Human performance

Improving safety and business performance across the nuclear sector

We are all human, and we all make mistakes; but is this an acceptable stand-point for our industry, asks Mark Burbridge?

The NHS has certainly had a share of bad press in recent years following the findings from the Francis report [1] that came out of the inquiry into serious failings at the Mid Staffordshire NHS Foundation Trust. Recent research around a more humanistic, patient-centred approach in the healthcare sector has led to the introduction of very simple but effective tools that in turn have led to significant reductions in infection and mortality rates in NHS Scotland. The work of Professor Don Berwick [2], who was one of the panel members in the Francis inquiry, has had a huge impact on mindsets around patient safety, errors and the ability to be open around potential error traps.

Within the UK nuclear sector we have been on a long journey with safety since the pioneering days of the Windscale site. Human Performance has now emerged as the leading thinking around safety and business improvement, and has strong similarities to the NHS changes described above.

Oakridge and Bury College have been working in partnership with the National Skills Academy for Nuclear over the last 18 months to develop specific training inputs against the agreed standards around human performance from fundamental level through to the training of HuP practitioners.

What is human performance?

At the simplest level the approach around human performance is about getting us all to stop and think before we act, but also to be curious about the systems, culture and ways of working we have in place that can lead to errors arising.

The basic principles that have been developed around human performance are difficult to disagree with:

- We are all fallible and make mistakes
- Errors are predictable
- The values of an organisation and its processes have a huge impact on the way we behave
- These behaviours are reinforced by encouragement from peers, leaders and colleagues
- Events that affect safety and business can be avoided by understanding why they occur and learning from past events

The first of these principles forms a key foundation to thinking around human performance: we are all human and are prone to making errors. If you cast your mind back over the day you have had so far, think carefully about your activities and be honest with yourself around how many small mistakes you may have made. According to Goldberg [3] we make on average between three and 11 errors per hour. The majority of these have little consequence, but all of them are important indicators of future incidents or events arising.

In the highly-regulated nuclear sector we have become accustomed to rules and standard procedures. However, we must also encourage an openness to admitting to our mistakes if we are to keep on improving those standards. Errors are certainly predictable, especially if we apply the learning from our experience of previous events and are open about those errors we see around us.
The culture that we have within our organisations will also impact on our safety and business performance. What the organisation values will dictate where our attention is focussed. Professor Berwick states that ‘culture will trump rules, standards and control strategies every single time’. This was seen within the NHS where the wrong standards and behaviours had been allowed to develop to the extent that the patient was not seen as central to patient care and attention became the accepted way of working.

In human performance we are encouraged to stop and think about what is happening around us and to challenge poor standards. This balance is to be found between acting automatically where we are ‘unconsciously competent’ and thinking about the task in hand where we may need to be more ‘consciously competent’. So is the blame around incidents to be placed firmly at the door of human error alone? Interestingly the statistics from the Institute of Nuclear Power Operators (INPO) database [4] show that around only 30% of human errors in the workplace are down to the individual but more importantly 70% of these human errors happen as a result of latent organisational weaknesses.

Human decisions and behaviours do have a role to play at the point of an incident happening, but there are always latent factors in the way that we set up activities. James Reason [5] introduces a Swiss cheese model where the final action taken by an individual may be the ‘active error’, or hole in the Swiss cheese that causes the event. He highlights those latent errors, or holes in previous layers of the cheese, that all align at the same time for the final act to lead to an event. These factors may include supervision, process, engineered and cultural aspects, all of which can carry weaknesses that can remain hidden in the organisation but which can align on the day of an event with significant consequences.

From a safety point of view, human performance is therefore centralised around reducing those errors (6) that we can see around us but also managing the defences (Md) effectively to stop latent errors having an impact at a future date. In simple terms:

\[ HUP = Re + Md \]

**Specific tools**

In addition to the key principles there are a range of tools that can be applied with teams and individuals to help prevent errors. Some of these tools appear very simple on the surface, but let us look at what they are applying to one of the key human performance tools around peer checking and verification.

Within key employers such as Magnox, EDF and Sellafield sites the human performance approach has been shared across all functions and there is good evidence of tools being used to help reduce errors in all areas. As a result there is a groundswell of interest in human performance within the suppliers to those nuclear-licenced sites as lessons are learned and shared across the nuclear community. Key employers and sites are also considering asking those suppliers to sit and develop evidence of human performance practice as part of any tendering process. Leaders and managers are pivotal to a successful human performance approach. Andrew Hopkins [8] uses the term ‘mindful leadership’ and references the Texas City BP Oil Refinery incident in 2005 where 15 people died and 200 were injured. He defines mindful leaders as being pre-occupied with the fact that something could go wrong and they have an awareness around the controls in place in the organisation. In Texas City the causes of the incident included the fact that the site had old pipework in place that needed replacing and that limited maintenance was taking place. The BP leadership team were unaware of the potential impact of all of this as the climate within BP actively discouraged bad news from passing up through the organisation. It is clear that there is a need for all employees to have a fundamental understanding of the principles and key tools that they can apply. However, it is hugely important that all managers can encourage and enable a culture of learning and openness around applying the human performance tools in their teams.

Senior managers in particular need to keep a focus on human performance and ensure that a balance of both support and challenge is present so that errors are highlighted and acted upon.

**Approaches being adopted**

Each organisation needs to assess the degree to which they want human performance to impact on their business. There has to be a real will and desire within the senior team to support and drive human performance: why do they feel human performance is important and how will they go about setting up a governance structure to ensure it has impact? They may then set responsibilities for human performance with site or function leaders with support provided from local champions or practitioners.

Managers at all levels should take a healthy attitude towards highlighting potential errors and incidents. For example, if you see an individual not wearing the correct eye protection it is often instinctive to just tell them to wear the right equipment. This will get an instant behavioural response but may be a one-off reaction. How about asking them what we are doing wrong that has led them to feel it is okay to wear the wrong equipment?

At team level, the key tools need to be used regularly so as to keep a healthy, open-minded attitude around errors. Some of the teams we have seen applying human performance tools in organisations as Magnus have made use of whiteboards in the office where they have a table showing potential error traps and mark these against possible human performance tools that could help prevent future errors occurring.

**Support for the sector**

Nationally agreed industry training standards at fundamental and full practitioner level have been developed with employers through the UK Nuclear Human Performance Forum, the National Skills Academy for Nuclear and Cogent Sector Skills Council to identify the skills, knowledge and understanding needed for effective training to take place through the Skills Academy High Quality Provider Network. Providers (Oakridge and Bury College) were chosen through a competitive tendering process to develop learning programmes to meet the industry standard. The partnership of Oakridge and Bury College Business Solutions now has training programmes and consultancy support in place to help organisations decide their best approach to introducing human performance and to train employees and managers in key tools and techniques.

**References**

4. INPO, March 2000; ‘Event Database’,
8. Hopkins, A; ‘Mindful Leadership’, DVD, Futuremedia

For further information on these programmes please contact: Peter.McCabeOakridgecentre.co.uk or Tracey.Schofield@burycollege.ac.uk

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