Human Performance for Nuclear Leaders

Training Standard

Document History

This is a controlled document maintained by Cogent. Future revisions will be recorded below with revision details and date of revision.

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Issue 1	New Issue	M McManus	R Hardman & working group	L Auty

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Introduction

Human Performance refers to the technology that applies error management, organisational defence management, safety culture, and performance improvement principles and tools to prevent Human Performance events or to mitigate their consequences if they occur.

The analysis of events within the nuclear industry has highlighted the need to strengthen the focus on Human Performance excellence in organisational processes, practices and behaviours to enhance the safety and reliability of nuclear plant operations.

This Training Standard has been developed with employers in the UK Nuclear Human Performance Forum, to identify the skills, knowledge and understanding needed for effective training to take place, and it is not intended within this document to cover the requirements of all the disciplines discussed above. The Training Standard itself is established under the collaboration agreement between the National Skills Academy Nuclear and Cogent Sector Skills Council, and forms part of Cogent's Nuclear Industry Training Framework, which provides a skills benchmark for world class performance for the nuclear industry.

Aim and Purpose

To provide the learner with an understanding of how organisational leaders in the nuclear industry need to incorporate Human Performance concepts into their work, to reduce the severity and frequency of events and thus improve organisational performance.

Audience

Leaders in the nuclear industry at all levels, from supervisor to executive team.

It is assumed that all learners will already have undergone training mapped to the Human Performance Fundamentals Training Standard, as well as suitable leadership/coaching training.

Human Performance - definition

Human Performance (HU) is a unique blend of behaviours, managing organisational defences, safety culture and preventing errors to avoid or mitigate the impact of events and accidents. Simply defined, HU is "Behaviour + Results"; HU=B+R

Human Performance is an important function for any high reliability organisation, which is any organisation whose operation has the potential to cause serious consequences if an event occurs. An event is an occurrence triggered by human error that causes, or has the potential to cause, reduced safety margin to personnel, equipment, property, the environment, or the public.

Human Performance focuses on both *reducing errors* and *managing defences* to decrease the likelihood of significant events occurring.

Human Performance is based on the following principles:

- People are fallible; even the best make mistakes
- Error-likely situations are predictable, manageable, and preventable
- Individual behaviour is influenced by organisational processes and values
- People achieve high levels of performance based largely on the encouragement and reinforcement received from leaders, peers and subordinates
- Events can be avoided by an understanding of the reasons why mistakes occur and application of the lessons learned from past events

Training Standard

Title	Human Performance for Nuclear Leaders
Detail	
Aim & Purpose	To provide the learner with an understanding of how Human Performance theory is applied to leadership in the nuclear industry, and thus improve organisational performance.

Learning Outcomes The learner will:	Assessment Criteria The learner can:
1. Refresh their understanding of the fundamentals of Human Performance theory and principles	1.1 Explain the five key principles of Human Performance 1.2 Describe the three modes of performance (skill-based , rule-based, and knowledge-based) 1.3 Explain the importance of managing organisational defences and how Human Performance tools and techniques can be used to reduce the frequency and severity of events 1.4 Describe the fundamental components of an error, including the Anatomy of an Event and Error Precursors 1.5 Summarise the difference between active and latent errors and describe when and how error reduction tools can be used to minimise or detect the potential for human error
2. Understand why Human Performance is important to their role as a leader	2.1 Outline the strategic value of Human Performance in the nuclear industry and how its key principles apply within an organisation 2.2 Explain why leaders take responsibility for Human Performance, and how it is a core business value that has impacts on the cost of poor quality and on safety 2.3 Describe the key elements of regulatory guidance relative to Human Performance 2.4 Explain the risk for leaders and knowledge workers to create latent errors and flawed defences

3. Understand the role of leaders in reducing errors and decreasing the frequency of events	3.1 Identify the different organisational factors and management processes that can influence human error and affect the frequency of events and serious accidents
	3.2 Explain how these organisational factors and management processes can interact to influence human error and impact on the frequency of events and serious accidents
	3.3 Understand the relationship between the human machine interface, the potential for human error and mitigation strategies
	3.4 Describe the behaviours necessary for leaders to decrease frequency of events, including:
	    3.4.1 Setting the bar (Standards)
	    3.4.2 Promoting discretionary effort
	    3.4.3 Encouraging open communication
	    3.4.4 Adopting the values and modelling the behaviours promoted by the Human Performance programme
	    3.4.5 Rewarding behaviour, not results
	    3.4.6 Visibly holding others to account (both positively and negatively)
	3.5 Avoiding "Fix the Worker"
	3.6 Understand the importance of maintaining a process for the investigation of why error has occurred or defences have failed

4. Understand the role of leaders in Managing Defences and reducing the severity of events	4.1 Identify the different organisational factors and management processes that can impact on organisational defences and affect the severity of events and serious accidents 4.2 Explain how these organisational factors and management processes can interact to undermine organisational defences and affect the severity of events and serious accidents 4.3 Explain the Drift Model as described by Dekker (see Recommended Reading, Appendix 2) 4.4 Explain the importance of the observation process (being out "on the floor") 4.5 Explain the culpability model and how it aids the investigation process

5. Understand the link between business decisions and Human Performance in the workplace	5.1 Outline the importance of conservative and systematic decision-making by leaders and appropriate consideration of safety 5.2 Identify the links between the decision-making process, change management, the transition curve and Human Performance 5.3 Outline the leadership behaviours and actions necessary during decision-making to achieve and sustain high levels of Human Performance and minimise disruption to the organisation
6. Understand the link between leaders' communication and Human Performance throughout the organisation	6.1 Identify the links between effective leadership communication and Human Performance 6.2 Explain the importance of routine communication that continually reinforces adherence to organisational values and clearly defines expectations and standards for effective Human Performance 6.3 Explain the importance of leadership communication in setting clear expectations of roles, responsibilities and accountabilities relating to Human Performance 6.4 Explain the importance of keeping channels of communication open, actively soliciting information from employees on ways to improve safety and quality, and encouraging employees to report problems
7. Understand governance and oversight of Human Performance systems, tools and techniques	7.1 Understand why Human Performance must be treated as a process and not an initiative 7.2 Outline the organisational structure, resources and management processes required to ensure effective governance and oversight of Human Performance 7.3 Explain the value and benefits of routine internal/external challenge and scrutiny of Human Performance to achieve real time awareness of organisational status 7.4 Outline the importance of a systematic process for the identification, analysis and resolution of gaps in Human Performance 7.5 Outline the importance of routine self-assessment to compare current practices and conditions with standards of excellence and regulatory requirements 7.6 Explain how to review performance, identify deltas (metrics & trending) and develop improvement strategies 7.7 Understand why to look at leading indicators
8. Understand the impact of leaders' own behaviours	8.1 Describe how leadership behaviours can influence the commitment, behaviour and performance of others within the workplace

and leading by example, with regard to Human Performance behaviours	8.2 Explain the importance of releasing time to lead, both for themselves and for other leaders in the organisation 8.3 Outline the barriers to Human Performance improvement that may exist in an organisation and how leadership behaviour can overcome them 8.4 Describe how to identify and coach the "first followers" (as described by Derek Sivers at the 2010 TED Conference) to increase wider take-up of behaviours across the organisation
Additional information about this standard	
Assessment methodology	The purpose of assessment is to ensure that effective learning has taken place. Assessment of the candidate's performance will be against the stated learning objectives and should involve both written and practical assessments. The assessment process should: • Be fair and clear for those undertaking it. • Explain clearly the standards for satisfactory completion of the model. • Be consistent and transparent in its marking. • Be open to audit by the National Skills Academy Nuclear, or its appointed body. The Training Provider should arrange for summative assessment to take place in suitable conditions and where appropriate, for the responses to be collected immediately and marked within 24 hours. The learner should be informed of the result as soon as possible and recorded.
Training delivery time	There are no Guided Learning Hours for this Standard, but it is expected that the delivery time will be approximately one day.

Appendix 1: Person specification – Trainer / Course director

Domain knowledge and experience
Trainers / course directors should:

- Have practical knowledge of Human Performance in a high hazard and/or highly regulated sector, normally by extended periods of working in industry in roles with specific nuclear safety responsibilities
- Have a thorough knowledge of the principles of Human Performance, over and above the specific scope of the course(s) they plan to deliver
- Be able to demonstrate knowledge of relevant regulations
- Ideally, hold an accredited qualification relevant to Human Performance (Psychology, Human Factors, Organisational Development)
- Be recognised as competent via (Human Performance professionals) peer review
- Have a personal commitment to high standards of safety and professional ethics

Teaching knowledge and experience
Trainers / course directors should:

- Have proven experience in delivering professional training and continuing professional development (CPD), including experience at the level of seniority appropriate to the course, given the typical learner
- Undertake personal CPD to keep their knowledge and skills up to date
- Be able to provide references as to their training ability and learner satisfaction
- Be articulate and engaging, able to establish interaction and rapport with learners
- Be willing, where appropriate, to undertake pre-course interviews with a view to tailoring delivery to learner needs
- Be conversant with, and able to select and apply, a range of appropriate training techniques and styles
- Be able and willing to adapt their delivery and, where possible, material and examples used, to suit the learners concerned
- Be willing to mentor other presenters in delivery of the course or similar material
- Be willing for their presentation, and the course content, to be subject to feedback and evaluation
- Be willing to provide feedback after each course in order to guide the improvement of course design, content and materials
- Be willing, if requested, to undertake follow-up visits and discussions with learners
- Ideally, have received formal training in teaching/learning techniques

Appendix 2: Recommended Reading

- U.S. Department of Energy, Human Performance Improvement Handbook Volume 1: Concepts and Principles. 2009
- U.S. Department of Energy, Human Performance Improvement Handbook Volume 2: Human Performance Tools for Individuals, Work Teams and Management. 2009
- The Field Guide to Understanding Human Error. Dekker, S. 2014
- Drift Into Failure: From Hunting Broken Components To Understanding Complex Systems. Dekker, S. 2011
- HSG 48: Reducing Error and Influencing Behaviour. Health & Safety Executive. 1999
- TED Conference speech, "How to start a movement", Sivers, D. 2010. (www.ted.com/speakers/derek_sivers)
- NS/TAST/GD/058 – Office for Nuclear Regulation Technical Assessment Guide 'Human Factors Integration', Revision 2, Appendix 2. February 2014

Appendix 3: Acknowledgements

Major contributors to this document

The content of this document has been developed by UK working groups consisting of nuclear Human Performance specialists.

UK Nuclear Human Performance Forum

The UK Nuclear Human Performance Forum was established in 2008 to focus on the development of Human Performance across the UK. At that time, there were no established UK or European standards for Human Performance training for practitioners, or any consistent approach to the development of Human Performance in the UK nuclear industry. In addition, there was no national network for learning and sharing best practice in Human Performance across the nuclear industry, despite the growing field of interest and commitment to Human Performance within the UK.

Members of the UK Nuclear Human Performance Forum include:

- AWE
- Babcock
- BAE Systems
- Cavendish Nuclear
- Cogent Sector Skills Council
- Doosan Babcock
- Dounreay Site Restoration Ltd
- EDF Energy
- GE Healthcare
- Horizon Nuclear Power
- Magnox Ltd
- Ministry of Defence
- National Nuclear Laboratory
- National Skills Academy Nuclear
- Office for Nuclear Regulation
- Rolls Royce Nuclear
- Research Sites Restoration Ltd
- Sellafield Ltd
- Urenco
- Westinghouse UK

Cogent Sector Skills Council

Cogent is the Sector Skills Council for the Chemicals, Pharmaceuticals, Nuclear, Oil and Gas, Petroleum and Polymer Industries, established in 2003. Cogent is licensed by UK Government to help employers in these industries to address their workforce development needs so that they can compete successfully in a global market.

As an employer-led Sector Skills Council, Cogent works with industry to research and forecast skills needs and to develop fit-for-purpose standards, qualifications and other skills solutions.

Cogent has a unique place in the UK's skills infrastructure and operates to provide a voice for employer demand.

National Skills Academy Nuclear

The National Skills Academy Nuclear was officially launched by the UK Government in 2008. It was established at the request of nuclear employers to address the key skills and training challenges facing the nuclear industry.

The Skills Academy is the lead strategic body that represents the industry to stimulate, coordinate and enable excellence in skills to support the nuclear programme.

The National Skills Academy Nuclear is an employer-led membership organisation established to ensure that the UK nuclear industry and its supply chain has the skilled, competent and safe workforce it needs to deal with the current and future UK nuclear programme, including all sub sectors: Defence, Decommissioning, Operations, Uranium Supply, Enrichment & Manufacture, Waste Management & Disposal, and New Nuclear Build.