NEW FEATURES, GREATER ADDED VALUE

WNE 2018 got off to a good start yesterday with a full programme of events and lively conversations in the exhibition hall, topped off by the presentation of trophies to the eight winners of our second WNE Awards. Congratulations to them, and to everyone who had a successful first day at the show.

Today promises to be just as interesting. Just like the dynamic industry WNE serves, the show itself is continually evolving. In 2016, we launched the WNE Awards. An important feature we are introducing this year – which we believe will prove as successful as the awards – is our guided tours of the exhibition. We know it can be a challenge to find and meet the right people at an event such as WNE, so we have identified some of our most innovative exhibitors to fast-track your show experience. Those who sign up for a tour will get a brief introduction, in the space of about an hour, to 10 companies they may be interested in, and can follow up after the tour at their leisure.

There are four separate tours, focusing on Dismantling and Deconstruction (D&D) and Deconstruction. The tours are being run morning and afternoon today and tomorrow. I strongly recommend them to you.

A second new feature at this year’s show, one which we are very proud to present, is our lunchtime debates. There are two, one today and one tomorrow, which we believe will prove as successful as the awards.

You can also follow the debates live on our dedicated website.

The guided tours of the exhibition will be run morning and afternoon today and tomorrow. 

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NUCLEAR INVESTMENT IS VITAL FOR FRANCE

The importance of the nuclear energy industry to France, its economy and industrial future was reinforced as Bruno Le Maire, France’s economy and finance minister, officially opened WNE yesterday. Le Maire said the country must continue to invest in the sector in order to lead the global industry in skills and technology. “This is now the third largest industrial sector in France with more than 220,000 direct jobs. We are investing in innovation. With €10bn invested in recent years we are showing the confidence the state has in the nuclear energy industry.”

The minister swept aside concerns that the sector was threatened by investment being directed toward renewable energies. “France is in equilibrium” he said. “We have a temperate climate, temperate politics and in our energy too we must balance between renewable energies and nuclear energy. We rely on nuclear energy to develop while at the same time ensuring we have the growth in renewable energies.”

Le Maire said that France’s competitiveness relies on the efficiency and stability of nuclear energy, French energy costs 40% less than that of its European partner Germany, he said “We have to continue to look forward” he said. “The investment in disruptive technologies should ensure France becomes the master of the storage of reactive materials. We should be a country of new technology, initiatives and working together with other countries.”

The need to work with developing nations in gaining access to nuclear power was a key message from Yukiya Amano, the director general of the International Atomic Energy Agency (IAEA). “Energy security and the need for nuclear power are key issues for developing nations and are driving the need for a sustainable future,” he said.

Continued on p2
Abu Dhabi opts for Assystem support

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s the UAE celebrates the near completion of its first of its four reactors at Barakah in Abu Dhabi, a new joint venture was signed at WNE to provide engineering support for the Gulf country’s ongoing nuclear programme. French-headquartered Assystem – now operating on nuclear projects in 13 countries – inked the agreement with Abu Dhabi engineering company NAMA, which provides specialised design, engineering, project management and construction and contracting services in the emirate. The new venture, called Emirates Nuclear Systems and Services (ENSS), will support sustainability in the UAE’s new nuclear industry.

Assystem chief executive Stéphane Aubarbiert said: “We partnered with NAMA, one of the permanent industrial systems and services in the field in the UAE, to make a sustainable presence in the UAE nuclear programme. It is not only a matter of construction. It is a long-term activity. We are working together to help find solutions to sustainability.”

The UAE government has been developing science and engineering skills through education as one of the strands of the government’s future policy. The new ENSS chairman, Abdulsamad Nassouri, said that the new venture would take it a stage further into the private sector.

“The is a lot of training happening with the government’s Emirates Nuclear Energy Corporation which trains its own staff, but what we aim to do is provide local engineering support, manned by UAE nationals who are in the private sector, and support the operation of the nuclear power plant,” he said.

“How do we do that? By handpicking Emiratis and sending them to France to Assystem. Through their networks, they will receive on-the-job training, perhaps in some EDF plants or engineering companies, then when they come back to the UAE they will be experienced in providing real engineering support for operating companies and provide that know-how in the UAE.”

Matthew Hollis, NAMA’s managing director, said the company and the new joint venture were committed to having a long-term presence in the UAE.

Nassouri agreed: “We have plans to help build the infrastructure to support the plant, for example, repair facilities for equipment exposed to radiation, and help government build facilities for managing waste, be it low, intermediate and eventually high-level waste,” he said.

Currently, the second reactor at the Barakah nuclear power plant project is 92% complete, the third 81%, and the fourth 61%. The overall completion rate of the entire project currently stands at 86%...

INVESTMENT IN NUCLEAR IS VITAL FOR FRENCH ECONOMY

is an essential tool for development. Increasing supply of energy will help two million people come out of energy poverty,” he said. Nuclear power plants (NPPs) offer a stable supply and eliminate greenhouse gases (GHG). Amano said. To meet targets on CO2 emissions, the world must switch from its current 70% reliance on fossil fuels to 80% supply coming from low GHG generators such as a nuclear or renewables.

Amano (right) said: “The pace of construction of NPPs must accelerate if we are to attain our objectives. It is difficult to envision another low-carbon system will replace nuclear. Asia is seeing the largest and fastest growth. Most of the 58 reactors being constructed now are in Asia. Amano stressed that one of the biggest challenges facing the industry remained public acceptance: “Of course development of technology is important, but we need to secure public acceptance. The investment in enhancing safety since the Fukushima incident is helping develop public confidence and acceptance,” he said.
Operational excellence, in the context of a nuclear power plant (NPP), is the dedicated focus and attention to detail relative not only to how the NPP operates, but also the support provided to the plant. It's all-encompassing, says Maria Korsnick, and she should know. Before she became president and chief executive of the US's Nuclear Energy Institute (NEI), she came up through the ranks of the nuclear industry and 'walked in the shoes' of an operator.

She said: "All the different jobs at an NPP support operational excellence. It's a question of providing what operators need to do their job well, to keep their focus on the power plant, to operate safely."

Korsnick brought her decades of expertise to the WNE Awards this year as chair of the jury judging the operational excellence category.

Choosing two winners and four runners-up from among 110 entries from around the world wasn't an easy task, she said. "It was challenging in a good way and testament to the fantastic applications. There were some great innovations. They all provided value. It was encouraging to see."

"You can only pay attention to so many things. If you're working in an inefficient way, you're using your attention poorly. Reducing the burden can help you spend time better on more important things."

She was instrumental in launching the NEI's 'Delivering the Nuclear Promise' strategy in 2016. It was conceived as a way of helping pull the industry together and coming up with ways to improve efficiency and reliability, disseminated through bulletins – now numbering 67 – which are posted publicly on NEI's website. The programme has helped enable savings of $1.7bn across the industry, Korsnick said, and while the monetary value is significant, so is the efficiency created and the focus and attention it brings. Although the NEI's bulletins are intended for an American audience subject to US regulations, they could still be "meaningful" in other jurisdictions.

See p5 for pictures of this year's WNE award-winners.

Second life extensions

NEI is involved in "ground-breaking" work on second licence renewal, under which NPPs can apply for a second 20-year extension of their original 40-year licences.

Korsnick said the Institute worked with the US Department of Energy and others to prove the feasibility of second life extension, a repeat of the work it had done to promote first licence renewal.

Florida’s Turkey Point NPP was the first to apply for a second 20-year licence renewal. Its owner, Florida Power & Light (FPL), said the licence renewals would allow Turkey Point’s two reactors to operate until 2052 and 2053 "and save FPL customers billions of dollars by avoiding the need for other more expensive power generation."

Korsnick said she expected others would follow this year and next. "This is setting the tone worldwide and showing others that it is possible. I’m optimistic that it will be under two years for regulator approval this go-round."

Welsh NPP work ‘on schedule’

Hitachi-GE Nuclear Energy (C173) is ‘on schedule’ with its work on the Wylfa Newydd nuclear power plant (NPP) project in Wales.

A company spokesman confirmed that the Japanese-American alliance had completed a four-year generic design assessment (GDA) process in December 2017, and will carry out engineering work under contract from Horizon, the UK subsidiary of Hitachi which is developing the NPP.

The project, one of several in the UK’s recently revived nuclear programme, is the subject of media reports on the state of the financial agreement with the UK government and ongoing discussions between the parties.

In Japan, Hitachi-GE is focusing on preparation work for plant restart and decommissioning of Fukushima, in addition to new construction projects and maintenance projects worldwide.

The company is at WNE to showcase its broad experience and capabilities, including its Advanced Boiling Water Reactor (ABWR), which it describes as "the world’s most experienced operational Generation IV reactor", and other innovative work.

Hitachi-GE is cooperating with its sister company GE Hitachi on the development of the BBWR-300 small modular reactor (SMR) and PRISM Generation IV reactor.

For more than 70 years the German company Wälschmiller Engineering is a leading manufacturer of industrial manipulation especially for high-safety projects in the nuclear area, hazardous environments and rough industrial practice. We offer unique, cost-effective and very smart solutions for safe remote handling, remote handling devices, robotics and radiation protection equipments – all engineered and made in Germany. Just grab for reliability and safety!
Immersiv.io uses AR to improve processes

Immersiv.io (K46) provides collaborative solutions with augmented reality (AR) to improve industrial processes such as design, training and maintenance. It says AR can help technicians handle complex tasks by presenting information exactly where and when they need it. Remote assistance by an expert is also available directly from an audio headset. The technology is useful for training as it enables contextual role-playing, either in real life or remotely.

Road more about Digitalisation at world-nuclear-exhibition.com

New instrument range to monitor radiation

APVL ingénierie’s capabilities also include installation, commissioning, training and maintenance services plus a metrology department equipped with two laboratories that incorporate an X-ray generator and a gamma/neutron irradiator.

VTT ProperScan extends facility lifespan

Finland’s VTT (D155) says its ProperScan service offers a collection of semi-analytical tools and research designed to extend the lives of nuclear facilities and their components. VTT says it can extend component lifetimes by understanding the root cause analysis of failure mechanisms, corrosion management, and the evaluation of mechanical behaviour. It says its scientific research and practical experience of materials covers processes at temperatures up to 1,500°C. The company can provide criticality audits, maintenance planning and risk-based inspections to ensure operations run at maximum efficiency.

Intelligent monitoring of industrial fluids

Pall Corporation (F19) is showcasing its new Crixus ‘Intelligent’ Fluid monitoring platform. Pall says it gives real-time data to instantly warn of performance issues and potential problems in industrial fluids.

NUCLEOPOlis – A NEW NORMAN CONQUEST

Flying the flag for the burgeoning nuclear industry in Normandy is the aptly named Nucleoplis (H142), an association for organisations and companies working in the sector. It is part of the Normandie Energies cluster and demonstrates the importance of the sector to Normandy.

“We have more than 100 companies and organisations in the group now,” said Elise Ducot, director of Nucleoplis. “These range from the big companies like EDF or CEA through to small and medium-sized enterprises that gather all the skills in the nuclear fuel cycle value chain, from research to dismantling as well as electricity generation, recycling of used fuel and storage of final waste.”

More than 15% of French nuclear facilities are in the Normandy region. They account for 18,000 direct jobs and 10,000 indirect jobs with a combined value of €3bn to the region.

The goal of Nucleoplis is to make its members more competitive and to promote access to new markets. It does this through providing training resources, sharing innovation and shared marketing at events such as this week’s WNE.

REPORT | STEVE NICHOLS

The ITER research reactor, which will mimic the sun’s nuclear processes, is well on its way to producing its first plasma in December 2025.

ITER will use hydrogen fusion controlled by huge superconducting magnets to produce massive heat energy. Its hydrogen plasma will be heated to 150 million degrees Celsius, 10 times hotter than the core of the sun, to enable the fusion reaction.

At the same time its superconducting magnets must be cooled to minus 269°C – as cold as interstellar space. The project is being built at Saint-Paul-lez-Durance in the south of France by a scientific partnership of 35 countries and will be the world’s largest experimental tokamak fusion facility.

“Our design has taken advantage of the best expertise of every member’s scientific and industrial basis,” said ITER director general Ilennard Bigot pictured right. “No country could do this alone. We are all learning from each other, for the world’s mutual benefit.”

More than 200 doughnut-shaped tokamaks around the world have contributed knowledge and research, paving the way for ITER.

A two-decade research programme is planned during which the members will share the experimental results and any intellectual property-generated.

Europe is contributing almost half of the construction costs (45.6%), while the other six member states – China, India, Japan, South Korea, Russia and the United States – are contributing equally to the rest (9.1% each).

Preparation for machine assembly has begun and the cryostat, the twin magnet power conversion buildings, the assembly hall and the cooling tower zone have now received their first equipment.

In factories on three continents, ITER members have continued to manufacture strategic components.

On site, the fifth 18m-diameter field coil is currently being wound in the poloidal field coil winding facility. Nearby in the cryostat workshop, Indian contractors have nearly completed work on a second cryostat section – the lower cylinder – and continue with welding and nondestructive examination testing of the cryostat base.

Bigot said “The stakes are very high for ITER. When we prove that fusion is a viable energy source, it will eventually replace burning fossil fuels, which are non-renewable and non-sustainable. “Fusion will be complementary with wind, solar, and other renewable energies.”

ITER says the final goal is not just circulating plasma (scheduled for 2025), but fusing deuterium and tritium to create a “burning” plasma that generates significantly more energy than it uses.

ITER as a research facility won’t generate any electricity from the heat, but it will pave the way for future commercial fusion power plants.

ITER TARGETS 2025 FOR FIRST FUSION PLASMA
Everyone’s a winner! Smiles all round from the 2018 WNE award-winners.

**WNE AWARDS**

—This year’s eight winners collecting their awards at the ceremony last night—

**STARS OF THE SHOW**

Eight awards, eight grand prize winners. Those were the results revealed yesterday afternoon at the second WNE Awards presentation. But the judges were unanimous in their declaration that all 148 entrants were winners, thanks to the exceptionally high quality of their entries.

**INNOVATION**

1) **Big Companies**—Orano Projets (Gamma visualization) – An ultra-compact gamma camera in support of nuclear investigation operations.

2) **SMEs/VSEs**—Oreka Group (Simulation 3D) – DEMplus for nuclear safety.

**NUCLEAR SAFETY**

3) **Big Companies**—EDF – Innovative foundation to avoid the ruin of buildings by liquefaction in case of earthquake.

4) **SMEs/VSEs**—Laboratoire Cevidra – New emergency medical treatment for external exposure to uranium, plutonium, americium and thorium.

**OPERATIONAL EXCELLENCE**

5) **Big Companies**—ABB – ABB Ability™ Asset Suite.

6) **SMEs/VSEs**—Newtesol – Cladding welding technology.

**SKILLS & KNOWLEDGE MANAGEMENT**

7) **Big Companies**—Rosatom – Integrated approach to implementation of the knowledge management system at JSC ‘Afrikantov OKBM’.

8) **SMEs/VSEs**—Experconnect – Innovaging management.
EDF and GE sign agreement for six EPRs in India

EDF (F137) and GE Power have signed a strategic cooperation agreement for the planned construction of six EPR nuclear reactors at the Jaitapur site at Maharashtra, India.

The agreement, signed at WNE by Xavier Ursat, EDF’s group senior executive vice-president in charge of new nuclear projects and engineering, and Andreas Lusch, president and chief executive of GE Power’s Steam Power business, lays the foundations for a long-term partnership for the construction of the conventional island on each of the six reactor units.

GE Power will design the island and supply its main components. The company will also provide operational support services and a training programme to respond to the requirements of the Nuclear Power Corporation of India (NPCIL), the owner and operator of the future nuclear power plant, currently under discussion.

EDF will be responsible for engineering integration covering the entire project (nuclear island, conventional island and auxiliary systems) and will provide all the requisite input data.

EDF and GE Power say they will move forward with the work currently being performed to freeze the project’s technical options, fine-tune industrial arrangements between both companies and finalise the design-engineering and procurement schedule.

Meanwhile, GE Power’s Steam Power and EDF Energy have just announced another project milestone for the Hinkley Point C (HPC) project in England. GE has started manufacturing the first rotor of HPC’s Arabelle steam turbine at its French centre of excellence at Belfort under a contract awarded in May 2016.

The first 1770 MWe EPR reactor unit is on track for 2023 completion.

WESTINGHOUSE LOADS FUEL IN SECOND CHINESE AP1000 PLANT IN SHANDONG

Westinghouse Electric Company (WEC), along with customers China State Nuclear Power Technology Corporation (SNPTC) and Shandong Nuclear Power Company (SDNPC) have announced they have begun to load fuel into the Haiyang Unit 1 AP1000 nuclear power plant in China.

The fuel loading started on 21 June after the reactor passed all the required testing and regulatory reviews. José Emeterio Gutiérrez, Westinghouse president and chief executive officer, said: “This is a great day for Westinghouse, our China partners and the nuclear industry. Haiyang Unit 1 continues to demonstrate our ability to deliver safe, innovative solutions for power generation.”

The plant’s start-up process includes the completed testing phase, the fuel load, initial criticality and synchronisation to the electrical grid before an increase to 100% power. Westinghouse currently has six AP1000 nuclear power plants progressing through construction, testing and start-up, four in China and two in the USA.

REPORT: STEVE NICHOLS

ROLLS-ROYCE AND CTEC SIGN AGREEMENT ON I&C SOLUTIONS

R olls-Royce and CTEC have signed an agreement at WNE to provide instrumentation and Control (I&C) integrated solutions to the global nuclear market.

The companies plan to integrate their respective I&C technologies and expertise on selected projects abroad and in China. They say the agreement will enable the future involvement of CTEC in international projects, as well as the future involvement of Rolls-Royce in upcoming projects in China.

Eric Blanc, Rolls-Royce, civil nuclear, president I&C, said: “This agreement underpins the full alignment of our shared objectives and agreed timelines, marking another significant step in driving our cooperation towards greater success in multiple key areas.”

Jiang Guoyin, CTEC general manager, added: “Today is a new step of our cooperation, based on years of efforts in building understanding and trust between us.”

The agreement will see us further strengthening our already strong partnership and leveraging our combined capabilities and expertise to develop safe, reliable and competitive nuclear I&C solutions for China, and the world.”

Under the agreement, Rolls-Royce and CTEC have also committed to releasing a new distributed control system (DCS) platform made from a combination of their existing digital and analogue technologies: Spinline and Hardline for Rolls-Royce; FirmSys and Frelief for CTEC.

Rolls-Royce says Spinline is a modular digital solution dedicated to developing safety I&C systems for nuclear reactors. It’s specifically designed to implement Class 1E/Category A safety functions and is currently installed in more than 90 nuclear reactors around the world.

Hardline is the latest generation of hardened safety technology developed by Rolls-Royce and specifically designed for nuclear safety I&C. Its platform allows building new or programmed safety systems to monitor and control nuclear reactors.

CTEC is a provider of both safety and non-safety distributed control systems and is involved in newbuild and in-service programmes across China and the world. It says five of its platforms have been applied in more than 600 I&C projects, covering various types of nuclear reactors, such as the M310, CPR1000, ACPR1000, HPR1000 and High Temperature Reactor (HTR).

It has successfully delivered the first FirmSys safety DCS system for Yangjiang 5, a nuclear power reactor connected to the grid in May 2018, which was considered a major milestone in the development of indigenous safety DCS technology in China.

The companies say the new integrated platform will provide both parties with extended flexibility to better adapt to stringent customer needs and requirements.

The agreement also lays the foundations for continued discussions in exploring further development of new joint technologies.
CLEANING WITH PURE LIGHT

Laser cleaning is a new, innovative approach to cleaning hazardous materials, plus nuclear engineering expertise means we have what it takes to decontaminate in the nuclear sector and have an impact on the upcoming decommissioning wave. Want to know more? Come and visit us at booth C43 at WNE.

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OREKA GROUP | VIRTUAL REALITY

SYNERGIES OF NUCLEAR EXPERTISE

Since 2010, OREKA Group companies have offered optimised performance, control data and project risks through comprehensive and innovative solutions. Our customised solutions make use of DEMplus software for nuclear and 3D (mockup, assistance, advice); our collaborative approach benefits from the expertise of our team and our network of experts; our partners, specific software development, training, engineering; and the Presage immersive room at Marcoule (south of France).

OREKA Solutions is the only company offering an intervention simulation tool for the nuclear environment achieving comprehensive ALARA approaches, optimising waste management and finally reducing project costs and delays.

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Private sector investment is poised to make a major impact on the nuclear industry, thanks to the development of advanced walkaway safe reactors. The new technology that promises smaller, cheaper, cleaner and safer reactors also holds the key to broadening the scope for investors worldwide who increasingly see nuclear as a sound investment.

It’s the focus of tomorrow’s Investors’ Day breakfast in the VIP lounge when Walter Howes, managing partner of the US merchant bank Veredis Capital, leads discussion on WNE’s Space X, Nuclear X. Where will the necessary capital (debt and equity) for new nuclear technologies come from?

“Currently, the majority of nuclear investment comes from government or sovereign wealth funds,” says Howes. “With these new technologies, there’s movement away from 95% government finance, to a much larger share coming from the private sector.” The globe is “awash in capital”, he says. There aren’t enough projects that financiers can flow on some of these projects. That’s where we’re headed,” he says. Howes sees a trend in the increasing movement away from 95% government investment comes from government or sovereign wealth funds,” says Howes. “With these new technologies, there’s movement away from 95% government investment.

One reason is the rapid development of a ‘new kind’ of nuclear technology: small modular reactors (SMRs). These are reactors that are smaller, safer and more cost-effective than traditional reactors. They can be built in a factory and then transported to the site where they will be used. This makes them a very attractive option for small and medium-sized projects.

Another reason is the increasing demand for nuclear energy. More and more countries are turning to nuclear energy as a source of clean, reliable and sustainable power. This is especially true in countries that have a lot of coal-fired power plants.

The characteristics of ARs “will be a compelling case technically,” going forward. The wave of investor interest in nuclear is “exceeding people’s expectations”, he says, and it’s accelerating.

Join Walter Howes at tomorrow’s Investors’ Day breakfast at WNE.