

wood.

Shaping nuclear energy



Wood is a global leader in project delivery, engineering and technical services, providing efficient, integrated solutions across the asset life cycle in multiple sectors. We are proud of our rich heritage which underpins our unrivalled breadth and depth of capability. We employ people with the brightest minds and the sharpest skills, who use our leading-edge technology to help our customers succeed.

Our differentiators include our extensive range of services, the quality of our delivery, the passion of our people and our unique culture. True to our values, we work in an open and transparent way; a committed partner to our customers, supply chain and the communities we work with.

Our values set the tone for what is important in our business, they are the essence of our identity and fortify everything we do.

### Care

Working safely with integrity, respecting and valuing each other and our communities

### Commitment

Consistently delivering to all our stakeholders

### Courage

Pushing the boundaries to create smarter, more sustainable solutions

160+

year heritage

60,000

employees

60+

countries



"Each and every individual in our business has the ability to make a significant impact to our safety delivery. Safety is what we care about most and being safe means looking out for yourself and showing care for your colleagues. Keep safety at the heart of every conversation you have."

Robin Watson,  
Chief Executive

We are working at the world's most challenging decommissioning sites including Sellafield, Chernobyl and Fukushima.



# Shaping Nuclear Energy

We have been at the forefront of nuclear energy for over 60 years. We are passionate about nuclear energy, its role in the world today and in the future.

## Playing a critical role in nuclear projects across the world

Our reputation is founded on the very best technical expertise and the reach to deliver this knowledge locally to projects across the world. Our approach is highly collaborative and based on long-term relationships. We are a trusted partner for customers on five continents.

## Technical excellence breeds innovation and assurance

By combining engineering and technical excellence with innovation, research and development, we have the ability to solve the world's most complex nuclear problems safely and cost effectively. Our experience across the lifecycle provides unique insights into the complex issues faced by our customers, including the commercial challenges caused by fluctuating global energy prices.

We provide flexible, commercial and technical solutions that span the entire nuclear lifecycle of civil and defence nuclear markets at Tiers 1, 2 and 3. This is enabled by a powerful combination of research and development, expert knowledge of nuclear regulatory and licensing frameworks, design, engineering and project and programme management.

## Our people write the world's standards

At the very heart of our business are our nuclear specialists, including international technical leaders in their field. We choose to be technology independent so that we can bring our partners the very best-in-class experience from different technologies and vendors. We also own the UK's largest independent nuclear research and testing facilities with 12,000m<sup>2</sup> of labs and test rigs plus remote handling and inspection technology.

As part of Wood, we can call on the skills and resources of more than 60,000 multi-disciplinary professionals across engineering, design, project and programme management disciplines.

We are developing critical technologies for the future including SMRs, Generation IV reactors and fusion.

# New build

Wood understands the complex commercial, political and technical challenges facing new build programmes. And we also share the passion to create clean, secure and cost effective power for future generations.

## Reactor design

We have substantial heritage in reactor design, including a significant role as principal designer of the first and second generation of nuclear power plants in the UK. Today we work with EDF Energy, China General Nuclear Power Group, Hitachi, Horizon, and others on all of the UK's third generation nuclear new build programmes.

## Engineering design

Our engineering design capabilities, covering all aspects from concept and optioneering to detailed design, give us a leading role in reactor technology, conceptual design and engineering relating to existing and new nuclear technologies, encompassing all major reactor types worldwide.

## Licensing, environmental studies and hazard analyses

Wood has global licensing, environmental and site hazard evaluation knowledge, as well as experience in Western, Central and Eastern Europe, the Middle East, Japan and South Africa. We support our customers in both public consultation and meetings with regulators and if the regulatory framework is not well established, we can advise on its creation.

We apply our in-depth knowledge of international regulations and site conditions to help our customers choose and develop sites that meet licensing requirements. In the UK we draw upon our detailed knowledge of the regulatory environment and specific requirements to guide reactor vendors through the UK's regulatory process. We have been working with every new build vendor and developer, helping them to minimise commercial risk associated with the Generic Design Assessment and other key steps.



## Inspection validation and equipment qualification

With substantial research and development facilities, we provide non-destructive testing services to the current fleet of nuclear stations and for the nuclear new build market.

Our Inspection Validation Centre (IVC) is an established qualification body that was originally tasked with qualifying the critical inspections for Sizewell B in the UK and has subsequently supplied qualification services worldwide. For new build projects, the IVC verifies that inspections and the inspectors that apply them are capable of detecting any defects that could compromise structural integrity. Wood provides extensive support for materials qualification and equipment qualification (EQ) including testing programmes designed to establish, preserve and upgrade equipment qualifications. To provide a broad and global EQ service we have formed the Equipment Qualification Services Alliance, pooling our expertise with Tecnom, TÜV Rheinland and Element Materials Technology.

## Plant engineering, procurement, construction and commissioning

Our project managers, construction experts, mechanical and structural engineers know how to manage and deliver high value, complex programmes and projects from concept through to commissioning and startup. The ability to draw on expertise covering all aspects of new build projects led to our appointment as owner's engineer/technical adviser to Poland's first ever nuclear power project.

## Construction integration for ITER

We are leading the MOMENTUM consortium, the Construction Management-as-Agent (CMA) contractor to ITER, the world's largest nuclear fusion project. MOMENTUM is managing and coordinating the assembly and installation of more than one million components for the ITER reactor in the South of France. At its centre is the world's largest tokamak, an experimental machine designed to harness the energy of fusion, the nuclear reaction that powers the sun.

Playing a key role in every UK new build project.

Integrating the construction of ITER, the world's largest fusion reactor.

# Reactor support and generation services

Wood has a deep understanding of the complex technical challenges and commercial imperatives of maintaining and improving operational performance and safety of ageing nuclear power plants.

Our experts work across a huge variety of science and engineering-related projects. This ensures we have the experience and the expertise to design and implement solutions to extend the life of ageing nuclear power plants and equipment. The heart of our business is providing safe, practical solutions for maintaining operational performance of ageing assets, overcoming life-limiting issues and extending the operational lifetime value of plants. We achieve outstanding results for our customers thanks to our comprehensive knowledge of reactor technology and regulatory requirements combined with a flexible, collaborative approach.

Extending the operation of any complex nuclear asset beyond its original design life takes a deep understanding of nuclear engineering and the systems within these assets.

We have developed innovative approaches to life extension and provide technical and engineering solutions to avert or resolve emerging problems. Our specific capability in the management of ageing and obsolescence allows us to define cost-effective solutions and deploy the solutions rapidly, improving operability, generation and ultimately plant life.

## Lifetime partner to EDF Energy

We are the largest research and development partner for EDF Energy and one of the largest suppliers of engineering and technical services to the current UK reactor fleet, an enduring partnership that has been built over almost 50 years.

We are EDF Energy's strategic lifetime partner, supporting its Central Technical Organisation and the power stations in delivering core programmes and new investment to support fleet-critical projects. As architect engineer for their fleet, Wood has intrinsic plant knowledge covering reactor systems, balance of plant, life-limiting components, plant technology and performance. In response to customer demand we also offer services to support coal, gas and renewables generation. Our work covers outage support, technical services, plant modifications, new build and decommissioning.

## Plant performance services

We deliver targeted engineering investment to maintain and exploit operational margin, improving safety and output. With tacit knowledge and targeted tools to help predict plant performance and drive improvements in equipment reliability, we support unit outages, develop safety cases and manage everything from basic engineering change to critical projects.

## Modelling and simulation

Providing compliance with design codes, standards and regulations, and future proofing of key platforms and systems, our ANSWERS® software has been at the forefront of radiation transport modelling for more than 30 years, providing solutions for customers across the world.

## Managing ageing and obsolescence

To improve generation output and eliminate constraints on plant life extension we have extensive experience of upgrading high integrity control and instrumentation systems.

## Engineering and safety case

Our capability, skills and experience, ranging from engineering design and risk assessment to human factors, puts us at the forefront of technical professional services relating to nuclear safety. After the tragic earthquake and tsunami in Japan in 2011, we assisted nuclear plant operators to review plant susceptibility to seismic, flooding and other safety hazards and to take mitigating actions to ensure public safety.

## Programme and project management

We are experienced in delivering projects that vary widely from large programmes to small-scale change management. We are able to balance the needs of project processes based on significant industry experience, insight into business drivers and safety management considerations.

Principal designer and architect engineer for the UK's first and second generation reactors. Largest R&D provider to EDF Energy in the UK and Lifetime Partner to EDF Energy.

# Decommissioning and clean-up

Clean-up and management of the nuclear legacy is one of the most demanding challenges facing the industry today.

Wood brings decades of experience to the task of decommissioning and clean-up, drawn from our work at the most complex sites in the UK and overseas.

This includes helping operating partners to manage the change of mindset and culture required to move from operations to decommissioning. Underpinned by our research and development base, practical technology and an unrelenting safety ethos, we bring practical, cost-effective solutions that are both technically and commercially innovative.

Our teams provide innovative, safe and cost-effective solutions for decontamination, dismantling, deactivation and demolition of high-hazard plants and sites. And we combine safety case management, environmental and radiological consultancy, and health physics support with our core engineering capabilities.

## Waste management and remediation

We provide customers with solutions in waste characterisation, minimisation and processing through to storage, transportation and safe final disposal. Our services include radiological monitoring and segregation of contaminated material using ScanPlot™ and ScanSort™, our proprietary automated technology; the use of sophisticated remotely-operated vehicles for difficult access; and design and implementation of innovative decontamination processes.

SIAL®, our proprietary solidification and encapsulation technology, has been used successfully at nuclear power plants over the past 20 years. It can be used on site, saving the customer significant time and cost by transforming low, intermediate and higher-level radioactive wastes into a much safer solid form which is easier to handle, transport and store. As a geopolymer, it is superior to cement because it can incorporate significantly more waste into the matrix, thus saving disposal costs, and because it performs better in terms of compressive strength and leachability.

## Design and construction

We provide engineering design expertise to tackle some of the world's most challenging nuclear problems. At Sellafield, we are part of a joint venture delivering the Box Encapsulation Plant, a £600m facility which is essential to the site's hazard reduction mission. Through the AXIOM joint venture, we are delivering engineering design and safety case services to Sellafield Ltd under the 15-year, £1.5bn Design Services Alliance framework.

## Site restoration and environmental remediation

We provide consultancy and analysis on environmental management, including remediation of contaminated land. Where on-site analysis is unsuitable, we can provide analysis in our in-house facilities, which include one of the UK's largest UKAS-accredited commercial radiochemistry laboratories.

## Global Tier 1 experience

We apply results-driven strategic programme management to solve some of the biggest nuclear problems on the world's most challenging nuclear sites. This work is underpinned by our broad engineering capability and large scale project experience, allied to our very specific technical understanding of nuclear decommissioning sites, processes and waste.

As part of Nuclear Management Partners, we managed the Sellafield site in the UK for eight years under the largest civil nuclear decommissioning contract in the world, yielding over £715m of efficiency savings. We are

leading an international consortium which runs the client-side Project Management Unit (PMU) for the decommissioning of Ignalina Units 1 and 2 in Lithuania, including the Interim Spent Fuel Storage Facility.

Since the early 1990s, we have been working at Chernobyl. We carried out short-term safety upgrades to the three surviving reactors, ChNPP 1, 2 and 3. Following this we provided project management support for the decommissioning of the three undamaged units, and consultancy and project management services for the Liquid Radwaste Treatment Facility and the Interim Spent Fuel Storage Facility.

At Fukushima, we have carried out a major study into managing radioactive waste for Japan's Nuclear Damage Compensation and Decommissioning Facilitation Corporation and we are working closely with TEPCO.



# Defence

## Wood is a key partner in supporting the UK's nuclear defence requirements.

For more than 50 years, we have provided independent nuclear assurance to the Ministry of Defence's (MOD) naval nuclear propulsion programme. This vital service ensures that the reactors powering the UK's submarines are safe, available and effective. Our service gives the MOD confidence that designs and safety cases are fit for purpose.

Under a long-term research & technology contract with the MOD, our world class research facilities provide experimental data and interpretation to keep current submarines operational.

We also work with Rolls-Royce and BAE Systems to support current UK submarine operations and we are developing the materials and designs of new reactors for the UK's future submarines. Wood has more than 20 years' experience delivering mission-critical design house and implementation services in support of the UK nuclear deterrent. We are one of the major engineering consultancies providing safety-led engineering design to major facility build and refurbishment projects. We provide implementation services, safety assurance and environmental consultancy to the UK's Atomic Weapons Establishment.

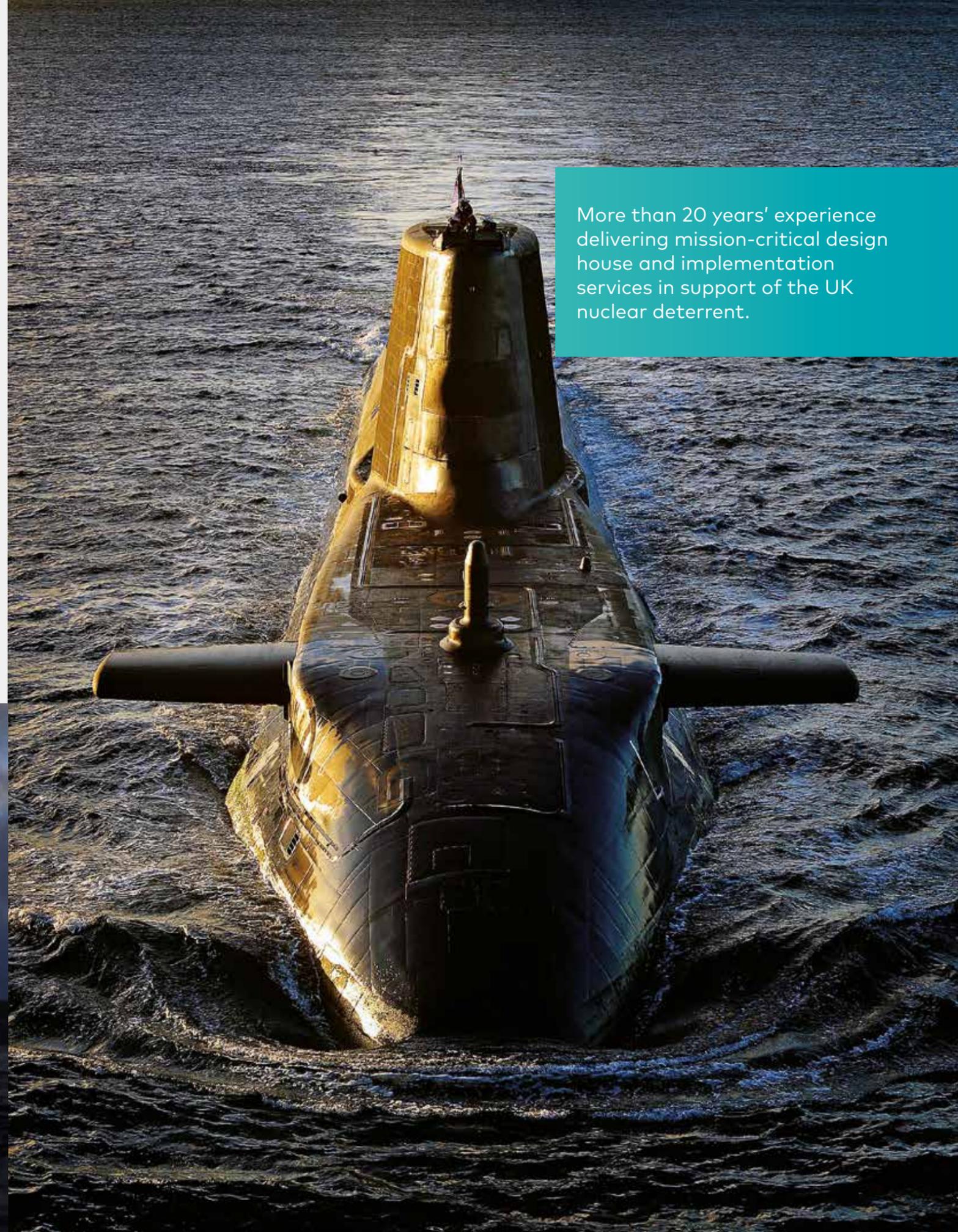
### Independent nuclear regulatory support

We are the sole provider of regulatory and technical support to the UK's Defence Nuclear Safety Regulator (DNSR). We have been providing assurance that the nuclear submarines and weapons operations are safe for more than 50 years. We also support the DNSR's civilian counterpart, the Office for Nuclear Regulation.

More than 20 years' experience delivering mission-critical design house and implementation services in support of the UK nuclear deterrent.



The Astute class is the latest nuclear-powered fleet of submarines in service with the Royal Navy.



# Research, development and ingenuity

Wood is a business built on knowledge and its application to help customers meet their objectives

Our deep technical understanding of nuclear energy is underpinned by constant research and development on behalf of vendors, operators, regulators and state governments.

Our 12,000m<sup>2</sup> complex of laboratories and test rigs – the largest independent laboratories in the UK – includes the UK's High Temperature Facility, which carries out essential research on materials for Generation IV future reactor designs. The labs provide a unique combination of multi-disciplinary experts, practical technicians and nuclear-experienced site operatives who can develop concepts, build prototypes and implement engineering change or major projects on site.

Our experts include world leaders on research into corrosion and structural integrity of materials in pressurised water reactors. To assist this research, we have the rare capability to replicate complex chemical, radiological and physical operating environments encountered in the nuclear industry.

## World-leading expertise

Wood's nuclear staff are at the forefront of their disciplines, including international technical leaders in their fields. Many play an active role in International Atomic Energy Association (IAEA) missions, technical committees and International and National Industry Standard committees.

Our Heads of Profession network drives the professional development of technical and scientific staff whilst our knowledge management system is recognised as good practice by the IAEA. This is supported by a Competency Assurance System (CAS) which supports and substantiates the competency of our staff. We also understand that good ideas often come from diverse thinking and our approach to diversity and inclusion is award winning.

## Independent Nuclear Assurance

We support operators and regulators with Independent Nuclear Assurance (INA) and Independent Technical Assurance (ITA). Our impartial, expert, second opinion – based on the best technical and safety advice – helps licensees manage the risk in designs and safety cases.

## Regulatory support

We have supported the UK civil regulator, the Office for Nuclear Regulation, for many years and we recently became the first UK organisation to join ETSON, the European Technical Safety and Support Organisations Network.

## A collaborative approach

Collaboration with delivery partners and customers is a hallmark of many of our major projects. We are one of the first organisations in the nuclear sector to achieve BS11000, a collaborative standard for assessing and selecting potential partners and managing business relationships. We operate Lifetime Quality Assurance (QA) Programmes, which ensure that our quality policies are regularly reviewed, and we are approved to international standards of quality, including: ISO 9001; ISO 14001; and OHSAS 18001.



## Developing the future

Wood has a leading position in reactor technology, conceptual design and engineering relating to new nuclear technologies including Generation IV reactors, fusion and small modular reactors (SMRs). We are the largest UK industrial contributor to ITER, the world's largest nuclear fusion project, where our work ranges from designing prototypes for key components to complex remote handling systems essential for reactor operations.

Our work on SMRs includes designing the reactor cores and containment, steam generators and refuelling systems and drawing up policies for waste management, environmental management, licensing and decommissioning. We are also leading the UK Digital Reactor Design project, a government-funded research programme focusing on the use of virtual engineering and high-performance computing to enhance the techniques used to design reactors and optimise their performance.

## A critical success factor

No matter where we work or what we're doing, we never compromise on the safety of our people, our partners or anyone affected by our projects. Our relentless commitment to safety is encapsulated in our strategy for achieving sustainable, world-class health and safety performance. Our HSSEA performance is a critical factor of our business success.

We never stop searching for ways to refine and strengthen our safety management approach to ensure it is at the forefront of a continually evolving industry. What's more, our breadth of expertise across the entire nuclear lifecycle enables us to holistically manage nuclear safety and wider health, safety, security and environmental (HSSEA) issues at every level.

The UK's only UKAS accredited Inspection Validation Centre non-destructive testing (IVC NDT) provider for the nuclear new build market.



Wood is a global leader delivering technical, engineering and project services across the entire asset life cycle. We operate in more than 60 countries, employing about 60,000 people. We provide performance-driven solutions from development to decommissioning for a broad range of industries including all energy sectors, process and refining, power and utilities, mining and manufacturing.

For further information please go to:

**woodplc.com**

