

Newsletter

UK Nuclear Human Performance Forum

October 2015

Welcome from our new Chair

Ray Hardman, Program Manager, Westinghouse

Welcome to the October 2015 edition of our newsletter. Since the last edition I have had the honour to have been selected as the new chair.



Ever since I first learnt about the principles of Human Performance back in 2004, I have been an advocate of spreading the message.

The UK Nuclear Human Performance Forum provides a perfect opportunity to share best practice within the industry, and to mould Human Performance to provide consistency of approach, right across our industry.

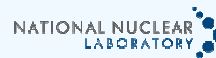
Over the past few years the forum has driven towards this purpose with the development of excellent Training Standards and a comprehensive Human Performance Blueprint developed to help those setting out on the journey to avoid some of the pitfalls that we identified as we developed our own programmes. I am sure that as we learn further lessons we will continue to develop and adapt this excellent document.

As chair, I am keen to look forward and to ensure that we continue to share our best practices for the good of all our members, as well as identifying opportunities for innovation through our contacts both nationally and internationally.

Our industry is maturing and with this comes new concepts and challenges. Currently there is much talk about Nuclear Safety Culture (NSC) with the international development of the 10 Traits of a Strong Nuclear Safety Culture. Our specialism of Human Performance is seen as a key part of this. Therefore I am keen to ensure the forum has a strong voice in moulding its development in the UK industry.

Over the coming months I am sure we will spend much time debating this topic and with the expertise we have in our membership, we will be able to provide help and guidance to the industry, the Safety Directors Forum and our regulator in the successful implementation of the concepts of NSC.

Finally, with regards to our membership, I am keen to ensure our voice is seen as representative of both the nuclear sector and other high reliability organisations, and as such I would like to see our membership expand to other key industries so we can continue to learn from each other and identify opportunities for improvement that we can share and implement.



Learning from events – Piper Alpha

On the 6th of July 1988, a catastrophic series of explosions occurred on the Piper Alpha Oil Rig in the North Sea. 165 men died.

As Human Performance Practitioners what can we learn from this terrible event? What were the error precursors, flawed and missing defences and organisational weaknesses which led to the disaster? Piper Alpha was an oil rig which was converted to also deal with natural gas. This meant that installation of the gas equipment had to be fitted into the existing space.



The main workings had to be situated close to the control room and accommodation block, this was to prove fatal to many of the workers on the rig. The cladding was fireproof but was not rated for withstanding an explosive force.

On the fateful day, new gas pipes were being fitted to the rig and large gas leaks were commonplace, these soon became part of the normal expectations on the rig.

Alongside the installation work, maintenance was ongoing on one of the 2 large gas compression systems and a relief valve had been removed for service work. The work over ran and the decision was taken to complete on the following day. The permit was signed off...there were 2 permits issued for the same equipment but one had been issued on the control panel, while the other for the valve had been issued by the safety department. The permits were not cross referenced.

When the duty compressor failed, the decision was made to re-start the compressor that was under maintenance. The oncoming shift were not aware the valve had been removed. It was noted in the enquiry that turnover was poor. The problem was compounded by the rigs power system relying on gas to fuel the generators. The maintenance team had little time to get the gas back on before the power was lost. The compressor was re-started and there was a huge gas escape which found an ignition source and this caused an explosion which destroyed the control room. Other ongoing work on the seabed meant the fire deluge system had been placed in manual and could only be started by an operator manually throwing the switches. This never happened. Over time this heated up the huge gas pipes coming from the seabed and they melted which caused further explosions which were the final straw for the rig and the conflagration.

Error precursors present (conditions which provoke error)

Time pressure	Due to the possibility of losing all power the maintenance team were under severe pressure to get the compressor back on line.
Lack of standards	The standards for PTW's had decayed as had the shift handover process. Much was left to the individual workers to understand current plant conditions.
Imprecise communication habits	The exchange of information was poor. There were repeated problems with the quality of turnovers.
Complacency	The culture of accepting gas leaks and other "off normal" conditions as matter of fact meant there was a lack of questioning attitude.
Unclear goals, roles and responsibilities	The rig had separate areas for issuing permits. The lead safety operator was responsible for monitoring the PTW system but no indication had been given to mangers that there was a problem.

Error Precursors /continued

Unexpected equipment conditions	There was no indication the pressure valve had been removed and a blanking plate fitted but only loosely. The oncoming maintenance supervisor had no briefing as to the condition of the compressor under repair.
Assumptions	When the duty compressor broke down, it was assumed there was only the one permit and it could be signed off and returned to duty.

Defences (measures taken to prevent human error)

Defences which create awareness	Training & Qualifications – Drills were not conducted weekly as required and no full scale shutdown drill had been carried out in the 3 years before the event. This meant there was confusion as to what action to take.
Defences which protect	Equipment design – Piper Alpha had no fireproofing on the miles of pipe work and it was known to management that structural integrity could be lost within 10-15 minutes. A report commissioned the year before had made recommendations for the fitting of emergency isolation valves. Several days would be required to de-pressurise the lines. However nothing had been done. The Cullen Report criticised management oversight and follow up on identified issues.
Defences which detect and warn	Management oversight – Management had been made aware of the problems with the permit system. A senior maintenance technician had raised concerns during a meeting at the company’s headquarters however, no real improvements had been made.
Defences which enable escape	The emergency plan called for the rig manager to run evacuation operations from the radio room adjacent to the control room. The explosion destroyed the radio room and there was no back up process. The heli-deck was covered in smoke preventing helicopters landing. The life boats were outside of the rig and could not be reached by the men due to the heat and smoke.

Organisational weaknesses

- The company did not demonstrate a ‘safety first’ philosophy and managers on adjoining rigs did not feel that they could take action to shutdown production without obtaining permission from on-shore. This continued to feed the fire.
- The continuous leaks experienced in the days leading up to the disaster were treated as normal and not as critical events. There was a ‘production first’ philosophy operating on the rig.
- There had been a number of reports, complaints and indications that standards on the rig were not all they should be. Along with this, the company had ignored reports warning of the dangers to the rig from the lack of cladding, the recommendation for isolation valves on the gas lines and the discontinuation of switching the fire pumps to manual.

Human Performance conclusions

It is clear to see the workers were doing the best they could in difficult conditions. There were a number of error precursors over which there was local control however, this event demonstrates that many defences had deteriorated or were missing, and the organisation did not recognise the seriousness of the issues.

Human Performance is often aimed at front line level. This event demonstrates that managers, engineers and knowledge workers must also identify and act upon deteriorating performance and missing or flawed defences.



Embedding Human Performance Seminar WANO Paris Centre, July 2015

The seminar was attended by 31 delegates from 11 countries. The key focus of the seminar was the learning the organisations represented had gained through the implementation of Human Performance programs in their own organisations.

The presentations reflected how programs had been developed, their current direction and provided food for thought for all delegates. The presentations are available to members through the Share Point site (follow link below) and can be found in Section 9 in the Conferences folder.

Three forum members were invited to provide presentations to the seminar and all were well received. Ray Hardman presented the UK Forum's Blueprint for Human Performance, and Westinghouse Human Performance to Nuclear Safety Culture Journey, Liz Auty presented on Embedding Human Performance within EDF Energy and Bob Duarte presented on Safety Culture for Nuclear Construction Projects within EDF Energy, New Build.

The UK Nuclear Human Performance Forum was also represented by Mandy Carter (Magnox) and Andrew George (Sellafield).

2015 Workscope update

➤ Human Performance Leaders Training Standard.

The standard is complete and is available on the Share Point Site, SDF Website and Nuclear Training Network Website.

➤ Maturity Matrix for Human Performance Programmes.

A sub group led by Reg Rudd (Doosan) are working on this complex topic and progress is being made to ensure this worthwhile project provides a document with which forum members can identify their areas of strength and areas for improvement against a common standard.

➤ Body of Knowledge, Leader Training Standard and Blueprint Alignment

A sub group led by Ray Hardman (Westinghouse) has been identified to ensure there is consistency between the three documents listed above.

➤ Human Performance Knowledge Worker Training Standard

Work is underway to identify the best practices, case studies and methods used by the member organisations to train Knowledge Workers. We are considering whether there are enough differences between the existing Training Standards to warrant a separate standard or whether modifications to the current Fundamental and Leaders Standards would be sufficient.

Future meetings

Our final Face to Face meeting for 2015 will be held on 11-12 November, hosted by LLWR in Cumbria.

We are in the process of confirming our teleconferences and Face to Face meetings for 2016.

Chair: hardmarw@westinghouse.com

Website: <http://www.nuclearinst.com/HPF>

Secretary: amanda.carter@magnoxsites.com

Guest Editors: elizabeth.auty@edf-energy.com
james.cowell@urenco.com