SONE

Supporters of Nuclear Energy

Newsletter

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DELIVERING THE NUCLEAR RENAISSANCE

Welcome evidence that the Government is pressing ahead with plans to help secure a nuclear renaissance in the UK came this month with the announcement of a £20 million spend on the first phase of a new nuclear research and innovation programme. At the same time work began on the National Nuclear College project it announced earlier this year, at a potential cost of £15 million.

If the nuclear renaissance is to happen other actions are also essential. We need to secure the investment needed for the construction of nuclear power stations, inspire young people to take up careers in the nuclear industry and carry public opinion. These are all issues which I consider this month, prompted in part by the thoughts of other SONE members, including the controversial suggestion from one of them that it may be time for the Government to re-examine the possibility of direct State investment in new build nuclear power stations.

At SONE's annual meeting last month there was considerable discussion of the need for more to be done to involve the young if there is to be a renaissance and to ensure that education and employment are provided for the UK's potential scientists and engineers. It is estimated that the nuclear industry will need 30,000 new employees over the next decade and the new National College for Nuclear (NCfN) will play an important part in meeting this target.

The NCfN is a partnership between the Government and nuclear employers, led by EDF Energy and Sellafield Ltd, and will be based at hubs in Bridgwater in Somerset and Workington in West Cumbria, both close to major sites of nuclear investment. With access to £15 million of Government funding the intention is that they deliver high level technical training to more than 7,000 students by 2020.

VOCATIONAL SKILLS NEEDED

The thinking is that the industry is going to need people with high quality vocational skills if it is to continue to operate the existing nuclear fleet safely and for longer as well as for taking forward plans for the UK's first new

nuclear power stations in a generation. The Government's ambition is for 90 per cent of the nuclear sector's skills needs to be met from a UK workforce.

With major investment getting under way in new and existing nuclear power stations the forecast is that the demand for skilled staff at all levels will increase by 40 per cent from 70,000 to 98,000 workers. This is where the NCfN comes in. It will work with local schools, colleges and universities, including Bristol University and the University of Cumbria, with the objective of setting rigorous training standards and providing inspiration to local young people to take up careers in the nuclear industry.

Among the courses on offer will be foundation degrees in nuclear, civil engineering and project management; bachelor of engineering top-up courses; nuclear apprenticeship components; nuclear pathway courses and generic courses such as nuclear fundamentals and environment.

Newsletter readers will know that I feel very strongly that one of the more important ways of interesting young people in nuclear energy is by introducing them to the subject in an entertaining way. This was what used to happen with the many school parties which were taken to the Sellafield Visitors Centre, mistakenly closed several years ago, and which still happens at the exhibition centres near EDF's operating sites. The Moorside developers plan to have one, too.

There are two other potential venues, however, which have been largely ignored - until now. One of SONE's newer members, Louis Plowden-Wardlaw, is leading a campaign to get permanent exhibitions covering the evolution of atomic theory and its civil nuclear energy applications established at the science museums in London and Manchester and possibly other centres as well. It is a campaign which I believe SONE should support and we will be discussing what form support might take at our next committee meeting. At the very least I would urge members to visit the two museums. I believe they will be appalled by what they find there - or rather don't find there - and want to help Louis do something about it if they can.

In brief, Louis believes that now nuclear energy is largely accepted by the public and politicians as an important part of the UK's low carbon energy mix it is time for good quality nuclear energy information to be made more widely available.

A HEALTH WARNING

Prompted by Louis, earlier this month I visited the Manchester Museum of Science and Industry, accompanied by my wife. The nearest metro station is Deansgate and Castlefield and a sign there suggested we take a lift down to the

street housing the museum. We did -and quickly regretted the decision. The inside of the lift was filthy and stank of what we took to be urine and excrement. Later we reported this, after struggling to find out who was responsible for the lift maintenance. Hopefully we finally reached the right people and the lift will be cleaned -or shut down.

Inside the Museum itself we went to the information desk and asked a member of staff where the nuclear energy exhibits were. She didn't think there were any - "the museum's only to do with Manchester things" - but pointed across to an area where she thought there might be something about energy. There was - poster style information about the contributions to nuclear knowledge made by such people as Dalton, Rutherford and Joule. It was pathetic. Surely we can do better than this.

RESEARCH AND INNOVATION

The research and innovation funding announced this month forms part of the Government's wider commitment to doubling the UK's energy innovation spend. The objective is to build it up to a level of more than £400 million a year by 2021. The initial nuclear innovation programme was announced by the new Department for Business, Energy and Industrial Strategy (BEIS) - not a title that trips easily off the tongue. It covers five major themes, building on recommendations made by the Nuclear Innovation Research Advisory Board (NIRAB):

* Some £6 million will be devoted to work on advanced nuclear fuels which could provide greater levels of efficiency.
* A further £5 million will be directed towards research that underpins the development, safety and efficiency of the next generation of nuclear reactor designs.
*Another £5 million will be used to develop the UK's capability in materials, advanced manufacturing and modular build for the reactors of the future.
*Around £2 million will be deployed on research into fuel recycling processes that may reduce future environmental and financial burdens.
*Finally, £2 million will be used to continue with the development of a suite of tool kits and under-pinning data that will enhance the Government's knowledge basis for future decision making in the nuclear sector, up to the year 2050.

Dame Sue Ion, Chair of NIRAB, described the Government's initiative as a significant step forward in the UK in its drive to be a leading nation at the forefront of nuclear research.

"The research into new fuel, advanced manufacturing, reactor design, improved recycling processes and strategic tools aligns with NIRAB's recommendations and will plug gaps in the UK's current activity," she said.

"It will begin to equip our universities, national labs and industry with world leading skills and capability and act as a stimulus to national and international collaborative working."

THE SMR DESIGN COMPETITION

It is now 12 months since the Government announced plans to invest at least £250 million over the next five years in a nuclear research and development programme which included a competition to identify the best value small modular reactor (SMR) design for the UK.

The first phase of that competition, a call for initial expressions of interest, was launched in March and interest has already been declared publicly by several companies. Only last month Rolls-Royce announced that it had submitted a paper to BEIS outlining its plan to develop a fleet of 7 GWe of SMRs with the consortium it is busy establishing. This consortium could provide a £100 billion boost to the UK economy, Rolls-Royce said, because the companies expected to become involved in the consortium are either UK-owned or have a strong UK presence.

"We firmly believe a UK SMR programme presents a once in a lifetime opportunity for UK nuclear companies to be involved in the design, manufacture and building of next generation reactors for our needs at home and to access a huge global opportunity," Rolls-Royce said. "It's in the Government's hands with regard to the timetable of our announcement."

In a somewhat pointed reference to the interest being shown by overseas nuclear companies, Rolls-Royce said that the British character of its consortium was important. Because the jobs would be rooted in the UK it would give a significant boost to the country's nuclear supply chain and export potential.

Other participants in the UK's SMR competition included EDF Energy, which is of course French owned, and its Chinese partner, the China National Nuclear Corporation, Westinghouse and the United States developer NuScale Power. NuScale and Sheffield Forgemasters International announced earlier this year that they will work together to develop the manufacturing techniques needed for the future development of SMRs in the UK.

Sheffield Forgemasters will forge a large civil nuclear reactor vessel head by the end of next year, it has said, as part of a programme supported by Innovate UK, the UK's innovation agency, to develop and validate innovative forging and

fabrication solutions for the nuclear industry. NuScale Power is providing funding to support the use of the geometries required by its innovative SMR design.

Led by Sheffield Forgemasters the project has five contributing partners, including Rolls-Royce plc. Rolls-Royce has emphasised, however, that this is separate to its own submission of an SMR solution to the UK Government.

GET THE ROADMAP OUT

The objective of Phase One was to gauge market interest among technology developers, utilities, potential investors and funders in developing, commercialising and financing SMRs in the UK. When the Government launched Phase One it said that an SMR Delivery Roadmap would be published later this year.

The Roadmap is important. It will summarise the evidence so far, set out the policy framework and assess the potential for one or more possible pathways for SMRs to help the UK achieve its energy objectives, while delivering economic benefits.

The Roadmap will also include details of the process that the Government will use to identify suitable sites and any work that the Government will undertake with the Office for Nuclear Regulation to ensure that appropriate provision is made within the process for regulatory approval.

The industry wants the Government to publish the Roadmap as soon as possible, to enable it to build on increasing international interest and benefit from the supply chain opportunities and intellectual property rights already established in the UK.

Like much of the rest of industry the nuclear sector is seeking clarity over what happens when Britain leaves the European Union, to give investors in important infrastructure developments the confidence that a stable policy framework will be maintained to deliver new projects that promote growth.

It is now four years since the then Coalition Government produced what it called a durable agreement against which companies could invest and support jobs and a hoped for economic recovery. As the Coalition put it then: “With a fifth of the UK’s electricity generating capacity due to close this decade, reforms are needed to provide certainty to investors to bring forward £110 billion investment in new infrastructure to keep the lights on and continue the shift to a diverse, low carbon economy as cheaply as possible. It will suppoort as many as 250,000 jobs in the energy sector.”

One of the actions taken by the Government was to bring in the Levy Control Framework to provide £7.6 billion of market support for low carbon investment up to the year 2020. The intention was to help diversify the UK’s

energy mix to avoid gas import dependency by increasing the amount of electricity coming from renewables from 11% (as it was four years ago) to around 30% by 2020.

The Levy Control Framework funding was also intended to support new nuclear power projects and carbon capture and storage schemes, which are now not getting the sort of funding anticipated four years ago. The nuclear and renewables industries are all seeking assurances from the Government that the Framework is either renewed beyond the 2020-21 funding cap - or replaced.

TIME FOR GOVERNMENT INVESTMENT?

Something needs to be done to enable Contracts for Difference, the long-term contracts that provide stable revenues for investors in low carbon energy projects at a fixed level known as a strike price, to be agreed, including agreements for the new large-scale nuclear power stations at Moorside in Cumbria and Wylfa Newydd in Wales.

It is widely expected that the Government will try to negotiate a lower strike figure for these new build nuclear projects than the £92.50 per megawatt hour (or £89.50 if another new reactor is built at Sizewell) it agreed for EDF Energy's Hinkley Point C scheme, which has been widely criticised as far too generous. The strike price mechanism was introduced by the Government because it has always insisted that it would not provide subsidies to the nuclear industry through the taxation system. Such subsidies would not be illegal but the Government would currently need permission from the European Union to subsidise nuclear or any other form of energy. But we are leaving the EU aren't we?

While all large infrastructure projects contain a considerable range of special features nuclear projects have more than most, all of which have to be covered if the nuclear sector is to attract investment. New nuclear programmes have to dovetail in with associated infrastructure developments, such as grid and transport networks, as well as develop a supply chain, receive planning consents and engage with national and local government, along with the businesses, educational establishments and communities in the area the project is based.

They also need to have their reactor design scrutinised by national regulators, a process that can take as long as five years in the UK. In addition, the project needs to have a fuel supply, operations, maintenance and decommissioning strategy, looking as much as 80 years ahead. In all, delivery of a new nuclear project involves a complex set of high risk, high impact activities over 10 to

15 years, with huge financial implications. The one constant, sitting at the centre of all this, is surely Government.

These are the sort of considerations which led Gerald Clark, one of SONE's long-standing committee members to question whether there could be direct Government investment in the nuclear energy industry to support it rather than mechanisms such as the Contract for Difference regime. I asked him to make the case for such action and what follows is a summary of it.

Gerald started with a reminder that all of the existing nuclear power stations in the UK were built by a nationalised electricity industry. Even Sizewell B, which was completed after privatisation, was launched in the days of the State-owned Central Electricity Generating Board.

"Even so," he said, "the prevailing assumption over the last 20 years has been that it is for the privatised electricity utilities to make the necessary investments to keep the show on the road and for the Government to keep out of it. As there was surplus generating capacity until very recently there was no effective pressure on the Government to invest directly.

"While the Contract for Difference mechanism is primarily a device to allow us to achieve our renewables obligations, despite the obvious uncompetitiveness of wind and solar technologies, it has also proved useful in enabling private investment in nuclear technology to take place in the face of a difficult market.

"The Hinkley C project nevertheless had a hard time in satisfying the EU's rules regarding state aid, on grounds of market failure. In 2014 the Austrian government challenged the European Commission's decision to allow it, and had not given up before the Brexit referendum made their objection obsolete."

Gerald pointed out that when she became Prime Minister, Theresa May hesitated before allowing the Hinkley Point scheme to go ahead. Two considerations suggested that she might not, he said - the high strike price figure, which was more than twice the average wholesale price electricity at the time, and the equally widespread criticism of the major presence of a State-owned Chinese nuclear company, CGN, in the consortium of investors put together by EDF.

"In the event, the Prime Minister decided to endorse the Contract, subject to a couple of interesting conditions," Gerald said. "EDF will not be able to offload its obligations without the consent of the British Government and secondly in any future nuclear contracts of this kind the British Government will take a 'golden share' giving it control.

"She said nothing about the British Government's taking a share of the investment burden in either instance but, if the circumstances required it, it is implicit that the British Government would have to pay up. This is surely a significant departure from the neutral position taken by the Brown Government in 2008.

"In other words we have moved to a much more pro-nuclear position and have completely reversed the line taken in the 2003 White Paper where HMG did not see the need for any more nuclear investment at all. SONE ought to welcome this development and seek to build on it. There are several more contracts for large reactors in the pipeline and Mrs. May's move on Hinkley creates a more favourable climate for them to succeed.

GROWING PUBLIC SUPPORT

"We do not want a repetition of the situation which obtained in the 1980s – 90s where only Sizewell B was built instead of the larger original programme of 4-5 similar reactors. Whereas the waters were muddied then by the eddies of privatisation policy (and by the fall-out from Chernobyl) it is notable that the British public took the more recent Fukushima disaster in its stride and seems to have accepted the climate change arguments in favour of nuclear power."

Gerald also pointed out that other countries do invest directly in nuclear energy - and not only the State-owned and controlled companies. The US Government, for example, has already provided investment assistance directed towards the development and exploitation of SMRs. "If the British Government is really in favour of a nuclear revival in this country it ought to follow suit," he said.

"SMRs will also be a bridge to the Generation IV reactors which will make much more efficient use of what is after all a limited resource but which needs to be deployed at ten times the present scale world-wide if nuclear is to make a real difference to the possible control of climate change."

I am grateful to Gerald Clark for setting out his views on possible Government investment in nuclear energy. If other SONE members have contrary or supportive views to those expressed by him or more generally on investment issues I would be glad to hear from them.

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