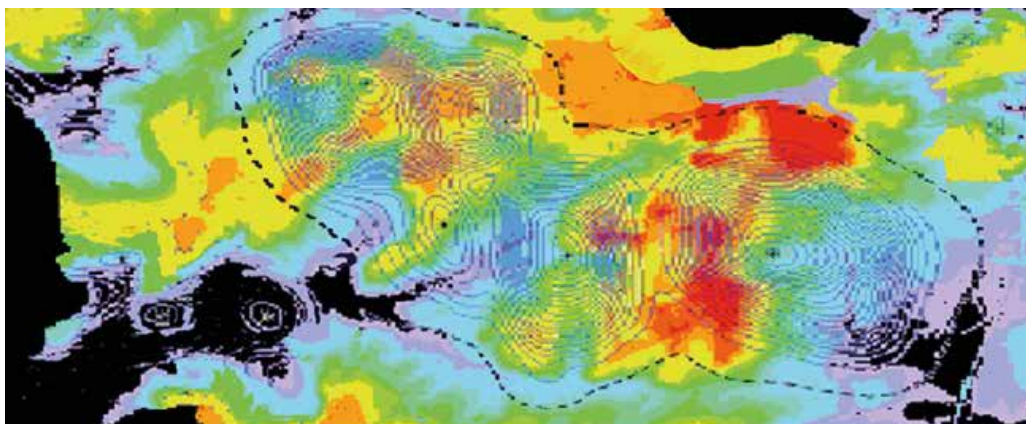
**Environmental Impact Assessment for Decommissioning of Nuclear Power Plants in Europe**

In most European countries Environmental Impact Assessment (EIA) is a mandatory requirement prior to the decommissioning of nuclear power plants. EIA is a multi-disciplinary and inter-sectorial endeavor, usually including a diversity of topics ranging from geological investigations to noise/vibration assessments, that looks at the possible impact that decommissioning project may have on the wider environment. Following the results of studies carried out by the European Commission to establish the basic safety requirements, the recommended way of assessing these impacts is:

- i) characterize the existing baseline condition,
- ii) evaluate potential hazards and their impacts in the short, medium and long term,

- iii) assess the risks associated to the hazards and set up mitigation measure,
- iv) evaluate residual risks and set up monitoring means and reviewing procedures.

In this presentation we firstly review European legislative and guidance framework for the Environmental Impact Assessment in NPP decommissioning projects. Then we examine the steps involved in undertaking EIA. We present methodology to identify potential impacts and site investigations needed to predict significance of these impacts. Finally we develop strategy for risks mitigation.



**EIA: Prediction of soil contamination**

**ABSTRACT TITLE**

**ABSTRACT TITLE**

**Status of the Claims – Moratorium, Phase-Out, Nuclear Fuel Tax**

**1. Unconstitutionality of the amendment of the Atomic Energy Act 2011**

The amendment of the Atomic Energy Act 2011 revoked the before granted extension of lifetime for nuclear power plants and determines for every plant a definitive end date. The operating authorization for eight of the 17 power plants expired on 6 August 2011. E.ON, RWE and Vattenfall lodged a constitutional complaint. They plead that the law terminating the lifetime is unconstitutional and infringes article 14 Grundgesetz.

**2. Legal disputes concerning the "moratorium"**

In answer to the incident in Fukushima, the Federal Minister of Environment requested the responsible Länder authorities to shut down the seven oldest nuclear power plants for three months for the purpose of a security check. Only RWE filed an action against this order. On 27 February 2013 the Higher Administrative Court declared the order to be unlawful. The Federal Administrative Court rejected the appeals. The question whether RWE is entitled

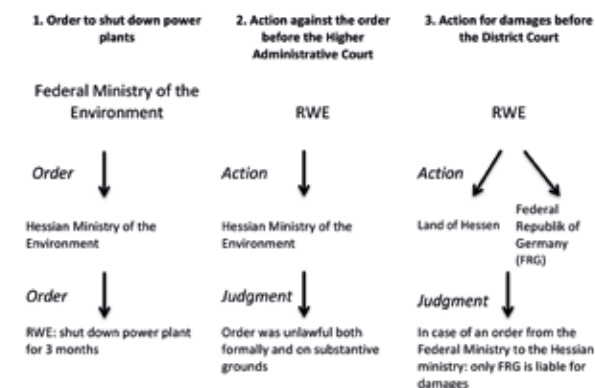
to compensation from the Land of Hessen will be subject of a possible civil action.

**3. Legal disputes concerning the nuclear fuel tax**

The Law on Nuclear Fuel Tax was enacted at the same time the lifetimes of nuclear power plants were extended. Whereas these were revoked by amendment of the Atomic Energy Act 2011, the Law on Nuclear Fuel Tax persists. E.ON applied to the Financial Court Hamburg and RWE to the Financial Court Munich for annulment of the enforcement of the tax declaration. Both courts suspended the enforcement.

The Federal Fiscal Court allowed the appeals against these court orders: the Law on Nuclear Fuel Tax was not evidently formally unconstitutional. Subsequently, the Financial Court Hamburg submitted the question to the Federal Constitutional Court, whether the Law was formally unconstitutional and referred to the ECJ for a preliminary ruling on whether the directives 2008/118/EG and 2003/96/EG preclude the tax on nuclear fuel. Rulings have not yet been issued.

**RWE: Claim for damages**







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Decommissioning Risk Management – The IAEA-Project DRiMa

ABSTRACT TITLE

ABSTRACT TITLE

Interface between Post-Operational Phase and Decommissioning: Effective Use of own Expertise

There is an increasing number of decommissioning activities worldwide at facilities that used radioactive material during their operation. In most cases this is because these facilities are reaching their end of life; or have already been shut down as planned or prior to their expected lifetime (e.g. economic reasons, political, social, or as a result of accidents). In 2007 the International Atomic Energy Agency (IAEA) established the International Decommissioning Network (IDN) to help Member States develop capabilities and plans to undertake decommissioning activities.

During its 2011 annual meeting, the IDN discussed and recognized the importance of risk management as an important factor for sound and safe decommissioning. Risk is considered both in the context of decisions relating the overall strategy for decommissioning and from the perspective of operational decisions during project implementation. In order to provide assistance and feedback on the application of risk management during decommissioning, IDN agreed to establish a

three years project on aspects on risk management during decommissioning (Decommissioning Risk Management project – DRiMa project), which was launched in December 2012.

The DRiMa project focusses on risk management relevant to operating organizations, although the outcomes of the project may be relevant also for other organizations and institutions concerned with decommissioning, particularly the regulatory authorities. Its main aim is to provide recommendations and practical illustrations concerning the application of existing risk management approaches and concepts during planning and execution of decommissioning nuclear facilities. As such, the project reflects the differences of risk management at a strategic level and at an operational level.

This contribution to the ICOND 2014 will report on the first outcomes of the project which will complete its work by end of 2015.

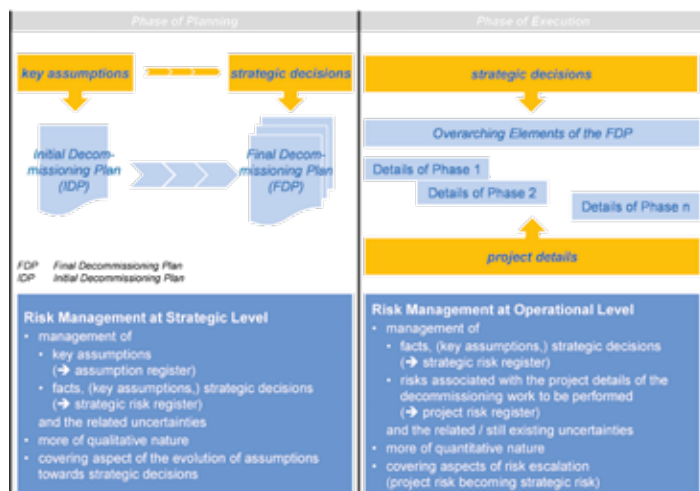
Challenge of post operational phase and decommissioning is to match the requirements of ongoing waste heat rejection and of reliable activity retention while decommissioning work is in effect. In comparison to a new built project decommissioning ends up with no functional plant. On the other hand, many systems have to be full operational during the process. In addition low, medium and high active waste has to be handled with respect to safety standards justified by technical means and national law.

The operating team has to cope with this. All operational measures have to be adopted to reduced demands; reductions have to be identified and negotiated with the authorities. Experience of plenum shows a huge potential of not yet identified cost savings in this area. This leads to a new dimensioning of own resources. To reach fast cost cut, tem-

porary in-sourcing of maintenance and engineering is an interesting option.

For decommissioning a project team has to be set up. Within this team owner's engineering is not only necessary to keep available resources occupied. It's a co-requisite to profit from essential core-competencies and specific know-how with respect to the existing plant.

The presentation outlines the procedure of post-operational cost cut projects and shows, how core-competencies can be defined and how an efficient economic co-operation between own staff and external project management can be achieved. All this within the frame of safety requirements given by atomic law and additional company safety compliance rules.



| market prices | core-competency |                           | no core-competency  |                     | own transfer prices |
|---------------|-----------------|---------------------------|---------------------|---------------------|---------------------|
|               | post-operation  | decommissioning           | post-operation      | decommissioning     |                     |
| higher        | make            | make! & insourcing learn! | make                | predominantly: make |                     |
| same          | make            | make! & insourcing learn! | predominantly: make | buy                 |                     |
| lower         | make            | predominantly: make       | predominantly: buy  | buy                 |                     |





WEDNESDAY 14:30

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SPEAKER

SPEAKER

WEDNESDAY 15:30

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PROGRAMME

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### Change-Management – Vom Leistungsbetrieb und Produktion zum Rückbau

Die durch die Stilllegung erforderlichen personellen und organisatorischen Veränderungen stellen Rückbauprojekte vor besondere Herausforderungen. Leistungsbetrieb wie Produktion sind wesentlich gekennzeichnet durch ein weitgehend stabiles Arbeitsumfeld, konstante Auslastung und etablierte Organisationsstrukturen; und nicht zuletzt, durch den Geschäftszweck das Kraftwerk sicher, umweltfreundlich und wirtschaftlich zu betreiben. Im Gegensatz hierzu hat man es bei Stilllegung und Rückbau mit einem dynamischen, sich ständig verändernden Arbeitsumfeld zu tun. Gekennzeichnet durch abnehmende Auslastung und veränderten fachlichen Anforderungen entstehen Ausgaben, denen kein wirtschaftlicher Ertrag gegenüber steht.

Abgeleitet von bekannten und in der Produktionsindustrie erfolgreich angewandten Management-Methoden entwickelte AREVA wirksame Prozesse zur

Produktivitätsverbesserung und zur Steuerung der beim Übergang von Leistungsbetrieb und Produktion zum Rückbau eintretenden Änderungen. Speziell entwickelte Programme unterstützen die Führungskräfte bei Durchführung von Maßnahmen zur Umschulung und Re-qualifizierung sowie bei den notwendigen organisatorischen Änderungen bei gleichbleibend hoher Motivation und Leistungsbereitschaft im Konsens mit der Belegschaft.

### ABSTRACT TITLE

### ABSTRACT TITLE

### Aging, Structure in Companies und Fluctuation - Consequences for a HR-Strategy

Aging is in all european countries - east and west- a real challenge for companies success. You may find in the literature mainly a discussion of discounting „old employees and managers and all averaged companies“ at all. The most value point of view is that utility providers will have the highest maturity average of companies in Germany.

The reality of companies is the other way around. Managers and experts are, if they between 50 and 65 years old, the important resource of a company and a society in general. Companies have to stop this discussion of discounting and start with new, positive pattern of thought. Germany legislated a specific law against discrimination of sex, race and age. This is a brought public commitment in our country.

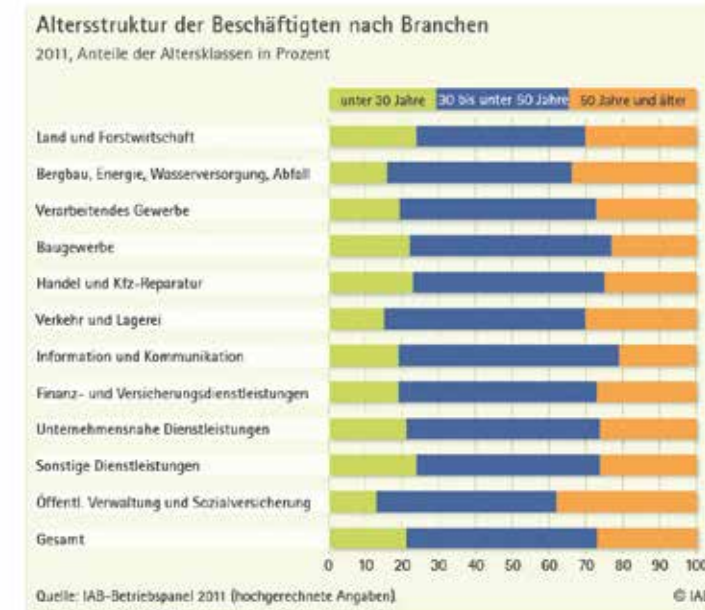
Public companies and energy utilities have the highest average of elderly employees in Germany. This presentation gives advices how to handle this resource of human capital with a skill analysis, in mentorship, impart experiences and advanced training.

PROGRAMME

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**SPEAKER**

**SPEAKER**



**Alastair Laird**

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**Use of Highly Selective IX for the Decommissioning of Fukushima Daiichi**

Fukushima accident on March 11th 2011 created many types of water treatment needs. During first days after the accident sea water was used for cooling. This brought a lot of salts into the buildings. 400 m3/day water penetrated into the buildings, which created a need to treat this water and not to allow it released into the sea. Later on, when leakages occurred, groundwater was contaminated, and this created need for a different type of water treatment system. In order to protect sea from releases several actions have been taken.

There are three management strategies: contaminant removal, contaminant isolation, and leakage prevention.

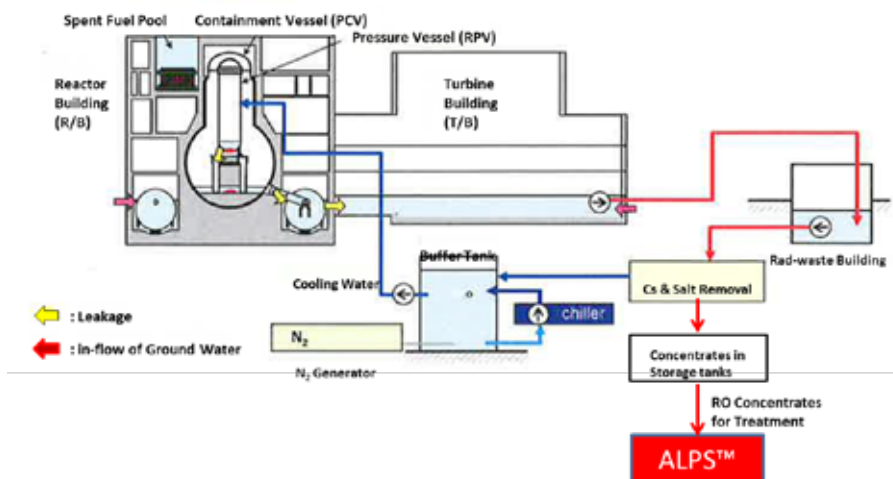
For leakage prevention the actions are ground improvement close to the sea shore, and installation of seaside impermeable wall.

For contamination isolation a groundwater bypass is constructed to reduce penetration of groundwater into the buildings. For this purpose an „ice wall“ will be formed around the units. This will keep

contamination inside of the wall and further reduces income of groundwater into the buildings. Oneother action is the use of „Subdrain system“, by which groundwater is pumped and treated before its release into the sea. This will further reduce groundwater flow into the buildings and limits releases to the sea.

For contamination removal very soon after the accident „Circulating Water Cooling System“, including cesium removal, was installed. Here cesium is removed by engineered zeolites and silicotitanate. From this cooling system the same amount of water has to be removed as comes from groundwater. This water, including practically all Sr, is taken to tank storages. For treatment of these salt concentrates an ALPS system has been installed. In ALPS 62 nuclides are removed, and there Cs is removed by CsTreat and Sr by SrTreat.

Selective ion exchangers have to be used in these water treatment systems. CsTreat and SrTreat has proven ability to give highest decontamination factors on the level of several millions.



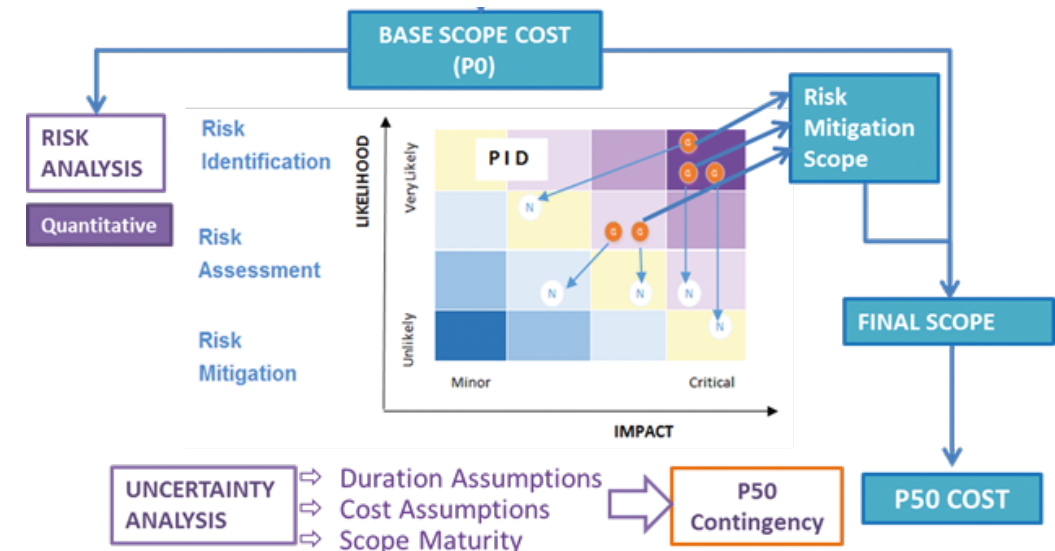
**ABSTRACT TITLE**

**ABSTRACT TITLE**

**Identification of Cost Drivers for Decommissioning of Nuclear Facilities**

The cost of decommissioning nuclear sites (like the cost of new Nuclear Power Plant construction) continue to increase. At some stage contractors will surely be offering competitive fixed price contracts as methodologies are standardized and uncertainties are better understood. Certainly for standard facilities and unit types like PWRs and BWRs the time for such market maturity is not that far away. Some early examples such as Zion in the US are also taking place which may build confidence in these type of contract models. Balanced against this are owner requirements, governmental interventions, national skills agendas and regulatory change that generate a different set of uncertainties on both the decommissioning journey and also the agreed end-state. Country to country and site to site these issues are different and often more complex than the expected uncertainties that arise from managing radiation and contamination hazards during facility clean out and subsequent decommissioning. So what can one do?

The need for better cost estimates and more knowledge and understanding of risks and uncertainties seems to be a common feature of how NPP owners and utility companies are now seeking to best to plan and execute decommissioning projects. Better cost modeling, more data share (e.g. IAEA and OECD NEA) and a desire for accuracy appears to be driving analysis of case studies. Benchmarking is now a key tool in assuring cost budgets. Unfortunately historical data can be inconsistent, knowledge can be incomplete and risk transfer may not always be possible. Under such circumstances decommissioning funds are under scrutiny and cost driver and boundary condition analysis is vital to establish an optimal baseline decommissioning strategies which meet stakeholder and shareholder expectations. Surprisingly it appears that the technology uncertainties to decommissioning are in fact now quite low. So what are the cost drivers and how can they be controlled and optimized?







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SPEAKER

SPEAKER



Andrew Davies

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**Strategic Decommissioning Management - Sellafield PBO, a Case Study**

Sellafield is one of the most complex nuclear sites in the world. In the 1940s it supported the UK's World War II efforts before hosting the world's first nuclear power station in 1956. The site is now under the ownership of the Nuclear Decommissioning Authority (NDA), which has made the decommissioning of the highest radiological hazards from the site's early operations its priority.

The NDA is a non-departmental public body created in 2004. It is a strategic authority that owns 19 sites, including Sellafield, and the associated civil nuclear liabilities and assets of the public sector. These were previously under the control of United Kingdom Atomic Energy Authority (UKAEA) and British Nuclear Fuels Ltd (BNFL).

There are more than 250 nuclear facilities within the two square mile site, which supports the employment of more than 10,500 people and clean-up operations are complex, due to factors including the age of the facilities and the condition of the waste they contain. Furthermore, the site is also focusing on current commercial reprocessing and waste treatment and management operations alongside the decommissioning programme.

In 2008 the NDA awarded a contract to Nuclear Management Partners (NMP) a consortium comprising URS of the United States, AMEC and French company AREVA, which became the Parent Body organisation (PBO)

The contract, which can run up to a total of 17 years, is effectively the largest civil nuclear decommissioning contract in the world, and introduced private sector skills and experience to the UK's nuclear decommissioning programme.

The PBO owns the shares in Sellafield Ltd (the Site Licence Company) and is responsible for accelerating the delivery of Sellafield's lifetime plan, through the provision of skills and expertise from the parent companies, robust governance and appropriate culture change to the SLC.

Significant progress is now being made on the delivery of the NDA's clean-up mission, but the complexities of the site continue to generate uncertainties of cost and timescale. However, it is widely acknowledged that the PBO model has proven to be a robust vehicle to help ensure effective nuclear decommissioning.

Which lessons learnt can now be taken into Germany?



**ABSTRACT TITLE**

**ABSTRACT TITLE**

**Concept of Programmisation: Cost Reduction & Knowledge Transfer in Decommissioning Projects**

**What is Programmisation?**

The traditional approach to reactor decommissioning has been to treat each site as separate, and to manage decommissioning projects one by one. Across the world, projects managed this way are often late and over budget. Programmisation is a method for managing multiple, geographically dispersed reactor sites in parallel that improves predictability of the outcome in time and money. This paper will explore its application by EnergySolutions to the UK Magnox programme.

**What benefits does it bring?**

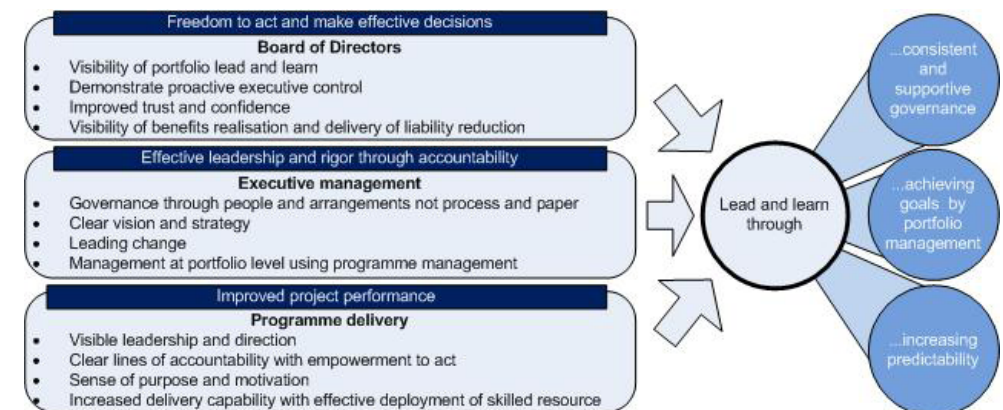
Programmisation makes learning transfer easier. The lessons learned from a project at one site can be taken on to the next site, avoiding the same mistakes and mitigating project risks. This brings predictability, as the project schedule and cost are underpinned by experience, and the risks that do arise can be better managed. When projects become more predictable, opportunities for efficiency and cost savings become apparent.

**What are the challenges?**

Programmisation is a relatively simple concept, but how do you make it work for you? For a utility

organised to run and support power stations, this is a significant leadership and management challenge. The potential problems for leaders in the following areas have been successfully overcome by EnergySolutions:

- Improving Safety – learning and good practice is transferred with people
- Technical strategy – clear technical strategy that was easily communicable and applicable
- Skills and organisation – Magnox was re-organised to deliver projects through specific technical programmes
- Uniform delivery of projects – leadership and processes focus on ensuring that strategic goals are achieved consistently
- Supply chain engagement – close working with suppliers has evolved a single storage design, with common safety analysis for middle active wastes
- Stakeholders – continuous process of open external communication with local communities and Regulators who become familiar with the strategies applied.





THURSDAY 09:00

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**SPEAKER**

**SPEAKER**

THURSDAY 09:30

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### Off-Site Treatment of Scrap Metal

The company Gesellschaft für Nuklear-Service mbH, Essen/Germany (GNS), has operated on behalf of the utilities E.ON, RWE, EnBW and VENE since the nineteen-nineties, delivering services in various areas including the management of radioactive scrap metal and radioactive waste, originating in particular from German nuclear power plants, during operation and now through decommissioning.

One of the main objectives within this responsibility is to maximize the value of recyclable fractions for further re-use while minimizing the overall radioactive waste volume, especially the waste deriving from the recycling process. To achieve the foregoing objective, GNS operates in close cooperation with the company EnergySolutions, among others, primarily by using EnergySolutions' off-site treatment service to melt metallic scrap for beneficial re-use.

This technique, with its focus on safety for humans and the environment combined with all its accompanying rigorous processes and procedures, has achieved a high level of acceptance as a qualified treatment method among German operators, experts and regulators during this time period and has become common practice.

The motivation of this paper is to reflect on the results of the experience gained by both companies over the course of many years in connection with the planning, implementation and processing of such campaigns and to comment on waste management services which might be implemented in the future.



### ABSTRACT TITLE

### ABSTRACT TITLE

### Dismantling of Russian Nuclear Powered Submarines

The presentation demonstrates the execution of the German-Russian project for dismantling of Russian nuclear-powered submarines as an element of the initiative "G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction", adopted by the Heads of States at the Summit 2002. The Federal Ministry of Economics charged the Energiewerke Nord GmbH Lubmin (Germany) with the technical execution of the project in November 2003. The Power-Point presentation is illustrated with a lot of photos and is structured as follows:

**Complex I**  
Presentation of the starting situation and aims of the project, project structure and project handling, works and services under the condition of an restricted area in the Russian polar region, interaction with the Strategic Masterplan II of the EBRD and with the work of the Contact Expert Group of the IAEA.

**Complex II**  
Providing of conditions for an effective dismantling of submarines at the premises of the local dismantling shipyard "Nerpa", near Murmansk Dismantling

of submarines, forming of reactor compartments, suitable for long-term storage.

**Complex III**  
Construction of a long-term storage facility for 175 reactor compartments of nuclear powered submarines and radioactive sections of service vessels in the Sayda Bay Technical facilities / infrastructure of the storage facility. The long-term storage facility was completed and set into operation in 2011.

**Complex IV**  
Construction of a regional center for conditioning and long-term storage of radwaste (RCCLS RW) in the Sayda Bay is designed for all radioactive waste, accumulating in the dismantling of submarines and already accumulated in the past decades of operating the submarine fleet. Introduction of the dismantling, decontamination, conditioning, packing and transportation facilities. According to the contract completion of the operational RCCLS RW is scheduled for December 2014.



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THURSDAY 10:00

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SPEAKER

SPEAKER

THURSDAY 11:15

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### Regulations for Release in the new EU Basic Safety Standards for Radiation Protection

After extensive negotiations at the European Union the Council Directive 2013/59/EURATOM laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation came in force on February the 6th in 2014. The directive has to be implemented in national regulations within the next four years by member states. The directive contains detailed requirements for the clearance of materials and provides a list of clearance and exemption levels for artificial and naturally occurring radionuclides. As a new approach the clearance and exemption levels for activity concentrations are now uniform. These two values are now identical. For this purpose the exemptions level have been lowered to a similar range as the existing clearance levels.

For special materials or for materials from special practices the directive allows the member states to define specific national clearance levels. Hence the existing German clearance concept, which

contains also specific clearance levels of options for landfill or incineration disposal of solid substances, could basically be sustained without fundamental alterations. A new aspect is the exemption of naturally occurring radioactive material (NORM) from regulatory control. According to the directive, under particular circumstances the handling of NORM is defined as a practice and classified as a planned exposure situation.

Disposal, recycling or reuse of NORM materials arising from these practices may be released from regulatory control with regard to compliance with the criteria for public exposure. While for artificial radionuclides the prevailing value of the effective dose in the range of 10 µSv per year should not be exceeded, a higher value of 1 mSv per year is applied for NORM.

### ABSTRACT TITLE

### ABSTRACT TITLE

### Limits and Thresholds in the new Basic Safety Standards and their Transposition into the new Radiation Protection Ordinance

The following limits and threshold values in the new Basic Safety Standards on radiation protection of the EU (BSS) have effects on exemption, clearance and dose assessments for normal operation of nuclear installations:

- the values in Appendix VII Table A BSS, designated as exemption and unconditional clearance levels,
- the dose limit for the population of 1 mSv/a according to Article 12 Sect. 2 BSS in connection with the definition according to Article 12 Sect. 1, requiring this dose limit to be interpreted as a sum of the annual doses from all planned exposures.

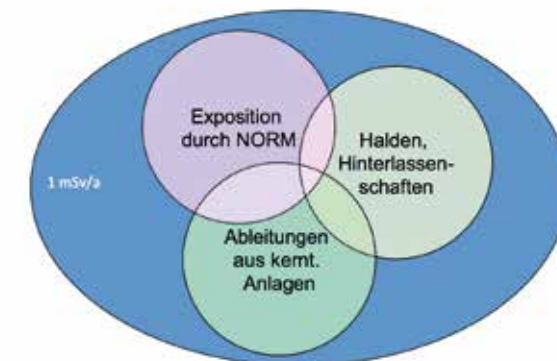
The current plans for the amendment of the Radiation Protection Ordinance (StrlSchV) until 2018 intend that the structure of the clearance options is preserved according to Section 29 paragraph 2 No. 1 and 2 StrlSchV. With respect to the sets of clearance levels in Appendix III Table 1 StrlSchV, the present values for unconditional clearance in column 5 will be substituted with the values in Appendix VII Table A BSS. The other sets of values in the remaining columns 4 and 6 to 10a (options for

unconditional clearance and clearance for a specific purpose) will undergo only slight changes to maintain internal consistency of the value sets. In particular, no discontinuation of clearance options for specific purposes (metals for melting, rubbish is planned for the removal) is planned.

In view of the dose limit value of 1 mSv/a for the population, more significant changes than with clearance are to be expected. In future, the exposure by direct irradiation as well as gaseous and liquid releases from:

- nuclear installations (Sections 47 and 48 StrlSchV),
- handling of radioactive materials in research, medicine and technology (Section 7 StrlSchV),
- NORM industries as well as NORM residues (Sections 93 to 102 StrlSchV),
- legacy waste and residues from uranium mining and mining residues,

which were up to now treated separately on the basis of 1 mSv/a each must now be considered together. The presentation gives an overview on the current state of the discussion in Germany.







THURSDAY 11:45

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SPEAKER

SPEAKER

THURSDAY 12:15

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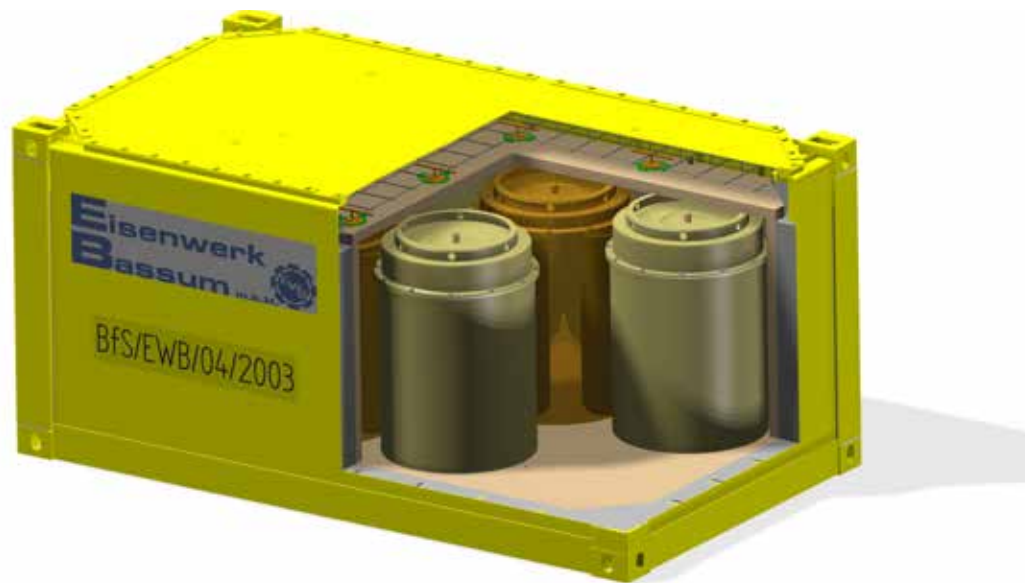
### Zulassung konradgängiger Stahlblechcontainer und deren Einsatzbereiche

Die Eisenwerk Bassum mbH, kurz EWB, verfügt seit dem Jahr 2001 über diverse Zulassungen für Stahlblechcontainer, sogenannte Konrad-Container, die für die Einlagerung in das Endlager - Schachanlage Konrad - geeignet sind. Hierbei wird unterschieden zwischen Containertypen, in die Abfälle der Abfallbehälterklasse I, nicht störfallfest und Containern, in die Abfälle der Abfallbehälterklasse I+II, störfallfest und nicht störfallfest gegeben werden.

In die erste Behälterausführung werden Abfälle gegeben, die in der Regel nicht durch eine Betonmatrix fixiert werden. In Container der Abfallbehälterklasse I+II, störfallfest und nicht störfallfest werden Abfälle gegeben, die immer durch eine Betonmatrix fixiert werden müssen.

Im Laufe vieler Anwendungen zur Konditionierung von Konrad-Containern wurden hierzu diverse Nuancen entwickelt und im Rahmen diverser Kampagnen Abfälle in Behältern konditioniert. Der Vortrag behandelt spezielle Anwendungsfälle, die beispielhaft für unterschiedlichste Kampagnen und Fixierungsmöglichkeiten von Abfällen in Konrad-Containern stehen.

Die Beispiele stammen aus Kampagnen der Energieversorgungsunternehmen und anderweitiger Konditionierer. Es werden im Vortrag Möglichkeiten der zugelassenen Einsatzbereiche bildlich dargestellt.



### ABSTRACT TITLE

### ABSTRACT TITLE

### Approval Status of the CASTOR®-Casks and Fuel-Loading Schedule

For the regular decommissioning process of nuclear power plants the spent fuel need to be removed as fast as possible.

The on-site dry interim storage of spent fuel elements is the only disposal option for German nuclear power plants until a suitable repository will be available. In total, there are still about 20,000 spent fuel elements to be disposed in that way until the last nuclear power plant will be shut down in 2022.

For this disposal option GNS provides the German nuclear power plants with casks of type CASTOR® V which are suitable for transport and storage. For the disposal of spent fuel from PWR casks of type CASTOR® V/19 are used, for the disposal from BWR type CASTOR® V/52 is used.

In order to load, dispatch and store a transport and storage cask in a German nuclear power plant two different fields of law shall be observed.

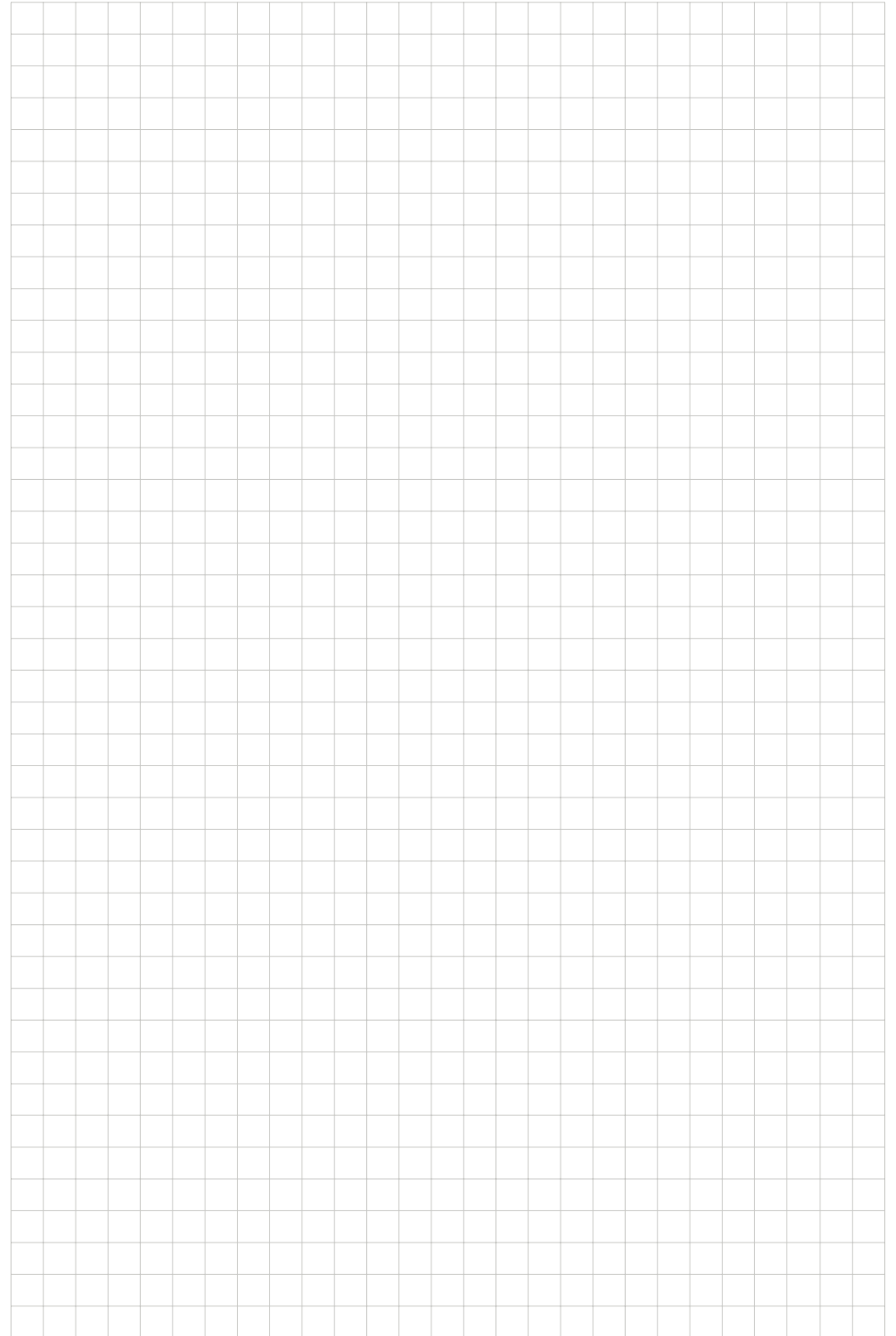
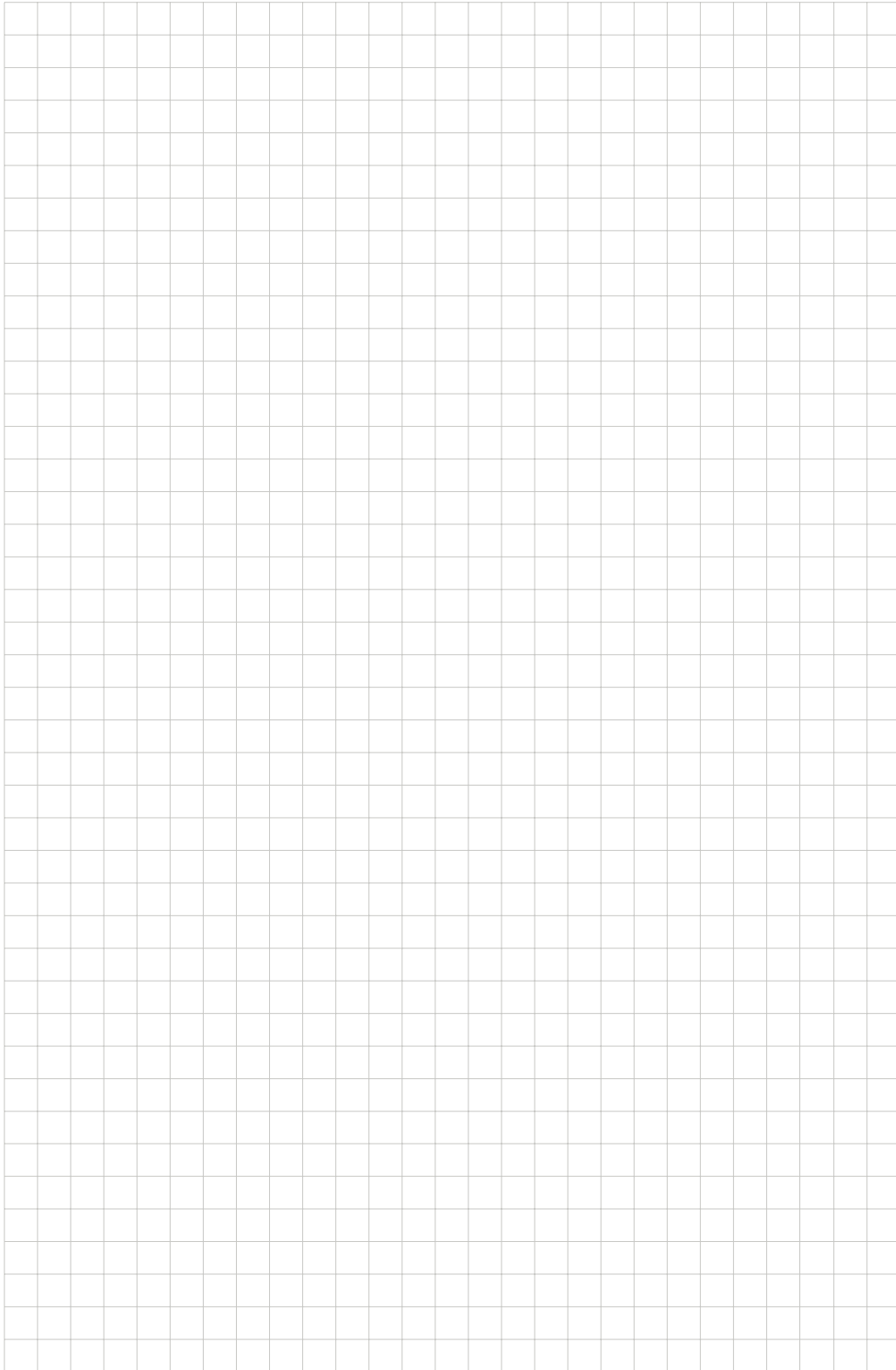
CASTOR®-casks require a so-called type B(U)F-licence in order to be transported on public roads. GNS applies for this licence according to traffic law and is authorisation holder of this licence; the competent authority is the Federal Office for Radiation Protection, BfS.

The operator of the storage facility applies for a storage licence for the spent fuel in CASTOR®-casks according to §6 Atomic Energy Act also at BfS. After the storage licence is granted the competent ministry of the federal state is the supervisory authority for the nuclear power plant and monitors the implementation of and the compliance with the licence (supervisory process).

While the loading volume between 1996 and 2013 was up to 45 casks per year it is now expected to amount to 60 to 100 casks between 2015 and 2018. This presents major challenges in view of staff, equipment and logistics, which need to be met.

### CASTOR®-Behälter





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**COMPANY  
PROFILES**





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**Heavy Transport - Next Level**

August Alborn GmbH & Co. KG is an experienced and competent family-run company since 1891. We are specialized in heavy lifting, fluids, relocation and transportation of large components, heavy and wide loads in the conventional as well as in the nuclear area.

Individual and economic solutions by the project processing in all areas, permanent call availability, careful planning and coordination accompanied with very short – term actions characterize our provision of service. We also provide feasibility studies, detailed routes and time planning, route reconnaissance and obtain the necessary permits.

This is achieved by qualified and committed team of employees, using advanced equipment and innovative technology. We provide a wide range of transportation devices and special vehicles like

saddle trucks, low loaders, flatbed trailers with high pay loads, mobile cranes and special equipment like our 1.440 to. hydraulic gantry.

Our responsible use of the environment and resources is reflected in our quality management and certified according to ISO 9001:2008 and SCCP: 2011 Standards.

“If you intend to rebuild yourself, do it every day” is our motto for over 120 years.



**COMPANY DESCRIPTION**

**COMPANY DESCRIPTION**

**Specialized in Technologies and Furnaces for Nuclear Applications**

ALD France is a European Company specialized in technologies where, vacuum or controlled atmosphere and heat are involved. We are a subsidiary of ALD Vacuum Technologies GmbH with the strength of the AMG group.

We offer highly engineered products and furnace systems, designed for high tech industries, research institutes and nuclear industry. We are one of the leading suppliers in sintering furnaces and remelting technology. Our leadership position is further enhanced through our high product quality and technical service.

We offer turn-key solutions for the fuel cycle.

Front end:

- UO2 fuel sintering furnace
- MOX fuel sintering furnace units including gloves boxes.
- High vacuum annealing furnace for LWR fuel elements or steam generator tubes out of Zircalloy, Inconel or Stainless steel
- HTR fuel manufacturing
- Hot cell furnaces.

Backend:

- Impermeable graphite Matrix (IGM®) for managing nuclear wastes.
- Vacuum furnaces for the melting of contaminated materials under safe confinement.

With these two solutions ALD France proposes new and innovative approach for the waste management. Vacuum technology used at high-temperature processes improves the safety of installations. Confinement is well controlled, guaranties a safe enclosure in case of a leakage and the absence of oxygen excludes the fire risk. Technical solutions implemented in sintering furnaces for nuclear fuel and for contaminated metals scrap melter

- Guarantee the containment of the radioactive material
- Reduce drastically the amount of gaseous and liquid effluents
- Allow maintenance without loss of confinement

Vacuum also allows high temperature processes to manufacture a density matrix containing nuclear waste without oxidation. The vacuum hot pressing process guarantees the complete removal of gas phases which enables the compaction without pores. IGM® (Impermeable Graphite Matrix) is a porosity free graphite-glass composite, which is leaching resistant and which can embed high activity nuclear waste.



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PROGRAMME

ABSTRACTS

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AINT

**AMEC - World-Leading Decommissioning and Clean-Up Expertise**

AMEC (LSE: AMEC) is a focused supplier of consultancy, engineering and project management services to customers in the world's oil and gas, mining, clean energy, environment and infrastructure markets.

Within our Clean Energy business, we have more than 3,300 experts supporting the entire nuclear lifecycle, from new build and operational support to decommissioning and waste management. Furthermore, as part of a global business, we can access the resources and skills of over 27,000 engineering, consultancy and project management experts worldwide.

In the decommissioning and clean up market, our mission is to help our customers meet the upcoming challenge of decommissioning their legacies. We have supported customers across the globe bringing our skills and experience to a number of major decommissioning projects.

Within Germany, we have four offices supporting customers with local expertise.

Our world-leading decommissioning and clean-up expertise covers:

**Decommissioning** - The design and delivery of complete decommissioning and clean-up solutions, including research and development, design, manufacture, testing, installation of equipment and technology for an array of decommissioning operations.

**Waste management** - A comprehensive range of services, from waste characterisation, waste minimisation and processing through to transportation and safe final disposal. Our expertise includes radiological monitoring and the segregation of contaminated material, design and the use of remotely-operated equipment, the design and implementation of proven and innovative decontamination processes, and the repackaging and disposing of historical waste.

**Site restoration and environmental remediation** - Consultancy and analysis on environmental management, including land remediation. Where on-site analysis is unsuitable, we can provide analysis in our in-house laboratories.

**COMPANY DESCRIPTION**

**COMPANY DESCRIPTION**

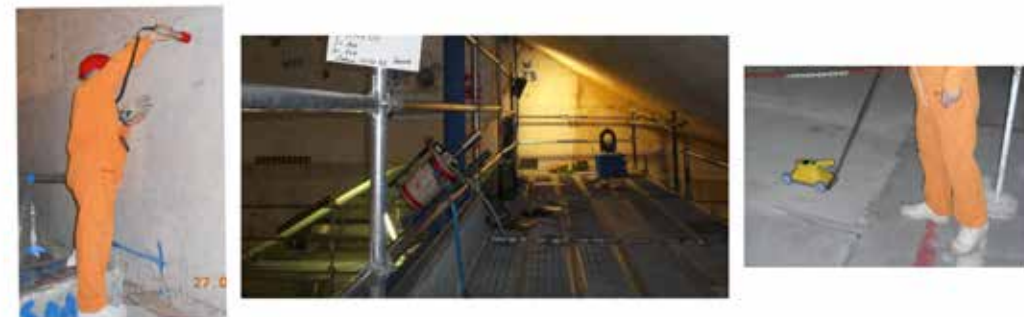
**Brenk Systemplanung GmbH (BS)**

BS has been active in the consultancy business for more than 30 years now. The services cover the areas of radiation protection, nuclear technology, software development, plant and process engineering as well as mining and environment. Founded at Aachen, BS has now additional branches in Hamburg, Bruchsal and Andernach, with a total of about 50 employees. Our work in the nuclear field is executed under contracts with the nuclear industry as well as with administrative bodies of the European Union, international organizations like OECD and IAEA, national governments and responsible licensing authorities of Federal States of Germany. It covers all aspects of radiation protection, like dose assessments, activation and shielding calculations, calculation of dispersion of radionuclides in the environment etc., and a large variety of services in the area of decommissioning and dismantling, like planning, execution of licensing procedures (both in the nuclear and the conventional sector), radwaste management, decontamination, clearance of materials, buildings etc..

We have at our disposal a complete set of measurement instruments for radiological characterisation and clearance, including 9 in situ gamma spectrometers, several laboratory gamma spectrometers, contamination monitors etc.. Our extensive software packages installed at several NPPs in Germany support clearance processes considerably.

We also deal with NORM and radioactive materials discovered in scrap or waste loads. Our transport license as well as our license for handling radioactive substances allows us to offer complete waste management solutions from a single source.

Several of our employees have been appointed members of advisory bodies like SSK (Commission on Radiation Protection) and ESK (Nuclear Waste Management Commission) as well as international working groups of IAEA, EU and OECD/NEA. Our work at DIN (German Institute for Standardisation) fosters standards on clearance measurements.



PROGRAMME

ABSTRACTS

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**Bringing Solutions for your Radio Nuclide Analysis Applications**

Baltic Scientific Instruments was established in 1994 on the basis of Riga Research and Development Institute for Radio-Isotope Apparatus (RNIIRP, est.1966), which belonged to Ministry for Atomic Energy. In 2003 the company entered the group of BRUKER companies and in 2007 changed its name to Bruker Baltic. In June, 2010 the company bought out its shares from Bruker AXS and returned its name Baltic Scientific Instruments (BSI).

Baltic Scientific Instruments specializes in the development and serial production of the spectrometric devices based on silicon, high-pure germanium and cadmium-zinc-tellurium spectrometers. Our products are applied in nuclear energetic and ecology, geology and mineral resource industry, medicine and research activities, customs control and other spheres.

We know that off-shelf-solutions are in many cases not sufficient to meet the costumers needs. To provide the best possible solution for your application, we offer additional to our off-shelf-solutions also highly customized solutions. If necessary, our well-trained specialists will find new and unique solutions to fulfill your requirements.

Just contact us and our Sales Team will help you to find the best solution for your application.



*Bringing Solutions*

**COMPANY DESCRIPTION**

**COMPANY DESCRIPTION**

**ENVINET is a leading provider in environmental radiation detection**

For more than 25 years our customers have been relying on ENVINET GmbH solutions when monitoring environmental parameters. With over 4,000 online detectors in operation, we are the leading manufacturer of networks to monitor environmental radiation. ENVINET's products and solutions reflect the experience and innovative capability of our team. We guarantee top quality and extremely reliable and highly functional solutions.

We create turnkey integrated solutions for radiation monitoring – especially as:

- nationwide early warning systems
- ring monitoring systems around nuclear plants
- area monitoring systems within nuclear facilities

- water monitoring systems for the use in sweet and salt water
- mobile solutions to detect and locate radioactive contamination.

We offer the complete service, from the actual detector right through to the central control and analysis software, thereby guaranteeing optimally configured functionality.

We are happy to welcome you at our booth and we are sure that we can offer you a perfect solution for your monitoring problems.



Innovative Radiation Detection - ENVINET GmbH



**IT Solutions for Operations, Maintenance and Decommissioning**

GiS – Society for Integrated System Planning- with its headquarters in Erlangen and its software centre in Weinheim, is dedicated to IT based (operational) management and maintenance solutions for nuclear power plants since its foundation in 1984. Until now, the exclusive market segment of GiS is nuclear power. The company is known as a leading expert in this area these days. All productive nuclear power plants in Germany and Switzerland are longstanding customers of GiS (one exception in each country).

With 85 employees GiS develops professional solutions for customers with high quality requirements, which are particularly noted for their holistic approach, accompanying the entire life-cycle of assets – from design, construction, operations, maintenance to decommissioning whilst ensuring maximum safety and compliance with regulations. The GiS portfolio covers the Enterprise Asset Management System (EAM) as well as the related software development and business process consulting.

Enhancement of the operations management system with decommissioning specific values and functionalities in nuclear power plants.

GiS uses its comprehensive know-how to develop innovative solutions for the decommissioning of nuclear power plants:

The competence portfolio of GiS in the area of decommissioning of nuclear plants contains a wide range of services and software solutions. For example, the company developed cDecom - a holistic, system-independent IT concept which is able to enhance successfully used operations management systems into optimised systems for the decommissioning, mitigating the need for several siloed solutions. Consequently, cDecom lays the ground for a consistent and expedient path of the operations management system to the decommissioning system. Moreover, the solution is particularly cost-efficient due to its evolutionary approach.

**COMPANY DESCRIPTION**

**COMPANY DESCRIPTION**

**NUKEM Technologies - Your Partner for Nuclear Engineering Solutions**

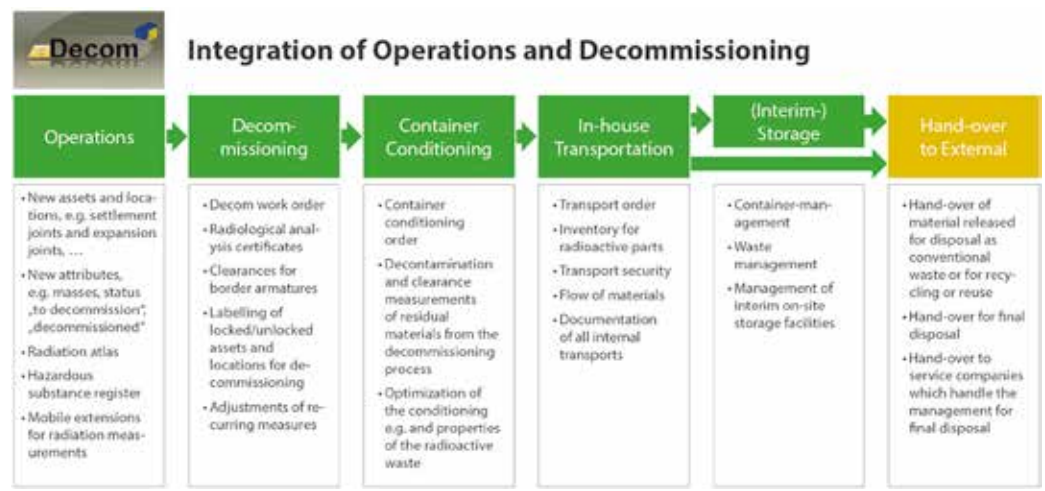
NUKEM Technologies is world-wide active in the areas of management of radioactive waste and spent fuel, decommissioning of nuclear facilities, engineering and consulting. NUKEM Technologies GmbH belongs to ROSATOM.

The company's engineers develop solutions that are both modern and proven effective. Furthermore, the solutions build upon NUKEM Technologies' extensive experience within the nuclear sector, which began over five decades ago. The company's activities comprise a broad spectrum of services ranging concept studies to the delivery of turn-key projects, from partial solutions to complete project and contract management. The company's Engineering and Consulting services play an important role in contributing to innovative design and build.

NUKEM Technologies is based in Alzenau, Germany where also the majority of the more than 250 staff is working.

As part of business optimisation processes and successful implementation of the full range of services on the global market, the organization provides its business activities by two acting companies. NUKEM Technologies GmbH is concentrating on complex turnkey projects and taking on new tasks within the value added chain of ROSATOM. Additionally, NUKEM Technologies is in charge for all international business development activities for both companies. NUKEM Technologies Engineering Services GmbH focuses on implementing classic design and equipment delivery tasks.

Consistent customer orientation and quality management are essential cornerstones of NUKEM Technologies' corporate philosophy. We place a high premium on individualized service, timely project completion, complete and understandable documentation and providing our customers with superior-quality products. A visible sign of our emphasis on quality is NUKEM Technologies' quality assurance system based on DIN EN 9001. In addition, we are proud being certified regarding KTA 1401, DIN EN ISO 140001:2009 and OHSAS 18001.



**People**

- Committed management team with long-term industry experience
- Uniquely qualified team of engineers, scientists, and technicians
- Distinctive language knowledge

**Technology**

- Excellence in decommissioning, waste management and spent fuel handling solutions
- Innovative and proven engineering solutions

**Processes & Infrastructure**

- A culture of project management excellence
- State-of-the-art management processes
- Local offices in key markets

**International Brand & Track Record**

- One of the leading international nuclear engineering names recognised around the world
- Strong international market presence

**Omexom Kraftwerk Service GmbH - Subsidiary Company of the VINCI Group**

The Omexom Kraftwerk Service GmbH (OKS) is a subsidiary company of the VINCI group, which employs 193,000 employees in more than 100 countries. More than 3,000 employees work for nuclear facilities. Vinci is a world leader in the fields of energy, automation and information technology, construction and concession services.

Omexom Kraftwerk Service is the successor of the Cegelec Kraftwerk Service, which was founded in 2008 as an independent spin-off from Cegelec Deutschland to meet the requirements of the German nuclear power industry. With 80 qualified employees, OKS delivers German wide services regarding designing, planning, detail engineering, construction, maintenance, documentation, and plant inspections for electrical and I & C systems and equipment in nuclear power plants.

Furthermore, there is a back-up of 200 German specialists hired from our affiliated companies for support in operations in nuclear power plants. Our employees are consistently equipped with radiation protection and safety passports and trained in part

as AVO and appointed VDA. We are permanently certified according to ISO 9001:2008, ISO 14001:2004, KTA 1401 und SCC\*\*.

The cutting edge for our customers are years of experience and system knowledge in nuclear power plants (since the construction period started) our technological competence and our decentralized structure.

We are service providers for solutions in electrical and control systems. Together with our German affiliates we are able to combine industrial ideas and standards with special requirements in NPPs. Therefore we are able to provide cost efficient solutions.

Furthermore we can provide together with our affiliate companies in Europe a range of services that goes far beyond the possibilities already known in Germany. Together we have profound experience in dismantling and have already developed systems for decommissioning.

To find appropriate solutions for you please don't hesitate to contact us.

**COMPANY DESCRIPTION**

**COMPANY DESCRIPTION**

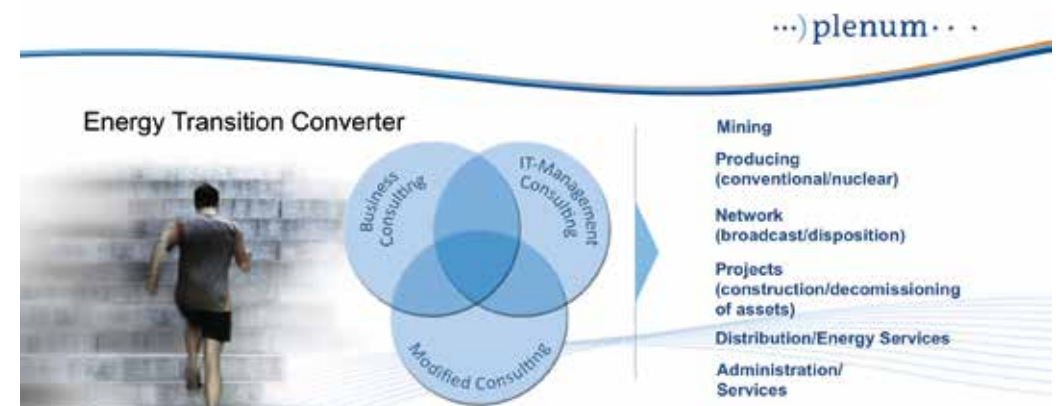
**Enabling German Energy Transformation**

plenum is the leading management consulting company for turnaround and change projects in energy industries. Change needs of the German Energy Transition imply outstanding challenges for most energy providers and utilities. plenum serves its clients best in redirecting their business with:

- Strategic planning of futures energy conversion portfolios: nuclear, combustion, regenerative/ small, medium sized and large/centralized and decentralized
- Set up of and support in new development, refurbishment/outage or decommissioning projects
- Implementation of Value Based Maintenance (VBM)
- Implementation of structured top-down and bottom-up Continuous Improvement Processes (CIP)

Success of plenum's services originates from the long term experience of our accomplished consultants. Academically educated in (nuclear) energy, professionally trained in long-term operative business processes, and methodically skilled in numerous projects, their collective strengths enable you to "spread your wings and take to the sky"!

The track record of plenum's management consultants covers high performing cost cut and change projects supporting Europe's top ten energy providers in Germany, UK, Austria, Russia, Hungary and Romania.





**Radwise Limited**  
Unit 1, 36 Ballot Road  
KA120HW Irvine - United Kingdom

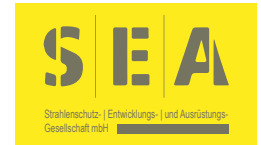
Contact David McBride  
Phone +44 1294 318375  
Email davidmcbride@radwise.co.uk  
Website www.radwise.co.uk

**CONTACT**

**CONTACT**

**S. E. A. GmbH**  
Ostdamm 139  
48249 Dülmen - Germany

Contact Heinz Kirsch  
Phone +49 2594 94240  
Email info@sea-duelmen.de  
Website www.sea-duelmen.de



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PROFILES

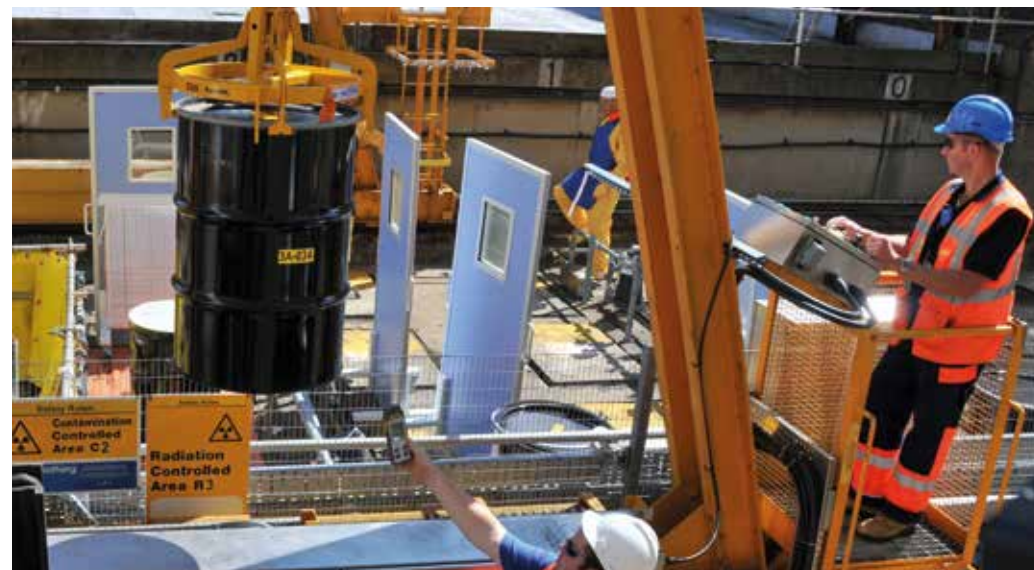
A/INT

**A Leading Supplier of Radiation Protection Services to the UK Nuclear Industry**

Radwise Limited is a UK based Radiation Protection Services company which has been providing support to the UK nuclear industry since 2001. Our main aim is to provide excellence in service delivery to our customers. Our business is a framework supplier to the Nuclear Decommissioning Authority (NDA) and to EDF Energy, supplying a range of services to support their decommissioning, operational, and outage programmes. Our business can provide services that are easily transferable to meet requirements in other European countries in technical consultancy and advice, waste management, site characterisation, radiation protection training, and radiation protection monitoring.

Our personnel work within the requirements of the Ionising Radiations Regulations 1999, which implements the Basic Safety Standards Directive

96/29/Euratom and the Environmental Permitting Regulations as well as many other Statutory Instruments that apply in the industry. In addition to these requirements our personnel are also fully compliant with our client arrangements regarding site licence conditions e.g. Safety Rules, Management Control Procedures, Local safety Instructions, etc. Due to the nature and scope of the work that we undertake, safety and regulatory compliance are seen as critical to the success of the business. The company Quality Management System is certified to ISO 9001:2008 Standard by Lloyds Register Quality Assurance (LRQA). We are also a supplier member of the Achilles Utilities Vendor Database (UVDB). Both LRQA and UVDB undertake audits of our arrangements on a regular basis which assist us with our drive for continuous improvement and excellence in our operations.



**COMPANY DESCRIPTION**

**COMPANY DESCRIPTION**

**S. E. A. GmbH (Radiation Protection Development and Equipment Company)**

The main focus of S.E.A. GmbH is development and production of mobile and stationary contamination monitors, for use both in operative nuclear plants and during dismantling.

We use the innovative detector technology of the thin-layer plastic scintillator for  $\alpha$ - and  $\beta$ - $\gamma$  measurements (gas-free detector) as well as pure  $\gamma$ -detectors (for example to detect contamination behind coatings during dismantling).

S.E.A. GmbH has 20 years of experience in developing and manufacturing custom-made products. Here we combine high-tech detectors with mechanics adapted to daily practice needs.

The detector lift for release measurement of wall and ceiling surfaces (<http://www.sea-duelmen.de/en/decommissioning/decommissioning.html#Kinds>) is an example.

We are happy to support you in finding a measurement-technical solution for your particular task!



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A/INT





NUCLEAR  
TRAINING **AiNT**



**CONSULTING**

**Ingenieur- und Beratungsleistungen**

AiNT verfügt über weitreichende Erfahrungen in den verschiedensten Teilgebieten der Kerntechnik. Hierzu zählen insbesondere die Kernstrahlungsmesstechnik, das Reststoff- und Abfallmanagement, die Simulation kernphysikalischer Prozesse und die radiologische sowie stoffliche Charakterisierung von Rest- und Abfallstoffströmen. Mit unserem Know-How stehen wir unseren Kunden bzw. Ihnen gerne beratend zur Seite, um gemeinsam komplexe und tiefgehende Herausforderungen zu meistern.

Des Weiteren bieten wir Ingenieur- und Beratungsleistungen in den Bereichen Projektplanung bei der Stilllegung von kerntechnischen Anlagen sowie bei der Behälterverwendung und -entwicklung an. Wir erstellen z.B. Konzepte für eine endlagergerechte Abfallkonditionierung und Verpackung. Im Weiteren sind unsere Beratungsdienstleistungen kurz dargestellt.

**PORTFOLIO**

**Projektplanung bei der Stilllegung von kerntechnischen Anlagen**

- Identifizierung und Darstellung von Randbedingungen, Prämissen und Anfangsbedingungen
- Lösungsansätze für die technische Ausführung
- Umgang mit Ressourcen (Mitarbeiter, Maschine, Material, Infrastruktur, etc.)
- Ablaufplanung, Nachverfolgung und Bewertung von Projektfortschritten (Zeit, Qualität und Kosten)

**Reststoff- und Abfallmanagement bei der Stilllegung**

- Konzeptentwicklung für die Behandlung und Konditionierung von radioaktiven Abfällen unter Einhaltung endlagerrelevanter Eigenschaften
- Erstellung und Bewertung von Ablaufplänen & Konditionierungsverfahren
- Freigabeverfahren gemäß §29 StrlSchV
- Software-Lösungen für Rückbau und Waste-Management (in Kooperation mit der Gesellschaft für integrierte Systemplanung GIS mbH)

**F&E Kernstrahlungsmesstechnik**

- Radiologische und stoffliche Charakterisierung von Rest- und Abfallstoffen gemäß StrlSchV und den Endlagerungsbedingungen Konrad
- Aktivitätsanalysen durch zerstörungsfreie Messungen (z.B. Gamma-Spektrometrie)
- Kernphysikalische Analysen & Aktivierungsrechnungen
- Abschirmberechnungen (inkl. Konzeptionierung von individuellen Detektorabschirmungen für Neutronen- oder Gamma-Strahlung)

**Behälterverwendung und -entwicklung**

- Unterstützung bei der Beantragung von verkehrsrechtlichen Zulassungen
- Beladungspläne und Verpackungskonzepte für endlagergerechte Abfallgebände
- Genehmigungsunterlagen für die Qualifizierung von endlagergerechten Verpackungen
- Sicherheitsanalysen zur Freisetzung von Radionukliden aus Abfallgebänden

**Kundenspezifische Aus- und Fortbildung**

Als das führende Ausbildungsinstitut in der Kerntechnik bieten wir gerne ein auf die Bedürfnisse des jeweiligen Kunden zugeschnittenes Training an. Wir arbeiten mit einem breiten Spektrum an Partnern aus der Kerntechnik zusammen. Ein individuelles Training kann beim Kunden vor Ort oder in externen Veranstaltungsräumlichkeiten durchgeführt werden. Gemeinsam mit unseren Kunden sprechen wir Schwerpunkte und Inhalte ab. Hierauf aufbauend erstellen wir einen Programmwurf inkl. einer Vorstellung der eingebundenen Dozenten/-innen. Insbesondere beim Übergang von einer Betriebsorganisation zur effizienten Rückbauorganisation verändern sich Verantwortlichkeiten und Tätigkeitsbereiche.

Bei einem bedarfsgerechten Training können wir kritische Herausforderungen aufdecken und Mitarbeiter/-innen zur Erfüllung neuer Aufgabenbereiche weiterbilden. Unsere Erfahrung zeigt, dass Mitarbeiter in einem neuen Ressort effizienter arbeiten und Hürden schneller überwinden, wenn sie gezielt fortgebildet werden. Demotivierende Anfangsschwierigkeiten werden so ebenfalls überwunden und die Teamfähigkeit gefördert. Ein erfolgreiches Training zeigt den Teilnehmern/-innen neue Chancen auf und hilft dem Unternehmen zukünftige Aufgaben leistungsfähiger zu bewältigen.

**Bedarfsgerechte Fortbildungsmaßnahmen werden z.B. in den folgenden Bereichen angeboten:**

- **Grundlagen der Kerntechnik**
- **Der Umgang mit natürlichen radioaktiven Stoffen und deren Gefährdungspotential**
- **Die Erstellung von Abfallgebindedokumentationen im Endlagerungsverfahren Konrad**

Folgende Übersicht zeigt beispielhaft die Inhalte eines Inhouse-Trainings:



**Vorbereitung und Training von Erörterungsterminen**

- Rechtliche Grundlagen (AtG, AtVfV, VwVfG, UVPg)
- Funktion und Risiken eines Erörterungstermins
- Organisation & Vorbereitung
- Zeit- & Ablaufplanung
- Kommunikation zwischen Verhandlungsleiter, Delegationsleiter & Teammitglied
- Professionelle Frage- & Antworttechniken
- Strategien von Einwendern
- Aufbereitung der Einwendungen
- Erstellung eines antragstellerbezogenen Schulungs- und Beratungsprogramms

**INHOUSE-TRAINING**



**MODUL 1 KG Kerntechnik I - Wissenschaft und Technik**

|            |   |
|------------|---|
| DATUM      | Termin auf Kundenwunsch   |
| ORT        | Mercure Hotel Aachen, Joseph-von-Görres-Straße 21, 52068 Aachen   |
| SPRACHE    | Deutsch   |
| PREIS      | 1.680,- € zzgl. 19% MwSt.   |
| LEISTUNGEN | Im Preis sind Mittagessen, Verpflegung zwischen den Unterrichtseinheiten, Social Event und Seminarunterlagen enthalten. |

**KUR SINHALTE**

In diesem Modul lernen Sie die wissenschaftlichen bzw. technischen Grundlagen der Kerntechnik kennen, und bekommen darüber hinaus einen Einblick in die historische Entwicklung der Kerntechnik.

Die Referenten/-innen werden auf physikalische sowie kernphysikalische Vorgänge in einem Reaktor (z.B. Diffusion und Moderation von Neutronen) eingehen und dabei den kompletten Kernbrennstoffkreislauf – von der Urananreicherung bis zur Entsorgung der radioaktiven Abfälle – besprechen. Sie werden über den wissenschaftlich-technischen Aspekt hinaus eine detaillierte Einführung in energiewirtschaftliche Themen wie die Bildung des Strompreises in einem liberalisierten Markt bekommen.

Weiterer Bestandteil des Moduls sind die Grundlagen der nuklearen Messtechnik sowie eine Einführung in atomrechtliche Aufsichts- und Genehmigungsverfahren.

**Kerntechnik II - Sicherheit und Strahlenschutz****MODUL 2 KG**

|            |   |
|------------|---|
| DATUM      | Termin auf Kundenwunsch   |
| ORT        | Mercure Hotel Aachen, Joseph-von-Görres-Straße 21, 52068 Aachen   |
| SPRACHE    | Deutsch   |
| PREIS      | 1.560,- € zzgl. 19% MwSt.   |
| LEISTUNGEN | Im Preis sind Mittagessen, Verpflegung zwischen den Unterrichtseinheiten, Social Event und Seminarunterlagen enthalten. |

**KUR SINHALTE**

In diesem Modul werden Ihnen die Grundlagen der Reaktorsicherheit und des Strahlenschutzes vermittelt. Die Referenten/-innen werden den aktuellen Stand von Wissenschaft und Technik sowie anhand von konkreten Beispielen relevante Sicherheitskonzepte vorstellen. Sie lernen die innovativen Reaktorkonzepte der Generation IV kennen und diskutieren über deren Vor- und Nachteile.

Neben den Grundsätzen des Strahlenschutzes wird Ihnen der Umgang mit radioaktiven Stoffen und der von diesen Stoffen emittierten ionisierenden Strahlung erläutert. Die Auswirkungen von Reaktorunfällen, die INES-Skala sowie Meldepflichten sind ebenfalls ein wesentlicher Bestandteil des Moduls. Darüber hinaus werden wichtige Themen wie die Stilllegung kerntechnischer Anlagen und das Abfallmanagement in Kernkraftwerken angeschnitten.

Zum Abschluss des Seminars lernen Sie die spezifischen Anwendungen der Kerntechnik in der Medizin kennen und werden über neueste kerntechnische Entwicklungen diskutieren.







### MODUL 3 VE Vorbereitung auf den Erörterungstermin, Öffentlichkeitsbeteiligung

**DATUM** 20.01.2015 - 21.01.2015  
**ORT** Novotel Aachen City, Peterstraße 66, 52062 Aachen  
**SPRACHE** Deutsch  
**PREIS** 890,- € zzgl. 19% MwSt.  
**LEISTUNGEN** Im Preis sind Mittagessen, Verpflegung zwischen den Unterrichtseinheiten, Social Event und Seminarunterlagen enthalten.

#### KUR SINHALTE

Die Öffentlichkeitsbeteiligung in atomrechtlichen Genehmigungsverfahren stellt eine besondere Herausforderung für die am Verfahren beteiligten Parteien dar. Dieses Modul dient als Vorbereitungstraining für die Durchführung von Erörterungsterminen.

Im theoretischen Teil des Seminars liegt der Fokus auf den organisatorischen Gesichtspunkten und juristischen Grundlagen bei der Planung eines solchen Termins. Außerdem werden die inhaltlichen, psychologischen und demographischen Aspekte vermittelt, die im Verhandlungsprozess eine wichtige Rolle spielen. Im Hinblick auf die oft gegensätzlichen öffentlichen, politischen und wirtschaftlichen Interessen der Beteiligten sollen Schwierigkeiten beleuchtet und entsprechende, Konflikt vermeidende Ansätze aufgezeigt werden. Der praktische Teil dieses Moduls besteht in der Simulation eines Erörterungstermins, um unter realistischen Bedingungen den Ablauf zu erproben.

Als Teilnehmer werden Mitarbeiter der Aufsichts- und Genehmigungsbehörden angesprochen sowie alle Personen, die sich im Rahmen ihrer Tätigkeit mit der Vorbereitung und Durchführung von Erörterungsterminen beschäftigen.



### Atomrechtliche Genehmigungs- und Aufsichtsverfahren MODUL 4 GA

**DATUM** 21.04.2015 - 22.04.2015  
**ORT** Novotel Aachen City, Peterstraße 66, 52062 Aachen  
**SPRACHE** Deutsch  
**PREIS** 1.050,- € zzgl. 19% MwSt.  
**LEISTUNGEN** Im Preis sind Mittagessen, Verpflegung zwischen den Unterrichtseinheiten, Social Event und Seminarunterlagen enthalten.

#### KUR SINHALTE

In atomrechtlichen Genehmigungs- und Aufsichtsverfahren werden verschiedene nationale Organisationen eingebunden. Die Dozenten/-innen vermitteln Ihnen in diesem Modul die Funktionen und Zuständigkeiten der beteiligten Institutionen im Bereich der Reaktorsicherheit und des Strahlenschutzes, wobei vor allem die Rechtsverordnungen und das deutsche Atomgesetz zu beachten sind. Das Zusammenspiel zwischen Antragsteller, Genehmigungsbehörde, Sachverständigenorganisation und Öffentlichkeit bildet dabei den Hauptschwerpunkt des Moduls.

Da insbesondere bei atomrechtlichen Genehmigungsverfahren die Einbeziehung der Öffentlichkeit eine große Rolle spielt, ist die erforderliche Öffentlichkeitsbeteiligung im Verfahren ein Bestandteil des Moduls.





**MODUL 5 SR** Stilllegung und Rückbau kerntechnischer Anlagen

|            |   |
|------------|---|
| DATUM      | 03.02.2015 - 06.02.2015   |
| ORT        | Hotel Pullman Aachen Quellenhof, Monheimsallee 52, 52062 Aachen   |
| SPRACHE    | Deutsch   |
| PREIS      | 1.680,- € zzgl. 19% MwSt.   |
| LEISTUNGEN | Im Preis sind Mittagessen, Verpflegung zwischen den Unterrichtseinheiten, Social Event und Seminarunterlagen enthalten. |

**KUR SINHALTE**

In dem Modul werden die notwendigen Schritte zur Entlassung einer kerntechnischen Anlage aus dem Geltungsbereich des Atomgesetzes erörtert. Hierbei werden sowohl an die Stilllegung kerntechnischer Anlagen als auch an die sichere Entsorgung bzw. Endlagerung radioaktiver Abfälle sicherheitsrelevante Anforderungen gestellt, welche im Modul behandelt werden. Auf die Technologien, die während der Stilllegungsphase einer Anlage in den Aufgabenbereichen Dekontamination, Zerlegung und Rückbau sowie Freigabemessungen eingesetzt werden, wird vertiefend eingegangen.

Die Dozenten/-innen werden Ihnen die Anforderungen bzgl. Projektplanung und -abwicklung sowie die rechtlichen Rahmenbedingungen für die Stilllegung kerntechnischer Anlagen darlegen.

Den Abschluss des Moduls bildet eine eintägige Fachexkursion zum Geschäftsbereich Nuklear-Service im Forschungszentrum Jülich. Dort werden unter anderem Abfallbehandlungsanlagen für nukleare Abfälle und Reststoffe sowie die entsprechenden Lagereinrichtungen für radioaktive Abfälle besichtigt und deren Anforderungen mit dem Leiter der Anlage erörtert.

**MODUL 6 KE** Konditionierung, Entsorgung & Endlagerung radioaktiver Abfälle

|            |   |
|------------|---|
| DATUM      | 10.03.2015 - 12.03.2015   |
| ORT        | Hotel Pullman Aachen Quellenhof, Monheimsallee 52, 52062 Aachen   |
| SPRACHE    | Deutsch   |
| PREIS      | 1.560,- € zzgl. 19% MwSt.   |
| LEISTUNGEN | Im Preis sind Mittagessen, Verpflegung zwischen den Unterrichtseinheiten, Social Event und Seminarunterlagen enthalten. |

**KUR SINHALTE**

Das zentrale Thema dieses Moduls ist die sichere Behandlung und Endlagerung radioaktiver Abfälle. Am Beispiel des Endlagers Konrad werden Ihnen die Abläufe und Verantwortlichkeiten im Endlagerungsverfahren erläutert. Verschiedene Konditionierungsverfahren, deren Verfahrensqualifikation sowie die Anforderungen des Produktkontrollverfahrens zur Qualifizierung radioaktiver Abfälle stehen im Mittelpunkt. Hierbei spielt die Berücksichtigung wassergefährdender Stoffe in radioaktiven Abfällen eine besondere Rolle. Die technischen bzw. genehmigungstechnischen Anforderungen für die Endlagerung der wärmeentwickelnden Abfälle im Wirtsgestein Salz werden am Beispiel der vorläufigen Sicherheitsanalyse des Standortes Gorleben vorgestellt und diskutiert.

Die Vor- und Nachteile anderer Wirtsgesteine bei der Umsetzung von tiefen geologischen Endlagern werden aufgezeigt und die Umsetzung von Endlagerprojekten im Ausland vorgestellt.

Zum Abschluss des Moduls werden die Dozenten/-innen mit Ihnen über neue Technologien (Partitioning und Transmutation) für zukünftige Strategien zur Entschärfung der Endlagerproblematik diskutieren.





