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WNE DAILY



NOVEMBER 30 2023 // PARIS NORD VILLEPINTE

RADIOISOTOPES IN CANCER BATTLE

Bruce Power in Canada has found a way to create radioactive isotopes that are seeing good initial results in the fight against cancer. Eric Chassard, EVP Process and Engineering, Bruce Power, told delegates to a WNE panel yesterday that they could now produce medical isotopes results in one week. "We can check the isotopes in a couple of days," he added.

The medical isotope, Lutetium-177, is made by irradiating the stable isotope Ytterbium-176 with high-flux neutrons. Irradiated targets are then transported to an isotope processor who extracts the Lutetium-177 from the Ytterbium-176 so that it may be used for drug preparation.

Each shipment of Lutetium-177 may contain enough medical isotope for the treatment of 2,000 patients. Together with its

partners Isogen, ITM, and Saugeen Ojibway Nation, they are supplying Lutetium-177 across the globe using its innovative Isotope Production System (IPS).

Isogen is a joint venture between Framatome (E114) and Kinectrics (F012), whose mission is to enable the use of CANDU reactors to produce the medical isotopes needed to treat and diagnose patients with serious diseases world-wide.

Isogen's enabling partnership with Bruce Power allows it to produce the world's largest and most reliable supply of lifesaving, short-lived, medical isotopes.

Bruce Power's nuclear generating station operates a fleet of eight CANDU reactors. Its Unit 7 reactor in Bruce County, Ontario, is the world's first commercial reactor that is capable of producing short-lived medical isotopes. Bruce Power, ITM and Isogen have

recently implemented an isotope target innovation that will increase the amount of Ytterbium-176 inside each sample that is sent into the Bruce Unit 7 reactor core.

It is the first part of a phased approach to expand the capacity for Unit 7's production of the medical isotope, which will be fully realised next year.

Bruce Power has also recently successfully completed another harvest of cancer-fighting Cobalt-60 during its planned outage in Unit 8, which will also see the installation of an innovation that will increase the production of the medical isotope to meet the increasing demands of the world market.

Last year Bruce Power announced that it has entered into a Memorandum of Understanding (MOU) with Boston Scientific to explore the feasibility of producing cancer-fighting yttrium-90 (Y-90) in its reactors.

MOVING AWAY FROM RUSSIAN FUEL SUPPLY

Senior executives from Ukraine, Finland and supplier Westinghouse described on the fuel security panel yesterday how the west is progressing strongly on efforts to diversify their fuel supplies and reduce their dependence on Russia.

The need for Ukraine to find an alternative fuel supplier to its Russian source was made clear after February 2022 and it has now transferred entirely to western-sourced fuel via Westinghouse, explained Petro Kotin, CEO of Energoatom.

The move towards fuel diversification has been "a mix of planning, decisiveness and luck," said Patrick Fragman, CEO of Westinghouse.

"We needed a technology that was completely independent of the Russians to help not only Ukraine but also the 17 reactors of Soviet design which are operating in the European Union."

"We basically developed a fuel in less than 18 months that normally takes 5-7 years," said Fragman.

Finland is also moving away from Russian fuel, said Petra Lundstrom, Executive Vice President of Fortum. "I'm very happy to say this work is progressing well. I firmly believe the risk of disturbance in the fuel supply is very efficiently mitigated."

Kotin noted how it is attempting, in concert with the International Energy Agency, for operation of the Zaporizhzhia Nuclear Power Plant to be transferred to Ukraine to "avoid future degradation of equipment and condition". Zaporizhzhia is the largest nuclear power plant in Europe.



NUCLEAR FISH-IN!
Tim Woodrow of Intralox with some fishy business

Fishy tales: the ones that get away

Keeping fish out of nuclear plants and allowing filtered water in is second nature to Hydrolox (E014), one of the world leading brands for the design and manufacture of water-extracting filters for a wide variety of industries. Part of the US Pavilion, Hydrolox is showcasing its engineered polymer traveling water screens, which can be customised for any size of industrial water intake, said Tim Woodrow, Vice-President

Commercial at Intralox, the firm that makes the Hydrolox screens. Intralox has made its name in the US and UK supplying its non-corrosive screens. "They raise the bar in terms of safety and reliability for the nuclear industry," said Woodrow. The screens are designed so that fish are not trapped by the filter and there is a bucket system that catches any that do enter the screen, diverting them back into the sea, lake or river.

DAY THREE
Main Stage Programme

- 09:45-11:00** Building a Diverse Pool of Talents for Nuclear Industry's Success
- 11:15-13:00** Prospects and Challenges of the SMR and AMR Technologies
- 18.00** Closing ceremony

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What they said...

News from the Main Stage events

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STRONG SUPPLY CHAIN KEY TO SUCCESS: URSAT

The biggest challenge facing the nuclear industry is to deliver at scale, the president of GifEN said at the show yesterday. Delivering his keynote speech as the second day of WNE 2023 got under way, Xavier Ursat said that more and more countries were coming to realise the virtues of nuclear power as a means of fighting climate change and decarbonising their power industries. "We estimate we need something like 150GW of nuclear power by 2050. We need up to 30 to 45 new reactors in Europe, both large reactors and SMRs."

This number of new reactors would require bringing together, more than ever before, the huge nuclear sector supply chain, including the financing needed to underpin such large investments. "The biggest challenge is to deliver at scale. We have an impressive number of projects. "What happens in Europe is probably able to be developed worldwide," he added. With that in mind, one of the keys to success would be strengthening the supply chain and cooperation between French companies and international partners, particularly throughout Europe.

ANDRA APPROACHES MILESTONE FOR DEEP REPOSITORY

Building trust with local communities is vital when the nuclear industry seeks to create new projects, conference attendees heard yesterday. Patrice Torres, Andra's director of industrial operations and activities in the Grand Est region, spoke of his company's aim of building a deep geological repository for high- and medium-level nuclear waste on the borders of the Meuse and Haut-Main départements. "This project is the result of 30 years of research and of going through the democratic process. There was a recent important milestone, the submission of the authorisation request last January. We hope for authorisation in 2027." This is a pivotal moment for the project, but also for the local area, said Torres, and one key factor is that Andra has been in

the area for more than 20 years, building trust. "We had to be transparent, humble, to listen and to discuss." Naturally, much of the project revolved around safety and technical issues, he said, "but it's a human issue, too." Meuse and Haut-Main did not have a history of involvement in the nuclear industry, with no reactors in the area: "One key development was to build with them a nuclear culture, so they could understand the issue." It had been vital to involve local residents and officials in the project "and to work and consult on everything we could."



FRANCE WITNESSES A NUCLEAR RENAISSANCE

With six European Pressurised Reactors (EPRs) under construction by EDF in France, with the possibility of building up to eight more, the country is working on one of its largest-ever industrial projects, Agnès Pannier-Runacher, French Minister for Energy Transition, said during her opening remarks yesterday at WNE. "We have come a long way in two years... and are talking not just about new builds but extending the lifetimes of existing plants," she said, with nuclear power a key asset in French energy security and in its response to the climate challenge. "Nuclear power is an integral part of our energy future," she noted. The country's nuclear industry will require 100,000 more employees over the coming decade to build, maintain and manage this colossal nuclear build-up, said Pannier-Runacher. Earlier this year Pannier-Runacher instigated a European nuclear alliance, which is formed of 16 countries, that demonstrates Europe's renewed confidence in nuclear energy. It has a roadmap to develop a European nuclear industry that could produce up to 150GW of electricity by 2050.

LEGACY PRINCIPLES UNDERPIN SUCCESS

Long-held construction principles hold the key to successfully delivering new-build nuclear programmes, show visitors heard yesterday. At platinum sponsor Assystem's panel session, several speakers laid out ground rules for completing projects on-time and on-budget. Jacques Besnainou, Westinghouse's chief commercial officer, said that among key factors necessary to deliver projects included having a fixed design before onsite work got under way: "Don't start constructing, or anything like ordering material, before you have a fixed design." Additionally, "Get a fixed bill of material and know exactly where the components are coming from." Most components of Westinghouse's AP1000 reactor design were made off-site, to a settled design, he said: "Making modifications on-site costs 10 times as much." Damien Bilbault, director of equipment on the EPR2 project, which will deliver six new nuclear stations for France, said 'constructability' was vital. Standardisation, with as few different types of components such as pipes and pumps as possible, was important. So, too, was prefabrication, which should be maximised. And, although it may seem obvious, ensuring the quality of equipment shipped to the site was vital.

FLURRY OF SIGNINGS AS EDF EXTENDS HAND OF COOPERATION

EDF had a busy opening day at WNE 2023, with a number of industrial cooperation agreements signed in the presence of chairman and CEO Luc Rémont, with Canadian, Czech, French and Indian partners. A letter of intent signed with Ontario Power Group (OPG) relates to the launch of a joint assessment relating to the potential development of EPR technology in the province of Ontario and other regions of Canada. EDF said in a press release that the agreement demonstrates its commitment to strengthening industrial ties and sharing knowledge between Canada and France. It is also recognition of EPR technology as a reliable and agile technology, capable of meeting the needs of a diverse range of partners around the world. Further highlighting the "great potential" for Franco-Canadian cooperation on the development of new nuclear power, the two countries held a workshop at WNE yesterday on industrial capacities, hosted by EDF, with the participation of more than 20 industrial players. In line with long-standing efforts to

strengthen ties with Czech industry, EDF signed cooperation agreements with Czech companies operating in the nuclear sector, for the construction of Unit 5 of the Dukovany nuclear power plant. The companies included Czech Nuclear Industry Alliance (CPIA), ADAMEC, EnerSys, pump manufacturer ISH, KLIKA BP, LDM, and Nopo Engineering. EDF said these agreements underline its ambition to guarantee the localisation of activities within the Czech supply chain. EDF is involved with its EPR1200 technology in the current call for tenders process as part of the new Czech nuclear programme. With India, EDF signed a memorandum of cooperation with BHEL, one of the country's leading public sector enterprises and the largest EPC company in the Indian power sector, with the aim of maximising local content in the Jaitapur NPP project in Maharashtra state, where a decision is awaited on the construction of six EPR reactors. EDF and BHEL will also explore the possibility of broader collaboration regarding the EPR and Nuward SMR. Under an international cooperation

agreement between EDF and Egis signed at the show, EDF will gain the support of its fellow French enterprise in the search for sites for the group's international projects. Egis is already working alongside EDF in the UK at Hinkley Point C, and in Poland under an agreement signed with Egis Polska in 2021, and plans to create an engineering platform in India with EDF and other partners.



ONE REACTOR A YEAR IN 2030s: RÉMONT

EDF aims to build at least one large reactor a year during the 2030s, CEO Luc Rémont said at the show. He said the company is working on the construction of six new EPR2 reactors in France, two new EPRs in Britain at the Sizewell site, as well as projects in India, the Czech Republic and Poland. We are counting on an accelerated rate of construction for large reactors. Perhaps one or two per decade, and gradually increasing this to one or even 1.5 per year," Rémont said. Rémont added that EDF aims to build a series of reactors with "standardisation on a large scale".

READY, STEADY, GROW FOR URENCO

As global nuclear power capacity continues to grow, WNE gold sponsor Urenco (D035) is undergoing a similarly positive expansion. The business is increasing capacity at its sites to meet demand for enriched uranium for low-carbon nuclear power. As Urenco expands and diversifies, WNE becomes increasingly important. CEO Laurent Odeh says: "Industry engagement is vital to us. Having a strong, visible presence which showcases the extent of our business, both to those who already know us and those who don't, is a positive driver to kickstart and harness constructive dialogue." The business will showcase its 'One Urenco' culture at the exhibition. Members of its diverse teams and sites will be on hand to engage with industry colleagues. Visitors can learn more about Urenco's role in the nuclear fuel cycle, its work on nuclear stewardship and developments in stable and medical isotopes at its WNE workshop. Odeh says: "These areas are fundamental not only to our partners, customers and communities, but the civil nuclear industry as a whole, particularly our approach towards sustainability as more clean, reliable energy is delivered."

Marielle Smit, Urenco People and Culture Transformation Programme Director, will take part in a discussion panel, 09:45 Main Stage today

POLISH EXPERTISE BUILT ON OVERSEAS PROJECTS

Despite not yet having its own domestic nuclear power industry, Poland is an active player in the international nuclear arena, and returns to WNE with a packed national pavilion (J135) with 38 companies exhibiting under the auspices of the country's Nuclear Energy Department. Poland, says spokesman Andrzej Sidlo, has a "well-advanced nuclear programme with significant resources and experience in this market and has contributed towards more than 80 nuclear projects in the last decade alone". "Our companies play a growing role in the worldwide market," he said, pointing to work of increasing sophistication on nuclear newbuilds as well as revamping, modernization and other O&M tasks. Polish-made components are found in foreign power plants and other nuclear facilities. For Poland, the focus at WNE is to meet new partners, share its extensive nuclear expertise and work towards getting the buy-in it needs internally and externally.



Implementation of a domestic nuclear programme is now in an "advanced phase of preparation", with the advanced engineering works on the first large-scale project under way alongside administrative procedures. Characterisation work for a second large-scale NPP site is expected to start soon.

Above: Poland's stand at the show...

Poland introduces its nuclear supply chain in a workshop today at 12:30



UNITED STATES' NUCLEAR ENERGY MOMENTUM COMES TO PARIS

Cutting the ribbon to open the U.S. pavilion at WNE was David McCawley, Deputy Chief of Mission at the U.S. Embassy in Paris, flanked by Dr Kathryn Huff (right), U.S. Department of Energy Assistant Secretary for Nuclear Energy, and Reta Jo Lewis, U.S. Export-Import Bank President and Chair of the Board of Directors. The U.S. Department of Commerce, in partnership with the Nuclear Energy Institute (NEI) and RX Global, helped to support the U.S. civil nuclear presence at the WNE.

SLOVENIA LOOKS INTERNATIONAL

Slovenia returns to WNE with a desire to strengthen its presence and visibility in the international market, forge new partnerships and explore business opportunities. The country's own nuclear energy infrastructure is well-established and reliable, says a spokesperson. "This experience positions us as a trusted partner to other countries looking to develop or enhance their nuclear programmes," she said. "We aim to showcase our cutting-edge technologies and expertise in the nuclear sector. Our goal is to highlight our commitment to safety, innovation, and sustainable energy solutions."



inbrief

NIMBLE'BOT DEVELOPS AGILE ROBOT ARM

French deep-tech start-up Nimble'bot [B106] is developing a bioinspired robotic spinal architecture that will offer unparalleled levels of precision of agility, thanks to its torsion-free actuators. This disruptive architecture incorporates and integrates the latest tech (including AI and IoT) to produce fully agile, versatile precise robot arms. The company says these robot arms, developed specifically for the nuclear sector, could change the way inspection and maintenance operations are carried out.

EFFICIENCY BOOSTING APP FROM HAPSTER

New to WNE, Hapster [B055C] has an app for that – if 'that' is improving safety and efficiency in the nuclear sector through knowledge sharing and training. The company says its complete management solution enables training as well as monitoring, planning, evaluation and certification. Described as a bridge between operational staff and management, Hapster's app promises to help preserve and share essential skills across the industry.

PRESSURE TRANSMITTERS FROM MANOMETER KHARKIV

Manometer Factory LLC (AE149), a leading pressure, level and flow transmitters manufacturer based in Ukraine, is at the show to present its range of products to visitors. Founded in 1997, the company has been providing Ukraine's NPPs with pressure transmitters since 2001. It says more than 35,000 Manometer transmitters are operating in 15 NPPs in Ukraine and around the world.

A HIGH REL MICROCHIP TO RULE THEM ALL?

Belgium-based Magics Technologies [K063] is at the show to showcase its specialisation in providing high-reliability chips for the nuclear sector. Its core expertise lies in developing rad-hard microchips in order to support the advancement of next-gen robotic systems for various NPP processes.

RECRUITMENT

PATHWAYS TO FILLING THE TALENT POOL

The nuclear industry's need for new skilled talent, and upskilled talent, is a real and pressing challenge that will be addressed by members of a panel this morning. "The large programmes ahead of us will require attracting, training and retaining a large number of experts, in a very competitive context," says Anne-Charlotte Dagorn, Marketing and Communication director of Assystem.

Dagorn is moderating today's panel entitled 'Building a diverse pool of talent for the nuclear industry's success' (Main Stage, 9.45am). Panelists will share their experiences, provide industry insights, talk about challenges and the needs of the industry and identify ways to build and sustain a strong nuclear workforce for the future.

"The objective of this panel is to present concrete solutions and highlight that, even though we have a challenge in front of us, the industry is ready to tackle it," Dagorn said.

The panel draws on the expertise and experience of different parties in a four-part programme featuring speakers from the International Youth in Nuclear Congress; from industry including EDF, Urenco, the Nuclear Industry Association of Türkiye and the China General Nuclear Europe Energy (CGNEE); from organisations and individuals active in promoting nuclear including IAEA, Hefais, and Grace Stanke, the current Miss America; and from young generation representatives already onboarded in the industry.

GfK forecasts a 25% growth in the volume of work in the nuclear sector by 2033, and a need for 60,000 full-time new recruits to achieve this scope, half to compensate for retirements and half for business growth.

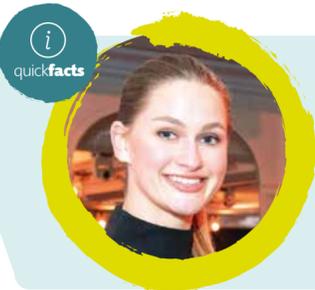


The French nuclear industry alone will need around 6,000 new workers every year during the next decade, with peaks reaching 10,000.

William Magwood, director-general of the Nuclear Energy Agency, said recently: "At present, the talent base in the nuclear field is extremely thin, making the threat of not having enough educated and trained professionals around to design and operate the future nuclear fleet a huge challenge."

Today's panel is planning to reinforce the message that there is a place for everyone in the nuclear industry and that the industry is ready to tackle these challenges.

Panel, Main Stage, 9.45am: Building a diverse pool of talent for the nuclear industry's success



quickfacts

INDUSTRY GETS MISS AMERICA'S VOTE...

Nuclear advocate Grace Stanke, the current Miss America who has used her platform to promote the industry, has found the most effective recruiting addresses three points: reliable energy, climate energy, and remuneration. She says: "I largely focus on recruitment in America, so I find that one of the first two arguments fits into people's missions and/or political affiliations. The third point tends to seal in the message."

Grace, pictured at the WNE Gala Dinner on Monday evening

PANEL DISCUSSION

WHAT'S NEXT FOR SMRS AND AMRS?

One highlight of the packed panel discussions programme will be 'Prospects and challenges of the SMR and AMR technologies', taking place on the morning of day three. According to the session's moderator Petra Lundström, who is EVP Nuclear Generation at Fortum, this will be one to watch because it offers seven distinct perspectives on a subject that has been headline news this month.

First, it was announced that NuScale's SNR project in Idaho, USA, won't go ahead. Even so, work on the project has made huge advances with US regulators to smooth the regulatory path for small-scale nuclear, according to NuScale CEO John Hopkins. And here in Europe, EU Energy Commissioner Kadri Simson has just backed development of an industrial alliance on small modular reactors, which could be launched within months.

This would be the latest in a series of EU industrial alliances supporting clean energy technologies. The aim is to create favourable regulatory environments for technologies that are developed in Europe. The alliance will also encourage designers, manufacturers, academic experts, regulatory bodies and potential customers to work together on initiatives to nurture talent, develop skills and share insights about how to develop, build and manage the necessary infrastructure.

Alongside these international, multi-stakeholder efforts to create the right legal frameworks and financial conditions to take SMR and AMR development forward, entrepreneurial businesses are working on promising technologies. The evidence can be found throughout this year's show; exhibitors in the main halls and in the Startup Village are keen to show their concepts.



Thursday's panel discussion will bring the conversation up to date and offer some fresh angles, as Petra Lundström explained: "The topics will be covered by experts working in the US, Canada and EU, each with insights into what is happening in those territories, and from interesting vantage points. We'll have contributions from a leading nuclear safety authority (ASN), industrial energy consumers, the venture capital sector and the nuclear fuel cycle."

'Prospects and challenges of the SMR and AMR technologies' panel discussion featuring Petra Lundström, Jan Panek, Peter Claes, Dr Kathryn Huff, Charles Beigbeder, John Gorman, Cécile Evans, Sylvie Cadet-Mercier. 11.15-13.00, Main Stage

MADE IN ITALY: SOLUTIONS FOR TOMORROW'S NUCLEAR POWER

The Italian Trade Agency, participating in WNE with a group of 11 Italian enterprises, presents a workshop today at 10.30 on the topic 'Made in Italy Technological Solutions for Tomorrow's Nuclear Power'.

The objective of the event is to present and show the potential of Italian technologies to address the future of the nuclear sector, especially at this moment of partial change of perspective, also within public opinion on the issue of civil nuclear power.

Various representatives of the Italian nuclear industry will participate, including Roberto Adinolfi, President of Ansaldo Nucleare, and Stefano Monti, President of the Italian Nuclear Association (AIN), former official of the International Atomic Energy Agency (IAEA).

After the workshop, the organisers have set aside time for discussion with the speakers from 11:00. Delegates planning to attend are asked to register their interest using a link: tinyurl.com/sac3uff

PARTNERING FOR SMR DIGITAL TWINS

Assystems Digital (J054) and Dassault Systèmes (F046) signed an MOU at WNE to work on a common solution to build digital twins for Small Modular Reactor and Advanced Modular Reactor technologies.

Announcing the tie-up, Christian Jeanneau, Group Executive Vice-President, Assystems Digital said the two firms have been successfully collaborating since 2016 on a variety of projects.

The new partnership is dedicated to producing digital twins of the complex infrastructure that surrounds reactor installations that will help project leaders save time and deliver the best designs first time, he said.

Stephane Degraeve, Vice-President Customer Solution Experience, Dassault Systèmes said the two firms have an "obvious complementarity" to address SMR and AMR development.



Christian Jeanneau, Group Executive Vice President, Assystems Digital (left) and Stephane Degraeve, Vice President Customer Solution Experience, Dassault Systèmes announce their collaboration at the show

Canada-Korea MOU signing, from left to right: ARC's Bill Labbe, Lori Clark of Energie NB Power and Jooho Whang of KHNP



Koreans team up with Canadians for SMR research

Canada's New Brunswick Power, ARC Clean Technology and Korea Hydro and Nuclear Power Co (KHNP) signed an MOU at WNE to explore collaboration opportunities for the commercialisation of ARC's advanced SMR technology in Canada, Korea, US, and other jurisdictions where KHNP has business operations.

It is a move described by ARC's President Bill Labbe as "an exciting opportunity for all three companies to explore fleet deployment of advanced SMRs on a global scale." Mike Holland, Minister of Natural Resources and Energy Development of New Brunswick, said this strategic collaboration on SMR technology offers a "great chance to show ourselves we can contribute to alleviate climate change."

Since 2018 NB Power and ARC have been working on the development of the ARC-100, a modular, advanced sodium-cooled reactor that will generate at least 100 MW of electricity, said Labbe. It is expected to be the

first deployment of an on-grid advanced SMR facility in Canada.

Lori Clark, CEO of NB Power, said: "Small modular reactors are a key part of NB Power's solution to phase out coal by 2030 and achieve net-zero supply by 2035, while maintaining energy security for New Brunswickers, and we are excited about potential future commercialisation opportunities."

Speaking at the signing, Jooho Whang, CEO of KHNP, said the partners will present a new roadmap for nuclear co-operation between Canada and Korea. "This agreement will afford us significant momentum for entering the Gen 4 SMR market," he said.

"Countries and businesses are actively pursuing the 2050 net zero emission goal with SMR recognised as a highly practical and effective solution," said Whang. "Consequently, efforts are under way to mitigate the market entry risks and expedite the deployment of SMR."

Groupe MONTTEIRO IRI SECOMOC CTI

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inbrief

GX ENERGY SHOWCASES FCVS FOR NPPS

Japan-based GX Energy Ltd (L103) is a new exhibitor at WNE, showcasing its containment filtered venting systems (FCVS) for NPPs. With more than 2,000 NPPs forecast to be built over the next 25 years, GX Energy is ready to supply its solution. Subsidised by METi, the Japanese Ministry of Economy, Trade and Industry, GX Energy is also showcasing a nuclear emergency shelter constructed from AgX radiation absorbent material.

VISUALISE EVERYTHING WITH TOTALYMAGE TECH

Totalymage [AD162] is at the show to present optimisation of on-site and remote work processes via imagery. Its proprietary technology algorithms can create 360 degree imagery from filmed images, and can project users into the images along with extra operational content. No coding necessary, this SaaS (or portable) platform can be hosted on clients' servers and uses EyeSnap AI image recognition plug-ins along with patented algorithms. It's also accessible on or offline.

HIGH PERFORMANCE H3D SPECTROMETERS

UK-based H3D Inc (D013) brings to WNE unique tech that's capable of surpassing most other radiation imagers on the market. The company claims to offer the highest performance image spectrometers in the world and is revolutionising the way in which measurements are performed. Demos and presentations of the tech promise to prove the company's claims. Expect to see the H Series gamma Imager, M Series customer Integrable CZT Module and the S Series mounted spectrometer at work.

YOU IN CONTROL

Leading manufacturer of mosaic control panels and other control room solutions for NPPs, Mauell GmbH is at WNE to promote its bespoke solutions (D021L). The company conducts in-depth analysis of specific workflow patterns in order to identify efficient optimisation options for existing systems.

Right: Christoph Adam, poses with one of his firm's tailor-made rubber expansion joints

hall highlights



Abseilutely fabulous: Ouest Acro's Benjamin Lorieux demonstrates how he uses abseiling skills to perform maintenance work at dangerous heights

JUST HANGING AROUND!

French exhibitor Ouest Acro (D134) is giving daily demonstrations of how its operatives use their rope-climbing skills to perform maintenance work on nuclear installations. Benjamin Lorieux and Clement Granger are showing how they can climb up a rope to get to the exhibition hall roof in seconds – and even hang upside down! The company, based in Louverne, France, covers the whole of the country. Its services include inspection and non-destructive testing, plus the application of anti-corrosion treatments, and the repair and reinforcement of steel and concrete.

INSIDE STORY ON ELIOS 3

The third-generation Elios drone, which is equipped with a radiation detector, flew away with the prize in the SME/VSE Nuclear Safety category at this week's WNE Innovation Awards. The drone is manufactured by Swiss firm Flyability and sold by Foretec in France. It was developed by Flyability with a mission to allow the inspection and measurement of radiation in hazardous nuclear environments without the need for humans to enter such areas. The drone navigates without GPS using light sensors and LIDAR pulse lasers which enable it to operate in dark, dusty, and confined spaces, explained Jerome Marron, CEO of Foretec.



Left: Jerome Marron with the award-winning Elios 3 drone

Marron believes the Innovation Award affirms the product's capability of delivering good results in challenging environments.

Left: Jerome Marron with the award-winning Elios 3 drone



A COOL JOINT

German company Ditec (L007) is showing a 1.1m diameter rubber expansion joint on its stand here at WNE, which is a relatively modestly sized joint as the company can make products up to 5m in diameter, said Christoph Adam, Managing Director of Ditec. This German outfit specialises in manufacturing these tailor-made products, which are used in the cooling water lines in nuclear plants. It began supplying the French nuclear industry in 2000 and has expanded again in recent years to deliver joints to plants in Finland, Sweden, Switzerland, Brazil and the UK, said Adam.



Syscan CEO Florent Callens with the ground contamination seeker making its debut at WNE

SCANNING NEW GROUND

Syscade (K063) has answered the call from Belgian nuclear operator Engie Electrabel for a mobile vehicle capable of measuring soil radiation levels around the site of its main power plant in Doel. The Belgian company has mounted an advanced gamma radiation detector array on the front of an electric vehicle with a mission to look for the presence of Caesium 137 and Cobalt 60. Called Syscan, the ground contamination seeker was commissioned in June and is making its public debut here at the show, said Florent Callens, CEO of Syscade. Engie Electrabel is the first customer for the Syscan, which can be rented or purchased.

Fusion focus

ITER PROJECT LEADS THE WAY TO FUSION ENERGY

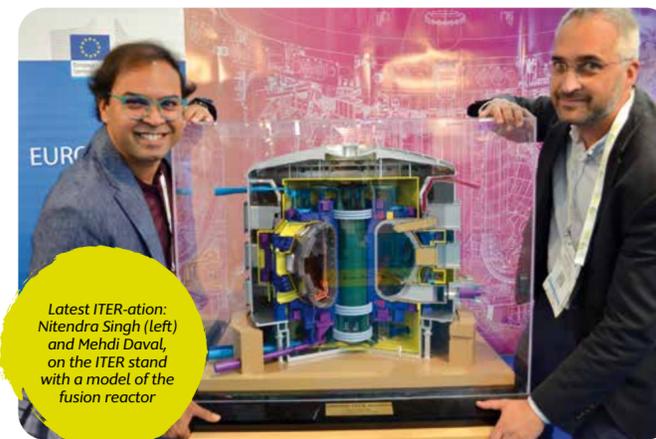
Global enthusiasm about the development of fusion energy is at an all-time high. The reality is that fusion will materialise. It's now a question of how, when and who will lead the charge.

From the international ITER project (AE140) to Germany's recent announcement of an investment of more than a billion euros into research at the Institute for Plasma Physics (IPP), the Karlsruhe-Institute of Technology (KIT) and the Research Centre Julich, there is an unprecedented surge in momentum – a clear signal that the dream of fusion energy is perhaps nearer than we think.

There are myriad challenges ahead before the world can roll out energy generated from nuclear fusion, not least the sheer scale of design specifications that are needed. And this is where the ITER project occupies a unique place in the sector.

Explains Iter's Sabina Griffith: "ITER is the only tokamak at the level necessary to achieve the physics phenomenon that scientists must be able to study as a prerequisite to optimising the design of industrial fusion plants."

"The achievement of the principal project specification – producing burning plasmas with a power amplification ratio across the plasma of Q>10 – will demonstrate that magnetic confinement fusion can be a scientifically viable method of net energy gain, paving the way for both next-generation DEMO reactors and private efforts to deliver fusion power to the grid." Via its first-of-its-kind diagnostic capacity, it



Latest ITER-ation: Nitendra Singh (left) and Mehdi Daval, on the ITER stand with a model of the fusion reactor

will be possible for ITER to provide essential data on burning plasma behaviour in long-pulse scenarios, optimised confinement techniques, and the management of heat exhaust, among other factors. All of this information is needed not only for tokamak designs, but also for magnetic confinement designs as a whole.

The construction and assembly of the ITER tokamak is driving industrial capabilities that benefit the international fusion ecosystem. Adds Griffith: "As well as providing practical experience in designing, fabricating, and

assembling a fusion facility, ITER is the first to go through the process of nuclear licensing." ITER's complex multinational procurement structure has resulted in the development of fusion technology supply chains, and is contributing to the creation of a diverse, global, and experienced fusion workforce.

ITER presents a workshop on procurement at 11.30 today

'THE WAY' FORWARD...

ITER – 'the way' in Latin – will be the first fusion device to test the integrated technologies, materials, and physics regimes necessary for the commercial production of fusion-based electricity.

The project is being built at Saint-Paul-lez-Durance in the south of France and will be the world's largest experimental tokamak fusion facility.

But as reported to the 31st ITER Council in November 2022, defects were identified in two key tokamak components.

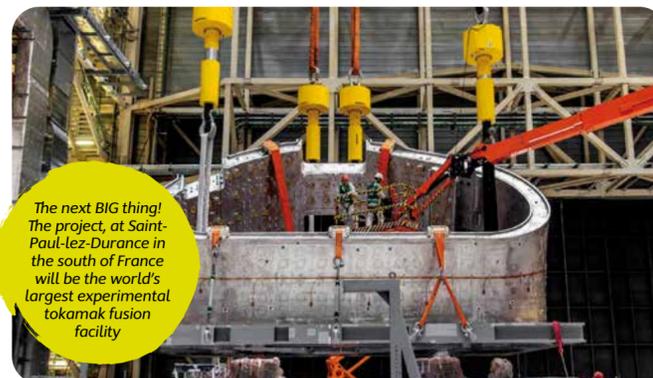
At the 33rd Meeting of the ITER Council earlier this month, the Council noted the progress achieved on repairs to key components – the vacuum vessel (VV) bevel joints and thermal shield

(TS) cooling pipes – as well as ongoing manufacturing, assembly, and installation.

Meanwhile, the final toroidal field (TF) coil from Japan has been delivered, and the final TF coil from Europe is in shipment.

The first two central solenoid modules have been stacked and are being aligned while the third central solenoid module has arrived at ITER.

Installation of magnet feeders has begun in the tokamak pit. Multiple support systems have been commissioned or are in the commissioning process. The ITER organisation plans to present an optimised cost and schedule baseline for presentation to the ITER Council in 2024.



The next BIG thing! The project, at Saint-Paul-lez-Durance in the south of France will be the world's largest experimental tokamak fusion facility

inbrief

IAEA SAYS UP TO 12 COUNTRIES TO GO NUCLEAR

Twelve more countries are expected to move to electricity generation from nuclear power within the next few years, Rafael Mariano Grossi, the Director General of the International Atomic Energy Association (IAEA), said at the show. The IAEA says this will be necessary to achieve the objectives of the Paris climate agreement.

Grossi said that to meet the COP targets, we will need to double the number of nuclear reactors in the world, from 400 to 800. Ghana, Kenya, Morocco, Nigeria, Namibia, the Philippines, Kazakhstan and Uzbekistan were all cited by Grossi as possible new nuclear power countries.

'SAFEGUARDS BY DESIGN' TO AVOID LEGAL PITFALLS

A workshop organised by European Commission - Directorate General for Energy (DG ENER) this morning at 09:30 showcases how early consideration of safeguard requirements in the planning and design stages of EU nuclear installations can benefit everyone. Speakers are expected to address the legal framework in EU member states and demonstrate how early communication on safeguards can help optimise costs and avoid delays of nuclear projects.

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**WNE 2023
in numbers**

20,000
participants

76
represented countries

1,000
decision makers

Parting Shots



AROUND THE SHOW

Clockwise from left: WNE President Sylvie Bermann shares a smile with Carole Grandjean, French Minister for Education and Vocational Training; Dr Fatih Birol, Executive Director of the International Energy Agency, is greeted by the WNE President; exhibitors share a smile with Sylvie Bermann; Agnès Pannier-Runacher views the Lego model of an SMR; Thierry Breton, the EC's European Commissioner for the Internal Market, with Sylvie Bermann in the halls.



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PRESSURE ON SUPPLY CHAIN IN COMING REACTOR WAVE

Planning ahead is the key challenge to cope with the wave of new nuclear projects expected in the coming decade, said Nathan Paterson of the World Nuclear Association.

With the rising number of new projects and life extensions of existing plants over the coming decades, the nuclear industry's huge supply chain faces three main challenges, says Nathan Paterson, Senior Programme Lead – Supply Chain at the World Nuclear Association (WNA).

"No 1 is planning," Paterson told delegates at the panel 'Nuclear industry and regulators – ensuring confidence in the supply chain

through international collaboration'.

"We certainly don't want any bottlenecks [in supply chains] 10 years down the line where we have this fantastic wave of newbuilds and much more long-term operation [of existing plants]," he explained.

"We see 140 refurbishment projects are going to be needed by 2040 and that's going to be in collaboration with newbuilds," he said, in an investment drive requiring about \$2 trillion to be invested in the supply chain.

The second challenge is managing the involvement of governments and ensuring strong planning in connection with national industrial strategies, said Paterson.

MAN OF STEEL

Steelman from Gdansk is making his second appearance at WNE bringing a fun talking point on the Polish stand. Armed with a welding machine, hard hat, and ear defenders, he was built by the engineering team at Poland's KB Pomorze in Gdansk, said the company's Karolina Langer-Woronko. KB Pomorze is a specialist in manufacturing steel structures for the oil, gas and industrial sectors and is talking to the nuclear primes with a view to securing sub-contracting services.

