

## Nuclear Island Employer Day: Workshop Summaries

Delegates were asked to consider two of three topic areas each containing a number of questions. These were:

- Topic 1: What is your ideal “new build” graduates?
  - What are the key skill sets to develop in a new build civil engineering graduate?
  - What activities would you like them to be able to perform on site?
  - Awareness and understanding of Nuclear Industry and Safety?
  
- Topic 2: How can employers help?
  - What do you do already?
  - What else could you do to add to the project?
  - Willingness to support?
  - How could you support?
  
- Topic 3: How can we adapt this programme for future engineering graduates?
  - What are the key skill sets to develop in a new build mechanical or electrical engineering graduate?
  - How can we encourage more input to future guard the project?

Following extensive discussion, feedback was taken from the four groups, leading to additional questions that facilitated the final session of the day: Plan me a project for 2011” which is to be used to inform the follow on event with HE and FE providers.

## FEEDBACK

### Topic 1: What is your ideal “new build” graduates?

- What are the key skill sets to develop in a new build civil engineering graduate?
- What activities would you like them to be able to perform on site?
- Awareness and understanding of Nuclear Industry and Safety?

#### Group 1:

Key skills should include “3 bar” menu of safety; a basic understanding of nuclear energy terms and radiation issues; a critical safety specification could be introduced; integration of nuclear risk assessment, project versus programme management; a record of procedures

Same activities as civil students, but different parameters to ensure need for radiation protection, longevity of plant, reinforced structures to quality level.

#### Group 2:

The key skills are similar to those embedded into the Constructionarium project already, but with distinct differences around the delivery of quality of construction to counteract radiation, and deliver shielding. In built would also need to be a significant appreciation of knowledge, skills and attributes relating to safety and regulatory frameworks, and design factors.

It was thought that a module around risk assessment, radiological risk, exploring elevated risk factors and build quality could be developed prior to site experience. Design changes to meet the nuclear requirements would need to be explored in depth.

The “moral imperative” to getting this nuclear build right needs to be acknowledged from the outset, engaging with the wider community, and international regulations needs to be highlighted.

**Topic 2: How can employers help?**

- **What do you do already?**
- **What else could you do to add to the project?**
- **Willingness to support?**
- **How could you support?**

Group 1:

The contractors already run graduate development programmes which ultimately lead to professional qualifications. These programmes are both site and classroom based but do not necessarily include hands on practical sessions. They also sponsor students through university and clearly feel that if “nuclear” courses were available they would consider sponsoring students in that area. Currently they also offer work experience for pre university students but naturally would be unable to do this on a nuclear site.

There was also a feeling that an ambassador type scheme for schools is needed to complete the package.

It was felt that there should be a method for sharing specific knowledge and experience in a transparent way added to the project.

All the employers expressed their willingness to support the project with manpower and time.

Group 2:

There was discussion around expanding the existing Constructionarium triangle to bring on board the client, contractor, suppliers and designers into the programme. There was also discussion around the role of the Nuclear regulatory bodies to establish a clear understanding of safety and awareness.

There was commitment from all parties to help fund, locate, design and find operators for supply chain materials to bring together a learning experience, and to build in employer and provider efficiency. This was thought to be more of a programme managed experience rather than a project management style, which may benefit and reduce barriers to employer uptake and input.

There was also commitment and discussion relating to Mechanical and Electrical Engineering aspects, where staff and materials would need to be developed – bringing together an alliance of committed stakeholders.

The programme was also seen as a tool to help deliver staff development and leadership skills, and real management experience, including a potential shift handover routine. This would benefit all parties engaged in the projects.

Group 3:

There was a good commitment from the delegates in this group (both employers and higher education) that is a good programme to invest in, and to consider for wider engagement on a consortium/supply chain basis. The delegates talked a little more about the “T-shaped” graduate – a broad, able student with a specialism. The areas to focus on included the need to increase regulatory affairs knowledge, understanding and practice, particularly as the needs of a nuclear power station are based on longevity when compared to other energy production facilities.

The delegates questioned the understanding of contractual agreements and who could really deliver on these – clarity on the engagement and requirements of the employer need to be stated. There was a need to increase industry attractiveness, and this programme could offer a solution whilst embedding a common language and understanding, with learners (students and employees) experiencing an “out of their comfort zone” programme that could build expertise and a shared attitude to safety culture and a willingness and competence to work in partnership.

The timing of the project was seen as crucial – “we ought to be doing this already”, and could we look at further investment, perhaps we could influence funding bodies as a critical body and lever research and development programmes and tax credits for engagement.

The ability of the project to deliver a single model was supported as a pilot scheme, which could be supported by a consortium of providers and employers, but allowing individual education providers to teach in an independent manner to meet the needs of their students – the concept of a critical mass approach to EU funding was approached enabling providers to meet the needs of the Bologna process. This, although seen as an issue for higher education, could be turned into an opportunity to meet the increased credit needs of UK programmes to reach the EU credit limit whilst embedding an European and internationally recognizable culture that might attract the European nuclear industry further.

Support to link university consortia would be required, whilst adding the nuclear specialism, with block learning packages financially modelled and projected so that there was clear return on investment for budget holders.

The concept of transferability was questioned – this was felt acceptable as the pre and post technical learning was flexible on delivery, and could be an opportunity to attract more education and employer partners if placed in the right location. The sustainability of developing such a large project was raised, especially as the on-site costs to set the project running would be large and up-front. The right balance needed to be struck.

The final discussions focussed on who exactly was this for – after some debate, the project could be taken forward on a large number of levels, including undergraduate levels as it currently stands, but also for new graduate recruits, where it could be part of the graduate training programme that employers already have to undertake, but also for wider staff CPD opportunities. A pilot could focus on undergraduates, but wider opportunities ought to be challenged on the longer term for sustainability.

**Topic 3: How can we adapt this programme for future engineering graduates?**

- What are the key skill sets to develop in a new build mechanical or electrical engineering graduate?
- How can we encourage more input to future guard the project?

**Group 2:**

It was felt that there are few differences between the skills sets needed for any of the process industries. Nevertheless, graduates should have adequate training and the agility to switch between industry sectors.

For the future it is imperative that “nuclear” modules are included in each of the relevant university courses. Perhaps by not only contractors but also universities forming joint ventures could be helpful in speeding up throughput of suitable engineers.

There was also commitment and discussion relating to Mechanical and Electrical Engineering aspects, where staff and materials would need to be developed – bringing together an alliance of committed stakeholders.

The programme was also seen as a tool to help deliver staff development and leadership skills, and real management experience, including a potential shift handover routine. This would benefit all parties engaged in the projects.

**Group 3:**

This group understood that a lot of facilities were already in existence at a number of universities within Engineering faculties. However, this project could raise the profile of nuclear for students and academics in mechanical and electrical engineering, allowing industry awareness and safety cultures to be embedded. The concept of the “Suitably Qualified and Experienced Person (SQEP)” was raised as an industrial standard for working in the nuclear environment, where the skills and competencies are well mapped. This would save on determining the specifics and learning outcomes may be – the concept of this ought to be embedded into programmes, and could be particularly attractive to employers who normally have to provide new graduates with this training.

Nuclear standards for site licences exist, and their specifics could be used to develop a set of “control zones” that students could experience and work with to regulation standards, and could be assessed, monitored and scored as part of the learning outcomes. The development of such modules might be considered in line with professional recognition, perhaps through the Nuclear Institute. Cogent agreed to consider this as an option for the development of both the civil and M+E programmes.

If a solid structure could be developed for mechanical and electrical fitting, it was thought that plans could be provided prior to site access, students could prepare for this fit, then when on site, find a defect in the structure that could act as a problem solving and client handling scenario. It was thought this could be an ideal opportunity to develop skills of supply and resource management, problem solving skills, communication and team working skills and vital client relationship developments, especially when communicating effects of the defect on time scales and project costs.

This could teach a systematic approach to project management, but also combine real life practical skills such as resource and team management, particularly is there was a shift pattern associated with the project.

It was thought a good concept to take further, with the caveat that a wide range of universities and colleges could access the facility, and a wide range of industry partners could support the development and delivery.

## PLAN ME A PROJECT

A final discussion around what a project might include followed these group discussions. A brief video of an existing construction project was shown as a potential exemplar to start final thought discussions.

Questions were raised as to the length of the project – did it have to be a 5 day programme, or could we expand it to be a longer or shorter period. Discussions agreed that from the academic perspective it was a good and solid amount of time, with timetabling issues easily managed as an on-site option.

Employers agreed that this was long enough, perhaps a little too long but acceptable, for their staff to be on-site. Delegates were also reminded of the pre and post-site learning that supports this project also.

There was some concern on keeping the project on a scale that is deliverable for civil engineering at this time, but there was great interest in considering a solid fixed structure that could be used to expand employer engagement in a facility that would tackle the fitting out of a nuclear reactor core, engaging a wider audience of mechanical and electrical engineering areas.

The idea of an existing model was tabled, and discussion around integrating mech/elec engineering into the programme, followed by a deconstruction project was also addressed. However, in general, although the idea was welcomed, there may be significant issues in delivering such a back to back concept if anything went wrong in the previous week programme of activity. The concept of having a Mech/Elec project that could be shipped into the Constructionarium site was also addressed. This area is to be considered as a potential area to explore, particularly if the site was set up with logistics issues to overcome.

The delegates were asked if they would consider continued engagement in the project – the response was an overwhelming agreement, with employers seeking a combined employer and provide event in early 2011.

This event is to consider:

1. The outline of a potential project
2. The academic learning outcomes
3. The entities of mechanical and electrical engineering
4. Flexibility in delivery options
5. partnerships

## ACTIONS AND NEXT STEPS

Following these discussions, the project team explained the next steps in terms of project plan. This included hosting the education provider event to feedback on employer views and engagement issues. The project team is to arrange a joint meeting in early 2011 to bring together employers and providers to consider the determination of the civil project to be trialled at Constructionarium, alongside a wider project plan to seek funding to secure a fixed facility option for mechanical and electrical engineering aspects.

All feedback from these events will be emailed to delegates and information placed on the web portal at: [www.cogent-ssc.com/Higher\\_level\\_skills/nuclearisland.php](http://www.cogent-ssc.com/Higher_level_skills/nuclearisland.php)

## MORE INFORMATION

For more information, please visit:

[www.cogent-ssc.com/Higher\\_level\\_skills/nuclearisland.php](http://www.cogent-ssc.com/Higher_level_skills/nuclearisland.php)

Or contact:

Dr Caroline Sudworth, HE Engagement Manager, Cogent SSC Ltd

[Caroline.sudworth@cogent-ssc.com](mailto:Caroline.sudworth@cogent-ssc.com)

Or Clive Smith, Nuclear Industry Representative, Cogent SSC Ltd

[Clive.smith@cogent-ssc.com](mailto:Clive.smith@cogent-ssc.com)

22<sup>nd</sup> October, 2010

## DELEGATES

1. Alison Ahearn	Imperial College London
2. Taiba Al-Arayedh	Westminster University
3. Janine Baker	National Skills Academy Nuclear
4. Lisa Brennan	Doosan Power Systems
5. Peter Brindley	Liang O'Rourke
6. Oliver Broadbent	Think Up
7. Tim Cribbens	Mace and EDF
8. Robert Dun	Skanska UK
9. Sarah Fielding	National HE STEM Programme
10. Steve Franklin	ECITB
11. Sheila Hoile	Hoile Associates Ltd
12. Robin Holsworth	Constructionarium
13. Hal Igarashi	RAE
14. Kirsty Lawson	Doosan Power Systems
15. John Male	AMEC
16. Chris Mason	Construction Skills
17. William Meldrum	Doosan Power Systems
18. Sarah Peers	NEF
19. Debbie Precious	Morgan Sindall
20. Alasdair Reisner	CECA
21. Barbara Smith	AMEC
22. Clive Smith	Cogent SSC
23. John Spencer	Costain
24. Caroline Sudworth	Cogent SSC
25. Mark Tippet	Horizon Nuclear Power
26. Ash Townes	Aker Solutions
27. Mark Wenman	Imperial College London
28. Jim Worthington	Balfour Beatty VINCI
29. Jane Wright	Westminster University

## ACKNOWLEDGEMENTS

The project team would now like to send their thanks for the time, consideration and effort from the delegates to consideration of the project as a whole and we look forward to starting off the Nuclear Island in early 2011.

We would also particularly like to thank the presenters for their valued input and expertise – this really helped to bring the project to life.

In addition, we would like to thank the Royal Academy of Engineering and the National HE STEM Programme in sponsoring the programme.