



Nuclear task group
Chair's report 2011–12

Introduction

The Nuclear Task Group formed in 2009 under the chairmanship of Sion Edwards. It was to focus on the nuclear construction sector and, like all of Constructing Excellence's activity, to engage clients, constructors, suppliers and professional services from all interested sectors.

My tenure as chairman started in June 2011 and was fortunate enough to have excellent foundations. For that I thank Sion, and for his continued contribution.

In the first session we took time to discuss what our mission should be in support of the wider Constructing Excellence vision, and what our programme going forward should be. The mission statement that emerged was:

'Promoting best practice to enable sustained improvement and enhanced value in nuclear construction'

This mission guides us in our work within both the nuclear and construction sectors.

This report describes what has been accomplished over the past year and what we seek to do in the coming year.

Constructing Excellence and NIA in Japan

I would first like to reflect on one of the most significant world events of 2011, the largest earthquakes Japan has seen and the devastating Tsunami that followed. This coincided with our joint study tour to the Japan nuclear construction industry in March 2011, so our safe arrival home was greeted with great relief by our families and friends. The event continues to affect Japan and the world's nuclear industry severely.

I think it fair to say we learnt a lot from their industry, observing some truly best construction practice, from their Japanese people in how they coped with the enormous disaster, and from each other. We are all truly grateful to the Japanese construction companies in building structures that allowed Tokyo to survive and essentially be back up and working within 24 hours. A separate report is available.

The future of nuclear in the UK

Since Fukushima there has been much debate about the future of nuclear energy. A year or so on, other than Germany abandoning nuclear energy, and Italy and Switzerland stopping nuclear new builds, the picture remains pretty much unchanged, albeit perhaps a little delayed. Emerging countries are stepping forward and the position in the UK has arguably strengthened, despite recent setbacks. The UK Government is still working to develop 16GWe by 2025 and this presents great opportunities to the construction industry, which in turn could lead to major export potential. However we must first deliver well in the UK to provide the track record for developers, constructors and supply chains to exploit. A goal our task group will work tirelessly to achieve.

Quarterly task group sessions

We have maintained our quarterly meetings and in June 2011 we identified the following learning themes:

- Building on 'collaborative working'
- Delivering 'productivity'
- Ensuring 'project delivery.'

We engaged with the major nuclear client organisations EDF, Horizon, Centrica, Magnox, Sellafield, MOD, and the Nuclear Decommissioning Authority. We have also had contributions from the Young Generation Network, BRE, HSE, BSRIA, colleges and universities, and other government departments and industry representative bodies.

Summary reports are provided later with full details available on request in minutes and presentations. For me there are some key messages:

- Constructing nuclear power stations needs to incorporate the principles and practices of collaborative working as promoted by Constructing Excellence to succeed.
- Productivity is a top-to-bottom challenge with clients enabling the right physical and cultural environment to release potential productivity.
- Learning lessons is all very well, but how many will be re-learnt again if we cannot institutionalise what we have learnt. Other sectors have found ways to do this and so must we.

We need to ensure for the reputation of our industry that these messages are understood, and help the industry understand what needs to be done to accomplish that. This will be hard and requires commitment from a fair number of us.

For the Future

In addition to the usual information transfer elements of our activity, we have a range of subjects we wish to explore based around:

- Transforming and skilling a workforce to work collaboratively.
- Developing a knowledge-led sector.
- Programme and project delivery processes.

We will continue to reach out to other sectors and countries to learn wherever we can. We also wish to be more effective in supporting our industry and have ideas that include speaking at events, publishing papers, and developing training and toolkits.

We will continue to engage with all elements of the sector including clients, consultants, constructors and supply chain.

Other achievements

We had sub-groups deliver on:

- An industry checklist of input requirements from client 'this is what we need to be productive', based on the 2012 Construction Commitments which helped the Olympics deliver successfully.
- Models for driving collaborative working in the sector, including integrator-led alliancing - what it is, how you do it, and why (the business case).

- A guide to collaborative working in the nuclear sector, plus a paper on who needs to be influenced and how.

Updates from other organisations

We have had regular updates from:

- **National Skills Academy Nuclear**
Charlie Bray has provided regular updates on skills, progress has included:
 - Certificate of Nuclear Professionalism, a new MSc level course
 - Existing Triple Bar now available at Quality Assured Training providers with eLearning available
 - New Build Triple Bar, Nuclear Skills Passport being developed
 - Nuclear Skills Awards 2012.
- **Nuclear Industries Association**
Chris Savage has provided regular updates covering an update of the 2006 Capability review, the establishment of a Programme Management Board that is identifying areas of common interest across all developers and starting to progress joint work.
- **Constructing Excellence**
Don Ward ensured we were aware of the broader range of their activities, especially on collaborative working.

My sincere thanks

There are many people I would like to thank, our speakers, those that hosted our sessions, Don Ward and Deborah Hynes for their constant support, and all the members of the task group for wanting to make a difference. We can and will.

Session Reports

June 2011

We visited the Energy Skills Centre at Bridgewater College to see what was happening around the area where the first nuclear power plant in the UK since Sizewell B will be built. Speakers highlighted standards, safety and quality, as well as what the college were doing to help upskill the local workforce. Workshops were undertaken to establish our mission and work programme over the next 12 months.

Nuclear Standards on EDF's NNB Programme ***Chris Squires - EDF***

Chris talked about EDF's programme for HPC and the application of Nuclear Standards. We learnt that HPC is at the enabling stage and 2 EPRs are to be built, currently being assessed through the GDA process by the Office of Nuclear Regulation. Considerations being addressed include: nuclear safety and classifications, design codes, nuclear site licensing and quality.

Regulating major construction projects ***Philip White – HSE***

Philip presented on 'Regulating major construction projects and nuclear new build'. He talked about risks arising from work activities being properly controlled, intervention strategies, client expectations, committed leadership, integrated teams, health and safety culture, occupational health, and seeing health and safety as an enabler of projects.

Japan reflections from the CE/NIA study tour ***Adrian Worker – CH2M Hill***

Adrian spoke of the key lessons from Japan that included: quality pre-planning being essential, collaborative working is integral, safety is an endemic part of the Japanese culture affecting all elements of the projects, quality is also an integral part of their culture. In the UK, we have come a long way but there remains a long way to go.

Energy Skills Centre, Bridgewater College ***Andy Berry - Bridgewater College***

Bridgewater College are working with EDF on new build and NDA and Magnox on decommissioning. They are the south-west's hub of NSAN and received funding from EDF to develop the college to develop local skills by offering foundation degrees and NVQs in nuclear decommissioning, engineering and other nuclear topics.

Standards, tools and materials ***Dr Julie Bregulla - BRE***

Julie talked about standards, tools and materials for the nuclear sector. BRE is a research consultancy offering testing, certification and training. They are developing solutions to manage risk through field and laboratory trials, using quantitative and qualitative risk assessment methods. They also address sustainability to enable informed choices of materials, technical feasibility, design to aid innovation, working with Eurocodes, safety concepts, reliability expectations.

The LINK Alliance for decommissioning ***Simon Lander – Mott MacDonald***

Simon presented on 'The Link Alliance' led by Mott MacDonald which offers a unique combination of six key professional service suppliers. It was formed in 2010 with a charter outlining their vision, goals and values and a new commercial strategy. They recognise and promote the principles of early engagement, long term framework and collaborative working.

September 2011 – Collaborative working

We visited the Coleg Menai, Llangefni, Wales, to learn about what was happening locally on Anglesey, and we focused on collaborative working, looking also at other sector approaches. Through workshops we developed an 'elevator brief' and examined how it could be promoted. We observed evidence where collaborative working has supported successful delivery, noting it taking many forms. We also heard from Milica Kitson from Constructing Excellence in Wales.

Anglesey Energy Island **Sasha Wynn Davies**

Sasha presented on 'Anglesey Energy Island'. We learnt that £200bn capital expenditure was needed to overcome the energy supply deficit and that nuclear, renewables and clean carbon are all required. They were looking to keep the benefit (work) within the UK and have a robust vision for the Energy Island programme and planning performance agreement with Horizon to ensure they can deliver the project and attract the investment required.

Collaborative working in other industries **Paul Davis, Sigma MDL**

Paul presented on 'Collaborative working in other sectors'. Key points were that Sigma offers business relationship management services that help to facilitate change. Sigma support a number of brands and sectors, such as SCRIA for Aerospace and Defence, Nuclear de-commissioning, Home Office, Building Schools for the Future, and VIP for Rail. It uses an audit process and methodology that sets standards for relationship management, improving supply chain performance and reducing risks.

Constructing excellence principles **Tim Smith, Pectel**

Tim presented on 'Collaborative working: the principles' to remind us of the core values of Constructing Excellence. The key points included how commercial alignment and transparency are essential. Figure 1 summarises the three overriding principles: Common vision and leadership, Process and tools, Culture and behaviours; and the six critical success factors: Early Involvement, Selection by value and quality, Aligned commercial arrangements, Common processes and tools, Performance measurement and long-term relationships.

Strategic Integrated Framework (TSIF) **Gwyndaf Williams, Magnox**

Gwyndaf presented on TSIF at Trawsfynydd where decommissioning started in 1995. By 2016 it will be in storage and maintenance mode, and there are a number of aspects including recovery, encapsulation and storage, ILW store, safestores, demolition and landscaping. Trawsfynydd looked at best practice that showed better value in procuring for a collaborative partnering arrangement, leading to TSIF. It was a big change but created an environment where people could give their best, and led to huge benefits with fantastic results for health and safety and cost savings of £10M.

December 2011 – Productivity

Arup kindly hosted this session on the critical matter of productivity. Again there was a range speakers followed by a panel discussion to determine what industry should be doing. This led to workshops to derive take-away points as follows:

- Ensure client and delivery teams have a shared understanding of what is required.
- Have an integrated programme and project plan and facilitated peer review and advice.
- Get the culture right, engage with the workforce and show them what good looks like.
- Ensure supervisors are engaged and empowered and adequately rewarded.

Defining the productivity challenge - Alan Cumming, EDF

Alan sought to define the productivity challenge for EDF, explaining the primary risks are where capability has dwindled, which needs a change of approach to ensure that the capacity, capability and quality is available. Collaborative working is essential to EDF with the challenge being that the effectiveness of management is seen as key to productivity. Management and set-up equals the ability to be effective. Figures show that the UK falls behind France and the USA. A number of thoughts about what could be done were shared with a significant focus on the capabilities of supervisors.

Horizon Nuclear Power Update Amanda MacMillan, Horizon

Amanda presented on 'Horizon Nuclear Power', at the time* a joint venture between E.ON and RWE developing 6GWe by 2025. The team is now 130 people with land acquired. They have finished preliminary site investigations, offshore geophysical survey and ground investigations and transport options. Selection of vendor is a key activity at the moment. They are undertaking various impact studies, and planned to start site investigations and defining requirements in 2012. They are engaging with the supply chain now* and undertaking further recruitment.

(* note this was before Horizon's owners announced their withdrawal from the market)

Productivity

Howard Shiplee, Laing O'Rourke

Howard reflected his thoughts from his time at the ODA. In 2006 they had a £9.3bn programme that few wanted to work on. It was a huge challenge to become a desirable client, working hard with Constructing Excellence to develop the '2012 Commitments'. He shared many insights, including: dealing with things at the beginning ("pre-conditioning for success"), valuing people, training and local employment, treatment as a programme not a project, direct employment, occupational health initiatives, safety as a culture, supervisor ability with a right first time mantra, and strong discouragement of change.

Pre-conditioning for productivity Joe Dowling - CWC

Joe recognised that much ground work was done by Latham and Egan, shaping the construction landscape over the last decade and more. The ingredients are:

- The right cultural environment including strong client leadership
- The right commercial environment
- The right physical environment
- Building the capability.

Lessons from Japan include that their way of working is essentially about long-term relationships and collaboration. Failure to adopt these practices has a negative effect. However, if you do implement them, you will have a successful project.

Site productivity in M&E Glen Hawkins from BSRIA

Glen indicated that, on a 'business as usual' basis, one third of time is wasted due to changes, translating to a 15% loss with one out of every two projects late or over budget. He noted seven pre-requisites for productivity: information, materials, workforce, plant, tools and equipment, working space, connecting works and external conditions; and six qualities of output: completeness, accuracy, defect-free, on time, safe, tidy. When combined these inform the behavioural, organisation and technical skills necessary to prepare and build, requiring an integrated delivery process focused equally on the small and big details.

March 2012 – ‘project delivery’

HR Wallingford was kind enough to host this session and we were privileged to tour the facilities including the Physical Modelling Hall and Ship Navigation simulator. We watched videos of Sizewell B's construction that made for fascinating viewing, most notably on how safety standards have improved - and in equal measure, fashion! We also heard from Stephen Wearne questioning how we can institutionalise learning in the same way as the Japanese and other sectors.

Introduction to HR Wallingford Mark Liddiard - HR Wallingford

Mark told us about HR Wallingford, an independent, non-profit organisation which seeks to be 'the most respected international research and consultancy organisation in civil engineering and environmental hydraulics'. They have an international presence and world leading experts. They are currently working to build a wave generator at scale to be able to test for tsunamis. Nuclear interests started in 1949. They currently work with Sellafield, Magnox, and EDF amongst others, and cover cooling water systems, coastal defences, drainage studies, hydrology and climate change adaptation.

Learning from experience Stephen Wearne - University of Manchester

Stephen reflected on his experience in constructing nuclear power plants. There were many insights including: the greatest resources are needed after construction, developer's should commit suppliers through commissioning, all engineering should be complete before starting construction if the driver is earliest power, the project supply chain needs to be designed in steps to transform the developer's single large risk into repetitive small risk work packages, JVs are valuable for planning, cooperation, interfaces and logistics but weak as contractors can be driven by conflicting motivations.

June 2012 – ‘inducing change for the better in nuclear construction’

The final theme for the year flowed from previous work and identified areas to concentrate on to ensure the UK's performance and reputation in nuclear construction is high. We worked in workshop mode to influence DECC, BIS and the Royal Academy of Engineering in their sector strategies for the nuclear industry – and to ensure construction is recognised as a key sub-sector. We will continue to support them in this work for the benefit of the industry, and we were able to identify areas of interest for the next year's worth of task group meetings.

Sellafield's approach to Supply Chain Management John Sidney, Sellafield

Sellafield have seven nuclear reactors on site and over 10,000 employees, in total they employ 25% of the local workforce. Key operations include decommissioning and cleanup, commercial operations, nuclear waste treatment and processing, waste and product storage facilities. They have a £6.3bn programme to 2025 with an acquisition strategy based on integration, cultural and behavioural change. The focus is waste, sustainable supply chain relationships and enabling better collaboration through information systems.

Exploiting technology to enable smarter nuclear construction

Loh Koon Tan, IBM

Loh Koon set out the challenges facing nuclear construction and suggested that safe, on-time delivery to quality and budget could be helped if we had (amongst other things) a single source of asset information, an integrated project design environment and a common standards and collaboration. Technology covering these issues has been deployed in a number of sectors and can be applied to nuclear construction with demonstrable return on investment. A number of systems were subsequently described, and he referred to integration as key.

Constructing Excellence through collaborative working

