

Taking nuclear skills development to the next level

When it comes to staff training and development, a more holistic approach is on the rise within the nuclear industry, say **Clare Pollard, Viv Matthews, Joseph Leigh and Ruth Hall**

“What kind of training and development opportunities can your company offer me?”

In the interview room, this question comes up time after time as new recruits, especially graduates, demand a structured development programme from their prospective employer. To expand and maintain its workforce, the nuclear industry therefore needs to respond to the call for open and coherent training and development more than ever before; but how has this demand arisen? What does the term ‘training and development’ mean for today’s workforce and how can we deliver what is needed? These questions represent one of the most significant challenges to the industry today, with a workforce that needs an estimated influx of 8600 people per year over the next five years, according to results of a government survey, in order to meet the challenges ahead [1].

Along with the projected industry expansion causing the rising demand for training and development, comes the need to ensure that our workforce is suitably qualified and experienced in industry competencies, and primed to deal with new developments. Training and development has already been established as a priority for the nuclear industry, and was recognised in the Nuclear Industrial Strategy in 2013, which “identified priority areas where Government and Industry can work together” and set out the strategic direction for collaborative action on skills. In addition, it has been the focus of several industry-level meetings with institutions such as the National Skills Academy for Nuclear (NSAN) [2], and an agreement between NSAN, the Nuclear Institute and the Institution of Chemical Engineers, to promote the highest standards of professionalism in the nuclear sector [3].

The implementation of this strategy over the next five to ten years will be vital to deliver the correct and appropriate training to our employees, and without its success the industry is threatened by a skills and worker shortage that will ultimately push up the costs of our key national projects.

Bridging the gap

One of the most important routes to workforce expansion for the nuclear industry is to capitalise on the waves of new graduates that are flowing into the workplace from our universities; however, it is notably one of the most challenging

since, following the Fukushima accident in March 2011, the nuclear sector has not been as attractive to graduates in science, technology, engineering and maths (STEM) subjects. This is a phenomenon that may have been further amplified by the time needed to set up the new build programme. The result has been a shortage of mid-level nuclear engineers, felt keenly over the last couple of years, as the nuclear industry competes with other sectors. Compounded by an ageing workforce, with a projected figure of 4000 people expected to leave the sector every year, the industry urgently needs to open up the internal paths to promotion and accelerate its recruitment of graduates to close in on the growing ‘skills gap’ [4]; however, new graduates from STEM subjects, that arguably have the most transferable skills, may be choosing to go elsewhere.

The graph in Figure 1 shows that the number of people leaving higher education in STEM subjects is increasing, although the graph in Figure 2 indicates that this number as a percentage of all full-time higher education leavers is decreasing [5].

The conclusion is that the STEM graduate workforce is not growing as quickly when compared with other faculties. This is an additional challenge for a growing industry that relies heavily on STEM graduate intake as a key source of skilled and technical workers.

So, how is the industry addressing this issue? We return to the original question posed at interview. In terms of graduate intake, organisations now find themselves having to ask what the graduates of today want from their employer, and how they can make it easier and more accessible for those starting

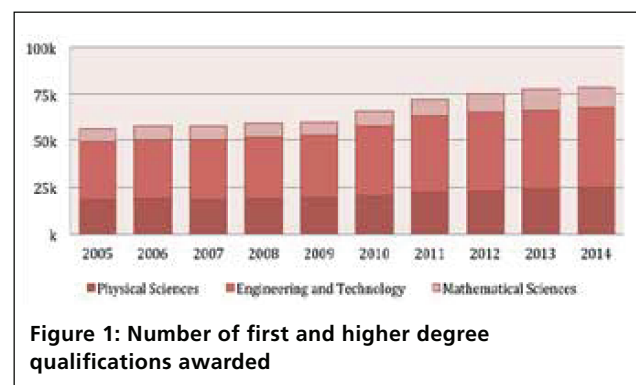
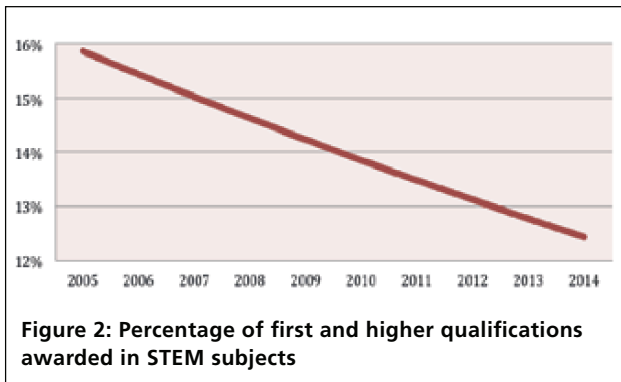


Figure 1: Number of first and higher degree qualifications awarded



a career in nuclear; a question that was also at the heart of a survey commissioned by the UK government at the end of 2015 [6].

During the graduate recruitment process at AREVA RMC, a fully owned subsidiary of the AREVA Group, we have found that there is now a much bigger emphasis on the need to provide a defined training programme, and a commitment to continuous development at all career stages. In our most recent round of graduate recruitment, all of our successful graduates said that the training and development opportunities offered by the company were a deciding factor in accepting the role. In other words, graduates are not simply looking for a menu of training courses on offer to them, but a clear demonstration of how the company will invest in their on-the-job skills and experience and provide them with opportunities to explore and progress within the industry.

Stepping out into the nuclear industry

One way in which many companies cater for graduate demands is to offer dedicated graduate programmes that map out a personal, tailor-made development plan. A series of technical training courses can form the basis of this, refreshing and building on graduates' knowledge of areas such as radiation physics and protection, nuclear safety cases, human factors and the nuclear fuel cycle. At AREVA RMC, we have recently developed a week-long Graduate Academy initiative, to kick-start this training cycle so graduates are aware of how their future training and technical work for clients fits into both the nuclear industry as a whole and also the business strategy of their new company. Technical modules interspersed with presentations on consultancy skills and business acumen aim to open up a forum for graduates to ask questions and develop a thirst for knowledge they can pursue throughout their career.

It is worth noting that a significant number of people are also looking for the opportunity to 'try before they buy' in the form of work experience or internships, which has led to a complete overhaul of the approach to recruitment and training. Before the 1980s, anyone considering an engineering career would typically leave school at 16 or 18 and take up an apprenticeship. This was less academically challenging than obtaining a university degree, and was seen as the right way

to develop the hands-on skills required to be an engineer. The 80s saw the UK become less and less industrial, the number of available apprenticeships reduced, and engineering became a less attractive career option. Since then, a university degree has become a prerequisite for most skilled jobs, ruling out some of those who may have taken the equally challenging route of HNC/HND qualifications while gaining hands-on experience within industry.

In the 2000s, with the growing cost of university places, there has been a steady increase in apprenticeship applications. In the nuclear sector alone there has been a 300% rise in the number of apprenticeships on offer since 2008 [7]. To encourage more apprenticeship-based entry into the workplace, and attract more young people back into engineering, the UK government announced its plan to develop nine new Degree Apprenticeships, including one in nuclear engineering, created in partnership with many of the industry's key clients [8]. NSAN and the Nuclear Institute have also developed an apprenticeship approval process, demonstrating industry-level investment in high-quality, professional nuclear apprenticeships, as more and more companies begin to offer these schemes [9].

Defining the training needs

In the nuclear industry there is also a safety requirement to ensure there are sufficient numbers of competent personnel to undertake all areas of technical application, such as radiological protection, human factors, criticality and plant engineering. This requirement covers plant personnel as well as consultants and contracting resources. Training needs analysis (TNA) is the formalised process of defining the training and development needs of staff to ensure they are appropriately trained to carry out their roles and responsibilities both effectively and efficiently. This process covers both the current job and growth into successive roles.

TNA forms part of the systematic approach to training which is broken down into five interrelated phases: analysis, design, development, implementation and evaluation feedback. In this model, the analysis provided by the TNA informs the design of the training programme, which is then developed further before being implemented. Throughout these phases, ongoing evaluation and feedback is undertaken, which further informs and refines the process to ensure that the training programme remains responsive to ongoing development or evolution of the training requirement.

The systematic approach to training (SAT) states: *"A central challenge and requirement for ensuring the safety and reliability of nuclear power is to attain and maintain the qualification and competence of nuclear power plant (NPP) personnel, which includes operations, maintenance, management and technical support personnel. The objectives of safety and reliability cannot be achieved solely by the quality of equipment and hardware, but depend critically also on sufficient numbers of personnel having the necessary qualification and competence to carry out their tasks and responsibilities"* [10].

The SAT is recognised best practice in the nuclear industry. From initial entry level to senior positions, the process requires the examination of a specific role or task, in order to understand requirements. This will identify job competencies, both behavioural and professional aspects such as communication, written skills, team-working and technical skills relevant to the role. In the case of recruitment, once the competencies have been identified and fully defined, the necessary prerequisites for the role also need to be defined. The gap between the required competencies and the skills of the new recruit or person being promoted is filled by the training objectives and the designed training programme for the role.

The SAT does not promote a checklist approach to training definition; it requires specific reviews for each role, a dynamic and flexible approach that responds to industry, plant and regulatory influences. It considers the long-term needs and goals of the business as well as the short- to medium-term requirements of the individual. TNA is developed in conjunction with key stakeholders to ensure buy-in and learning from those undertaking key activities; however, training and development requires more than consideration of the role to be undertaken. Once the baseline level of training is defined for each role, the programme must then be tailored to the individual, factoring in career aspirations alongside defined requirements for their specific role, to ensure engagement and to increase the likelihood of staff retention.

The industry responds

To ensure that staff are trained effectively and essential knowledge is absorbed and maintained, the training methodology employed by companies in the nuclear sector is therefore evolving. As the concept of 'personalised learning' flows over from the education sector into business and industry, the 'one-size-fits-all' attitude to training finds itself on the path to extinction, as businesses rethink the most effective route of transferring and developing knowledge in their company, and equally, retaining that knowledge by continuing to develop and invest in its talent as people move from role to role.

As a result, a more holistic approach to professional development is on the rise, integrating opportunities for staff to widen their knowledge and experience through routes other than the traditional training course, and stressing the important role line managers and internal business hierarchies have to play in supporting this. In the Chartered Institute of Personnel and Development (CIPD) Annual Survey Report on Learning and Development, this trend was described as 'a shift towards creating a learning culture, with increased use of industry knowledge-sharing events, job rotation, secondment and shadowing, action learning sets and collaborative and social learning [11].

With activities such as attending conferences, gaining professional accreditation, job rotation and secondments as integral parts of individual development, staff are encouraged to contextualise discrete technical skills and knowledge gained in a classroom setting in a wider industry reality, and

vice versa. For example, attendance at industry events can be a dynamic, outward-facing way to maintain technical and industry knowledge, keep up to date with recent developments and build a professional network. As an additional benefit, this approach facilitates dialogue between the various sector disciplines, making it more relevant to the development needs of senior members of staff.

In this vein, organisations are also looking towards ways in which knowledge can be shared and transferred internally, calling upon more senior members of staff to steer the development of less-experienced employees. In fact, the 2015 survey on learning and development by the CIPD also identified how this has influenced a rise in internal coaching and mentoring cultures, with three-quarters of all organisations across the UK now offering these to their employees [12]. As one of these companies, AREVA RMC makes this support structure accessible to staff at all levels, with a view to provoking fruitful dialogue on career aspirations, and regular communication to ensure there are suitable and attainable routes of progression for all. Starting from an employee's first day, it establishes a point of interaction with more experienced members of staff able to support and enhance the development of newer or less-experienced employees. Coaching schemes, which typically offer more specific, shorter-term support mechanisms [13] are also used to optimise the learning of new skills, as the recipient develops their knowledge in a supportive, open environment that lends itself to resolving specific and individual challenges.

Finally, gaining a professional accreditation, offered by institutions such as the Nuclear Institute, Safety and Reliability Society, Institute of Ergonomics and Human Factors, or similar professional bodies, can provide greater access to industry updates and career development information, and is recognised as a useful development tool even at university level [14]. Companies need to be investing time in allowing their staff to develop their standing in professional bodies to help meet individual career aspirations, for example through gaining Chartered status, as well as positioning themselves to help others in the organisation achieve similar status.

As an additional means of knowledge transfer, AREVA RMC also runs a lunchtime seminar scheme, which involves monthly presentations by members of staff to the rest of the company, detailing their area of work or any new developments of interest. With the two-pronged benefit of providing a simple knowledge transfer system for staff, and also the opportunity to develop presentation skills, these seminars have proved hugely popular, and receive a generous turn-out.

Conclusion

By establishing effective knowledge transfer systems, and acknowledging the role of more on-the-job training methods, employers advocate greater investment from staff to engage with their own development and that of others in their teams. Moving beyond the days of the appraisal where the employee states a desire to attend a course and the company

agrees, employers can also optimise how their training and development budgets are spent on a case-by-case basis, and focus on the return on their investment for any training and development activity. In terms of their workforce, this more proactive ethos is not only attractive to prospective candidates but is also a key tool in retaining valuable members of a skilled workforce.

With a greater responsibility for line managers and in-house mentors, however, this approach requires senior management to communicate a clear business strategy and focus throughout the company's hierarchy. With the wider picture clear for all to see, individuals and their managers can direct their development so it is pertinent to the needs of the business, allowing them to open up paths to promotion and mobility. This cohesion can then be used to boost a collective and concerted effort to bring training and development to the forefront of the nuclear industry agenda, expand our workforce and ensure our skills are maintained, developed and relevant.

As such, if our industry is to fill the skills gap and secure the numbers necessary to support itself, we must answer the simple and relevant question posed at interviews: "What kind of training and development opportunities can your company offer me?" It is apparent that the industry must adapt to these changing times and should be responding to the needs of the new talent. Additionally, the industry must recognise the role that the existing workforce has in terms of coaching, mentoring and providing training. Ultimately, companies that adapt and innovate will benefit from increased workforce motivation, capability, retention and industry standing.

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Authors



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Clare Pollard joined AREVA RMC in 2010 as head of the human factors team, supporting nuclear licensees on many types of project across the UK. A Chartered Fellow of the Institute of Ergonomics and Human Factors, Clare has particular interests in security behaviours, operator error and the human aspects of decommissioning.



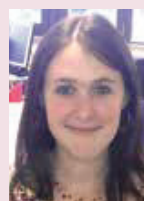
Viv Matthews

Viv Matthews is HR manager for AREVA RMC, having joined in March 2013 with 30 years of HR experience. She has an MA in HR management and is a Chartered Fellow of the CIPD. Viv provides a comprehensive HR service to ARMC and in particular enjoys graduate recruitment, training and development.



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Joseph Leigh is a graduate safety consultant at AREVA RMC and has memberships with the NI, IoP and SaRS. Joseph joined the company in January 2015 after graduating from the University of Sheffield with an MPhys (Hons) degree. Recently, he has been supporting projects for radioactive waste management in Harwell.



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Ruth Hall has been working as a management trainee for AREVA RMC for two years since completing an undergraduate degree and Masters in Modern Languages at the University of Oxford. Ruth supports several functions within the business, including the current training and development programme, marketing and communications.