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WNE TRIBUNE

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“ We are facing a climate urgency and we need nuclear

ENERGY USE NEEDS TO CHANGE: LÉVY

Jean-Bernard Lévy, Chairman and chief executive officer of EDF Group, was in the hot seat at WNE as three young people representing associations focused on climate and societal issues put some of their concerns to him. “Floods, droughts and climate migrations are fossil-fuel based problems,” he said. “We are facing a climate urgency and we need nuclear.” Answering Jadwiga Najder, president

of European Society Young Generation Network, Lévy said EDF’s strategy is aligned with the French government’s policy, as outlined by President Emmanuel Macron in October, to deliver low-carbon energy solutions. This ambition is EDF’s company *raison d’être*. “We need a mix in renewables including hydroelectricity and solar energy. We need more nuclear in our energy mix. Nuclear is essential.” EDF’s aims at reaching the net zero

goal through a well-defined roadmap, projects, actions, strong guidelines, and not only words. Energy saving and efficiency are important issues to be addressed by all parties. “We need to draw a line between what can be done and well-being of people. We need a radical change in our way of using energy.” He said smaller countries are looking

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THREE YEARS PUTS SWITCH PROJECT ON TRACK

EDF and Dassault Systèmes, partners in the Switch digital transformation project, have “learned a lot” in the project’s first three years. Speaking at WNE for an update of the 20-year project that uses Dassault’s 3DExperience software to digitise the nuclear decommissioning process, EDF’s Thomas Paugam (above) said Switch “has been about making the business more efficient, more competitive and more collaborative.” “We have learned a lot from ‘best practice’ in other industries and we have also influenced the research and development roadmap at Dassault Systèmes.” Paugam said that up to 150 new functions have been included in the software and there have been upgrades every two years. “The system gives our engineers easier access to information,” he said. Dassault Systèmes’ work on plant conformance and quality was also short-listed in the operational and excellence category of the 2021 WNE Awards. The solution is a web-based collaborative platform, allowing inspection bodies, manufacturers and regulators to manage data and document, findings, audits and inspections.

INNOVATIVE PROCESS GIVES ‘BRUSH-OFF’ TO D&D SECTOR

Innovation in decontamination products and practices has been an ongoing theme at WNE this week. Creative thinking and new ideas are a feature of the nuclear industry, and examples are on show throughout the exhibition hall. French consulting company Tech Y Tech (L17) specialises in decontamination and effluent treatment processes with a particular focus on nuclear dismantling challenges. Tech Y Tech represents German manufacturer Reuter for nuclear applications and is highlighting portable electroerosion equipment to decontaminate metallic surfaces such as stainless steel with other metals.

Frédérique Damerval, founder of Tech Y Tech, said the latest Reuter technology is a highly efficient way to clean metal surfaces and welding seams. It revolves around a newly developed carbon fibre brush with up to two million fibres per brush, conducts a high current to the metal piece. The brush removes oxides as well as the top layer of metallic surface, thus removing all contaminants. The fibres of the brush hug the shape of the workpiece and separate brushes can be used to clean pipes and holes to be cleaned from the inside.

More innovation from the exhibition halls on Page 7



Reuter's Lukas Klein brushes up on the latest decontamination method on display

Day 3 highlights



Today's focus is on 1 Students / 2 SMRs / 3 Nuclear's part in a low-carbon future

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EDITORIAL

THESE ASPECTS ARE IMMENSELY IMPORTANT FOR THE PLANET

Welcome to Day 3 of WNE 2021. I hope the show is proving successful for you. We've dedicated our final day to SMRs and Advanced Reactors, plus today we have a special programme for students. We might have called it 'Futures Day', because both these aspects are immensely important, not just for our industry, but for the planet.

We've been talking about SMRs and Advanced Reactors – Generation IV and beyond – for some time as the concepts and designs worked their way through the rigorous testing and proving processes that characterise our industry. It is fortuitous that WNE is highlighting SMRs the same day that we have students visiting to learn about the opportunities that the nuclear industry holds for them: the immediate future is right in front of their eyes. I hope they are truly inspired.

For anyone already in the industry, today's schedule presents an opportunity to discuss everything from investment needs to supply chain challenges, regulatory harmonisation, public acceptance, and safety and security requirements with key decision-

makers. It should make for stimulating conversations.

As we approach the conclusion of WNE 2021, we will be reflecting on many things. Top of the list will surely be the timeliness of our exhibition, coming hard on the heels of COP 26, and how these two very different events – one focused on policy, the other on industry – have shown what we must do to combat climate change, and what we actually can do, right now.

Perhaps our biggest challenge, as an industry, is making our voice heard in a world full of noise. We need strong, intelligent communications to reinforce what we know, that a responsible future must include nuclear industry as a key player in creating a low-carbon society. Our future depends on it.

May I wish you a safe and pleasant journey to your home, wherever it is. Thank you for supporting WNE in these difficult times. I look forward to greeting you at WNE 2023.

Sylvie Bermann
Ambassador of France
and President of WNE



“Perhaps our biggest challenge, as an industry, is making our voice heard in a world full of noise. We need strong, intelligent communications to reinforce what we know, that a responsible future must include nuclear industry as a key player in creating a low-carbon society...”

CONTINUED FROM p1

ENERGY USE NEEDS TO CHANGE

to go nuclear but financing remains a barrier, just like regulations and licensing. Lévy said that if Western countries can invest in long-term infrastructure projects, they also have the ability for export financing.

On EDF's vision on hydrogen, Lévy told Bruno Idini, International Energy Master's student at Sciences Po, that low-carbon hydrogen which can be produced by electrolysis – key to the value chain – and fuel cell technology through a sustainable process has good prospects for heavy load transport.

“We are accelerating the curve for decarbonised hydrogen solutions,” he said. “We feel we are in the right place. EDF has a good track record.”

Camille Theron, shift project member who was at COP26 in Glasgow, asked a question as to the right balance between energy transition and the need to bring electricity to poorer populations in the world.

Lévy said: “We take no decision which would not be sustainable globally, be it capital expenditure, human resources, R&D...” He added that the EDF Group

supports countries to decarbonise their economies while respecting local policies and interacting with local communities to find the right balance.

He suggested that governance on nuclear projects needed to be improved. A key element to ensure successful and safe nuclear programmes is financial stability, especially in emerging markets, coupled with a democratic process.

The need for the nuclear industry to educate and reassure populations and reluctant countries globally was also raised. Lévy said that taxonomy discussions in Brussels are very important.

To a question on the needs of youth and women in the nuclear industry, Lévy said EDF has the largest number of apprentices in the industry. “We encourage women and ensure that they go higher in the hierarchy.”

Lévy said SMRs have good market perspectives.

Lévy also welcomed the interest of “wealthy people” such as Bill Gates, Jeff Bezos and Elon Musk in innovation and sustainable energy.

DIGITAL ECOSYSTEM: THE KEY TO SUCCESS

Assystem (D53) works to create the most diversified innovation ecosystem possible for digital technology, working with partners large and small. It includes more than 10 universities and engineering schools, nearly 20 start-ups and software companies, plus Assystem's own people.

A strategic partnership with the start-up Sparte provides expertise on virtual reality. Another partnership, with the start-up CosmoTech, takes advantage of a highly original platform to manage the inherent complexity of nuclear projects. More will be signed during WNE.

Christian Jeanneau, Assystem's senior vice-president for digital activities, says four solutions have already been developed internally and are currently in use by the customer. “We are very proud of the speed of ramp-up of these solutions which are based on our own engineering processes and the customer experience we have,” he said. “We have progressively made these solutions available to the marketplace.”

WNETRIBUNE

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Caen harbours RFID technology into hand-held detectors

CAEN (J12) is demonstrating its latest radiation measurements systems and spectroscopy solutions designed for nuclear facilities.

The company's Giacomo Mangiagalli (pictured) explained that its latest digiwaste device relies on an "innovative and unprecedented" handheld instrument, the RadHAND 600 Pro.

This device combines radiation measurement capabilities with read/write UHF RFID tagging, all while integrating a colour camera, audio recorder, and GPS

and ultra-wideband (UWB) localisation for both outdoor and indoor positioning.

Taking advantage of this system speeds up the entire process and stops inadvertent mislabelling. That is, the RFID tag is automatically produced and so eliminates mistakes due to transcription errors.

The device also helps with the identification of radioactive sources, contaminated objects and hotspots for waste analysis plus radioprotection in dismantling and decommissioning (D&D) applications.



ROSATOM'S SCOPE LEADS TO INTEGRATED SOLUTIONS

The secret of success in the export market for WNE sponsor Rosatom (D62) "is no secret at all." Maximum flexibility, one of the Russian company's main features, gives it competencies and capabilities covering the entire nuclear supply chain, from uranium mining to decommissioning, that allows it to offer "effective tailor-made solutions" to everyone.

"Our business today is no longer about reactors," says a spokesman. "We offer integrated solutions that enable our customers to reduce their carbon emissions at the lowest cost and maximum positive impact on economic growth and industrial development.

"Such solutions cover more than just energy. We offer research facilities for the production of medical isotopes needed to diagnose diseases and treat cancer, to process agricultural products to reduce waste in food production and much more."

The basis of Rosatom's international cooperation is the desire to provide the customer with the best product at the most competitive price. "That is why Rosatom has a long history of partnership with high-tech vendors, for example, in the EU countries,"

the spokesman adds. Rosatom cooperates with Framatome in the automated process control system (APCS) segment and production of fuel for reactors in EU countries; its VVER power units use Arabelle turbines manufactured by GE-Alstom.

Major companies, including EDF and Schneider Electric, are involved both in projects for the construction of new VVER reactors and in projects to ensure the long-term operation of existing plants.

Joint work was carried out with Dassault Systems (France) in the development of advanced information solutions, such as the Multi-D PLM construction management software package.

Last spring, Rosatom launched a global awareness campaign called Atoms for Humanity to "humanise" nuclear technology

with the stories of individuals from around the world whose lives have been transformed by nuclear.

"When one thinks 'nuclear', what comes to mind is state-of-the-art innovations," says the spokesman. "But these engineering marvels exist for one purpose: to increase the quality of life.

"In a discussion about technological advantages and disadvantages, personal human stories are often left behind. Rosatom launched Atoms for Humanity to flip the narrative.

"Ultimately, the Atoms for Humanity initiative is tasked to persuade people that nuclear is more than a sector, a vendor, or a technology. It is the ultimate connector of hopes and aspirations, of businesses, of people and geographies."

“When one thinks ‘nuclear’, what comes to mind is state-of-the-art innovations. But these engineering marvels exist for one purpose: to increase the quality of life. In a discussion about technological advantages and disadvantages, personal human stories are often left behind. Rosatom launched Atoms for Humanity to flip the narrative

RUSSIANS GEAR UP TO LAUNCH FLEET OF FLOATING SMRS

The world's first floating nuclear power plant, the Akademik Lomonosov, has been successfully working off the Russian Arctic city of Pevek since May 2020.

Now the Russian state nuclear corporation Rosatom (D62) said it plans to deliver four more floating nuclear plants by 2030 in Chaunskaya Bay, to open up Chukotka, the region close to Alaska rich in precious metals.

Speaking at the show, Rosatom vice-president Anton Moskvina said the company's special design bureau was currently working on 20 small reactors for marine applications. "We have 400 reactor years of experience in this marine area," he said.

The four new floating units will also power Russia's major copper mine at Baimskaya, helping to meet demand for renewable energy technologies. Rosatom says the additional plants will deliver a power source at predictable costs for the next 60 years.

The Akademik Lomonosov has proved to be a life-changer for people living in the Arctic coastal region.

"This provides both year-round heat and light to the community for the first time. It is a harsh environment within the Arctic Circle and covered in permafrost," a Rosatom spokesperson said. "This has made an incredible difference."

At the show, Rosatom also announced that the first of its new generation of nuclear nuclear-powered icebreakers, the Siberia, is completing sea trials and will begin operations later this month. The second, the Urals, is under construction in St Petersburg.

There are three others planned and six of the older generation of atomic ice breakers still in operation.

Opening of the Northern Sea Routes and the expansion in the Arctic has been a long-term goal of President Putin. The opening of the Arctic routes has an environmental advantage too as it will reduce the voyage time for ships compared to the Suez Canal transit.



Evgeny Pakermanov, Rosatom's overseas president, speaks today as part of the keynote on SMRs and Advanced Reactors, at 09.15, Panel Discussion room

inbrief

REDUCING D&D COSTS WITH LINDAPTER CLAMPS

Lindapter International (H96) is using WNE to promote its steel-to-steel girder clamps and Hollo-Bolt products, which offer a faster, cost-effective alternative to on-site drilling or welding. The company says this can reduce time and costs for D&D.

STIMULATING SIMULATION

L3Harris (C26) is showcasing its expertise in training simulators that assist in and de-risk nuclear power plant operations. Its Orchid simulation software helps create high-realism nuclear plant simulations with fully-immersive display technology. It says personnel trained with their solutions get real-world skills without excessive downtime.

SMALL IS BEAUTIFUL...

Argentina's INVAP, which specialises in the design and build of small reactors for purposes such as training, research and medical isotope production, is at the show seeking new contacts, clients and vendors. Among current projects are basic engineering for the Netherlands' Pallas 25MW reactor, which will be used for radio-isotope production and testing of nuclear fuels and materials.

COOL UNDER PRESSURE

Keeping cool is vital in the nuclear sector and French firm CAP2i (F145) has 30 years experience of producing air and fluid conditioning systems for the nuclear industry that ensure safe and ongoing site operations. "We have dedicated systems for the nuclear industry that have resilience to accidents, explosion, earthquake and irradiation and can operate in extreme weather conditions," said project engineer Louis Juillac."

**HANDS ACROSS THE OCEAN**

The French Nuclear Energy Society (SFEN) and the Canadian Nuclear Association (CNA) cemented their relationship at WNE yesterday, signing an agreement to promote scientific and technological exchanges and cooperation. The agreement is aimed at developing the friendly exchange between the two organisations, and promoting the development of nuclear science and technology as part of the solution to fight climate change.

For France, Philippe Stohr (left) of CEA, with John Gorman, (right) of the Canadian Nuclear Association

EDF SIGNS MULTIPLE DEALS WITH INTERNATIONAL PARTNERS

EDF has signed a number of industrial cooperation agreements involving Czech, Polish, Indian, Saudi and French partners at WNE.

Czech cooperation agreements were signed with BAEST, I&C Energo, Hutní montáže, MICO, MSA, REKO Praha, SIGMA, Škoda JS, ÚJV Řež, and ZAT, in the presence of CPIA (the Czech Power Industry Alliance).

As part of EDF's strategy to deliver four to six units for the Polish nuclear power programme, EDF has also entered into cooperation agreements with leading Polish companies Dominion Polska, Egis Poland, Energomontaż-Północ Gdynia, Rafako, and Zarmen.

The company also signed a contract related to the Jaitapur Nuclear Power Plant project in Maharashtra, India.

EDF is supporting the Indian government's "Make in India" initiative through numerous

partnerships with local suppliers.

As part of the Indian government's "Make in India" initiative, EDF and Larsen and Toubro (L&T), one of the leading Indian conglomerates, further extended their cooperation agreement which has been in place since 2017.

This agreement aims to maximise the local content of the project through qualification of L&T's industrial manufacturing capabilities and assessment of the Indian nuclear supply chain.

FRAMEWORK AGREEMENT

Finally, EDF and Bouygues Travaux Publics entered into a framework agreement for their global cooperation on future European pressurised reactors (EPR) projects in the Czech Republic, Poland, or Saudi Arabia.

They signed a memorandum of understanding with the Saudi construction

company NESMA and Partners to jointly participate in the execution of civil works of a potential project in Saudi Arabia.

Jean-Bernard Lévy, EDF chairman and CEO said: "These industrial cooperation agreements clearly demonstrate the growing interest of many countries in nuclear energy and our ambition to secure robust partnerships with local supply chains for EPR projects worldwide.

"As an example, the significant involvement of the British supply chain for the Hinkley Point C EPR project is a tangible result of our long-term strategy with the local industry.

"We envision the same approach in any country where we promote our technologies and I look forward to seeing these cooperations materialising for the successful delivery of future EPR projects in Europe and worldwide."



Putting pen to paper: ASSystems' Christian Jeanneau (left) and Dassault's Laurent Valroff at the show

Assystem, Dassault Systèmes strengthens partnership

Assystem and Dassault Systèmes have extended their collaboration in nuclear engineering, aiming to harness digital technologies to improve the management and industrial performance of complex engineering projects.

After a first partnership in 2016, Assystem deployed Dassault Systèmes' 3DEXPERIENCE platform in its nuclear design offices to address more complex projects with greater efficiency.

Under the extended collaboration, Assystem will specify and integrate the platform's digital solutions with its customers to improve the efficiency of nuclear projects in Europe, Africa and the

Middle East.

Christian Jeanneau, senior vice-president of Digital at Assystem, said the partnership "will accelerate the deployment of digitalisation programmes for large and complex engineering projects... a crucial issue for developing a low-carbon electricity mix made up of nuclear and renewable energies, and for successfully completing the global energy transition."

For Dassault Systèmes, Florence Verzelen, executive vice-president, Industry, Marketing and Sustainability, said the renewed partnership "will increase our impact at a time when nuclear programmes are multiplying."

24%
of roles in nuclear are populated by women

30%
In comparison, women make up 30% of the workforce across all French industrial sectors

SMR innovation takes leap forward with XSMR

As the surge of interest in Small Modular Reactors (SMRs) grows, French pioneer in micro-nuclear power NAAREA has signed a cooperation agreement with Assystem to build an ultra-compact micro-nuclear power generator, the eXtra Small Modular Reactor (XSMR).

The announcement yesterday at the show heralded today's SMR and Advanced Reactor day. The XSMR is an ultra-compact, 1 to 40 megawatt power plant that uses the untapped potential of used radioactive materials and thorium, an unused mining reject. NAAREA expects the first units to be produced by 2030.

The proposed XSMR can be seen as a complement to France's Nuward project, which aims to develop an SMR in the 300-400

MWe range.

Assystem will provide project management, integration and engineering services for the XSMR. It will also develop a 'digital twin' of the reactor to model its behaviour. This will hasten development of an optimal design and enable the rapid launch of construction of the physical prototype.

Collaboration between NAAREA and Assystem has been under way for several months and is already delivering results, said Jean-Luc Alexandre, co-founder of NAAREA. "The agreement we are signing today... is a fundamental step in the progress of the NAAREA project."

Stéphane Aubarbier, COO of Assystem, described the company's mission as

developing decarbonised sources of electricity production globally to combat climate change. "As such, Advanced Modular Reactors represent an additional technology alongside high power reactors, SMRs and renewable energies to accelerate the energy transition."

In Canada, meanwhile, the country's largest power producer, Ontario Power Generation, is expected to announce a winning SMR design within weeks after evaluating options from Canada's Terrestrial Energy and Moltex (both in the 80-90MWe range) and one from GE-Hitachi (around 300MWe).

"We have a keen interest in this," said Carl Marcotte, senior vice-president, marketing and business development, Nuclear, of Canada's SNC Lavalin at the show yesterday. "As an

engineering company we've been working with many players behind the scenes to support their [SMR] development efforts."

Another keen proponent of SMRs is Hitachi Energy, which provides software to support asset management, supply chains and engineering change. One great advantage of SMRs is their 'cookie-cutter design', said Thomas Trepanier, senior vice-president, of Hitachi Energy's Generation Centre of Excellence.

That assembly-line approach also allows for standardised software and "our software is ready to align right now with the SMR concept."

 [Hear more about Nuward SMR and EDF today at 14.00 in Workshop 2](#)



Win: Win for women: Aline Des Cloizeaux (right), France president of Women in Nuclear, with vice-president Isabel Poli at the show

WOMEN'S EMPOWERMENT IN NUCLEAR: IT'S TIME TO ACT

Women make up less than a quarter of the workforce in the nuclear sector worldwide, hurting not only diversity within the industry

- a key point in ESG strategy emerging from the Paris Agreement - but also its competitiveness.

In France, this question is even more critical as the upcoming EPR2 newbuild and SMR programmes will require recruitment of thousands of people.

"With this huge need of talent, women have a key role to play," says Aline Des Cloizeaux, France president of Women in Nuclear (WiN), a non-profit organization of women working professionally in various areas of nuclear energy and radiation applications.

Mid 2021, as part of an action plan to promote gender balance in the nuclear sector, the Nuclear Energy Agency, an OECD organization, launched an international survey to measure the gender gaps in the global nuclear industry.

The French national survey conducted

by WiN France and GIFEN shows that with women comprising 24% - roughly in line with the rest of the developed world - the gender balance has remained flat over the last three years with under-representation of women in executive positions (10%) and in STEM (Science, Technology, Engineering and Mathematics) domains (21%) especially at technician levels.

Previously this percentage had increased, from 11% in 2011 up to 24% in 2018. And in comparison, women make up 30% of the workforce across all French industrial sectors. "Despite incentivising measures imposed by French law, the nuclear actors and their leaders have to get mobilized," said Aline.

Attracting more women to the nuclear industry is one of the main goals of WiN, which since its foundation in 1992 has been a strong advocate for environmental sustainability, diversity and gender equality.

In France, WiN acts on several fronts:

- Participation in forums and organized trades days for college students, high

school students, and women in job search at regional and national level,

- Mentoring of young graduates and professionals,
- Organization of the annual Fem'Energia awards in partnership with EDF,
- Organization of conferences on nuclear applications (energy, health, arts...)
- Participation in public debates on the energy transition,
- Joint events on gender diversity with other women's associations and networks.

At an international level, as for COP26, WiN Global uses its voice as a network of experts to call for urgent action from policymakers to include nuclear as part of the net-zero solution, and ensure that women are involved in all decision-making steps in addressing the climate crisis.

 [If you want to join us and help us to recruit women in nuclear industry, contact@win-france.org / www.win-france.org / www.win-global.org](#)

BUREAU VERITAS CELEBRATES SUCCESS WITH NEW ISO STANDARD

WNE sponsor Bureau Veritas (J90) celebrated the certification of a number of companies to the new ISO 19443 standard in a ceremony yesterday on its stand at WNE.

The new standard builds on ISO 9001 for enhanced quality management in line with the needs of the nuclear industry. It merges safety best practice with requirements that are unique to the sector.

Where the ISO 9001 focuses on the requirements of a quality management system, ISO 19443 has built on these requirements with a specific focus on nuclear safety - 'designing safety in' for companies that produce equipment, systems and services for the nuclear industry.

Bureau Veritas is a global leader in testing, inspection and certification. It offers innovative solutions for assessment on compliance with the standards and regulations to reduce risk, improve performance and promote sustainable development.



High standards: Jean-Louis Falgoux, of Bureau Veritas celebrating the certification of a number of companies to the new ISO 19443 standard

1,000



More than 1,000 UK businesses have participated in F4N since 2011

6



nations are in discussion with NAMRC looking to benchmark their suppliers' nuclear performance against the F4N standards

WINNING OAKRIDGE APP AIDS PREDICTIVE MAINTENANCE

French engineering and consulting specialist Oakridge is in celebration mode, marking two decades of dedicated focus on the nuclear industry plus its win in the WNE Awards.

"Over 20 years, whether it was trendy or not to work in the nuclear sector, we did," said Oakridge's president Cyrille Molina.

On Tuesday, the company lifted a WNE award for its Nuclear Ex-Core Instrumentation System app (NESTER).

NESTER is used by EDF to manage the neutronic channel measurement chamber, a critical piece of equipment in 19 nuclear power plants (NPPs) in France.

NESTER helps to manage the maintenance programme for this equipment. If an NPP goes off-line because of a problem with this component, it can be out of action for one to two weeks. So, NESTER assists in predictive maintenance, allowing long-lead replacement components to be ordered in plenty of time before a failure.

The app was developed to save EDF both time and money in overseeing the health of this component, said Olivier Cochard, Oakridge's vice-president development.

The company is now heavily engaged on several major newbuild projects, including the detailed design phase of the UK's Hinkley Point C and the basic design phase of Sizewell C.

Additionally, it is involved with the ITER project as well as EPR 2 development, which will see the creation of a second generation of EPR reactors to renew France's current fleet.

inbrief

IT'S MAGIC: AUTOMATED MOTION CONTROL

Magics (C66), a specialist in the design of semiconductor chips and machine-learning-based sensors, is promoting its radiation-hardened integrated circuits for the support of automation in motion control.



Left: Olivia Columbus from the USA tries her hand at Loxam's virtual reality (VR) training scenario

Below: Siléane's Kamido nuclear waste sorter and segregator in action



SHOW HIGHLIGHTS ADVANCES IN REMOTE HANDLING TOOLS



Try your hand with Wälischmiller's remote manipulator on stand (D24)

Remote handling and manipulation in the nuclear industry has come on in leaps and bounds over the past few years.

From manually operated manipulators, through fully automated robots, to the latest virtual reality (VR) systems, it has never been easier to safely handle nuclear materials in hot cells, nuclear medicine applications or during decommissioning.

Wälischmiller Engineering (D24) is giving visitors at the show the chance to try its manual manipulator for themselves. Can you put the wooden blocks in their correct holes?

In the real world, its A100 manipulator copes with tasks in areas that are inaccessible to human operators. The A100 is available as a basic or double-telescopic manipulator and has a reach of up to 5m and a 20kg handling capacity.

The A100 components in the hot cell, such as gripper tongs and jaws, or additional tools, can be changed remotely, even when using protective covers.

Meanwhile, on the Siléane stand (B32) visitors can see how its Kamido robot can sort

and segregate nuclear waste automatically. Its artificial intelligence (AI) system identifies picking possibilities and sorts the waste, putting it into the right container.

This allows it to meet a high production rate in difficult areas. The product entered the active phase with real waste in June 2019.

On the Loxam stand (C146), the latest virtual reality training system is on display. Visitors can don an Oculus Rift VR headset and take a virtual trip around a site, complete with a bumpy ride as they go.

This realistic scenario is used for driver training and shows just how far VR has come in the last few years.

VR makes it possible to create realistic and immersive training environments relating to nuclear power plants to train operators on how to perform tasks safely. VR training allows operators to practice various situations – such as emergency evacuation, plant operation, fuel handling, leaks and fires – in a virtual site.

The nuclear industry can use VR training to increase efficiency and maximise operations. It is a safe way of training teams and attracting young workers to the industry.

“From manually operated manipulators, through fully automated robots, to the latest virtual reality (VR) systems, it has never been easier to safely handle nuclear materials”

UK organisation NAMRC demystifies nuclear for suppliers worldwide

British-run business development programme, which gets suppliers ready for success in the nuclear supply chain, is spreading its wings and going global.

The Fit for Nuclear (F4N) programme is run by the Nuclear Advanced Manufacturing Research Centre (J136) in Sheffield, UK.

More than 1,000 UK businesses have participated in F4N since 2011, learning what the market expects from them, what they may be capable of supplying, and where they could sit in the nuclear supply chain.

"F4N is an industry-recognised hallmark of

business excellence," explains Lead Industrial Advisor Kevin Shepherd. "Suppliers follow our programme through an online portal, which manages the process in logical steps, and enables them to measure their operations against the standards required to supply the nuclear industry.

"It's also backed up by a team of industrial advisors with a strong industry background, who are forward-thinking and passionate about engineering. Plus, we have access to the world's best nuclear experts within NAMRC, so suppliers get a programme that's unmatched worldwide."

Increasingly, the F4N team is exporting its expertise overseas. In particular, it works with governments looking to develop similar programmes domestically and developers who are keen to build links with the UK supply chain.

In one project, NAMRC successfully collaborated with the UAE. The nine-month project, based on F4N, saw the team guide six UAE manufacturers through the early stages of assessment and support. This ultimately gave them the skills and experience to win contracts on the nuclear plant at Barakah.

Following that success, NAMRC is in discussion with six other nations keen to benchmark the nuclear performance of their own suppliers against the proven standards of F4N.

"By taking our programme outside the UK, we can use our domestic experience to foster international collaboration, as well as helping create new opportunities for UK companies worldwide," says Shepherd.



NAMRC workshop - 'Supply Chain and Opportunities': Workshop 1, 11.30 today

DAMAVAN PUTS BINOCULAR CAMERA ON DISPLAY

Low activity contamination can be a big problem particularly in the final stages of decommissioning. The classic Compton Camera, traditionally used, requires a long exposure.

But a business exhibiting in the Start-up Planet at the show has a solution.

Damavan Imaging from Troyes has developed a Binocular Compton Camera. "We had the camera ready in 2020 and then of course the Covid pandemic began. It is great to be at the exhibition now and meet people again. There has been a lot of interest in the camera," said Alain Ittis, chairman of Damavan Imaging.

The binocular Compton camera has two detector blocks 20cm apart which allows independent reconstruction of the

radioactivity. The data from the two blocks are then merged into a single probability distribution from a greater distance.

"Before an operator had to go close to manually scan a wall. Now we can do it quickly from a distance," Ittis said. "It brings savings when dismantling."

The new binocular system has been ordered by Amec Foster Wheeler/Wood for the Sellafield nuclear decommissioning project. The camera allows for a fast quantitative assessment of radiologic environment in order to better plan human intervention and waste disposal, the company said.

Right: Life through a lens: Damavan Imaging chairman Alain Ittis, showing off the Compton Camera



Above: Dr Tom Page demonstrates how CARTA and its augmented reality training tool will help a new generation of people in nuclear

GET CARTA...

UK consultancy Cerberus Nuclear has one of the largest independent criticality safety teams in the UK and is at WNE with a product that can take safety to a new level.

Based in the Start-up Planet, Cerberus has recognised a gap in the training market and is delivering an augmented reality system to help operators, project managers and others to understand the physics in criticality decision making.

"In the past, training has been done using Powerpoint to explain the physics and people just switch off", said Dr Tom Page, director criticality, safety and characterisation. "We worked with the regulators, Sellafield and Dounreay and others in the Atomic Resilience Consortium (ARC) to develop CARTA (Criticality Augmented Reality Training Aid) which with its augmented reality allows people to see what happens as an effect of their actions," Page said.

ROBOT TAKES THE RISK INSIDE REACTORS

French companies Elements (M17) and Innotech (L21) are showing a new robot in the Start-Up Planet that can monitor and investigate radioactive areas within nuclear facilities.

Innotech supplies the wheeled robot, while Elements provides the WiFi hub and communications links that connect the robot to an operator, stationed in a safe area.

The robot contains a camera and sensor to

allow it to undertake dose cartography, measuring areas of high and low radioactivity; the r3Care technology monitors the health of equipment within 'hot' areas of a nuclear facility and can detect when that equipment is about to fail.

Initial trials have been held in the past few weeks at Blayais nuclear power station near Bordeaux, in southwest France, with more trials planned for the near future.

Right: Wheely great: Edwige Aublant of Elements with Innotech's robot



inbrief

CONTAMINATION RISKS TARGETED BY CARMA

Contamination protection is a key element in the work of CARMA MC (F129), a French company specialising in development and marketing of a range of products to protect against radioactive dust in the form of isolation SAS in technical fabrics as well alpha and beta contamination with glove boxes. The company's lead mattress solutions and flexible structures protect against gamma radiation, provide protection solutions for equipment used in areas, with radiation protection covers and decontamination showers to limit the spread of sensitive particles.

FINN SPECIALIST IN PLANT INSPECTIONS

With independent and impartial conformity assessments and plant inspections a key factor in the safety of nuclear operation, Finland's DEKRA (C86) is ready to step in worldwide. It offers structural, commissioning and scheduled inspections. The company performs testing and assessment of pressure, electrical, fire alarm and fire extinguishing equipment, non-destructive testing (NDT) and destructive testing (DT).

BERTIN MONITOR DETECTS RADIATION IN LOADS

Bertin Technologies (J76) is showcasing its SaphyGATE G automatic radiological portal monitor. The device uses a smart algorithm to detect very low sources of artificial and natural radiation in truck, train and container loads.

CUSTOM-DESIGNED FASTENERS ON OFFER

When it comes to fastening solutions, AMECA (C32) has 40 years of production experience ranging from thread inserts and tangless inserts. The French company's design department works with customers to develop customised fasteners whether simple or complex.

START-UP'S RADIATION PROTECTION SOFTWARE

French start-up ABGX (L23) is at the show demonstrating its radiation protection software. Working in collaboration with operators in the radiation protection industry, the Clermont-Ferrand based firm has developed a daily management tool.

ADVANCED TOOLS FROM TYROLIT

Tyrolit (L22) is at WNE to showcase its pioneering machinery and diamond tools for drilling, as well as wire or wall sawing, which excel on durability, cutting ability and machine efficiency.

NETALUX LASER-BASED SYSTEMS CLEAN UP

Netalux (C66) is showing how to revolutionise cleaning. Its laser-systems can convert rusty components to brand new in seconds.

LIVESTREAM / REPLAY CONTENT

Look for this icon to watch this content live or on replay via the WNE LIVE & CONNECT platform



2040
Polish Energy Policy target is for more than half of the country's energy to be from zero-emission sources

6
Nuclear energy is at the heart of the programme, with a plan to develop up to six NPPs

DAY THREE
Programme highlights

Venue: Panel Discussion room unless otherwise stated

09.15–10.15 Keynote: SMRs and Advanced Reactors

11.00–12.00 Start-up pitches; Start-up Planet

11.30–13.00 SMR Techno Pitch and Debate

16.00–17.00 Closing ceremony

POLAND READY TO RAMP UP DOMESTIC NUCLEAR INDUSTRY

Poland is on the starting blocks to relaunch its nuclear programme – and the businesses in its growing support industry cannot wait.

In February the country's Council of Ministers approved the Polish Energy Policy 2040 and set a target for more than half of the country's energy capacity to be produced from zero-emission sources.

Nuclear energy is at the heart of this programme with a plan to develop up to six nuclear power plants (NPPs). Construction on the first will begin in 2026 and be commissioned in 2033. The last of the units will begin operations in 2043.

Poland has also become a focus of interest for companies seeking to develop small modular reactors (SMRs).

Moving from resolution to action cannot come too soon for the support industry.

Dmitri Bochenko is head of APS Energia's nuclear energy department which has been supplying safety and safety-related equipment for NPPs for more than 10 years.

"We have been providing equipment to Russia, India, Ukraine and Belarus among others at nine plants worldwide," Bochenko said. The company is hoping to work with EDF on future projects as the Polish market opens.

"We have developed a lot of experience and are excited about Poland moving to nuclear power," he said. "We know the advantages to



"We are excited about Poland moving to nuclear power" - Dmitri Bochenko, APS Energia

the planet with the reduction of CO₂ and other emissions."

Poland had begun a nuclear programme back in the 1980s at Zarnowec but the project was cancelled. The Baltic coastal site is likely to be one of the options for the launch site of the new programme along with Lubiatowo-Kopalino, also on the Baltic coast and an existing coal-fired plant at Kurchatow.

Poland's existing heavy industry and its resource extraction companies are said to be

actively interested in investing in SMRs for their existing industrial sites.

Another Polish company here at WNE and looking forward to developing a domestic market as well as an international one is Ecol.

Ecol offers condition monitoring by oil analysis and provides simultaneous collaboration with research units all over the world. It also provides hydrodynamic and chemical cleaners on condensers, turbines and other industrial systems.

inbrief

COMPACT DIRECTIONAL DETECTOR ON DISPLAY

An innovative compact directional detector is being showcased by Neutron3D (M28). The instrument measures neutron energy between 10 keV and 200 MeV as well as locating neutron sources, thanks to an innovative 3D camera providing 50 million pictures per second.

GERMAN NUCLEAR INDUSTRY / GERMAN QUALITY

Still Made in Germany

State-of-the-Art Technology and Know-how of the Pioneers in Nuclear Technology is presented by

- **BIG Entsorgungstechnologien** | D28 Disposal technology products
- **Böllhoff Verbindungstechnik** | D39 Fastening and assembly technology
- **GNS Gesellschaft für Nuklear-Service** | D32 Nuclear casks, spent fuel, waste management
- **Halfen / Leviat** | D21 Connections
- **IEM FörderTechnik** | D29 Nuclear waste handling systems
- **KSG | GfS Gesellschaft für Simulatorschulung** | D31 Technical training, human performance
- **MAUELL** | D30 Control room technology
- **pro-beam** | D34 Electron beam and laser technology
- **Safetec Entsorgungs- und Sicherheitstechnik** | D36 Radiation protection, dismantling, waste management and measurement
- **Schmiedewerke Gröditz** Smelting, forging, ring-rolling
- **Siemens Energy Global** | D25 I&C technology
- **SOMMER Design & Security** | D37 Safety doors, high security technology
- **VGB PowerTech** | D31 Technical association of energy plant operators
- **XORELLA-FRANK** | D26 Solenoid valves

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