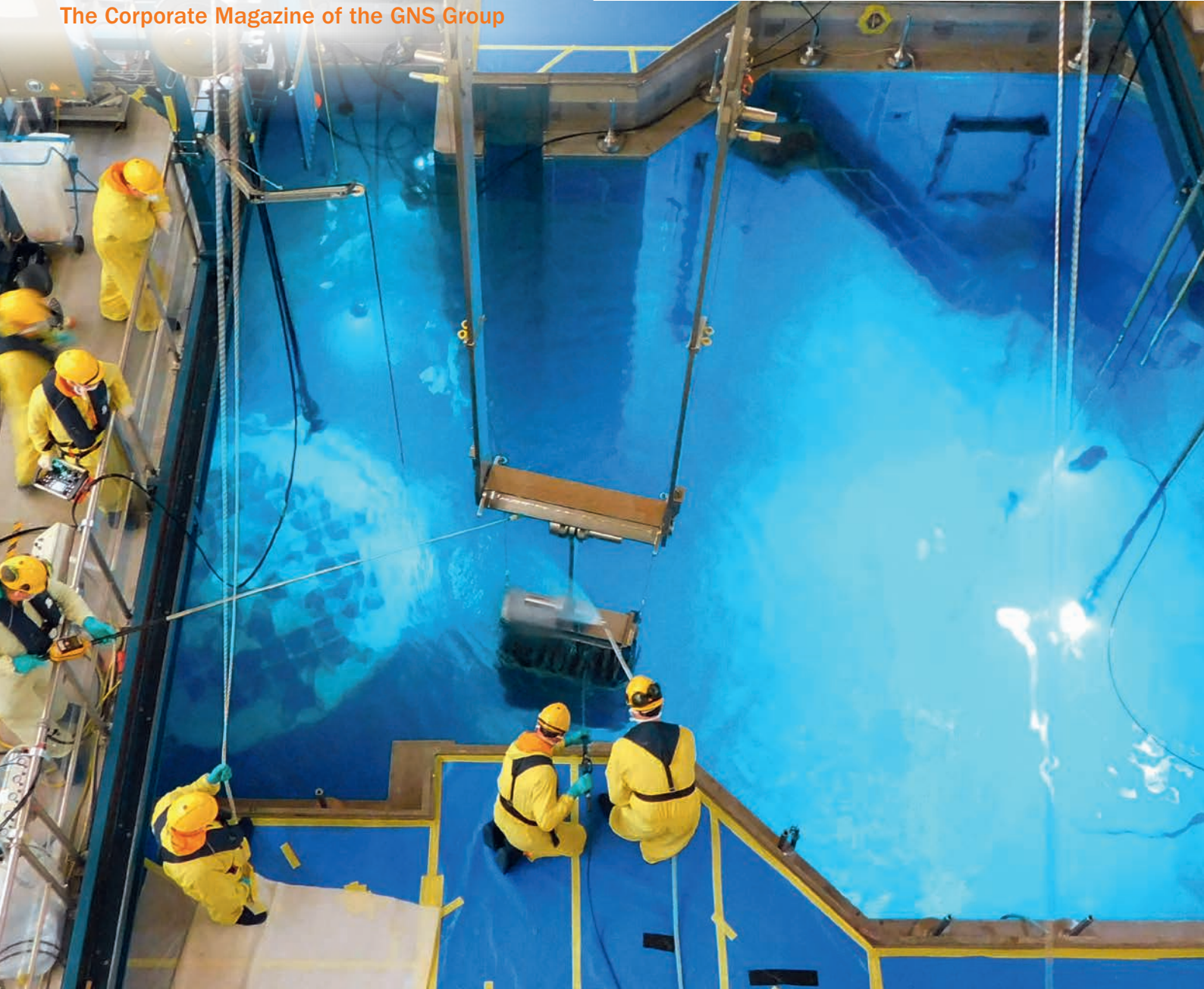


GNS

English Edition

Issue 13 – October 2022

The Corporate Magazine of the GNS Group



**Takeover Strengthens
GNS Container Business**
Eisenwerk Bassum Takes
Over Maschinen-Meyer

**From Sellafield
to Biblis**
First HLW-Transport
from England

**Missile and Drop Tests of
the CASTOR® geo32CH**
New Cask Type
for Switzerland



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ZerKon project: dismantling of the RPV internals at Grafenrheinfeld NPP.

Management

Daniel Oehr new Chairman of the GNS Management Board

Since 1 December 2020, Daniel Oehr has been the new Chairman of the Management Board and CEO of GNS Gesellschaft für Nuklear-Service mbH. He succeeded Dr. Hannes Wimmer, who had held the chair since 2011. At the same time, Daniel Oehr has also taken over the management of the GNS subsidiary WTI Wissenschaftlich-Technische Ingenieurberatung mbH in Jülich.

Dr. Wimmer left GNS at the end of 2020 after more than nine very successful years as Chairman of the Board of Directors by mutual agreement with the shareholders. On the occasion of the announcement of the change in management, Dr. Guido Knott, Chairman of the Supervisory Board of GNS, said: "On behalf of all shareholders, I would like



to thank Hannes Wimmer for his great commitment, especially in the internationalisation and repositioning of GNS over the past years. With the spin-off of the interim storage and final disposal activities and the successful acquisition of Höfer & Bechtel as well as Eisenwerk Bassum, the management team with Mr. Wimmer has succeeded in developing GNS into a renowned cask manufacturer and service provider in the field of nuclear waste management."

Before joining GNS, Daniel Oehr has worked for 18 years in various areas and functions in the E.ON Group, most recently as Head of Controlling and Performance Management of GNS shareholder PreussenElektra GmbH. He has therefore been very familiar with GNS for many years.

Dr. Knott: "The shareholders are pleased to have won Daniel Oehr for this challenging task. With him in the lead, GNS will be further developed into a quality and customer-oriented service provider with increasing business in third markets."

Editorial

Dear readers,

it has been two years since the last issue of our GNS magazine. As in all areas of life, our day-to-day business at GNS has been dominated by the need to maintain safe and reliable operations for our staff as well as for our customers under the constantly changing pandemic conditions. To date, we have largely succeeded in doing so, even though some measures were quite drastic.

However, many long-term planned personal events and projects, both internally and in the entire industry, had to be postponed and unfortunately often cancelled altogether. All the more we all appreciate it now when familiar formats such as our GNS Forum or our CASTOR® User Group Meeting can take place again after a long break and we can finally meet our customers and partners in person again.

In addition to the many cancelled or postponed conferences and events, the transport of six CASTOR® casks with high-level waste from the reprocessing of German spent fuel in England to the interim storage facility in Biblis, originally planned for spring 2020, had to be rescheduled by several months at the last minute. When the transport could actually start, everything went like clockwork thanks to the commitment of all the partners involved (p. 16/17).

The regular disposal of spent fuel from the German nuclear power plants continues unabated as well. More and more plants have now been completely defueled with the help of the GNS spent fuel casks and quivers, which have proven themselves hundreds of times over (p. 23). In the meantime, we are almost on the home straight here in Germany.

For our growing international business, the delivery of the first cask of the



CASTOR® geo series, specially designed for the needs of international customers, to Belgium was therefore an even more significant milestone (p. 24) – and further geo casks for Switzerland are already in the pipeline (p. 12/13).

Meanwhile, our dismantling activities in Germany are gathering pace: As part of the ZerKon project to dispose of the RPV internals of the five PreussenElektra plants, the segmentation and packaging work in Unterweser has now been completed. Our dismantling teams have moved on to the Grafenrheinfeld and Isar sites (p. 20/21). In Unterweser, the ReaDi project team has seamlessly started segmenting the RPV (p. 22). At many other sites, GNS is active itself or supplies equipment and containers. This underlines our position as the leading dismantling specialist in Germany.

In addition to the challenging routine disposal business, we have also used the past months to further expand our group of companies and thus strengthen our competitiveness. With the takeover of Maschinen-Meyer by our subsidiary Eisenwerk Bassum, we have achieved a significant increase in our production capacities for sheet steel containers, which are in demand both in Germany and internationally (p. 6/7). By taking over the nickel-plating of our casks, we retain this

globally unique know-how and secure the necessary production capacities in the long term (p. 8).

There have also been some changes within our company. After Daniel Oehr took over as chairman of the management board from Dr. Hannes Wimmer in autumn 2020 (p. 2), we have in the meantime positioned our organisation even more clearly along our two business areas “dismantling and disposal” and “casks and containers”. We have set new strategic goals for the period up to 2030 and started their implementation.

To make us even fitter for the challenges ahead, we have launched an internal transformation programme, which, as one prominent goal, is intended to promote cooperation in our group of companies, which has now grown to over 850 employees.

The focus for all of us is on the jointly formulated expectation towards our products and services, and thus also to ourselves: **Excellence for Nuclear**. In order to survive in competition, we have to deliver outstanding results and satisfy our customers.

In this GNS magazine you can read about what we are already doing today and what we have planned for the future.

Daniel Oehr
Chairman of the Management Board, CEO

Dr. Jens Schröder
Member of the Management Board, CTO

Georg Büth
Member of the Management Board, CFO

Transformation programme “new together” launched – focus on excellence and customer satisfaction



GNS Gets Fit for the Future

By Daniel Oehr

In March 2021, we launched the group-wide transformation programme “new together” in order to position ourselves even better for the future requirements on the national and international markets and to optimise the management and cooperation processes in the GNS Group. In several modules, we worked across the group on concepts and concrete measures to increase innovation and competitiveness, customer orientation, leadership & cooperation and efficiency. Above all, our vision is “Excellence for Nuclear” – we want to inspire our customers individually and sustainably with our service portfolio.

The environment and business conditions of GNS have changed significantly in recent years. Our home market of Germany is experiencing a transition from the operation to the decommissioning of nuclear power plants. Increasing competition and cost pressure is clearly noticeable, especially in the dismantling and disposal projects.

At the same time, the GNS Group has grown strongly again since the spin-off and transfer of the interim storage activities to BGZ in 2017.

We were able to decisively strengthen our portfolio through targeted strategic acquisitions. GNS has developed into a full-service provider for a wide range of nuclear dismantling and disposal tasks. (see also the article on the acquisition of “Maschinen Meyer” in this magazine).

The vision “Excellence for Nuclear”

A sustainable transformation is comparable to a marathon – focus, clear objectives and a systematic approach. That is why we have designed our transformation programme “new together” for



GNS-CEO Daniel Oehr during the kick-off of a “new together” workshop on the topic of leadership and collaboration.

the very long term. Together with the top managers of the GNS Group, we have developed the new vision “Excellence for Nuclear” as well as the strategies for our two business areas “Casks & Containers” and “Dismantling & Waste Management” as a uniform goal for the coming years.

The basic strategic thrust for the two business areas is clearly defined: Under the banner of “Excellence for Nuclear”, we want to at least keep or expand our market shares in the domestic market with increased competitiveness and customer orientation. At the same time, we are striving for selective interna-



“new together” also stands for improved collaboration – as in this workshop with participants from all companies of the GNS Group.

tional growth. To this end, we have developed a roadmap to 2030 for the GNS Group and sent implementation managers on their way with the operational work to realise the strategic goals.

The customer is our focus

It is and remains essential for the business success of GNS that we fulfil our tasks reliably and to the satisfaction of our customers. In this context, during the conceptual phase of our transformation programme, we directly addressed various feedbacks from our customers and developed measures to make our business even more customer-oriented.

We have restructured the “Dismantling & Waste Management” business area and focused it even more strongly on the requirements of decommissioning. With new functions and a new management team for the business area, the orders already won will be processed and the foundation for further growth will be laid.

In the “Casks & Containers” business area, various measures were implemented to increase the cost efficiency

of ILW containers in order to react to current developments in the procurement markets and to dampen the effects of rising material procurement costs. This should continue to enable an attractive price level for our container portfolio.

Furthermore, we are aware that for the immediate dismantling in Germany and also for the disposal projects of our international customers, the timely availability of containers is essential. For this reason, we have defined measures for all types of our CASTOR® and MOSAIK® casks as well as sheet steel container series in order to obtain the required approvals in accordance with the promised schedules and to ensure sufficient production capacities.

Asking the customer

Overall, satisfied customers – present and future – are our goal. To keep this goal permanently in view, we have revised and expanded our customer satisfaction surveys and dialogues. In future, we would like to regularly receive a quantified assessment of our deliveries and services from our customers

in all projects. And not just at the end, but at all important milestones of the project.

With the help of a standardised survey, satisfaction with all customer orders will be determined individually and compiled into a “GNS Customer Satisfaction Indicator”.

Building on this, qualitative feedback will also be systematically promoted. The revised process of determining customer satisfaction provides for a constructive dialogue between customer and GNS project managers on current project performance. Overall, customer feedback will contribute to the continuous improvement of our deliveries and services in line with customer needs.

In 2021, we initially conducted a pilot survey on around 40 projects: In 78% of the projects, the customers surveyed were satisfied with our deliveries and services. This is a very pleasing picture. However, we have higher ambitions and really want to inspire all customers with our deliveries and services. Always with our new vision in mind: “Excellence for Nuclear”.

Takeover strengthens GNS container business /
Container production tripled

Eisenwerk Bassum Takes Over Maschinen-Meyer

Eisenwerk Bassum GmbH (EWB), which has been part of the GNS Group since 2020, has taken over Maschinen-Meyer GmbH & Co. KG in Sulingen as of 21 February 2022. The two companies, located south of Bremen in the northern part of Germany have already been successful for decades in many areas of metalworking and metal processing, with a particular focus on the manufacture of packaging for radioactive materials such as containers and drums. These are needed in greatly increasing numbers, especially against the background of the dismantling of the German nuclear power plants.



Signing of the contract on 21 February 2022 (from left to right): Front: Hartmut Grunau (EWB), Alexander Beckedorf, Edda Beckedorf (MMS), Georg Büth, Sascha Klappert. In the back: Dr. Carsten Heuel (Kanzlei Ahlers & Vogel), Dr. Jens Schröder, Christoph Kohn.



Steel sheet container loaded with drums for final disposal in the German Konrad repository.

With this acquisition, the GNS Group completes its range of packaging solutions for the nuclear sector and offers a comprehensive range of packaging for low and intermediate level radioactive waste from a single source. The previous activities of Maschinen-Meyer will be integrated into the EWB organisation, and the Maschinen-Meyer site in Sulingen will be retained in its entirety, together with all of the approximately 80 jobs there. Alexander Beckedorf, previously Managing Director of Maschinen-Meyer, will lead Eisenwerk Bassum GmbH as the third Managing Director together with Hartmut Grunau and Georg Büth.

Both in Sulingen and in Bassum, the GNS Group is planning considerable investments and a significant expansion of production capacities. For example, the capacity for the steel sheet containers required for the final disposal of radioactive waste in the German Konrad repository is to be almost tripled from the current 500 units per year by 2024. With the takeover, the GNS Group now has more than 800 employees at nine locations in Germany.

Dr. Jens Schröder, CTO of GNS, is pleased about the personnel and technical reinforcement of the GNS business area “casks & containers”: “We welcome the new colleagues from Maschinen-Meyer to our group of companies and look forward to the future together! The proven drums and containers from Maschinen-Meyer complete our range of packaging solutions for the nuclear sector. From now on, we can reliably offer our customers a comprehensive range of packaging for low- and intermediate-level radioactive waste from a single source. The planned investments at both sites in Bassum and Sulingen will also improve the delivery reliability of our highly sought-after products and create new jobs.”



“Polarstern project”: Memento for everyone involved in the takeover project.

Takeover of the nickel-plating activities of MTV NT GmbH

GNS Takes Over Nickel-Plating of Nuclear Casks under its Own Control



Dr. Jens Schröder, Klaus Wilbuer and Georg Büth with the negotiating teams around Christoph Kohn (GNS, 2nd from left) and Arwed Gößler (MTV NT, right) at the signing of the contract.

At the end of June 2022, GNS has taken over the nickel-plating activities of MTV NT GmbH in Mülheim an der Ruhr. As a result of the takeover, GNS will operate the galvanic coating technology required for the nickel-plating of CASTOR® and MOSAIK® nuclear casks itself as a manufacturer. MTV NT has been a reliable partner of GNS for three decades. As part of the expansion of the GNS site in Mülheim in 2011, MTV NT relocated its cask nickel plating from Solingen to the GNS site in Mülheim. The takeover is designed as an asset deal, i.e. the facilities, know-how, property rights and all nine employees have

been transferred to GNS. MTV NT GmbH itself remains with its previous shareholders and will continue to exist for a transitional period.

Klaus Wilbuer, managing partner of MTV NT GmbH, is pleased about the continuation of the technology and the safeguarding of jobs: “As a family-run company, it was particularly important for us to arrange the company succession in good time. After we had already sold our main company in Solingen to an investor at the end of 2021, it was important to us to also place the nuclear cask business in Mülheim

an der Ruhr in good hands. We are pleased to have concluded this business deal with GNS, as the more than 30 years of successful and trusting cooperation can be continued in our interest”.

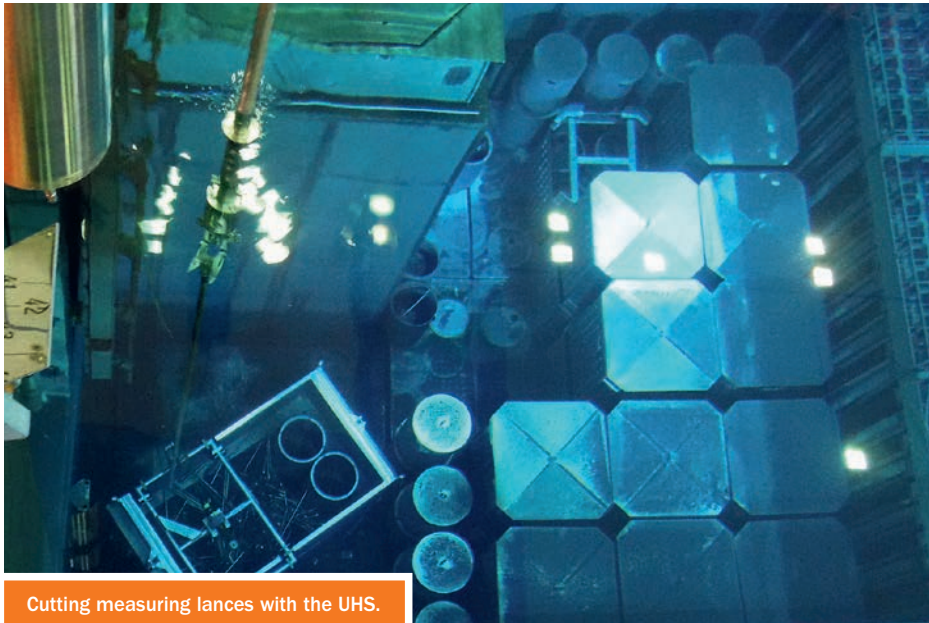
Dr. Jens Schröder, CTO of GNS, expresses his thanks for the mutual: “We are proud and excited to be able to continue the values and knowledge of MTV in the spirit of the long-standing owner. Taking over the technology under our own responsibility is a great task, which we are ready to take on. The takeover of the experienced staff and the existing facilities will further strengthen the production site in Mülheim. At the same time, we are securing the large order volumes for casks for our customers until well into the 2030s.”

Georg Büth, CFO of GNS, adds: “We would like to thank Mr Wilbuer not only for three decades of excellent cooperation, but also for his willingness to stand by GNS for a transitional period for the operation of the facilities, thus ensuring smooth continued operation and knowledge transfer. We welcome the former employees of MTV NT GmbH to GNS, count on their unique know-how and look forward to providing them with an interesting opportunity at the Mülheim site, to be able to offer them an interesting and future-proof job at the Mülheim site”.

Disposal of core components in German NPPs Krümmel and Gundremmingen

A Total of over 110 t to Segment and Pack

While the conditioning work on core components at the Krümmel nuclear power plant (see GNS magazine 11) could be completed in 2022, preparations are underway for the campaign at Gundremmingen.



Cutting measuring lances with the UHS.

During the campaign in Krümmel, 50 t of movable core components had to be disposed of from the spent fuel pool. These were mainly control elements, fuel assembly channels, fuel assembly channel fastenings, measuring lances and various small scrap that had accumulated in the course of operation or during inspection work.

The campaign was carried out in several parts: In the first part of the campaign, 474 control elements, 125 fuel assembly channels and one fuel assembly frame were dismantled, sorted and compressed under water by the GNS team using a GNS under-

water shear with subsequent recompression of the cuttings.

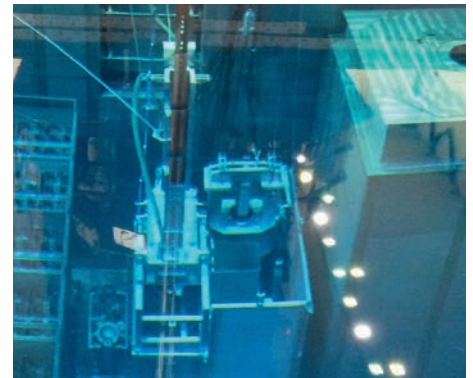
As part of the sub-campaign “Other core scrap”, the GNS team dismantled, sorted and packed all remaining core components from the fuel pool under water, partly with the help of the UHS universal hydraulic shear by GNS.

A premiere was the removal and preliminary dismantling of the 57 neutron flux measuring lances still in the core, each of which was approx. 15 m long, as an in-house service of the nuclear power plant supported GNS. The subsequent segmenting and packaging was carried out by GNS.

After Krümmel comes Gundremmingen

The experience gained from the campaign in Krümmel will benefit GNS in Gundremmingen, where it is in charge of conditioning the core components of the two units B and C in Gundremmingen (KGG).

Since mid-2021, GNS has been in the planning phase with the preparation of the application documents, which is part of the contract, as is the procurement of equipment, the on-site segmenting and packaging of the core scrap, the transport of the waste packages to the Mitterteich interim storage facility and the preparation of the waste package documentation. By 2026, around 670 control elements and other waste with a total mass of approx. 65 t will be processed and packed in MOSAIK® casks and steel sheet containers for final disposal.



In the spent fuel pool, the control elements were cut and compacted using an underwater shear with subsequent compacting of the cuttings.

GNS expert Christoph Rirschl certified according to ASNT NDT Level III

Unique in “Leak Testing” in Germany

The requirements are high to obtain the NDT Level III certificate of the American Society for Nondestructive Testing (ASNT): at least one year of practical experience as an inspector with a supervisory function (Level II) in “Nondestructive Testing” (NDT), plus 2,900 hours of experience in NDT, 1,500 hours of which in the leak testing procedure, and a two-part examination.



The certificate is valid for five years, after which it can be renewed by examination or via a scoring system.

While there are other certificate holders with Level III in Germany, for example in the area of dye penetrant testing or ultrasonic testing, the area of “leak testing” covered by Rirschl is unique.

Based on the certificate, Rirschl can be authorised by the quality management officer as a test supervisor for future foreign projects of GNS, for example to check and approve test specifications that require ASNT NDT Level III certification.

Christoph Rirschl has been involved in the loading and handling of CASTOR® casks at GNS for 20 years and has been head of the Cask Service department since 2018. Through his work, he was able to prove the hours required as part of the European certification according to DIN EN ISO 9712 and was admitted to the examination, for which he prepared himself through self-study.

Rirschl answered 135 questions on all non-destructive testing procedures, various manufacturing processes and training standards in four hours in the computer-based basic exam, and another 135 including many calculations on the leak test procedure for the Level III exam. At least 80 percent of the questions had to be answered correctly to pass the exam.



Christoph Rirschl

Development contract for the GNS Group

Cask Concept for Crystalline Rock



This is what crystalline rock can look like (here: granite). Photo: BGE

A GNS-led consortium with BGE TECHNOLOGY GmbH, which also comprises the GNS subsidiaries WTI, Eisenwerk Bassum and Höfer & Bechtel as subcontractors of GNS, has been awarded the contract by the Bundesgesellschaft für Endlagerung mbH (BGE) for the “Development of casks concepts for deep geological disposal of high-level waste in crystalline host rock”. BGE, the Federal company responsible for Final Disposal in Germany and thus the site search as well as the subsequent construction, has concluded a

2.5-year framework agreement with the consortium partners as the basis for the contract. The agreed work packages include the development of up to three different casks concepts.

In 2017, the Federal Government restarted the search for a repository for highly radioactive materials with the revised Site Selection Act. In addition to the host rock rock salt, which had previously been explored in the Gorleben exploration mine, clay and crystalline were included as further possible host rocks.

In order to be able to investigate suitable packaging and storage systems in parallel with the progressing site selection process, BGE commissions the development of cask concepts for each host rock. To this end, BGE is conducting three independent tender procedures.



**BUNDESGESELLSCHAFT
FÜR ENDLAGERUNG**

Missile and drop tests of the CASTOR® geo32CH

New Cask Type for Switzerland

When a “shrunk” CASTOR® cask stood on a beach in Wales, Great Britain, in April 2021, it was not an art installation, but a long-planned and well-structured missile test by GNS.



Instrumentation of the scaled CASTOR® geo32CH before the drop test.

A 1:2.67 scaled model of the CASTOR® geo32CH was tested, a cask series which – as the name suggests – will be used in a Swiss nuclear power plant.

For the approval of the cask type in Switzerland, the leak tightness after an aircraft crash must be proven. This is done by a missile test in which the most damaging position, i.e. the side of the cask, is shot at. In the case of a shot at the lid, the aircraft protection hood would have provided additional protection for the cask.

Impact at 1,200 km/h

Extensive preparations and rework were on the agenda, but the impact of the projectile could be missed by blinking: Just 20 milliseconds was the impact time after a run-up distance of one kilometre at a target velocity of 1,200 km/h. During the test, not only was the cask extensively wired, various action cams were also used, which – unlike their tripods – continued to function after the test.

The test sample, the scaled CASTOR® cask, completed an additional drop test during the missile test: standing freely on a concrete slab, it was forced over the catch structure by the impact of the 625 kg projectile, completed an



Set-up of the measurement instrumentation.

In addition to the impact test, the CASTOR® geo32CH also had to pass a drop test sequence consisting of a 9 m drop on the lid side and as a puncture test a pin drop onto the side. The tests were carried out with a test sample also scaled 1:2.67. Here, too, the helium-tightness of the lid sealing barriers could be proven. The pin drop was also completed with pinpoint accuracy: The 7.7 tonne test cask remained on the pin after the 1m drop.

Further approvals in Switzerland

The CASTOR® V/19 (CH) and the CASTOR® V/52 (CH) are already one step ahead of the CASTOR® geo32CH for their use in Switzerland: The Swiss Federal Nuclear Safety Inspectorate (ENSI) has granted a revision of the transport approval according to IAEA SSR-6 for the CASTOR® V/19 (CH) in 2021. For the first time in Switzerland, a validity period of ten years was granted and an approval in conformity with the new IAEA Guideline SSR 6, Rev. 1 (2018 Edition) was issued, which allows production even after 2028. This required the submission of an ageing management programme.

In 2022, the Swiss Federal Nuclear Safety Inspectorate (ENSI) granted approval under transport law for the CASTOR® V/52 (CH) design.



Test specimen after the 9 m drop.

additional drop onto the lid side and came to rest on its side.

Leak and corona tests

After the missile test, the helium leak test was carried out in Wales. Helium is used for these tests because it can penetrate even the smallest leaks. For the leak test, a GNS colleague had to spend ten days in quarantine on site, before the test could be carried out under COVID conditions. While all corona tests were negative, the leak test was positive!

The cask was then returned to the GNS facility in Mülheim, where further inspections of the test and the cask were carried out: The projectile had hit the pre-calculated impact point perfectly, the required velocity band had been reached, there was no damage to the interior and, of course, proof was provided that the CASTOR® geo32CH is still “leak-proof” even after an aircraft crash.

An outstanding feature of this approval is that it is the first time that GNS has been granted approval for loadings that take the so-called gadolinium burn-up credit: Since the fuel assemblies to be loaded have high enrichments, to enable full loading it was necessary to take into account the concrete decay of the neutron poison gadolinium contained in the BWR fuel rods during the criticality safety assessment.

GNS subsidiary in Japan assists approval

Approval Applied for CASTOR® geo26JP

Based on the CASTOR® geo cask family, which was designed to meet the needs of international customers for “high capacity casks” and is already established in Belgium and Switzerland, GNS is developing the CASTOR® geo26JP for spent fuel from Japanese nuclear power plants.

In 2021, GNS applied to the Japanese Nuclear Regulation Authority (NRA) for a type certificate. The CASTOR® geo26JP is based on the platform concept of the geo series. A special feature are the exposed trunnions in the transport configuration with shock absorbers. For transport operations in Japan, the use of a third cover is also mandatory. In addition, a new innovative fuel basket for up to 26 PWR fuel assemblies was developed.

In order to be able to accompany the application procedure locally, GNS Japan K.K. was founded at the beginning of 2021 as a corporation under

Japanese law with headquarters in Tokyo. The board of directors of the new company consists of Dr. Linus Bettermann (Director Marketing and Sales at GNS) as CEO, Christoph Kohn (Director Legal Affairs at GNS) as CFO and Tobias Fischer-Wasels as CTO (Team Manager Cask Development at GNS), who will oversee the application process in Japan on a permanent basis. Dirk Schlauch (Director Controlling at GNS) will accompany the Executive Board in an auditing and advisory capacity in the function of Company Auditor, which is required by law in Japan. The GNS management agrees: “The foundation of our Japan subsidiary is an important step for the



expansion of our spent fuel cask business to Asia and the intended internationalisation of our GNS. The CASTOR® geo26JP will be the most competitive disposal solution for Japanese PWR fuel assemblies.”

Another major order in German decommissioning

Dismantling and Treatment of 16 Steam Generators

Cyclife Sweden AB has commissioned GNS with the treatment, packaging and documentation of the waste produced during the dismantling and melting of the 16 steam generators of the PreussenElektra nuclear power plants Unterweser, Grafenrheinfeld, Grohnde and Brokdorf.

The first steam generators from the Unterweser nuclear power plant are to be transported to Cyclife in Sweden in 2023. From 2024, the waste from Sweden is expected at the GNS site in Jülich, Germany. The steam generators from the last site, Brokdorf, are to be taken to Sweden in 2030. The



Symbolic image of a steam generator (here from Stade NPP, Germany).

resulting waste is expected to arrive at Jülich between 2031 and 2033.

Long-term loading campaign in Gundremmingen

Longest Series Campaign at KGG

A total of 13 CASTOR® V/52 casks were dispatched in three-shift operation at the Gundremmingen nuclear power plant (KGG) between February and June 2021. Despite the difficult conditions caused by the corona pandemic, the campaign was completed within the scheduled time frame and a new record was set: It was the largest number of casks ever handled in series at KGG.

In February 2022, the next campaign started at KGG, with the aim of complete defueling unit B.



Loading of a CASTOR® V/52.

German-Korean partnership

Business Exchange with Korea

In 2019, the German-Korean Energy Partnership was concluded between the ministries of economics of Germany and Korea. Within this partnership, GNS is not only represented in the Business Exchange subcommittee of the Nuclear Decommissioning Working Group together with KORAD, KEPCO E&C, Doosan, Framatome, Nukem and others, but now also holds the German co-chair of the subcommittee. On the Korean side, KHNP holds the co-chair.

The aim of the German-Korean Energy Partnership is to strengthen energy policy cooperation between the two countries. Through the energy partnership, the countries are strengthening their exchange, particularly with regard to the expansion and system integration of renewable energies, increasing energy efficiency, energy systems of the future, green hydrogen and the phase-out of nuclear energy.



GNS has also opened a branch office in Korea in May 2022.



Opening of the GNS office in Korea.

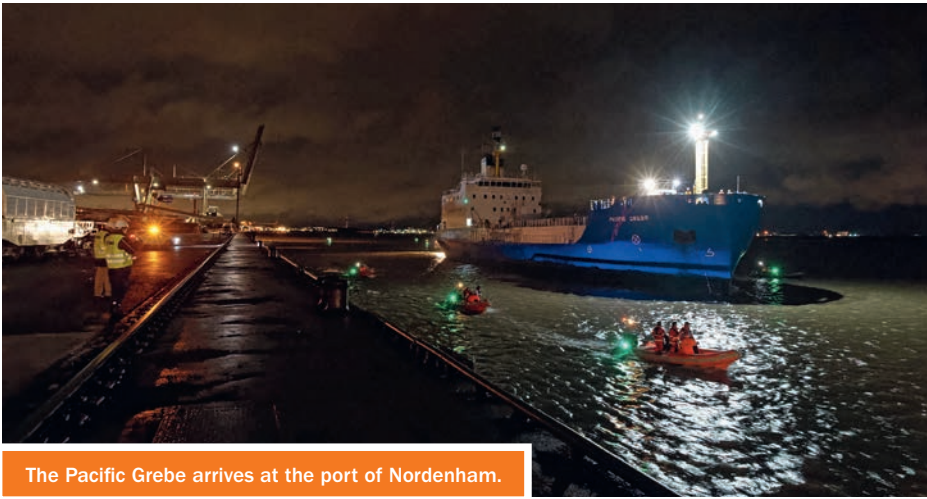
First HLW transport from England

From Sellafield to Biblis

The first six of a total of 20 casks with vitrified waste from the reprocessing of German spent fuel in Sellafield, UK, were scheduled to be transported to Germany to the federal interim storage facility in Biblis in spring 2020. Due to the spread of the corona pandemic, preparations for this transport had to be suspended (see GNS Magazine 12). After elaboration of comprehensive protection and hygiene concepts for all parties involved, the transport could finally be carried out in autumn 2020.



Transshipment of a CASTOR® cask at the port of Nordenham.



The Pacific Grebe arrives at the port of Nordenham.

From the British reprocessing plant in Sellafield, the six casks with HLW first travelled about 65 km by rail to the port of Barrow-in-Furness. There they were transferred to the Pacific Grebe, a dedicated vessel for the transport of radioactive materials.

After the ship's passage from England, the casks were again transferred from the Pacific Grebe to railway wagons in the German seaport of Nordenham. The train with the six casks then travelled directly to Biblis NPP, where the casks first had to be reloaded onto road vehicles, before they were taken to the interim storage building, where they were prepared for interim storage.

This included mounting the secondary lid together with the pres-

sure switch needed for permanent leak monitoring. Finally, the casks were placed at their location in the storage building using the overhead crane and connected to the monitoring system.



Dose rate measurements prior to rail transport in Germany.

Two more Transports from the UK

The two other transports from Sellafield each comprise seven casks and will go to the interim storage sites at Brokdorf and Isar. The sequence of these two transports has not yet been determined, nor have any transport time windows been fixed. The transport licences have not yet been applied for.

In addition to the high-level reprocessing waste that has already been completely returned to Germany, intermediate-level waste has also been produced in France during the reprocessing of German fuel elements and must also be returned. In June 2021, Germany and France agreed to return a comparable amount of radioactivity in the form of vitrified high-level waste instead of this intermediate-level waste.



Plants for EnBW residue processing centres

Six Plants Delivered

After the delivery of the drum drying facility to the Philippsburg site, a test drying of inactive simulated evaporator concentrate followed for several weeks – before the final acceptance by EnBW. The test drying once again demonstrated the correct functioning of the facility on site, including the interfaces to the customer.

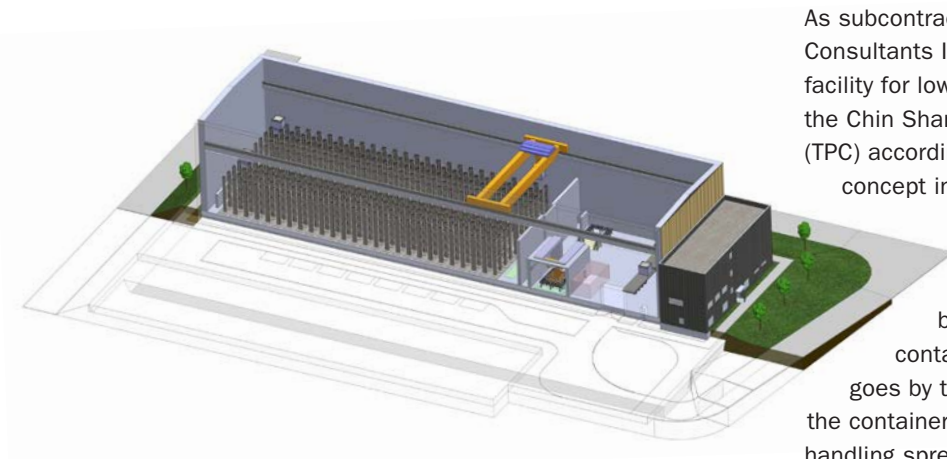
The acceptance concluded a project started in spring 2017, which comprised the planning, delivery, assembly and commissioning of six facilities, for both the Philippsburg and Neckarwestheim sites. The plant technology supplied by GNS to EnBW was installed in the newly constructed residue processing centres (“RBZ”). In total, two drying facilities each of the PETRA and FAVORIT type and two Konrad container filling facilities were supplied.



The Philippsburg residue processing centre. Photo: EnBW

Planning an interim storage facility for the Chin Shan nuclear power plant

Order from Taiwan



As subcontractors of the Taiwanese Sinotech Engineering Consultants Inc., GNS and WTI are designing an interim storage facility for low and intermediate level radioactive waste for the Chin Shan power plant of the Taiwan Power Corporation (TPC) according to German standards and guidelines. The concept includes the floor plan, views and sections of the storage facility as well as a description of the layout and utilisation concept. It takes into account the storage containers developed by GNS for Taiwan (see GNS magazine 12). The container system, which is based on the GNS SBoX®, goes by the name “T-Box” in Taiwan. For the handling of the containers in the interim storage facility, the design of a handling spreader with an interface to the crane control system was also commissioned.

Lithuanian nuclear power plant is completely defuelled

Last CONSTOR® Stored into Ignalina ISFSF



View into the full interim fuel storage facility in Ignalina.

On 21 April 2022, the 190th and thus last loaded CONSTOR® RBMK1500/M2 cask was placed in the interim spent fuel storage facility (ISFSF) at the Ignalina nuclear power plant (INPP) in Lithuania, where they will be stored for about 50 years. This means that the two units of the plant in north-eastern Lithuania, which were shut down in 2004 and 2009 respectively, are now completely. The

shutdown of what was once the most powerful nuclear power plant in the world was a prerequisite for Lithuania's accession to the European Union in 2009.

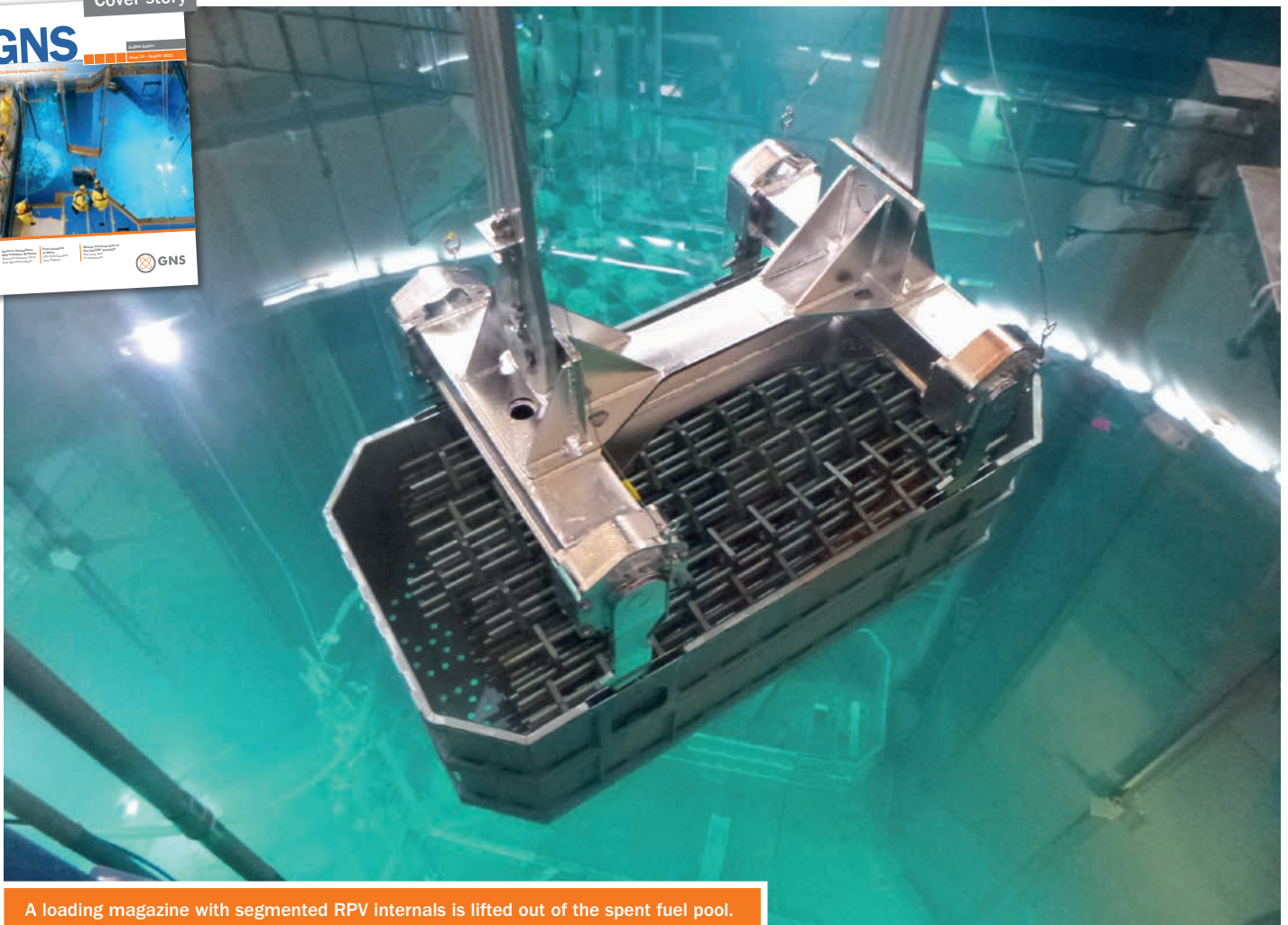
With the delivery of the last cask on 24 February 2020, the GNS contract for 191 casks, including a reserve cask and extensive handling equipment, was fully completed (see GNS Magazine 12).

Together with the 20 CASTOR® and 98 CONSTOR® casks already ordered during the operating phase of the power plant and delivered between 1995 and 2010, a total of 308 GNS spent fuel casks are now stored at INPP. This makes Ignalina the site with the second largest number of GNS casks worldwide, just behind Ahaus with 329 casks.

ZerKon

Dismantling and Packaging Completed at first NPP, further Sites already in Progress

The ZerKon consortium, consisting of GNS (consortium leader), Westinghouse Electric Germany (WEG) and Westinghouse Electric Sweden (WSE), was awarded the contract by PreussenElektra (PEL) at the end of 2017 for the dismantling and packaging of the reactor pressure vessel (RPV) internals and core components at six sites.



A loading magazine with segmented RPV internals is lifted out of the spent fuel pool.



The last MOSAIK® cask in the KKU.



Drying of the loaded MOSAIK® casks with the GNS facility KETRA.

Unterweser (KKU)

At the end of December 2021, the last MOSAIK® cask was loaded and transported for conditioning at the Unterweser nuclear power plant.

The project, which started at the beginning of 2018, was thus completed after a good four years. During this time, a total of 153 steel-sheet containers and MOSAIK® casks were filled with 167 t of material.

The spent fuel pool was handed over to the customer dry and cleaned at the end of January 2022, paving the way for the follow-up project ReaDi (see article p. 22). In April 2022, PreussenElektra granted the consortium successful acceptance of the implementation phase. Work on grouting the sheet steel containers is still in preparation.

Grafenrheinfeld (KKG)

With a second set of equipment, ZerKon, together with the GNS subsidiary Höfer & Bechtel, started the dismantling and packaging work at the KKG in autumn 2021, parallel to the progress of the project at the KKU.



The dismantling of the core components could already be completed in 2021. By the end of May, the dismantling of the upper core plate was completely finished. The cutting work on the lower core plate and the packaging are still ongoing, as is the loading of MOSAIK® casks with the filled baskets and the subsequent drying. ZerKon is expected to clear the pool floor in the KKG in the first quarter of 2023.

Isar-1 (KKI-1)

The dismantling of the core components at the Isar-1 nuclear power plant was brought forward due to accelerated processing and release. As a result, baskets could be filled with cut lance parts as early as the beginning of December 2021.

With the help of a special gripper developed by Höfer & Bechtel at short notice, it was possible to grab and segment lance parts that had been inserted deep into the storage racks. The dismantling and packing of the RPV internals in KKI-1 should be completed on schedule by the end of 2023.

The work on drying the MOSAIK® casks, grouting the steel sheet containers and completing the waste package documentation will extend into 2024.

Isar-2 (KKI-2)

The call-off order for the dismantling of the core components and the RPV internals in KKI-2 has also already been received by ZerKon. From September 2022, the technical planning phase will start, in which a large number of documents will be generated and submitted, including the cutting and packaging plans and the campaign applications.

Brokdorf (KBR) and Grohnde (KWG)

Preliminary technical and commercial discussions are already underway for these projects.

Joint contract of the GNS Group

Reactor Dismantling in Unterweser

In 2019, the ReaDi – short for Reactor Dismantling – project team formed by GNS and Höfer & Bechtel (H&B) was awarded the contract to dismantle and package the reactor pressure vessel (RPV) and the reactor pressure vessel head of the Unterweser nuclear power plant (KKU) as the first plant in the PreussenElektra fleet (PEL).



During the project, the know-how of the entire GNS Group will be utilised: The radiation protection concept was drawn up by WTI in close cooperation with H&B, WTI and H&B together carried out the iterative and complex cutting and packaging planning, as a result of which Eisenwerk Bassum (EWB) constructed individual installation aids for each container and has already delivered the first steel sheet containers. The dismantling work is carried out by Höfer & Bechtel, who also developed the tools used. GNS is in the lead as consortium leader and is responsible for the campaign procedure, packaging and documentation.

After the engineering phase, the implementation phase has recently started.

The assembly and commissioning of the RPV head dismantling and packaging equipment has been completed and the dismantling, disassembly and packaging of the RPV head is in full swing. The first two steel sheet containers could already be loaded.

At the same time, the insulation around the RPV flange area and on the main coolant lines in the RPV nozzle space was removed and the preparatory work, i.e. concreting and levelling of the surfaces for setting up the frame of the the lifting scaffold for the upcoming RPV lift.



The heavy-duty bandsaw system "The Beast" – ready for its first use.

After the water was partially drained from the RPV, the sawing of the main coolant lines, i.e. cutting free the RPV, could be completed.

With the help of the lifting system, the RPV is then transported to the dismantling site in the spent fuel pool, where it is dismantled with a heavy-duty band saw system.

In May, the function test and acceptance of the band saw system – also known internally as "The Beast" – took place at Höfer & Bechtel in Mainhausen, so that the the system is ready to be transported to the plant, brought in, set up and commissioned.

Campaign at Grafenrheinfeld NPP

Defueled with GNS Quivers

The loading of the 54th CASTOR® V/19 cask in 2020 completed the defueling of German Grafenrheinfeld nuclear power plant; two quivers for special fuel rods were used for this purpose.

With the help of the GNS IQ® Integrated Quiver System, the pressurised water reactor plants in Biblis and Unterweser as well as the boiling water reactor plants in Krümmel and Philippsburg have already been completely defueled. A total of 32 quivers have been dispatched there

by the GNS teams and stored in CASTOR® casks in the on-site interim storage facilities.

With the conclusion of the contract for the last quivers for the Isar nuclear power plant of PreussenElektra, which is to be shut down by the end of

2022, more than 60 quivers, which are necessary for defueling all nuclear power plants of the four German utilities, have now been ordered and scheduled.

The complete defueling at the end of the operating life of a nuclear power plant as an important milestone in the decommissioning of the plant. This comprises not only the irradiated fuel assemblies but also the defective fuel rods that occasionally occur during operation, which are also collected in the storage pool until the end of operation. For the safe packaging of these fuel rods, GNS and its subsidiary Höfer & Bechtel have developed a system that allows the defective fuel rods to be packed in hermetically sealed quivers and stored directly in the usual CASTOR® fuel element casks.

However, this will not be the only application in Germany, explains Dr. Linus Bettermann, Director Marketing and Sales at GNS: "Our GNS casks and quivers have established themselves as a time-saving and reliable disposal solution for both PWR and BWR plants in Germany. With the same technology, we also offer our international customers the opportunity to completely defuel their nuclear power plants as soon as possible after shutdown."



The last CASTOR® cask from KKG on its way to the interim storage facility.

Casks

First CASTOR® geo Delivered

CASTOR® casks leaving the GNS facility in Mülheim is part of everyday business. This cask, however, was something special: the blue CASTOR® geo24B, which rolled out of production at the beginning of May and made its way to Belgium, was the first cask of the new geo product family.



The first cask of the new CASTOR® geo series on its way to Belgium. Source: Engie

In 2016, Synatom and GNS signed a contract for the development, approval and manufacture of 30 CASTOR® geo24B and CASTOR® geo21B transport and storage casks. The casks are designed to meet the requirements for the storage of irradiated fuel elements from the Belgian nuclear power plants Doel and Tihange of ENGIE Electrabel.

“The delivery of the first CASTOR® geo is a significant milestone for GNS,”

said Dr. Jens Schröder, Managing Director of GNS. “We have succeeded in developing another versatile and internationally competitive new cask design for spent fuel that is well received internationally.”

The geo product family

To meet the requirements of international markets, GNS has developed the CASTOR® geo series as a modular cask

system for irradiated PWR and BWR fuel elements.

The CASTOR® geo series is a modular cask system with the proven features of the CASTOR® cask family. With different cask dimensions and baskets, the casks can be adapted to a wide variety of operating conditions. With proven components and state-of-the-art processes, this system meets the individual requirements of international customers for storage and transport of irradiated fuel elements from PWR and BWR plants. Thanks to the different lengths and diameters of the cask shafts, the CASTOR® geo24B can accommodate 24 fuel assemblies and the CASTOR® geo21B 21 fuel assemblies.

International demand

The new cask family is also attracting interest in other countries: Up to 51 casks of the new series have already been ordered by a Swiss nuclear power plant. In Japan, GNS has applied for approval of the CASTOR® geo26JP (see page 14), as well as with the United States Nuclear Regulatory Commission (NRC) for approval of the CASTOR® geo69.

Dismantling and packaging of RPV and RPV internals

RPV-Project in Neckarwestheim Completed



In a consortium with Uniper Anlagenservice (UAS) and Westinghouse Electric Germany (WEG), GNS received an order from EnBW Kernkraft GmbH in 2015 to dismantle and pack approx. 100 t of RPV internals and the RPV (approx. 235 t without lid) as well as approx. 73 t of peripheral components in unit I of the Neckarwestheim nuclear power plant (GKN I).

When packing the cut pieces in steel sheet containers, the entire handling process, including loading and transport, was mostly carried out by remote handling or by taking suitable shielding measures.

The activities on site started in April 2017 and were completed with the handover of the construction site in mid-February 2022.

Lifting and transport of the RPV by crane for dismantling in the spent fuel pool.

GNS develops central documentation and control system for final disposal

DORA II for Konrad

GNS is developing an electronic documentation system for radioactive waste for the Konrad repository on behalf of the federal Bundesgesellschaft für Endlagerung (BGE). Under the name DORA II, it is to document the waste packages and ensure compliance with the campaign-specific requirements for the acceptance of the waste packages. This makes it a central tool in the course of retrieval and emplacement logistics for the German repository for low- and intermediate-level radioactive waste.

The DORA I system (“Documentation System for Radioactive Waste of the Konrad Repository”) is currently used for documenting the waste. In addition to this, a DORA II system is planned for the Konrad repository, which, in addition to recording and managing relevant data of the waste packages to be finally stored or in final storage, also provides higher-level standard functions to ensure compliance with the campaign-specific requirements for the emplacement of the waste packages. At the heart of it all is the validation of the emplacement and retrieval planning. GNS has been commissioned by BGE to develop this system, called DORA II, and to put it into operation at BGE.

In addition to the scope of DORA II provided for in the Konrad licence, the contract includes the systems “Plattform DORA II” (PLATO) and campaign planning software (KEPLA). In terms of digitalisation, PLATO serves as a data in- and output platform for the exchange of data with the coordination offices of the waste producers and the waste producers themselves. As part of the storage campaign planning, the latter can register documented packages in PLATO, which are available for retrieval. In addition, the visualisation of an operational calendar for the Konrad repository is planned in PLATO, which provides different planning views depending on the user groups.

KEPLA is used to generate storage and delivery planning from the waste management data provided by PLATO. KEPLA is to generate valid storage realisations with the help of an optimisation algorithm. In doing so, a multitude of waste package-, repository-, waste disposal site- and disposal site-specific boundary conditions are to be taken into account. In addition to the safety-related and operational boundary conditions of the Konrad repository, the conditions at the interim storage sites and the logistical challenges of delivery to the Konrad repository should also be taken into account as far as possible.

Proven, Reliable and now also in the Cloud

GNS software is the backbone of nuclear waste management in Germany: For 33 years, German nuclear power plant operators have been using the Waste Tracking and Documentation System AVK as well as the conditioning sites and interim storage facilities. From cradle to grave, the programme documents evidence of the condition and whereabouts of radioactive waste and residual materials from the operation and decommissioning of nuclear power plants. Until all waste has been emplaced in the Konrad repository,

GNS will ensure the operation and further development of AVK. With the new programme version AVK 5, the software was converted to “Software-as-a-Service” (SaaS), the data is now stored in the GNS data centres as a “cloud solution”.

In addition to AVK, other GNS programmes have been established over the years, such as the BDB reporting database, the LPro storage programme, the BHDB container database and the PIK-AS project information and control



system for waste management. The goal is to offer all of these programmes as GNS cloud solutions (SaaS).

In addition to the utilities, GNS software customers also include federal companies, state collection centres, research institutions and the German armed forces.

Framework agreement with Siempelkamp secures long-term demand

Growing Demand for Melting Capacities during Decommissioning

During the dismantling of nuclear power plants, large quantities of contaminated or activated metallic residual materials accumulate. The most resource-efficient and economical way to dispose of these materials is to melt them down for subsequent recycling. In order to meet the significantly increased volume forecasts of its customers, GNS concludes additional agreements to the existing framework agreements with their proven partners. The “Project 2031” with Siempelkamp Metallurgie GmbH marked the beginning.

Current enquiries with customers indicate a total disposal requirement of around 25,000 tonnes of metallic residues to be melted down over the next ten years – more than twice as much as forecast just a few years ago. In order to be able to dispose of these quantities reliably and on time, GNS is expanding its framework agreements with the established smelters on bindingly guaranteed acceptance and processing capacities.

Long-term partnership

At the end of June 2022, an agreement was concluded with Siempelkamp Metallurgie GmbH (SMG) in Krefeld to secure demand until 2031. “We were able to quickly reach an agreement with our long-standing, reliable partner Siempelkamp to work off the projected demand via the ‘Project 2031’ initiated specifically for this purpose in a realigned partnership,” explains Souad Pederzani, as Director of the “Disposal Centre” division responsible for securing the disposal routes outside the power plants. “In this way, we have been able to secure the capacities required for the German utilities to accept and process their scrap at SMG

until 2031 in a binding manner and make a further contribution to securing

disposal services outside the nuclear power plants”.



The negotiating team of “Project 2031” (from left to right): Dr. Inga Tragsdorf, Dirk Howe (Siempelkamp); Andre Henning, Daniel Oehr (GNS); Thomas Kluth (Siempelkamp); Carsten Nowack, Souad Pederzani (GNS).

Certificates

Another Successful ASME Survey



In March 2022, GNS successfully passed an audit by the American Society of Mechanical Engineers (ASME) for compliance with the ASME III Division 3 Code using the NQA-1 QM system (Quality Assurance in Nuclear Engineering).

The new scope confirms that GNS is allowed to develop and manufacture storage and transport casks as well as baskets.

For this, GNS will receive another ASME certificate. The previous certificate expired in May 2022. The auditors will recommend the renewed N3 certification of GNS to ASME – as one of eleven companies worldwide (see GNS magazine 12).

The qualification of GNS according to ASME N3 is still an important proof to be able to successfully offer GNS products on international markets, for example for projects like the CASTOR® geo26JP (see page 14) as well as the containers for Taiwan (see page 18)

GNS Wins Contract from Norway in Consortium

Together with Fortum Uniper Nuclear Services (FUNS), GNS Group has signed a framework contract with Norwegian Nuclear Decommissioning (NND), the national agency for decommissioning and waste management related to the country's nuclear research programme.

The framework agreement covers technical support in the areas of design and engineering as well as safety demonstrations and analyses. It also includes the preparation of technical documentation for existing and new nuclear facilities, mainly interim storage facilities.

The FUNS-GNS consortium is one of three bidders who have been awarded the framework contract, the total value of which is approximately 100 million euros. The three-year framework contract includes three one-year extension options. In awarding

the contract to the consortium, the experience, but also the “very clear description of the areas of competence, capacities and profiles” were particularly praised. Eight bidders participated in the tender.

Founded in 2018, Norsk nukleær dekommisjonering (NND) / Norwegian Nuclear Decommissioning is responsible for decommissioning and final disposal in Norway. In 2024, NND will also take over the former tasks of the Institute of Energy Technology (IFE), which currently operates the Kjeller and Halden sites.



Fairs and Events

After a long Corona break, the first events were on the programme from 2021 – both nationally and internationally.



In 2022, the **KERntechnik** conference and exhibition, successor to the German Annual Meeting on Nuclear Technology, was held in Leipzig. GNS was not only represented with an exhibition stand, but also presented four technical lectures. In addition, GNS supported the Young Scientists Award 2022, which was part of KERntechnik, as a sponsor.

Dr. Linus Bettermann, Director Marketing and Sales, and Daniel Oehr, CEO, at **World Nuclear Exhibition (WNE)** in Paris. As an exhibitor in the German pavilion of VGB Energie, GNS participated in the WNE for the first time.



In Aachen, Germany, GNS was represented with a stand at the European specialist event on decommissioning, **ICOND**, where decommissioning strategies, nuclear waste management and technological developments were covered in presentations and at the accompanying specialist exhibition.

At the first **DECON** International Online Conference, GNS was represented with two presentations and a virtual exhibition stand. The 2021 international online conference on decommissioning and dismantling focused on current developments in Germany and South Korea.



Training Courses on Key Topics



Tripping, slipping, falling

Around 21 percent of reportable occupational accidents with at least three days lost are the result of tripping, slipping or falling. In addition to floors and surfaces, stairs play a particularly important role here. Many such accidents can be avoided by anticipatory behaviour.

In order to raise awareness among employees at the Mülheim and Essen sites, participation in a “stumbling parcours” was offered as part of the “Occupational Safety Action Days”, where a trainer presented possible causes of accidents in everyday operational situations.



Safety on the road

While car driving safety trainings are regularly offered for employees, the safety training for cyclists at GNS was a premiere.

In the theoretical part, a trainer presented danger spots and hazardous situations in road traffic, for which the cyclists then carried out braking and steering exercises on the course.

Active GNS employees

On the Move

GNS at the Essen company run

17 runners started for GNS at the Essen company run in 2022 – unfortunately less than registered due to illness, but still a significant increase compared to 2021.

The fastest GNS runner was Jan Seewald, who finished 13th in the men's category. The fastest GNS team (Jan Seewald, Marian Kozlowski, Tobias Petrack) made it to 40th place in the company ranking.

While the 2021 company run was still held over three days with only 3,000 participants, in 2022 it was run again along the usual 5-kilometre route. The 9,000 runners started in two waves.

Triathlon European champion on GNS running wheels

For almost 40 years Roth south of Nuremberg, has been the German triathlon Mecca. The Franconian long-distance triathlon is one of the most traditional and best-attended triathlon events in Europe. In 2020, the event could not be held at all due to the pandemic, but on the first weekend in September 2021 at least a significantly smaller field of starters than in previous years was able to take to the course under strict safety conditions: 3.8 km swimming, 42.2 km running and 170 km cycling had to be completed at the "Challenge Roth 2021". A total of 1,500 men and women went to the start, plus 300 relay teams. GNS employee Jan Seewald was also at the start. He not only finished



with an excellent time of 8:29:25 hours as 35th in the overall field including professionals, but also became European Champion of the European Triathlon Union (ETU) in the age group 35 as well as Vice German Champion of the German Triathlon Union (DTU) in the same age group.

Seewald started in the jersey of the German Amateur National Team, for which he was nominated by the DTU – and perhaps the "GNS wheels" also contributed to his success.

Safely on the move on two (or more) wheels

"Mit dem Rad zur Arbeit" ("Cycling to Work") and "Stadtradeln" ("City Cycling") are firmly on the calendars of GNS cyclists, whether they are leisure cyclists or cycle commuters. In 2021, seven GNS teams with a total of 24 participants cycled almost 15,000 km on their way to work and "around the home office". At the top of the internal ranking and in 92nd place out of 548 teams was our "GNS CASTOR" team.

The result of the "Stadtradeln" was also impressive with over 5,000 km and 35th place out of 211 teams.



Apprenticeships

100th Apprentice Started at GNS in 2021

Three new apprentices started at GNS in 2021, among them the 100th GNS apprentice since the start of apprenticeships at GNS in 1997. Traditionally, GNS trains in both commercial and technical professions: Julia Scheele is being trained as an industrial clerk, Janet Kirschner as an office management assistant and Maximilian Petrat as a technical product designer.

Ten apprentices are currently being trained at GNS. 91 trainees have completed their training at GNS to date, a number of them with extraordinary achievements. In 2016, for example, Dennis Leber was named best in Germany after completing his training as a materials tester (specialising in systems engineering), and in 2020 Lisa Puhl (industrial clerk), Andreas Dudlitz and Sarah Wehrmeister (technical product designer) were among the best in their final year at the Essen Chamber of Industry and Commerce.

The GNS apprentices already received awards during their training: in 2019, the then GNS trainees Andreas Dudlitz, Sarah Wehrmeister and Lisa Kulbatzki won the individual challenge of the BG RCI trainee competition "Safety from the start!". 2022 Julia Scheele took second place in the final of the BG RCI trainee competition.

GNS offers apprentices with very good academic and company performance the opportunity to shorten their three-year training period by half a year. In 2022, two commercial apprentices were able to graduate after only 2.5 years and were each taken on by GNS for the following year: Chantal Wehrstedt completed her training as an industrial clerk and now strengthens the Human

Resources department. Florence Klinger has completed her training as an office management assistant and is working in the Plant Technology & Equipment department. 2022 Linus Glasenapp started his training as an industrial clerk, Lukasz Orgas as an office management assistant and Annika Thiel as a technical product designer.



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Frohnhauser Straße 67
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Editorial team:

Michael Köbl (head) Tel. +49 201 109-1444
Sandra Fulland Tel. +49 201 109-1319
redaktion@gns.de

Design and Layout:

together concept Werbeagentur GmbH
Schinkelstraße 30–32 · 45138 Essen

Contributors to this Edition:

Tahir Akbaba, Mathias Banajanz, Dr. Niemma Buckanie, Marius Compall, Tuncay Ertugrul, Dr. Stefan Fopp, Yildiray Güc, Andre Henning, Martin Hoffmann, Thomas Horn, Lukas Ix, Dr. Frank Jüttemann, Stefan Kaden, Bernhard Kühne, Daiva Kühne, Lisa Kulbatzki, Christiane Lehmann, Daniel Oehr, Axel Ostermann, Jens Pauluhn, Tobias Petrack, Jörg Radzuweit, Wolfgang Reuter, Christoph Rirschl, Torsten Schliephake, Arndt Steinhäuser, Akin Üstün, Sebastian Wellnitz.