

EDUCATION | SPOTLIGHT

Our industry ignores training at its peril

STORY | STEVE NICHOLS

THE GLOBAL NUCLEAR industry needs thousands of recruits each year until 2020 if it is to reach its ambitious growth targets.

With many experienced nuclear engineers, who started their careers in the 1970s, approaching retirement age, the need for new people is becoming ever more acute.

The message at WNE is simple – countries that want to develop their own nuclear power industries must take education and training as seriously as France has. If they don't, they could be storing up problems for the future.

The problem was highlighted by Bernard Bigot, chairman of the French Alternative Energies and Atomic Energy Commission (CEA), who said: "With 72 civilian nuclear reactors under construction around the world and 173 projects being planned, the need for a growing army of individuals with the right skills is becoming more and more critical."

"The safe and reliable operation of current and future power plants relies first and foremost on people who can master these highly-advanced technologies."

Luckily, France saw a recruitment crisis looming years ago and launched its own government-backed organisation to avert disaster.

The International Institute of Nuclear Energy (I2EN) has a single mission – to provide France and its partner countries with the best human resource training and development for the nuclear industry.

Claude Barbatat, of I2EN's international relations, said the industry supported 220,000 direct jobs and many more in related disciplines. He estimated that around 15,000 recruits a year would be needed in France alone between now and 2020.

"About 1,400 students graduate each year



Above: 15,000 recruits a year are needed, said I2EN's Claude Barbatat at the show

from one of France's nuclear energy training programmes," Barbatat said. "Plus we have more than 200 PhDs, over 800 masters and around 100 technicians each year."

"The industry needs a lot of skilled people, which is why France has taken education so seriously."

"Thanks to careful and extensive work, our education system now covers the complete spectrum of professions necessary to the development and operation of a fleet of nuclear power plants and fuel cycle facilities."

As a massive player in the industry, EDF agreed and said it has a constant demand for people.

Bruno Mougel of EDF's HR division added: "EDF trains more than 1,500 people each year. We have to because of the large size of our nuclear business. One of the keys is to forge strong links with academia."

EDF supports many educational programmes, combining on-the-job training with study towards a nuclear engineering degree. They learn practical experience and engineering skills, plus get a kick-start towards a rewarding career.

NEWS | IN BRIEF

Day Two highlights

- French nuclear energy society (SFEN) used WNE to sign a cooperation agreement with the Mongolian Nuclear Society.
- Visit of Sergei Kirienko, CEO Rosatom.
- Visit of William D Magwood, Head of OECD Nuclear Energy Agency.
- Visit of Duong Quang Le, vice minister of industry, and Chi Dung Le, vice minister of science and technology, Vietnam.
- Visit of Areg Galstyan, minister of energy and natural resources, Armenia.
- Visit of Vigen Tchitchechian, Armenian ambassador to France.

Japanese move welcomed

France has welcomed Japan's announced intention to join an international nuclear liability instrument – the point where, in the event of a nuclear accident, national laws are supplemented by international conventions.

The news followed the fourth meeting of Japan-France Nuclear Cooperation Committee in Paris.

The committee reviewed progress made to strengthen French-Japanese cooperation in the field of fast neutron reactors, of decommissioning, decontamination, and an environmental survey related to the Fukushima incident.

Members also exchanged information on their respective nuclear energy and fuel cycle policies, and on nuclear safety regulation bilateral cooperation.

AMEC expands into France

International engineering, project management and consultancy company AMEC is expanding its nuclear division into France.

AMEC France (stand M26) is EDF's primary partner for engineering and consultancy services to the UK European pressurised reactor (EPR) new-build programme.

The company is also involved in the international thermonuclear experimental reactor (ITER) programme at Cadarache, and is positioned for a number of key opportunities, including hot cell and tritium project implementation (EPC) scope.

Licensed to thrill

Endel (stand F75), a GDZ Suez Group company, has signed a contract for multiple licences of the newly launched version of DEMplus for Nuclear, the 3D simulation software developed by Oreka Solutions (stand C48). The software provides a global view of a variety of nuclear project simulations.



Adding their signatures: EDF signs the contract for the rotating filters, (from left) Philip Jackson, general manager, Baudrey; Jean-Marc Miraucourt, director nuclear engineering division EDF, and Philippe Frantz, president and CEO, Reel SAS

CONTRACTS | SIGNING

Double delight for EDF

EDF HAS SIGNED two contracts during the show. The first with Reel SAS and Baudrey was for the renovation of large (11 to 22 metre diameter) rotating filters used in the pumping station of a nuclear power plant. The drums ensure easy transit of the water to the cooling systems of a nuclear facility.

The second deal, signed with Campenon Bernard Construction, Nuvia and Léon Grosse, covered the construction of buildings to house diesel back-up generators, used to strengthen safety following the Fukushima accident.

The first buildings will be erected at two different power plants. Eventually, 58 such generators will be used to equip the whole of EDF's nuclear facilities.

QUOTE OF THE DAY
LEONARDO DA VINCI

Learning never exhausts the mind...

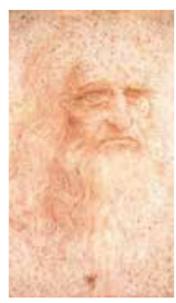


IMAGE: WIKIMEDIA COMMONS

EDITORIAL | GÉRARD KOTTMANN

Students' day at WNE!

WNE represents an opportunity for students – the future of our industry – to become immersed at the leading forum for international business meetings spanning all sectors of the civil nuclear industry and to get a better insight, identifying the range of skills needed.

Students, and of course all interested visitors, are invited to attend the panel discussion on training human resources for the nuclear programme, hosted by Yves Bréchet, High Commissioner for Atomic Energy (France), which will enlighten them about the need for expertise in the nuclear field.

Also, this morning, there is a panel discussion dedicated to medical applications, entitled 'Radionuclides and health: a promising future!' hosted by Richard Zimmermann, consultant in nuclear medicine – Chrysalium Consulting SARL.

There are 22 workshops today, offering you the possibility to listen to presentations from major industry players exhibiting at WNE.

This is your last day at WNE 2014; make the most of it, enjoy it and see you in October 2016!



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THROUGH THE EYES OF WNE VISITORS

RUSSIA

› Elena Zlatoustovskaya travelled all the way from Moscow to be at WNE on the first two days of the show.



“I was intrigued to see how the inaugural WNE event would work,” explained the Russian PR expert. “We have a saying that the first pancake always ends in a mess. I’m delighted to say that that’s not the case with WNE.

“I’ve been very impressed with how many companies are exhibiting and the fact that they have come from all over the world – this truly is a global show.

“I’ve learnt a lot about the industry and about what’s going on elsewhere. This is all very useful information.”

SPAIN

› Manuel Elola, from Spanish company Metcoex, said that he was finding the show very useful.



The company, which is based in Cantabria, specialises in gravity-cast steel, precision parts, welding and metallic structures.

“I have been very impressed with the buyers’ club meetings,” said Elola. “No other show has this and I have had eight meetings with potential customers already.”

The initiative gives trade visitors access to around 500 experts and suppliers from all over the global nuclear industry.

“I am here for three days and still have two or three meetings lined up – my trip has been very fruitful,” he concluded.



Staying in the loop...

THE NEED FOR rigorous testing of nuclear power plant back-up facilities, highlighted by the Fukushima incident, reflects the renewed importance of the EPEC3 test loop, which was developed for that purpose.

Owned and operated by the research and studies centre of Grenoble (CERG – stand C75), the EPEC3 facility was built in 1979 by EDF in partnership with Framatome, renovated in 2008 and acquired by CERG in 2012 to test new generation reactors (Gen3-EPR).

The loop tests overall security of pumps and valves. It reproduces nominal pressure conditions, temperature and thermal shocks, charged water and low net positive suction head (NPSH) or cavitation.

THE POWER OF THREE...

THE FRENCH CNIM Group, its Bertin Technologies subsidiary, and its partner, TechnoPlus Industries (TPI), are all exhibiting together (stand J35).

In the nuclear field CNIM provides nuclear power generation, research reactors and big science. The group has 150 years’ industrial expertise and around 3,000 employees.

Bertin Technologies has more than 50 years’ experience in the defence and security, energy and environment, and life sciences industries. The company provides consultancy services

with design and supply of high-added-value equipment, both in France and internationally.

Founded in 1986, TPI offers machining services, welding, design and manufacturing for the nuclear and aeronautical industries.

Its experience in the nuclear field has led it to work on the European Pressurised Reactor (EPR) project, the International Thermonuclear Experimental Reactor (ITER), the Jules Horowitz Reactor (JHR) and the next generation of nuclear reactors for naval propulsion (RES) on board Barracuda class submarines.

NEWS | IN BRIEF

Normandy’s cluster with medical lustre

› Medical applications of nuclear technology are among the main focus areas of Nucleopolis (stand C50-D49), the nuclear cluster of Normandy.

Nucleopolis members are involved in the full range of activities in nuclear medicine, including research, training and radiopharmaceuticals. They are also active in pre-clinical and clinical trials.

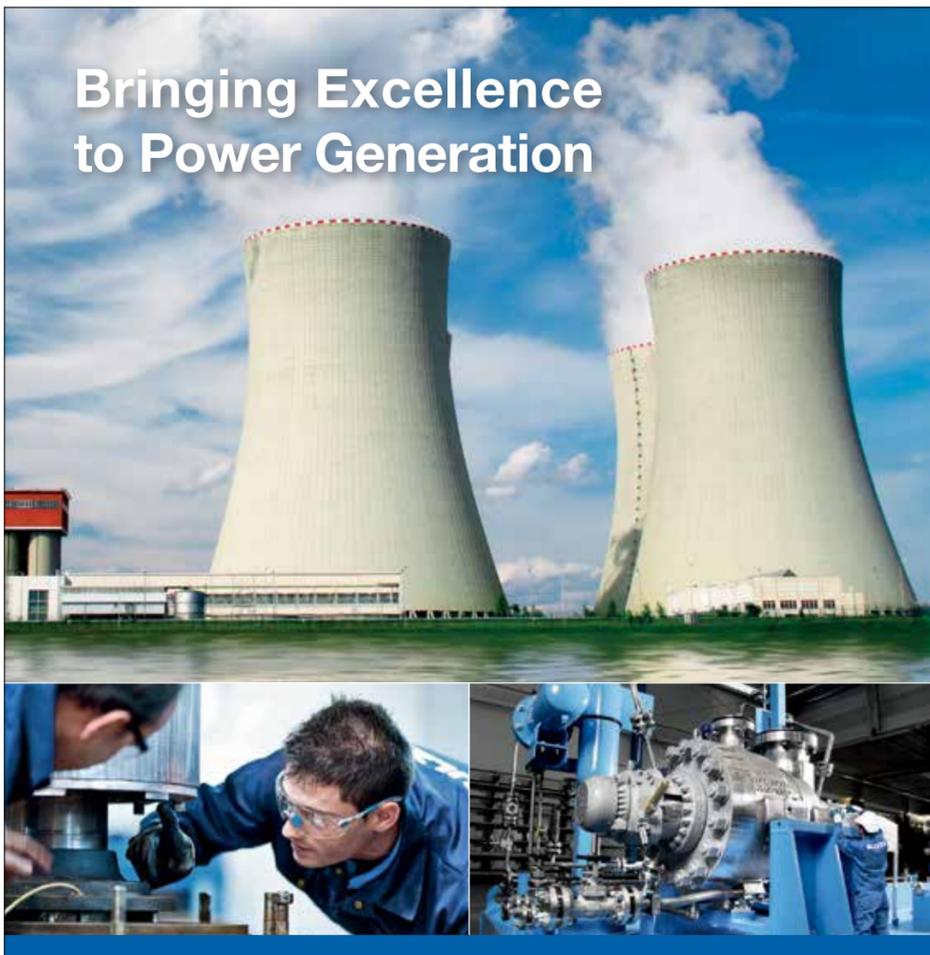
The cluster contains two healthcare centres – Francois Baclesse Cancer Centre and University Hospital Centre of Caen – research and training organisations, pure research institutes and innovators.

Members have exploited their technical and scientific skills in developing numerous promising initiatives, including the Archade hadrontherapy project, the Spiral2 linear particle accelerator (GANIL) and AREVA Med’s plant for the extraction of lead-212, which is used in cancer treatment.

Steaming ahead...

› Texas-based Peerless Manufacturing (stand C32) is at WNE to promote its steam dryers and moisture separators for boiling water reactor (BWR) and pressurised water reactor (PWR) commercial power plants.

The company, which has facilities worldwide, including Peerless China Manufacturing, fabricates nuclear dryers and moisture separators in the USA, Europe and China to meet American, European and Chinese requirements. Peerless dryers perform with better than 0.1% moisture carryover (MCO) with measured performance down to 0.004% MCO.



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INNOVATION | EXPERTISE

World-leading plant reflects Finnish skills

Nuclear energy is big business for Finland – appropriately, it has a big presence at WNE. The country has an ‘island’ site (stand J32) at the show with a number of companies and organisations sharing the stands.

Finland has four reactors and one more being built. The new EPR facility at Olkiluoto, which is being built by AREVA, should start operations in early 2018. It will be the most powerful reactor of its type in the world at around 1700MW.

Rauno Rintamaa, senior advisor, at the VTT Technical Research Centre of Finland, said nuclear power is vital to the country’s energy needs.

“About 27% of our power is generated by nuclear. We have a full mix of other types, including 15% being delivered by hydro-electric, bio fuel 13%, coal 12% and just 1% by wind power,” Rintamaa said.

“Once the new reactor is online the country will be self-sufficient when it comes to our energy needs.”

The nuclear industry employs around 5,000 people in Finland and there is a lot of expertise.

Lassi Hatakka, of Helsinki-based Kalliosuunnittelu Rockplan, said: “We may not have a lot of power plants, but we have a lot of technical know-how.”

Hatakka was referencing the country’s skills at building nuclear waste repositories, with its site at Onkalo leading the world in terms of new technologies.

The Onkalo spent nuclear fuel repository is a deep geological site, the first such repository in the world.

“Many countries are thinking about building repositories but we have actually done it,” said Hatakka. The site is currently under construction by Posiva at the Olkiluoto nuclear power plant in the municipality of Eurajoki, on the west coast of Finland.

Fortum/VTT’s Apros dynamic simulation and safety analysis software for nuclear power plant projects is also used by 27 different countries around the globe.

Other Finnish companies exhibiting include Ampko Oy, B+Tech, Dekra, Fortum Power and Heat, Konecranes, and the FinNuclear Association.



Work in progress at Finland’s Onkalo waste repository

ROLLS-ROYCE IS DRIVING STUDENTS FOR THE FUTURE

ROLLS-ROYCE (STAND F76) has established two university technology centres (UTCs) in the UK, dedicated to ensuring it remains at the cutting edge of the nuclear industry.

The centres are located at Imperial College London and the University of Manchester. Both are home to leading academics and research teams with particular capabilities in nuclear science and engineering. They work in close collaboration with Rolls-Royce.

The London centre, which

opened in 2010, focuses on material properties, modelling of processes in the nuclear plant, as well as safety and reliability, with applications in both civil nuclear power and submarines.

Both centres research a number of nuclear engineering issues of relevance to Rolls-Royce, including materials performance and ageing, micro-mechanics, radiation transport, structural integrity, and thermal hydraulics.

Topics include work with

computational fluid dynamics (CFD) on flow boiling, critical heat flux and buoyancy driven flows.

The centres also act as a conduit for students interested in a career in the nuclear industry, giving them better access to experts, industrial facilities and summer placements at Rolls-Royce.

At the opening of the Imperial College London University Technology Centre, Professor Stephen Richardson, principal of the faculty of engineering

and deputy rector of the college, said: "Imperial has a long tradition of nuclear engineering research and teaching in close partnership with Rolls-Royce."

"The establishment of the UTC was a natural extension of this important partnership. It creates more links with Rolls-Royce so that our students can get better access to valuable industry training and expertise, which is so vital in getting them ready for the needs of business when they graduate."



Americans embrace L'entente cordiale

The top man in the United States Nuclear Infrastructure Council (USNIC) has described WNE 2014 as a "beachhead for the US nuclear industry".

Executive director David Blee is heading up a US delegation featuring a number of companies in the country's pavilion (stand C32).

The pavilion was organised by USNIC and features exhibitors including: GE Hitachi Nuclear Energy, PaR Systems, CB&I AREVA MOX services, Nuclear Energy Institute, Excel Services Corporation, Fairbanks Morse Engine, Kurion, and Peerless Manufacturing.

"This array of companies shows the strength of companies and the breadth of services that we have to offer in the US," said Blee.

The pavilion was officially opened by Reginald Miller, the Minister-Counselor for the US Embassy in Paris, who told his audience that they were an important part of the energy mix within the US.

"It's great to be here and I've learnt a lot," he said later after visiting various different parts of the exhibition.

"Shows like this play an important part in bringing people together. It is vital that all the players can meet and discuss the important issues at the very highest level."

Blee was delighted with the assistance that USNIC had received, not just from US officials but also from the show organisers.

"We first heard about the show when Gérard Kottmann, president of the Association of French Industrialists Exporting Nuclear Energy (AIFEN), came to the States with a trade delegation," explained Blee.

"He told us about the plan for WNE and we immediately got involved. We have been enjoying regular phone calls ever since. We are particularly proud that we were able to offer advice and input into the workshop and other sessions during the three-day event."

President Kottmann was present for the US pavilion opening and Blee is looking forward to further cooperation in the years to come.

"WNE 2014 has been a great starting point and we have been delighted to be here," he said.

Deep storage plan nears licence date

WITH ITS CONSTRUCTION licence application due to be submitted next year, the engineering studies on France's proposed deep geological repository storage centre are at a critical phase.

The ambitious Cigeo project, an initiative of the French National Radioactive Waste Management Agency (ANDRA), would store high and intermediate level long-lived waste generated by French nuclear power plants, and their spent fuel.

Overall project management is being handled by the GAIYA consortium, made up of independent engineering consultancy Ingerop (stand M54) in joint venture with energy industry specialist Technip.

This programme, one of the largest in the world, is designed to include a high level of safety and automation, reversibility of storage for at least 100 years and the integration of surface facilities in the landscape and the region.

Examination of the licence application is expected to take until 2018. If approved, construction would start in 2019 with commissioning projected around 2025.

NEWS | IN BRIEF

A 40-year milestone

> Valinox Nuclear, part of the Vallourec Group (stand F67), a world-leader in premium tubular solutions, is celebrating 40 years of expertise and know-how serving the nuclear industry. Since 1974, Valinox Nuclear has produced more than 40,000km of pipes, a distance equivalent to the Earth's circumference.

Lemer Pax: Helping protect against cancer

> French radiation protection specialist Lemer Pax (stand K47) has equipped the Toulouse Cancer Centre with protective fabric tapes and tubes.

Lemer Pax's Novashield, an ecological composite of lead-free flexible sheets designed for gamma ray radiation protection devices, was specified during adaptation work at the centre. The company said the Novashield technology allows in situ creation of bespoke biological protection, which is easy to decontaminate.

Lemer Pax's products have also been approved by EDF for use by the French National Centres for Electricity Production (CNPE).

Protection in the quake zones

> Nuclear energy providers in earthquake risk areas will be heading to Anvis Industry (stand D88) at WNE. The Versailles-based company is demonstrating its Dilatoflex rubber expansion joints that do not create any end-thrust on the piping system. The system is said to offer a better resistance against earthquakes without any mechanical fitting, which would hinder movement.

FOCUS ON | EDUCATION

Far Eastern promise

> Four Chinese students from the Sino-French institute of nuclear energy (IFCEN) are among visitors to WNE this week. The four are sponsored by EDF, AREVA and CEA, industry partners of IFCEN, along with PFCE, AIFEN and the French Embassy in China.

IFCEN opened in September 2010 as the nuclear engineering department of the Sun Yat-sen University in Zhuhai, China. It admits about 100 students a year for a six-year course leading to a master's degree and engineer diploma.

The IFCEN project is supported by a consortium of French institutions.

The industry support for IFCEN guarantees the professional integration of its courses and underlines the need of both French and Chinese nuclear industries to train high-level engineers in a complex multicultural environment.

Expert advice for youngsters

> A group of 150 students from Burgundy had the opportunity to visit WNE today, thanks to AREVA, the CEA and EDF, who jointly financed their trip to Le Bourget.

Their benefactors hope the show will give the students on Partners in Nuclear Business (PNB)-accredited courses a better insight into the nuclear supply chain and the range of skills needed by the industry.

The students come from Burgundy University, Léon Blum du Creusot High School, Côte d'Or and Saône-et-Loire Industry Apprentice Training Centre and Eugène Guillaume de Montbard High School.

They were also expected to attend a panel discussion hosted by Yves Bréchet, High Commissioner for Atomic Energy (France), and focused on the expertise needed in the nuclear field.



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HALL 2A / STAND C50-D49

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