

The UK Nuclear Industry Guide To:

# Organisational Capability and Resilience



This Nuclear Industry Guide was produced by the Organisational Capability Working Group and published on behalf of the Nuclear Industry Safety Directors' Forum (SDF)

**September 2018**



## **Foreword**

This document has been produced in response to a request from the Safety Directors' Forum to address a strategic issue on organisational capability and resilience. It aligns with the recasting of Licence Condition 36 from Control of Organisational Change to Organisational Capability. The document is written at a high level and aimed at Board members and Senior Leaders.

Safely delivering a successful business in the nuclear industry presents unique tensions between a high hazard industry, public risk aversion and the requirement for robust management controls and regulatory compliance. There is a need to deliver a business cost effectively in the face of programme and political pressures and against a background of competition for scarce skill sets.

This Good Practice Guide describes the drivers for and the importance of organisational capability. It provides a framework to enable the reader to form a broad view of their organisation's capability with respect to nuclear and radiological safety, environmental protection, health, safety, quality, safeguards and security and identify areas for improvement. It sets out the key attributes of a capable organisation, how they are demonstrated and how they can be evaluated.

## Safety Directors' Forum

In a sector where health, safety, security and the protection of the environment is, and must always be, the number one priority, the Safety Directors' Forum (SDF) plays a crucial role in bringing together nuclear executives to:

- Promote learning.
- Agree strategy on key issues facing the industry.
- Provide a network within the industry (including with government and regulators) and external to the industry.
- Provide an industry input to new developments in the industry.
- Ensure that the industry stays on its path of continual improvement.

It also looks to identify key strategic challenges facing the industry in the fields of EHSQ&S and resolve them, often through working with the UK regulators and BEIS (Department for Business, Energy and Industrial Strategy), both of whom SDF meets twice yearly. The SDF members represent every part of the fuel cycle from fuel manufacture, through generation to reprocessing and waste treatment, including research, design, new build, decommissioning and care and maintenance. The Forum also has members who represent the Ministry of Defence (MOD) nuclear operations and authorisees, as well as "smaller licensees" such as universities and pharmaceutical companies. With over 25 members from every site licence company in the UK, every MOD authorised site and organisations which are planning to become site licensees the SDF represents a vast pool of knowledge and experience, which has made it a key consultee for Government and regulators on new legislation and regulation.

The Forum has a strong focus on improvement across the industry. It has in place a number of subject-specific sub-groups looking in detail at issues such as radiological protection, human performance, learning from experience and the implementation of the new regulatory framework for security (Security Assessment Principles [SyAPS]). Such sub groups have developed a number of Good Practice Guides which have been adopted by the industry.

## Sub-Group Description

This document is produced by the Organisational Capability Working Group, which is a sub-group of the Safety Directors' Forum. The Working Group was originally established in 2008 to produce a Nuclear Industry Code of Practice on the Nuclear Baseline and Management of Organisational Change (which has since been developed into a Good Practice Guide) and to share relevant good practice on this and related subjects. The Group brings together a wide range of representatives of UK Licensees and Defence Authorisees and also includes a representative from ONR, as shown on the front cover.

## ***Disclaimer***

This UK Nuclear Industry Guide has been prepared on behalf of the Safety Directors' Forum by a Technical Working Group. Statements and technical information contained in this Guide are believed to be accurate at the time of writing. However, it may not be accurate, complete, up to date or applicable to the circumstances of any particular case. This Guide is not a standard, specification or regulation, nor a Code of Practice and should not be read as such. We shall not be liable for any direct, indirect, special, punitive or consequential damages or loss whether in statute, contract, negligence or otherwise, arising out of or in connection with the use of information within this UK Nuclear Industry Guide.

This Guide is produced by the Nuclear Industry. It is not prescriptive but offers guidance and in some cases a toolbox of methods and techniques that can be used to demonstrate compliance with regulatory requirements and approaches.

It is recognised that – through the experience of using these Guides – there may be comments, questions and suggestions regarding its contents.

In the first instance, any such comments should be sent to the following:

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Further SDF Publications can be found at: <https://www.nuclearinst.com/Publications>

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# 1 Introduction

## 1.1 Background

Safely delivering a successful business in the UK nuclear industry presents unique tensions between a high hazard industry, public risk aversion and the requirement for robust management controls and regulatory compliance. There is a need to deliver business outputs cost effectively in the face of programme, political and fiscal pressures, be this in the civil nuclear or defence sector.

The industry faces key challenges in maintaining the organisational capability and resilience required including:

- A critical shortage of individuals with specific skills has driven competition between organisations in their quest to secure the staff they need.
- Many currently working within the industry are approaching retirement age in the near future.
- Nuclear facilities are generally located away from high density population areas so localisation is an issue. Employment terms and conditions need to be sufficiently attractive to entice in new recruits.
- Recruitment is often hampered by long lead times due to security vetting.
- It takes time to develop a new entrant's site and facility knowledge. It is important that effective arrangements are in place to successfully manage the knowledge transfer between incoming and outgoing staff.
- Delivery of goods, works and services may be outsourced to the supply chain so sustaining an effective intelligent customer capability is vital.

The case for organisations to be able to plan and adapt to meet these challenges whilst delivering objectives safely has never been more compelling.

A capable and resilient organisation:

- Can ensure the long-term viability of the organisation.
- Pays due regard to safety and the requirements of licensing/authorisation whilst delivering business objectives efficiently and effectively.
- Has a mature organisational culture that is demonstrated and promoted by strong, visible leadership.
- Is an agile organisation that is able to respond to a constantly changing business environment.
- Has effective processes and uses performance indicators to ensure work is carried out safely and achieves the intended outcomes.

Organisational and cultural shortcomings are consistently identified as the underlying causes of major accidents and events around the world. This applies to the nuclear industry and to other sectors. Whilst the underlying organisational and cultural issues are often complex, a number of common themes have been identified from the event investigations and research studies. A number of case studies have been selected to illustrate this and are set out below. Table 1 covers examples of incidents found to have underlying organisational and cultural causes, more information about the case studies is included in Appendix A.

**Table 1: Examples of Incidents with Underlying Organisational and Cultural Causes**

Major Event	Governance and Assurance				Culture		People		Processes and tools
	Leadership	Internal challenge	Governance	Intelligent Customer / Design Authority	Organisational learning	Safety culture	Organisational establishment	Supply chain	Management systems
Fukushima accident (March 2011)			✓		✓	✓	✓		✓
Waste Isolation Plant radioactive release (February 2014)		✓	✓			✓	✓		✓
US Department of Defense Nuclear Enterprise (June 2014 review)	✓	✓				✓	✓		✓
Boeing 787 Dreamliner battery fire (December 2014)		✓	✓	✓				✓	✓
Rail passenger disruption at King's Cross and Paddington (December 2014)	✓		✓		✓		✓		✓
Furness General Hospital maternity care (March 2015)	✓	✓	✓		✓	✓	✓		✓
WHO response to Ebola crisis (July 2015)	✓				✓	✓	✓		✓
Overstatement of profits by Toshiba (July 2015)	✓	✓	✓			✓	✓		✓

The ability of good organisational culture and capability to drive high performance is illustrated by the case studies in Table 2. The Onagawa nuclear power plant in Japan became a haven for local residents after the same tsunami that crippled the Fukushima power plant in 2011. The London 2012 Olympics are the only Olympics that had no fatalities during the construction of the facilities for the events. These cases show what can happen when the themes are managed well. More information about the case studies is included in Appendix B.

**Table 2: Examples of Good Performance Supported by Effective Organisational Capability**

Major Event	Governance and Assurance				Culture		People		Processes and tools
	Leadership	Internal challenge	Governance	Intelligent Customer / Design Authority	Organisational learning	Safety culture	Organisational establishment	Supply chain	Management systems
Onagawa Nuclear Power Plant (March 2011)	✓		✓		✓	✓	✓		✓
London 2012 Olympics	✓				✓	✓	✓	✓	✓

These themes in the tables also align with the themes identified by ONR under their Leadership and Management for Safety Topic Area<sup>1</sup>. For the purposes of this Good Practice Guide these have been grouped under five organisational attributes:

- Business objectives and plans.
- Governance and assurance.
- Organisational culture.
- People.
- Processes and tools.

The Safety Director’s Forum has identified the key areas that it believes should be addressed in an organisation’s approach to effective leadership and management for safety. It is not prescriptive in approach but rather an outline of the key aspects that would be expected in an organisation that has developed an effective approach to the leadership and management of safety. The principles are in Appendix C.

In relation to the principles “safety” is interpreted as all forms of health, safety, quality, environmental protection and security. However, it should be recognised that given the special nature of the potential nuclear hazard, nuclear safety should always be the overriding priority. This is the definition of safety used throughout this guide. The guide outlines how the SDF leadership and management for safety principles relate to the five attributes of organisational capability.

<sup>1</sup> Office for Nuclear Regulation, *Safety Assessment Principles for Nuclear Facilities 2014 Edition*, Leadership and Management for Safety Principles MS1 to MS4, 2014. <http://www.onr.org.uk/saps/saps2014.pdf>



The Guide has benefited from having an Office for Nuclear Regulation (ONR) member as part of the Working Group to provide both background information and challenge during its production. It is therefore relevant to ONR regulation and requirements.

## **1.2 Purpose**

This Good Practice Guide describes the drivers for and the importance of actively managing organisational capability. The document provides a framework that can be used to form a broad view of an organisation's capability with respect to safety and how to identify areas for improvement. Its purpose is to help licensees / authorisees (referred to as licensees throughout this document) to understand what a capable organisation looks like and how it can be maintained.

It is for individual licensees to determine the levels of applicability of the Guide to their circumstances. Factors which may affect this include the scale and nature of the associated nuclear risks, the complexity of the organisation and the current phase of its life-cycle.

## **1.3 Scope**

The scope of this document is kept at a high level to give a broad overview of organisational capability. Where possible it provides links to where more detailed information on a subject can be found.

Section 2 outlines the key attributes of a capable organisation. Sections 3 to 7 cover each key attribute in more detail setting out:

- Key characteristics.
- How these characteristics are demonstrated.
- Self-assessment and evaluation.
- Further reading.

Section 8 contains Appendices A to D which provide more detailed supporting information. Appendix E outlines the members of the Organisational Capability Working Group who have contributed to this document. Section 9 provides a glossary and Section 10 list other SDF publications.

## 2 Key Attributes of a Capable Organisation

### 2.1 Introduction

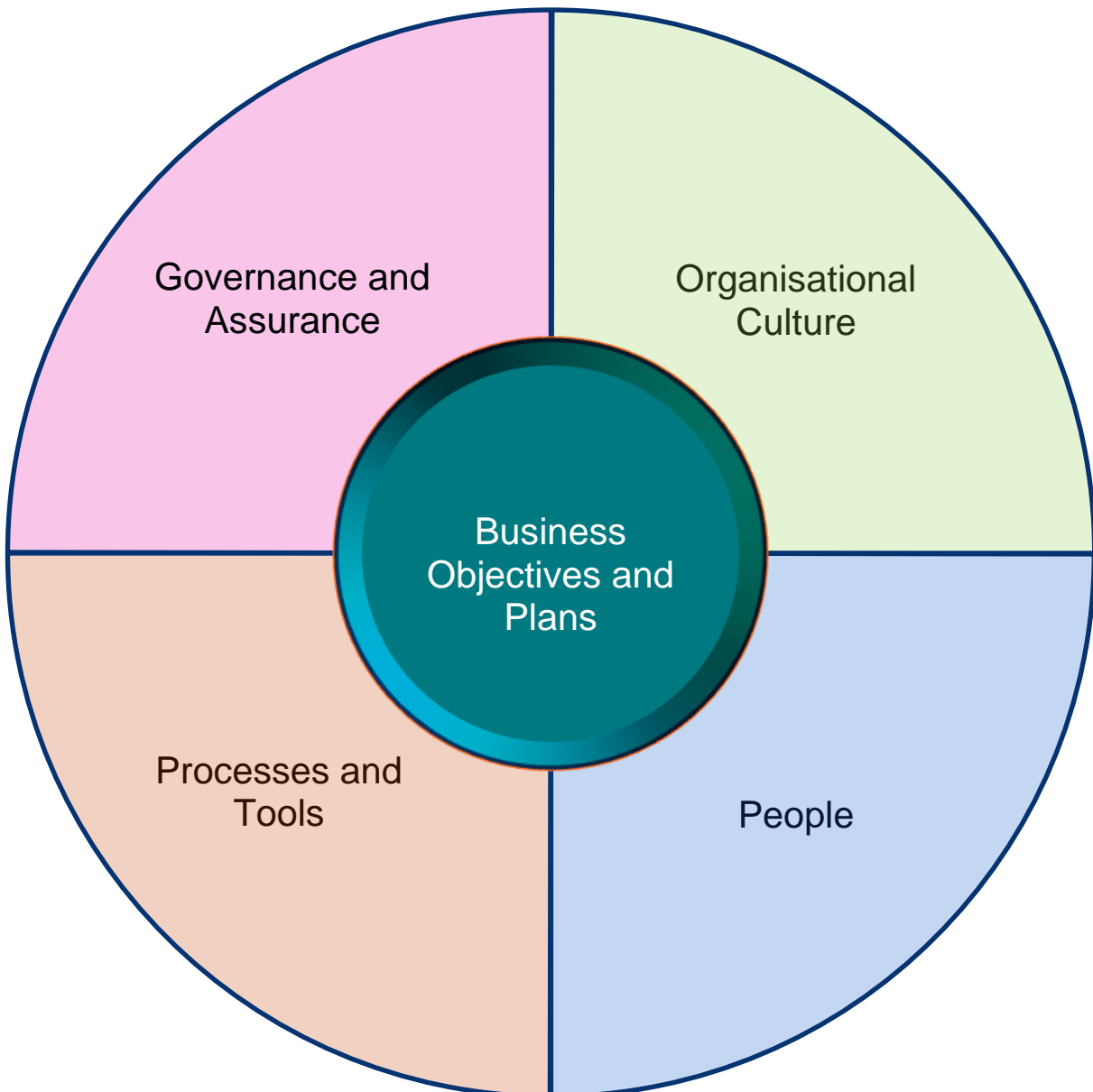
An organisation's ability to manage its activities efficiently and achieve the highest standards of safety and business performance requires the deployment of effective management systems, processes, functions, planning and human resources. These enable the business to actively maintain the appropriate levels of control and delivery performance, whilst displaying the principles of a strong organisational and safety culture.

For the purpose of this document, 'organisational capability' has been defined as:

*"the collective attributes of the licensee entity that enable it to understand and control the hazards associated with its activities and to sustainably deliver its vision and mission safely and effectively".*

Figure 1 presents these 'collective attributes' as an integrated model. The model is referred to throughout this guide and consists of the key characteristics and features typically found in a capable organisation that is adequately resourced to deliver its activities in a safe manner.

**Figure 1: Organisational Capability Attributes**



## 2.2 Attributes

Each of these organisational attributes incorporating the SDF leadership and management for safety principles are briefly described below. Further detail is provided in the following sections including links to key reference sources and more in-depth reading:

### 1. Business Objectives and Plans

The organisation has a clear vision which is supported by clear business objectives which consider the immediate and longer-term requirements of the organisation. The organisation develops goals and strategies for their delivery. It should be clear that as part of the vision and the objectives, safety is an overriding priority. The vision, mission and objectives have been cascaded throughout the organisation, and are linked to core activities.

### 2. Governance and Assurance

Leadership attributes at all levels throughout the organisation are clear and there is clear accountability for the delivery of the business requirements and the required safety performance. Robust structures, roles and processes for effective governance of the business and independent oversight of safety performance have been implemented with clear lines of authority and direction from the Board down to front-line activities. Oversight and challenge of organisational performance is robust, effective, timely and welcomed. Decisions, including those that support or affect organisational capability, are systematic, rigorous and well-informed.

### 3. Organisational Culture

The organisation has clear values and associated behaviours that support safety and these are openly promoted and upheld throughout the organisation. There is a prevailing culture of strong, visible leadership and proactive investment in resources to consistently achieve a high level of performance and a clear prioritisation of safety over delivery performance. There is a clear culture of continuous improvement and learning and action for improvement is timely and effective. There is good interaction and open communication at all levels.

### 4. People

The organisational capability and resources support the required business strategy and associated safety requirements. Knowledge and skills are being maintained and developed at all levels to sustain competency across the organisation. The management of the supply chain supports the delivery of safety and quality.

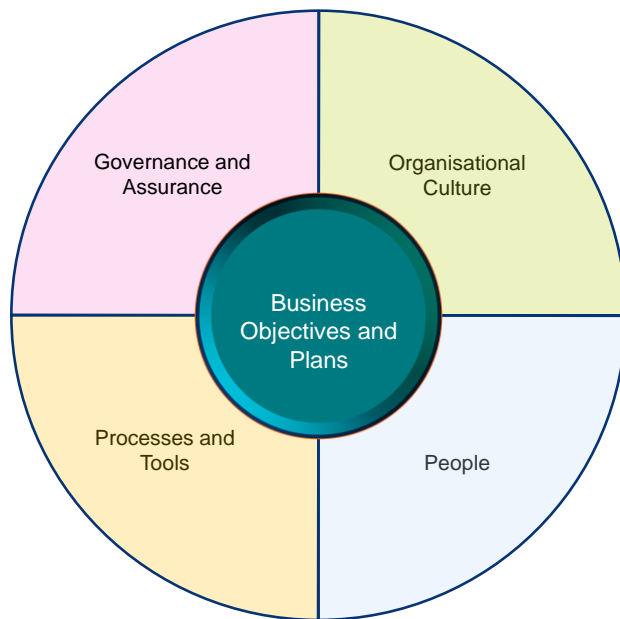
### 5. Processes and tools

A management system is developed that ensures all processes and procedures deliver the required standards of safety and quality performance, with safety being a primary consideration in decision making. Policies and standards are established and implemented that support safety. Key performance indicators are effectively utilised to manage the business and safety performance.

This model considers the ongoing definition and assessment of capability to be an inherent feature of the management process. It identifies what is required to lead, manage and maintain a resilient organisation, and is designed for proportionate application by licensees and other duty holders.

Maturity models are a way of assessing how well an organisation is doing with respect to a particular aspect of its business. Most recently within the nuclear industry maturity models have been applied to safety culture. In a similar manner an organisation's management of its organisational capability can be assessed through a maturity model such as the People Capability Maturity Model® (People CMM®). This approach is one way in which an organisation can evaluate its overall approach to organisational capability and help to guide an improvement programme. It is not developed further beyond the explanation in Appendix D but is included as an example of an approach that could be used.

### 3 Attribute 1 – Business Objectives and Plans



#### Key Characteristics

A capable organisation should have a clear vision which is supported by clear business objectives and considers the immediate and longer-term requirements of the organisation to enable it to deliver its mission safely and effectively. It should be clear that as part of the vision and the objectives, safety is an overriding priority. To do this the organisation should:

- Establish a clear link between its vision, mission and objectives.
- Cascade the vision, mission and objectives throughout the organisation.
- Demonstrate arrangements for managing safety.

#### Demonstration

This is demonstrated through:

- Fit for purpose vision, mission, business objectives and plans that cover short, medium and long-term requirements, including nuclear liabilities.
- Good understanding of the vision, mission, business objectives and plans across the organisation.
- A Safety (and Environmental) Management Prospectus that describes how the organisation is managed to control and safely undertake its activities and is an integral part of a licensee's business management system.
- A clear make versus buy strategy for resources.

## Self-assessment

Can you explain and provide evidence to demonstrate:

- How the business plan recognises the need to meet business objectives i.e. people, resources and funds etc.
- How the business plan is implemented via the resourcing strategy etc.
- How the business recognises and maintains the capability and business drive to deliver business objectives safely.
- How safety is the overriding priority in decision making.
- How the business objectives are cascaded throughout the organisation.
- Understanding of the vision, mission and objectives across the organisation.
- How the Safety (and Environmental) Management Prospectus links to the business objectives.
- The core activities that the organisation needs to undertake.
- What metrics are in place to demonstrate the effectiveness of the implementation of the above points.
- The organisation's make versus buy strategy or operating model.

## Further reading

HSE, *Managing for Health and Safety (HSG65)*, 3<sup>rd</sup> Edition, 2013.

<http://www.hse.gov.uk/pubns/priced/hsg65.pdf>

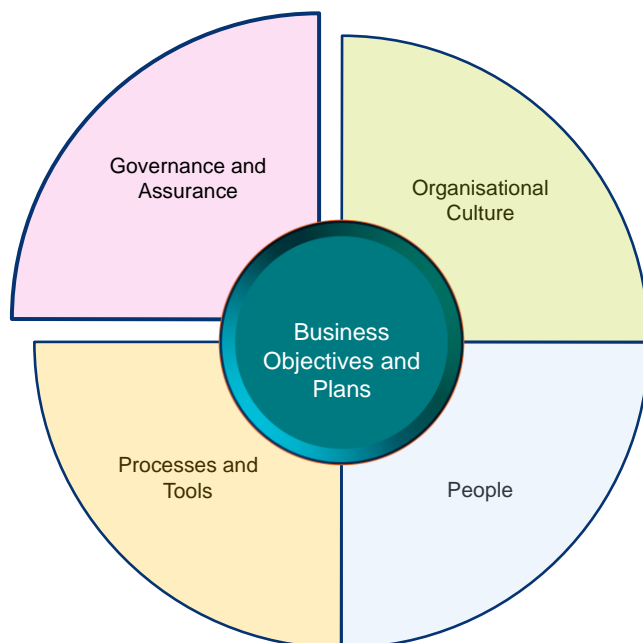
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Office for Nuclear Regulation, NS-TAST-GD-077, Office for Nuclear Regulation Technical Assessment Guide, '*Supply Chain Management Arrangements for the Procurement of Nuclear Safety Related Items or Services*', Revision 4, February 2018.

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## 4 Attribute 2 – Governance and Assurance



### Key Characteristics

A capable organisation should have clear leadership evident at all levels throughout the organisation and clear accountability for the delivery of the business requirements and the required safety performance. Effective governance and assurance of the organisation and its work should be in place. To do this the organisation should:

- Have robust structures, roles and processes for effective governance of the business from the Board down to front-line activities.
- Have independent oversight of safety performance of the organisation that is welcomed and acted upon.
- Clearly understand the capability it requires to support current and foreseeable business objectives.
- Preserve this capability and maintain a clear perspective of the risks to organisational performance and the enduring ability to deliver activities safely.
- Ensure that decisions that support or affect organisational capability are systematic, rigorous and well-informed.

### Demonstration

This is demonstrated through:

- Clear lines of control and oversight from the Board down to frontline activities and organisational performance.
- Leadership direction and commitment.
- An informed understanding of statutory and regulatory requirements and ongoing demonstration of compliance with the law.
- An independent oversight structure/function and programmes that provide the Board with the required level of challenge and assurance and ongoing perspective of organisational performance.

## Self-assessment

Can you explain and provide evidence to demonstrate:

- How the Board and senior leadership team actively govern the organisation.
- The Board and senior leadership team accountabilities for the organisation's activities and regulatory requirements.
- How the Board and senior leadership team actively improve organisational performance and the methods they use.
- How the Board and senior leadership team anticipate and undertake key organisational decisions and adequately prepare for them (e.g. are decisions aligned to organisational strategies, work programmes and regulatory requirements).
- How the organisation self-regulates and checks its own performance to ensure that risks are being appropriately managed.
- How the results of self-regulation (independent oversight) are reported back to the Board and acted upon.

## Further Reading

Office for Nuclear Regulation, *Safety Assessment Principles for Nuclear Facilities 2014 Edition*, Leadership and Management for Safety Principles MS1 to MS4, 2014.

<http://www.onr.org.uk/saps/saps2014.pdf>

Office for Nuclear Regulation, NS-TAST-GD-072, Office for Nuclear Regulation Technical Assessment Guide, '*Function & Content of a Safety Management Prospectus*', Revision 2, April 2013.

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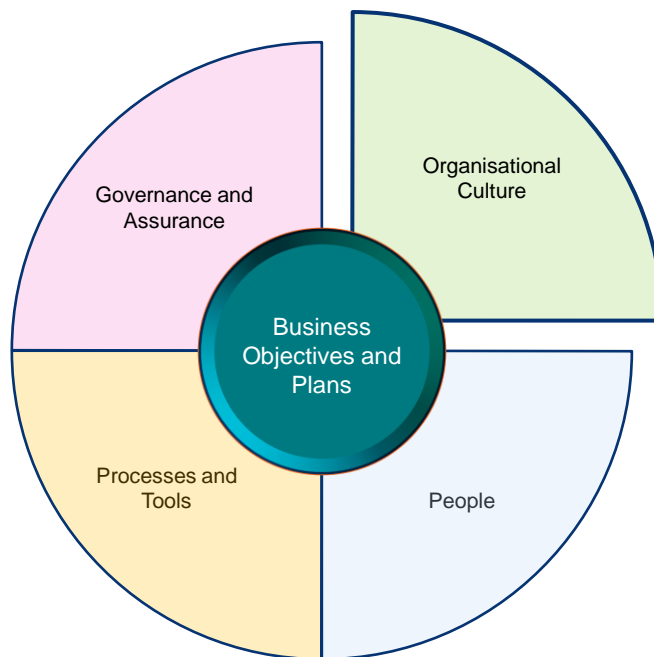
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SDF, *Development and use of Safety Performance Indicators: A UK Nuclear Industry Good Practice Guide*, 2016. <http://www.nuclearinst.com/Publications>



## 5 Attribute 3 – Organisational Culture



### Key Characteristics

A capable organisation should have clear values and associated behaviours that encourage the appropriate culture, promote safety and are openly promoted and upheld throughout the organisation. To do this the organisation should:

- Have strong, visible leadership that champions safety.
- Prioritise safety over delivery performance.
- Identify, report and rectify shortfalls in order to prevent recurrence.
- Have a culture of continuous improvement and learning with timely and effective actions for improvement.
- Be open to and encourage self-analysis.
- Encourage a questioning attitude and constructive challenge at all levels.
- Have good interaction and open communication at all levels.
- Proactively invest in resources to consistently achieve high safety standards.
- Encourage procedural adherence, but not blind compliance - instructions and arrangements should be challenged in a controlled and constructive manner.

A capable organisation's culture should include a mature safety culture that is regularly reviewed and measures taken to improve it. A good, proactive safety culture will support the resilience of the organisation and will help to improve overall safety performance. The World Association of Nuclear Operators (WANO) defines nuclear safety culture as:

*'The core values and behaviours resulting from a collective commitment by leaders and individuals to emphasise safety over competing goals, to ensure protection of people and the environment'.<sup>2</sup>*

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<sup>2</sup> WANO, *Traits of a Healthy Nuclear Safety Culture*, PL 2013-1, May 2013.  
<http://www.wano.info/Documents/PL%202013-01%20Traits%20of%20a%20Healthy%20Safety%20Culture.pdf>

## **Demonstration**

This is demonstrated through:

- Senior management commitment – visible leadership.
- Good communications throughout the organisation.
- A 'just and fair' culture.
- Continuous learning, leading to improvements.
- Involvement of staff.
- Self-assessment.
- Performance indicators.
- Conservative decision making.
- Human performance programmes.
- A questioning attitude.

## **Self-assessment**

Can you explain and provide evidence to demonstrate:

- The organisation's values and associated behaviours that support safety.
- Understanding and implementation of the values and behaviours across the organisation including evaluation of their implementation.
- Board and senior leadership team demonstrable commitment to and visible leadership of safety (e.g. conservative decision making, behaviours, time on plant, inspections, walk downs/rounds).
- How behavioural standards and expectations have been defined.
- How a 'just and fair' culture is encouraged throughout the organisation.
- How the Board and senior leadership team encourage people to challenge the status quo, yet ensure that procedures and arrangements are adhered to.
- How communications are managed to be effective, free and open within and between all levels and business groups of the organisational structure and maintain a focus on safety.
- How the organisation measures itself against a recognised cultural maturity scale with shortfalls being identified, actions implemented and review of effectiveness undertaken.
- How issues that could potentially impact safety are evaluated and promptly addressed commensurate to their safety significance.
- How the organisation identifies and implements changes as a result of organisational learning.
- How employees and contractor staff are encouraged to become actively involved in safety and take personal responsibility for safety.
- How a safety-conscious work environment is maintained where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination.
- How a conservative, systematic, rigorous and thorough decision-making process is utilised at all levels in the organisation.
- How safety is considered in decisions about organisational resources.

- What is the established staff performance review process and how are adherence to the values and culture considered in that process.
- What metrics are in place to demonstrate the effectiveness of the implementation of the above points.

### Further Reading

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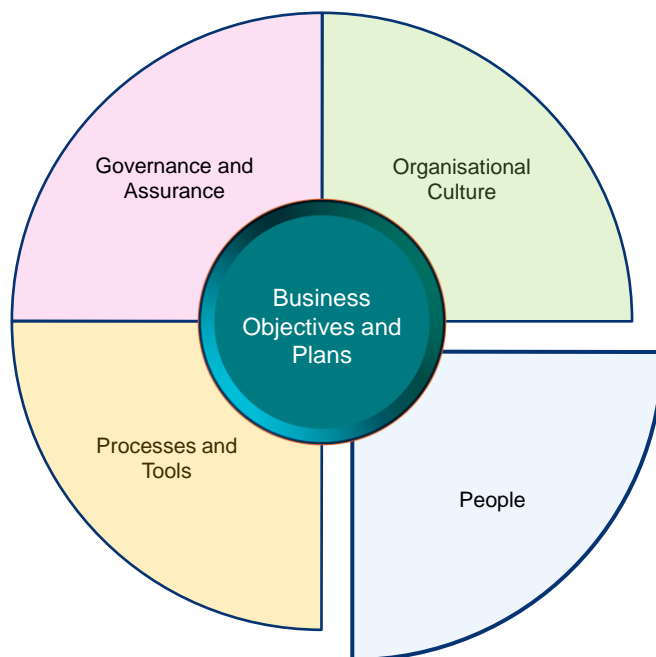
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## 6 Attribute 4 – People



### Key Characteristics

A capable organisation should clearly understand the resources required to deliver business objectives safely and effectively. To do this the organisation should:

- Understand clearly the activities (including nuclear) being undertaken.
- Have an agreed operating model (make / buy policy) that outlines what work will be undertaken in-house and what will be done by contractors.
- Establish organisational requirements (structures, posts and roles) to ensure:
  - A 'fully capable organisation', i.e. that necessary to sustain safety during normal operations and reasonably foreseeable events.
  - The total workforce required to deliver and sustain the business objectives is maintained.
  - There is capacity and capability available to manage contractors.
- Have a organisational baseline<sup>3</sup> and formally evaluate and manage changes to it.
- Identify any gaps and vulnerabilities and justify how they will be dealt with including:
  - Agency supplied workers and task based contractors.
  - Succession planning.
- Ensure knowledge and skills are being maintained and developed at all levels to sustain organisational competency and ensure suitably qualified and experienced personnel (SQEP) are available.
- Ensure the management of the supply chain supports the delivery of safety and quality.
- Manage change effectively and considerately.

<sup>3</sup> Some organisation focus of the roles with potential impacts on nuclear safety and have a nuclear baseline, others cover roles with potential environmental, safety and security impacts and have an organisational baseline.

All personnel must be competent to carry out their roles. To do this the organisation should:

- Define roles and responsibilities including lines of accountability required within the organisation.
- Identify the competence required to undertake roles at all levels (knowledge, skills, behaviour and leadership).
- Assess competence against the requirements.
- Identify mitigation for shortfalls.
- Implement a systematic approach to training (SAT).

Ensuring the safe conduct of nuclear activities is the priority for all nuclear organisations. They need to demonstrate to the regulators that they have sufficient expertise<sup>4</sup> to maintain control and oversight of safety at all times. They also need to demonstrate that they control and manage the use and oversight of contractors whose work (including goods and services) has the potential to impact on safety. The expertise to manage contractors is often called Intelligent Customer (IC) capability and is described in another Good Practice Note<sup>5</sup>.

### **Demonstration**

This is demonstrated through:

- Having a clear operating model (make / buy policy).
- An up to date Organisational Baseline.
- A management of change control process to control changes to the Organisational Baseline<sup>6</sup>.
- A Resource Plan (which pays particular attention to the Nuclear Baseline roles for nuclear safety).
- Job Descriptions, Post/Role Profiles etc.
- A competence management system.

### **Self-assessment**

Can you explain and provide evidence to demonstrate:

- How the Organisational Baseline is developed, maintained and modified.
- How the resource plan takes into account the short, medium and long-term requirements.
- How the organisational structure is configured to discharge accountabilities, authorities and responsibilities.
- How the construct of the Board facilitates challenge of organisational capability and its enduring ability to deliver business objectives.
- How the roles and responsibilities are set out clearly for all levels in the organisation (including Board members, senior managers and governance roles).
- How authorities have been defined, cascaded and understood.
- How you ensure there are sufficient resources to deliver the business objectives and maintain safety standards i.e. right people, right place, right time.
- How skills and experience are distributed amongst teams such that the business can function safely in the absence of some personnel.

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<sup>4</sup> In-house expertise may be delivered by seconded or agency staff where these people can be considered as 'employees' of the licensee and are included on the organisational baseline, see Appendix 1 of TAG049.

<sup>5</sup> Safety Directors' Forum, *Good Practice Note on Intelligent Customer*, 2018.

<sup>6</sup> The OCWG has published a Good Practice Guide on Management of Change and the Nuclear Baseline, see further reading.

- The strategy to consider how organisational capability requirements may develop in the future.
- How a pan-organisational view is taken across all organisational capability aspects.
- How you know that all staff have the appropriate competencies.
- How competence is developed, maintained and evaluated.
- How the business manages the mitigation actions put in place to cover any gaps / waivers in competence.
- How resource gaps are being mitigated.
- How people are retrained prior to implementing changes to plant and organisational structure.
- How objective information is used to underpin decisions affecting organisational capability.
- How the organisation defines, implements, maintains and tests the effectiveness of its Intelligent Customer capability and Design Authority function(s).
- What metrics are in place to demonstrate the effectiveness of the implementation of the above points.

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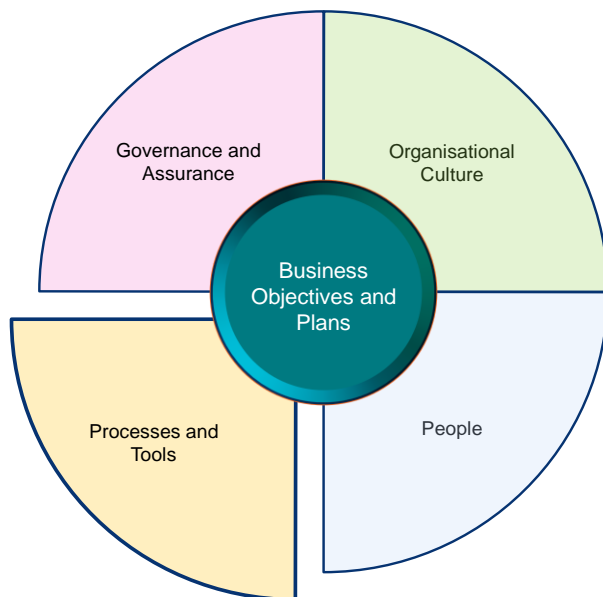
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## 7 Attribute 5 – Processes and Tools



### Key Characteristics

A capable organisation should have effective processes and tools captured in an Integrated Management System (IMS) to deliver the required standards of safety and quality performance. Safety should be a primary consideration in decision making. To do this the organisation should:

- Implement policies and standards that support safety.
- Be explicitly clear what the inputs and outputs of processes are.
- Ensure the Safety (and Environmental) Management Prospectus is an integral part of the IMS.
- Maintain the IMS to consistently support doing the right things in the right way.
- Ensure that proposed changes to the IMS are considered carefully, are systematically managed and that associated impacts on organisational structure and capabilities are adequately assessed.
- Utilise demonstrably reliable information to understand its business performance and people to inform decision making.
- Effectively use key performance indicators (KPIs) and safety performance indicators (SPIs) to encourage appropriate behaviours, improve safety performance and drive the organisation's objectives.

WANO emphasises that the process of planning and controlling work activities must be implemented so that nuclear safety is maintained.

### Demonstration

This is demonstrated through:

- The IMS architecture being based upon safe delivery of the business objectives.
- Integrated policies, processes and procedures.
- Arrangements which recognise and control the flow of information to enable the efficient supply of competent resource to the point of demand (i.e. through financial planning, procurement, HR delivery, security clearances, induction and training.)
- The organisational structure, resources, competency and IMS being aligned and configuration controlled through effective governance and change management.

- Definition and exercising of emergency and business continuity arrangements with key stakeholders.
- Proactive and timely deployment of effective Knowledge Management tools to capture and transfer 'tacit' and 'explicit' knowledge to maintain corporate memory.
- Efficient knowledge access and dissemination arrangements with demonstrable use of knowledge captured, shared and deployed at the workplace.

### Self-assessment

Can you explain and provide evidence to demonstrate:

- How the IMS architecture supports safe delivery of the business objectives.
- How the management system is based on recognised standards and approaches e.g. ISO accredited.
- How the effectiveness and adherence to the IMS is evaluated.
- How the organisational structure, resources, competency management and IMS arrangements are aligned and maintained through integrated configuration control.
- Clear ownership and governance of the data, processes and change management from the top of the organisation.
- The arrangements to verify key data used to support decision making.
- The arrangements and structures in place to direct and control organisational capability, including the setting and reviewing of performance measures with Board and senior leadership team oversight.
- How business processes are aligned to enable timely provision of competent resource to the point of demand.
- How safety performance indicators (SPIs) are used to monitor performance and how actions are implemented to improve performance if issues are identified.
- What information is used to evaluate the SPIs and how this is obtained.
- The range of techniques available to capture and disseminate knowledge, including evidence of knowledge capture deployed at the workplace.
- What metrics are in place to demonstrate the effectiveness of the implementation of the above points.

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## 8 Appendices

### 8.1 Appendix A – Case Studies of Incidents with Underlying Organisational and Cultural Causes

The following sections outline the findings from investigations into the incidents grouped under the organisational attributes:

- Governance and assurance
- Organisational culture
- People
- Processes and tools.

Text in italics is a direct quote from the references.

#### **Fukushima accident – IAEA Director General’s Report**

##### **Introduction**

The Great East Japan Earthquake occurred on 11 March 2011. At the Fukushima Daiichi nuclear power plant, operated by the Tokyo Electric Power Company (TEPCO), the earthquake caused damage to the electric power supply lines to the site, and the tsunami caused substantial destruction of the operational and safety infrastructure on the site. The combined effect led to the loss of off-site and on-site electrical power. This resulted in the loss of the cooling function at the three operating reactor units as well as at the spent fuel pools. The four other nuclear power plants along the coast were also affected to different degrees by the earthquake and tsunami. However, all operating reactor units at these plants were safely shut down.

Despite the efforts of the operators at the Fukushima Daiichi nuclear power plant to maintain control, the reactor cores in Units 1–3 overheated, the nuclear fuel melted and the three containment vessels were breached. Hydrogen was released from the reactor pressure vessels, leading to explosions inside the reactor buildings in Units 1, 3 and 4 that damaged structures and equipment and injured personnel. Radionuclides were released from the plant to the atmosphere and were deposited on land and on the ocean. There were also direct releases into the sea.

On 31 August 2015 the IAEA released a report of its assessment of the causes and consequences of the accident at the Fukushima Daiichi nuclear power plant in Japan. Some of the key findings from the report have been grouped under the organisational capability themes.

##### **Governance and assurance**

###### **Governance**

*The Fukushima Daiichi accident exposed certain weaknesses in Japan’s regulatory framework. Responsibilities were divided among a number of bodies, and it was not always clear where authority lay.*

*At the time of the accident, separate arrangements were in place to respond to nuclear emergencies and natural disasters at the national and local levels. There were no coordinated arrangements for responding to a nuclear emergency and a natural disaster occurring simultaneously.*

*The emergency management system for response to a nuclear emergency needs to include clearly defined roles and responsibilities for the operating organization and for local and national authorities. The system, including the interactions between the operating organization and the authorities, needs to be regularly tested in exercises.*

## **Organisational Culture**

### **Organisational Learning**

*Relevant domestic and international operating experience was not adequately considered in the existing regulations and guidelines (in Japan).*

*Worldwide operating experience has shown instances where natural hazards have exceeded the design basis for a nuclear power plant. In particular, the experience from some of these events demonstrated the vulnerability of safety systems to flooding. This has not been fully taken into account in the safety measure used at Fukushima.*

*The vulnerability of the Fukushima Daiichi nuclear power plant to external hazards had not been reassessed in a systematic and comprehensive manner during its lifetime*

*The safety of nuclear power plants needs to be re-evaluated on a periodic basis to consider advances in knowledge, and necessary corrective actions or compensatory measures need to be implemented promptly.*

*Operating experience programmes need to include experience from both national and international sources. Safety improvements identified through operating experience programmes need to be implemented promptly. The use of operating experience needs to be evaluated periodically and independently.*

### **Safety Culture**

*A major factor that contributed to the accident was the widespread assumption in Japan that its nuclear power plants were so safe that an accident of this magnitude was simply unthinkable. This assumption was accepted by nuclear power plant operators and was not challenged by regulators or by the Government. As a result, Japan was not sufficiently prepared for a severe nuclear accident in March 2011.*

*Before the accident, there was a basic assumption in Japan that the design of nuclear power plants and the safety measures that had been put in place were sufficiently robust to withstand external events of low probability and high consequences. Because of the basic assumption that nuclear power plants in Japan were safe, there was a tendency for organizations and their staff not to challenge the level of safety. The reinforced basic assumption among the stakeholders about the robustness of the technical design of nuclear power plants resulted in a situation where safety improvements were not introduced promptly.*

*In order to promote and strengthen safety culture, individuals and organisations need to continuously challenge or re-examine the prevailing assumptions about nuclear safety and the implications of decisions and actions that could affect nuclear safety.*

*A systemic approach to safety needs to consider the interactions between human, organizational and technical factors. This approach needs to be taken through the entire life cycle of nuclear installations.*

## People

### **Organisational Establishment**

*insufficient provision was made for the possibility of a nuclear accident occurring at the same time as a major natural disaster.*

*Organisations need to be prepared for the unexpected, i.e. ... to develop generic competencies and resources within the organization that help the personnel to quickly and flexibly adapt to new situations, to improvise and develop new solutions for unknown problems; in other words: to be resilient in unexpected situations.*

*The operators were not fully prepared for the multi-unit loss of power and the loss of cooling caused by the tsunami. Although TEPCO had developed severe accident management guidelines, they did not cover this unlikely combination of events. Operators had therefore not received appropriate training and had not taken part in relevant severe accident exercises, and the equipment available to them was not adequate in the degraded plant conditions.*

*Training, exercises and drills need to include postulated severe accident conditions to ensure that operators are as well prepared as possible. They need to include the simulated use of actual equipment that would be deployed in the management of a severe accident.*

*[Staff] had to improvise a response in circumstances for which they had not been trained, often lacking appropriate equipment.*

*Insufficient provision was made for the possibility of a nuclear accident occurring at the same time as a major natural disaster.*

### **Processes and tools**

*There were also certain weaknesses in plant design, in emergency preparedness and response arrangements and in planning for the management of a severe accident. There was an assumption that there would never be a loss of all electrical power at a nuclear power plant for more than a short period. The possibility of several reactors at the same facility suffering a crisis at the same time was not considered.*

*the insufficiency of operating procedures made it impossible to arrest the progression of the accident and to limit its consequences.*

*The regulatory guidelines in Japan on methods for dealing with the effects of events associated with earthquakes, such as tsunamis, were generic and brief, and did not provide specific criteria or detailed guidance.*

The Fukushima Daiichi Accident - Report by the Director General, IAEA, 31 August 2015.  
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## **Waste Isolation Pilot Plant**

A non-compliant drum was sent to WIPP and a reaction occurred in the underground breaching the drum and releasing radioactive contamination. At approximately 23:13 a Continuous Air Monitor located in an exhaust roadway detected a release of radioactivity. Staff initially believed it was a false alarm due to radon gas, a minute later another alarm sounded and underground ventilation was directed through the high-efficiency particulate air (HEPA) filters. Measureable quantities of radiological material bypassed the HEPA filters by leaking past two ventilation dampers. Radiological material was released to the environment via a ventilation exhaust duct.

On 16 April 2015 the US Department of Energy (DOE) released its Phase II investigation report into the radioactive release at the Waste Isolation Pilot Plant (WIPP), Carlsbad, New Mexico in 2014. The accident resulted in a three-year shutdown of waste operations and shipping from all consignors to WIPP. The recovery costs are in excess of US\$500 million and there have also been additional waste storage costs. There has also been a loss of confidence from the stakeholders, regulators and members of the surrounding communities.

### **Governance and assurance**

#### ***Internal Challenge***

*The Board identified the systemic root cause as the Los Alamos Field Office (NA-LA) and National Transuranic Program/Carlsbad Field Office (CBFO) failure to ensure that LANL had adequately developed and implemented repackaging and treatment procedures that incorporated suitable hazard controls and included a rigorous review and approval process.*

*Failure of Los Alamos Field Office (NA-LA) and the National Transuranic (TRU) Program/Carlsbad Field Office (CBFO) to ensure that the Central Characterization Program and Los Alamos National Security complied with .... requirements .... as well as the WIPP Waste Acceptance Criteria (WAC). Examples include the unapproved treatment (neutralization and absorption of liquids) and the addition of incompatible materials. As a result, waste containing incompatible materials was generated and sent to WIPP.*

*Failure of the Los Alamos National Security Contractor Assurance System to identify weaknesses in the processes for operating procedure development; hazard analysis and control; and review that resulted in an inadequate glovebox operation procedure for processing the nitrate salt bearing waste.*

The impacts of changes to the content of the waste packages was not fully evaluated.

There was no systematic checking of compliance with the Waste Acceptance Criteria for the WIPP, this meant that packages did not meet the Waste Acceptance Criteria.

The emergency plans considered a limited range of scenarios a package rupture had not been considered, therefore there were no plans for how to deal with the situation.

The independent oversight was not robust and adequate resources had not be allocated to follow up on actions, meaning that problems had not been resolved.

## **Governance**

*The systemic root cause [of the event] was the failure of the Los Alamos Field Office and National Transuranic Program / Carlsbad Field Office [all parts of DOE] to ensure that Los Alamos National Laboratory [waste generator] had adequately developed and implemented repackaging and treatment procedures that incorporated suitable hazard controls and included a rigorous review and approval process.*

*Failure of National Nuclear Security Administration Los Alamos Field Office to establish and implement adequate line management oversight programs and processes in accordance with DOE Order 226.1B, Implementation of Department of Energy Oversight Policy. As a result, weaknesses in Los Alamos National Security / EnergySolutions programs and waste operations procedures were not identified and corrected*

*Failure of DOE Headquarters to perform adequate or effective line management oversight ..... As a result, waste containing incompatible materials was generated and sent to WIPP.*

## **Organisational culture**

### **Safety Culture**

*The operator of the Los Alamos National Laboratory, its contractor and the Los Alamos Field Office allowed the safety culture at the Los Alamos National Laboratory [LANL] to deteriorate within pockets of the organisation as evidenced by the workers' feedback that they did not feel comfortable identifying issues that may adversely affect management direction, delay mission-related objectives, or otherwise affect cost or schedule. In addition, management failed to effectively respond to workers' issues regarding unexpected conditions, i.e., generation of smoke and foaming, encountered during waste processing activities.*

*Failure of Los Alamos National Security, EnergySolutions and the National Nuclear Security Administration Los Alamos Field Office to ensure that a strong safety culture existed within the Environmental and Waste Management Operations (EWMO) organization at the Los Alamos National Laboratory. As a result, although there was a questioning attitude, there was a failure to adequately resolve employee concerns which could have identified the generation of noncompliant waste prior to shipment.*

Schedule pressures had affected the approach taken: forest fires at LANL increased pressure to move waste to WIPP.

There had been several false alarms, therefore staff did not believe the alarms and respond appropriately.

The WIPP safety culture was poor there was a lack of questioning attitude and events were not reported. Event reports and actions to address issues were also not fully actioned.

## **People**

### **Organisational Establishment**

*Failure of Los Alamos National Security / EnergySolutions to adequately train and qualify EnergySolutions operators and supervisors in the identification and control of incompatible materials during waste processing. As a result, personnel did not question the instruction to add organic absorbent and other secondary waste items to the nitrate saltbearing waste.*

## Processes and tools

*Failure of Los Alamos National Security, LLC (LANS) to implement effective processes for procedure development, review, and change control.*

*Failure of Los Alamos National Security, LLC (LANS) to develop and implement adequate processes for hazard identification and control. As a result, an incompatible absorbent was specified and used during nitrate salt bearing waste processing.*

*Failure of EnergySolutions operators and Los Alamos National Security supervisors to effectively execute the stop work process when unexpected conditions, including foaming reactions and smoke during waste processing, were encountered at the Waste Characterization, Reduction, and Repackaging Facility. This resulted in waste containing incompatible materials being generated and sent to WIPP.*

The WIPP ventilation system had not explicitly been designed to work in emergency situations, therefore radioactive material was released to the atmosphere.

The facility had not been designed to be able to clean up after an accident little thought had been given to return to the service activities required in the event of an accident. This meant the cost of clean-up and re-opening was very high.

US Department of Energy, Office of Environmental Management Accident Investigation Report, Phase 2 Radiological Release Event at the Waste Isolation Pilot Plant, February 14, 2014, April 2015.

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## **US Department of Defense Nuclear Enterprise**

On 14 November 2014, the US Department of Defense released the results of two reviews of its nuclear (deterrence) enterprise which found that the demands of this mission were being met but with little margin of capability and an unsustainable price on sailors, airmen and marines.

### **Governance and assurance**

#### **Leadership**

*a series of significant disconnects including those between what the Department Of Defence and service leadership expected and what the leadership did to empower the forces to meet those expectations*

*[Leadership “say-do” gap] Senior leadership declares that the nuclear mission is uniquely important. Yet, in their daily work, sailors, airmen and marines experience shortages in the materiel, qualified personnel, facilities, and funding support.*

*leadership support [is] not consistent with the declared policy*

*serious inefficiencies from micromanagement, excessive security demands, and the need to address a plethora of requirements not directly contributing to the mission.*

#### **Internal Challenge**

*In many respects, the chain of command has allowed inspections and individual testing to supplant the authority and accountability of commanders.*

*[Inspection culture] Any misstep in the performance leads to an increasingly rigorous inspection regime, creating a downward spiral of ineffectiveness where an already undermanned and under-experienced unit is over-worked, over-evaluated, over-drilled, over-observed, and under-trained.*

*In many cases, in response to an inspection failure or untoward incident, new burdensome processes are implemented in an attempt to ensure “this never happens again.”*

*The current inspection regime does not achieve its intended purpose to ensure mission readiness and execution by validating that units meet established standards. Instead, the inspection system undermines commander authority and has become a major detractor to mission readiness and effective and efficient management. .... enormous management and leadership attention is devoted to preparing for and dealing with inspections.*

### **Organisational culture**

#### **Safety Culture**

*[Risk aversion] The intolerance of less-than-perfect outcomes at any level in the nuclear enterprise has fostered a culture characterised by risk aversion and over-reliance on processes and procedures to the detriment of personal responsibility and the authority and accountability of commanders.*

*the forces see ... leaders who demand zero mistakes in every operational and administrative action (an impossible expectation that cannot be realized), often unnecessarily and at the expense of sustained mission performance, primarily to reduce the risk of external criticism. The resulting disconnect of micro-perfection comes from a corrupted risk assessment process.*

*by failing to manage risk, [the] leaders bear direct responsibility for allowing a climate of fear to develop among Sailors, Airmen, and Marines in the nuclear forces. This risk-averse, inspection-focused culture has become self-perpetuating and presents a greater risk to the mission than the sum of the risks avoided.*



## People

### **Organisational Establishment**

*The Review did not find a coherent, integrated structure and synchronized set of activities that could be characterized as a DOD “nuclear enterprise.” Instead, the Review found a loose federation of separate nuclear activities often imbedded in and indistinguishable from support for and execution of a wide range of non-nuclear activities.*

The Review found that although manning levels were being reported at 100% this did not recognise that the number of staff who had the grades, qualification levels, and certification requirements to carry out work was inadequate. The lack of staff with higher qualification grades also made it difficult to train staff to the higher levels, as they were too busy with operational activities. The enterprise did not have sufficient qualified and effective manning available to meet the workload.

*The [training] staff, made up largely of senior enlisted Sailors, must conduct maintenance on the aging prototypes in addition to training students, while also pursuing their own qualifications necessary to advance as previously discussed. The result for the staff is 12-14 hour days to support training, followed by extra hours to study for their own qualifications.*

*Numerous previous reviews and assessments have examined support issues. It is sufficient for this review to confirm that there is continuing evidence, experienced every day in the forces, that the level of support is not consistent with the expected priority for the nuclear mission. Areas of longstanding and continuing deficiencies include logistics support, facilities, training support, guidance, and directives.*

Recognising the lack of resources available to staff the Review recommended that *the most basic needs for Sailors and Airmen and their families receive priority attention—repairing broken equipment, adequate clothing for cold-weather conditions, vehicle maintenance, and providing support services (e.g., childcare center hours, commissary hours, fitness center hours, medical services).*

### **Processes and tools**

*The Personnel Reliability Program (PRP) is to assist the commander in determining the mental fitness of his or her people to perform duties that could provide access to nuclear weapons. Instead, it has become a disruptive and distracting detractor to the nuclear mission. As implemented, the PRP undermines personal responsibility and commander authority and accountability, imposes an enormous tax on productivity, conveys distrust of Sailors, Airmen, and Marines dedicated to the nuclear deterrent mission, and, on balance, detracts from assurance of genuine fitness for duty.*

*The current set of PRP practices conveys the perception the leadership does not trust the men and women we trust to maintain, operate, and secure our nuclear forces to follow procedures to ensure that their commanders, supervisors, and work partners are informed on personal issues and conditions that could adversely impact work performance. PRP practices attempt to replace the personal responsibility of individuals, supervisors, and commanders with processes that create inefficiencies, hardships, and distrust.*

Independent Review of the Department of Defense Nuclear Enterprise, 2 June 2014.  
<http://www.defense.gov/Portals/1/Documents/pubs/Independent-Nuclear-Enterprise-Review-Report-30-June-2014.pdf>

# Boeing 787 Dreamliner Battery Fire

## Introduction

On 7 January 2013, smoke was discovered in the aft cabin of a Japan Airlines Boeing 787-8 'Dreamliner' parked at Boston International Airport. This originated from a fire in the auxiliary power unit (APU) battery. No-one was injured. Nine days later a similar incident occurred on an All Nippon Airways internal flight in Japan involving the main battery of the 787 which is of a similar design to the APU battery. In this case the aircraft had to make an emergency landing at Takamatsu airport.

Boeing was responsible for the overall integration and certification of the 787's electrical systems. Boeing contracted Thales to design the 787 electrical power conversion subsystem, which includes the main and APU batteries. Thales then subcontracted various manufacturers, including GS Yuasa to develop, design and manufacture the main and APU batteries. The 787 was the first transport-category airplane to have permanently installed, rechargeable lithium-ion batteries. As a result, the Federal Aviation Authority (FAA) identified special conditions for Boeing to meet as part of the certification process. Boeing's safety assessment - in support its compliance demonstration - determined that cell venting of the 787 battery would occur at a frequency of 1 in 10 million flight hours. However, at the time of the Boston and Takamatsu incidents - both of which involved cell venting - the in-service 787 fleet had accumulated less than 52,000 flight hours.

On 21 November 2014 the National Transportation Safety Board (NTSB) published a report of its investigation of the APU batter fire at Boston. The NTSB determined that the probable cause of the incident was an internal short circuit within a cell of the APU lithium-ion battery, which led to thermal runaway that cascaded to adjacent cells, resulting in the release of smoke and fire. The incident resulted from Boeing's failure to incorporate design requirements to mitigate the most severe effects of an internal short circuit within an APU battery cell and the FAA's failure to identify this design deficiency during the type design certification process.

## Governance and assurance

### **Internal Challenge**

*Cell internal short circuiting and the potential for thermal runaway of one or more battery cells, fire, explosion, and flammable electrolyte release.* GS Yuasa did not test the battery under the most severe conditions possible in service, and the test battery was different to the final battery design certified for installation on the airplane. Also, Boeing's analysis of the main and APU battery did not consider the possibility that cascading thermal runaway of the battery could occur as a result of a cell internal short circuit.

*Insufficient guidance for manufacturers to use in determining and justifying key assumptions in safety assessments.* Boeing's safety assessment for the 787 main and APU battery included an (incorrect) underlying assumption that the effect of an internal short circuit within a cell would be limited to venting of only that cell without fire. Boeing and FAA reviews of the safety assessment did not reveal this deficiency.

Boeing's safety assessment in support of its compliance demonstration determined that cell venting of the 787 battery would occur at a frequency of 1 in 10 million flight hours. However, at the time of the Boston and Takamatsu incidents - both of which involved cell venting - the in-service 787 fleet had accumulated less than 52,000 flight hours.

## **Governance**

The FAA's oversight of Boeing, Boeing's oversight of Thales, and Thales' oversight of GS Yuasa did not ensure that the cell manufacturing process was consistent with established industry practices.

### ***Intelligent Customer***

*The Federal Aviation Authority's oversight of Boeing, Boeing's oversight of Thales [designer of the 787 electrical power conversion subsystem], and Thales' oversight of GS Yuasa [supplier of batteries] did not ensure that the cell manufacturing process was consistent with established industry practices.*

## **People**

### ***Supply Chain***

*Cell manufacturing defects and oversight of cell manufacturing processes.* NTSB identified concerns over GS Yuasa's manufacturing process, including foreign object debris (FOD) generation, and a postassembly inspection process that could not reliably detect manufacturing defects. The FAA's oversight of Boeing, Boeing's oversight of Thales, and Thales' oversight of GS Yuasa did not ensure that the cell manufacturing process was consistent with established industry practices.

### **Processes and tools.**

*Insufficient guidance for FAA certification engineers to use during the type certification process to ensure compliance with applicable requirements.* Guidance to FAA certification staff at the time that Boeing submitted its application for the 787 type certificate did not clearly indicate how individual special conditions should be traced to compliance deliverables (such as test procedures, test reports, and safety assessments) in a certification plan.

Auxiliary Power Unit Battery Fire, Japan Airlines Boeing 787-8, JA829J, Boston, Massachusetts, January 7, 2013, Incident Report NTSB/AIR-14/01 / PB2014-108867, National Transportation Safety Board.

<http://www.nts.gov/investigations/AccidentReports/Reports/AIR1401.pdf>

## **Rail passenger disruption at King's Cross and Paddington**

In June 2015, the Rail Delivery Group (a group comprising Network Rail and train and freight operating companies) published an independent report on the planning and timing of engineering works on the rail network. The review was commissioned following significant disruption to services into and out of London on 27 and 28 December 2014, prompted primarily by overrunning works.

### **Governance and assurance**

#### **Leadership**

*It is essential that the industry works together at the highest level to improve the ways it plans engineering access and secures possession efficiency. Involvement at the highest level means engagement, support and funding from Network Rail's Executive Management Team and Route Managing Directors. It means involvement, support and funding from the Chief Executives of the passenger and freight owning groups and their operating company Managing Directors. It means the early involvement of senior managers from the supply industry.*

#### **Governance**

*Irrespective of the time of year at which major engineering work is undertaken the need for early and effective communication between Network Rail, its contractors, passenger and freight operators is critical for ensuring the effective and efficient delivery of infrastructure improvements. The same can be said for the different functions within Network Rail where good communication and full co-operation between Infrastructure Projects and the Routes is essential if Network Rail's CP5 investment programme is to be delivered on time and on budget.*

*In parallel the financial incentives and accountabilities within the overall industry and also within the different parts of Network Rail need to be aligned with the financial consequences of decisions taken about the delivery of engineering work. We heard evidence that this was not always the case in practice.*

*Rail Delivery Group should clarify the lines of accountability between the various players in the Industry, including the boundary between Train Operating Companies and Network Rail in responsibility for passengers, that Freight Operating Companies are responsible for freight customers, that Network Rail's Infrastructure Projects is an internal supplier for the delivery of most major projects, whilst the Routes are the clients for all projects and responsible for the delivery of some projects.*

### **Organisational culture**

#### **Organisational Learning**

*Decisions on the best time of year to do particular work should be informed by passenger data as well as comparative costs and efficiencies of possessions. We recommend the industry builds up a database with accurate and detailed passenger numbers to make selection of the best options possible and to refine the capacity for diversionary routes. Obtaining a detailed insight in volume and composition (commuter-leisure) passenger flows during the year as a base for planning is essential to be able to plan possessions. The same holds true of the costs of a possession at Christmas in comparison with the summer. The industry should undertake significantly more analysis to inform itself, customers and stakeholders of the operational and efficiency trade-offs from doing work at different times of the year.*

*Network Rail should consider extending best practice from overseas and Transport for London in isolations, taking possessions of engineering sites and installing and using BiDirectional signalling capability.*

*The lessons, advice and recommendations from past studies into effective engineering work should be kept under constant scrutiny and progress towards achieving best practice should be measured and reviewed by the industry.*

*Network Rail should review the operating knowledge of key individuals involved in project management and control positions*

## **People**

### **Organisational Establishment**

*Insights, experience and knowledge vary within Network Rail and the operator community. This leads to insufficient commitment and mutual understanding and ultimately to a breakdown of communication.*

*We were told of instances where the various parties involved in a possession did not have the same views as to what was operationally feasible.*

*Operating owning groups should build up expertise in the area of access and possession planning to be an equal and knowledgeable partner in each phase of the planning and execution for Network Rail*

*A way to reduce the risk of overruns is by planning for fewer projects at Christmas and Easter because during those peak times the quality and the availability of additional staff is less, logistics for the current number of projects is stretched as is the attention of management. Contingency planning is an essential element in the planning and execution of major works*

*The issue of the competence of the staff involved in engineering work was raised by many interviewees. Concerns about the understanding of different parts of the industry or other's duties and responsibilities has been flagged a number of times, especially the lack of understanding of operating practices and procedures and how services may operate in degraded conditions. Our conclusion is that best practice exchange within the industry has to be set up to create a shared level of knowledge and understanding.*

*The industry should give greater attention to the logistics of major works including the supply of key materials, equipment and staff.*

### **Processes and tools**

*key issues related to planning are the need to simplify decision support tools and to solve the inability to timetable engineering trains to and from sites of work leaving their operation to best endeavours on the day*

Planning and Timing of Engineering Works on the GB Rail Network, An independent report for the Rail Delivery Group, 31 May 2015.

[http://www.raildeliverygroup.com/files/Publications/2015-05\\_planning\\_timing\\_engineering\\_works\\_review.pdf](http://www.raildeliverygroup.com/files/Publications/2015-05_planning_timing_engineering_works_review.pdf)

## **Furness General Hospital Maternity Care**

On 3 March 2015, The Department of Health published the results of its investigation into the standard of care received by mothers and babies in the maternity and neonatal service at Furness General Hospital (now part of Morecambe Bay NHS Trust) between 2004 and 2013. The report details serious failures of clinical care associated with the death of 12 mothers and babies.

### **Governance and assurance**

#### **Leadership**

*there was no agreed vision, strategy or operational plan for maternity and neonatal services. Decision-making was reactive rather than proactive; short term rather than long term; and driven by finance rather than health needs.*

*Clinical leadership in maternity and neonatal services was ineffective. This was partly due to the lack of vision and strategic planning of these services, but also due to the lack of managerial support and the increasingly defiant behaviour by clinical colleagues. High-quality leadership skills are required in those difficult circumstances, and these were not evident.*

*There was weak clinical leadership and poor management at the directorate and division levels; and an executive team that was more focused on obtaining Foundation Trust status than on delivering high-quality care to the citizens of South Cumbria and North Lancashire.*

*There was no clear leadership responsibility or structure for the coordination of regulatory activity. Although arrangements were in place for communication and liaison between organisations, in relation to University Hospitals Morecambe Bay Trust (UHMBT) there was no explicit plan that came out of these to ensure the overall work of those organisations comprehensively addressed the issues.*

#### **Internal Challenge**

*All of these organisations [hospital, government and regulator] failed to work together effectively and to communicate effectively, and the result was mutual reassurance concerning the Trust that was based on no substance.*

*the failures of working relationships, approach and clinical competence affecting the maternity service must have been clear to senior and experienced unit staff, but we could find no attempt to escalate knowledge of this to the level of the Trust executives and Board.*

*There were failures, by both maternity unit staff and senior Trust staff, to escalate clear concerns that posed a threat to safety.*

#### **Governance**

*By the early part of 2009, there was clearly knowledge of the dysfunctional nature of the FGH maternity unit at Trust level, but the response was flawed, partly as a result of an inadequate flow of information through professional and managerial reporting lines. Clinical governance systems throughout the Trust were inadequate*

*As a consequence of the serial restructuring by the Trust, maternity and neonatal services had their management arrangements changed six times during the period covered by this Investigation. As a result of this managerial instability, there is evidence that lines of responsibility and accountability were blurred, many posts were combined and in some cases became unworkable, individuals were given management posts in maternity and neonatal services without any knowledge or experience of these services, and the focus was on operational objectives such as finance and waiting times rather than governance and quality of service.*

*The prime responsibility for ensuring the safety of clinical services rests with the clinicians who provide them, and those associated with the unit failed to discharge this duty over a prolonged period. The prime responsibility for ensuring that they provide safe services, and that the warning signs of departure from standards are picked up and acted upon, lies with the Trust, the body statutorily responsible for those services. When the dysfunctional nature of the maternity services became obvious, in 2008, the Trust's response was flawed and inadequate, and categorised for some years by instances of the same denial and cover-up that was evident in the maternity unit. At the time, the Trust was strongly focused on achieving Foundation Trust status, which both diverted capacity to manage day to day and surely fostered reluctance to disclose anything that may have jeopardised the bid. It may be that Trust officers believed that they were capable of resolving the problem internally, but they were wrong, and the failure to share information with other parts of the NHS system was inexcusable.*

*The review report was produced in draft in March 2010, but what was described as minor redrafting took until August 2010 to finalise. It contained significant criticisms of the Trust's maternity care, including dysfunctional relationships, poor environment and a poor approach to clinical governance and effectiveness. The report was given very limited circulation within the Trust, and was not shared with the North West Strategic Health Authority NW SHA until October 2010, or with the Care Quality Commission (CQC) and Monitor<sup>7</sup> until April 2011. Although we heard different accounts, and it was clear that there was limited managerial capacity to deal with a demanding agenda, including the Foundation Trust application, we found on the balance of probability that there was an element of conscious suppression of the report both internally and externally.*

*Monitor deemed the Trust to be in breach of its terms of authorisation as a Foundation Trust, and commissioned two major external reviews. One was critical of dysfunctional clinical working, the other of inadequate and ineffective clinical governance.*

*The NW SHA, Department of Health and the Parliamentary and Health Service Ombudsman (PHSO) failed to work together effectively and to communicate effectively, and the result was mutual reassurance concerning the Trust that was based on no substance.*

*There was insufficient clarity as to who was responsible for ensuring that the system operated effectively to understand the concerns of the families and establish what had occurred. Within the NHS, at regional level, this leadership responsibility clearly sat with the NW SHA. It was exercised through Gold Command but not consistently or effectively in relation to the concerns raised by families.*

*The reasons behind each missed opportunity [to identify and address the issues] differed, ....., but the effect of each was to delay further the recognition of the problem. This represents a collective and individual organisational failure to exercise an effective supervisory or regulatory function over the Trust's ability to provide safe and effective services. Whilst we are clear that the primary responsibility for assuring the quality of clinical services lies with the Trust itself, there is little point in having an elaborate system of overview and scrutiny if it cannot detect significant failure.*

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<sup>7</sup> Monitor is responsible for authorising, monitoring and regulating NHS Foundation Trusts.

## **Organisational culture**

### **Organisational Learning**

*the response to adverse incidents was grossly deficient, with repeated failure to investigate properly and learn lessons.*

*Serious incidents happen in every health system because of the nature of healthcare, and no blame should be attached to staff who make mistakes. It is, however, vital that incidents are properly investigated, in order to identify problems and prevent a recurrence. The investigation in 2004 was rudimentary, over-protective of staff and failed to identify underlying problems.*

*There were investigatory failures, so that problems were not recognised and the same mistakes were needlessly repeated.*

### **Safety Culture**

*There were repeated failures to be honest and open with patients, relatives and others raising concerns. The Trust was not honest and open with external bodies or the public.*

*the focus was on operational objectives such as finance and waiting times rather than governance and quality of service.*

*The clinical review has identified ..... clinicians who place their personal clinical interest before the safety of their patients*

## **People**

### **Organisational establishment**

*The clinical review has identified deficiencies at all levels within the organisation that impact on quality of clinical care*

*Arrangements for assessing pregnant women who present with concerns need to ensure that patients receive an opinion from experienced midwives or obstetricians. The consultants need to be closer to the front line, where they can be gatekeepers to their service and advise and support their junior doctors and midwifery colleagues. The staffing levels should ensure that this clinical opinion is available 24/7.*

*Clinical competence was substandard, with deficient skills and knowledge; working relationships were extremely poor, particularly between different staff groups, such as obstetricians, paediatricians and midwives; there was a growing move amongst midwives to pursue normal childbirth 'at any cost'; there were failures of risk assessment and care planning that resulted in inappropriate and unsafe care;*

*There was evidence of a lack of basic understanding of the processes of labour by both midwifery and medical staff. There were frequent examples of staff ignoring the whole clinical picture of the woman (including pre-existing risk factors) and her baby, and only reacting to events in isolation.*

*A lack of knowledge and experience is probably responsible for the 'wait and see' approach that was prevalent in both the labour suite and the special care baby unit, and often led to further deterioration of the patient's condition and a poor outcome in the cases we reviewed.*

*individuals were given management posts in maternity and neonatal services without any knowledge or experience of these services*

*There were clinical failures, including failures of knowledge, team-working and approach to risk.*



*Most importantly, there is evidence of poor interdisciplinary working relations and substandard care. The failure of obstetricians and paediatricians to communicate in a professional way on the planning and delivery of high-risk patients is unacceptable. Similarly, the reluctance of midwives and obstetricians to share responsibility for the care of high-risk pregnant women is denying patients their rights to the best care.*

*There was significant organisational failure on the part of the CQC, which left it unable to respond effectively to evidence of problems.*

*There have been many changes to the NHS, its governance and roles and responsibilities of different bodies. This is not only a complex and changing landscape to describe, the frequency of reorganisation has introduced uncertainty while roles, relationships and demarcation are being resolved, upheaval as staff must become accustomed to working with new organisations and colleagues, and loss of corporate memory of how to work effectively with widely variable NHS organisations and where the high-risk areas are. This repeated change to already complex systems has not helped them to function effectively.*

### **Processes and tools.**

*A lack of clinical risk assessment and planning for high-risk obstetric patients was an overarching theme.*

The Report of the Morecambe Bay Investigation, March 2015.

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/408480/47487\\_MBI\\_Accessible\\_v0.1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/408480/47487_MBI_Accessible_v0.1.pdf)

# World Health Organisation's Response to Ebola Crisis

## Introduction

In July 2015, the World Health Organisation (WHO) published an independent assessment of its response to the Ebola outbreak. The report exposed organisational failings in the functioning of WHO and significant challenges to re-establishing its pre-eminence as the guardian of global public health.

## Governance and assurance

### Leadership

*significant and unjustifiable delays occurred in the declaration of a Public Health Emergency of International Concern (PHEIC) by WHO.*

*WHO must re-establish itself as the authoritative body communicating on health emergencies. It must fulfil its role in rapidly, fully and accurately informing governments and publics across the world about the extent and severity of an outbreak.*

## Organisational culture

### Organisational learning

Following Pandemic (H1N1) 2009 a series of recommendations were made to improve the International Health Regulations (2005). Had these been implemented the global community would have been in a far better position to face the Ebola crisis.

## Safety Culture

*WHO has a technical, normative culture, not one that is accustomed to dealing with such large-scale, long-term and multi-country emergency responses occurring at the same time or that is well-suited to challenging its Member States.*

*WHO must develop an organizational culture that accepts its role in emergency preparedness and response.*

## People

### Organisational Establishment

WHO was under-resourced to independently identify the risks and declare a health emergency.

*All levels of WHO should be strengthened in order to increase the Organization's ability to independently identify health risks and to declare health emergencies.*

*The Panel considers that WHO does not currently possess the capacity or organizational culture to deliver a full emergency public health response. Funding for emergency response and for technical support to the International Health Regulations (2005) is lacking.*

*When a health emergency occurs, there must be an ability to shift into rapid decision-making and action, and adapting and adjusting resource allocation, methods of work and information practices .... Regional Directors and WHO Representatives need to understand and fully support "step aside" and "no regrets" policies ... in emergencies.*

*WHO must adopt a new approach to staffing in country offices; the country circumstances must be taken more fully into account and the highest level of capacity must be ensured for the most vulnerable countries. At country level, the WHO Representative must have an independent voice and be assured of the full support of the Regional Director and the Director-General, if challenged by governments.*

*WHO should ensure that its staff and stand-by partners have a better understanding of the humanitarian system.*

*The United Nations Secretary-General's High-Level Panel on the Global Response to Health Crises should emphasize the need for the United Nations system to understand the special nature of health risks, the International Health Regulations (2005) and the implications of declaring a Public Health Emergency of International Concern (PHEIC).*

*Member States have largely failed to implement the core capacities, particularly under surveillance and data collection, which are required under the International Health Regulations (2005)*

*WHO should propose a prioritized and costed plan, based on independently assessed information, to develop core capacities required under the International Health Regulations (2005) for all countries.*

### **Processes and tools.**

Following Pandemic (H1N1) 2009 a series of recommendations were made to improve the International Health Regulations (2005). Had these been implemented the global community would have been in a far better position to face the Ebola crisis.

The regulations were also not fully implemented by the States and the WHO Secretariat.

*in violation of the Regulations, nearly a quarter of WHO's Member States instituted travel bans and other additional measures not called for by WHO, which significantly interfered with international travel, causing negative political, economic and social consequences for the affected countries.*

*WHO should consider how to coordinate its own emergency grades and declarations of a Public Health Emergency of International Concern (PHEIC) with the emergency levels applied in the broader humanitarian system, in order to facilitate better interagency cooperation.*

Final Report of the Ebola Interim Assessment Panel, World Health Organisation, July 2015. <http://www.who.int/csr/resources/publications/ebola/report-by-panel.pdf?ua=1>

## **Overstatement of Profits by Toshiba**

On 20 July 2015 Toshiba published the results of an internal investigation into its accounting practices, which revealed that the company had systematically overstated profits by US\$1.2bn over a seven year period.

### **Governance and assurance**

#### ***Leadership***

The president set “*challenges*” for each business to improve income with the strong suggestion that the targets needed to be achieved, sometimes implying that the company would withdraw from the business if the targets were not met.

*it has been recognised that, regarding some of those projects, the President of the Company, as Company-level top management, actively instructed that inappropriate accounting treatments be carried out.*

#### ***Internal Challenge***

*Internal controls at the Company-level did not function. ... there were many projects where not action was taken in accordance with the instruction of a superior business unit head .... The internal control by the Accounting Division was not functioning.*

*There was no Internal Audit Department at any Company, other than the Accounting Division, such as could check for inappropriate accounting treatment.*

*Internal control at the Corporate-level did not function. .... [There was no] internal control over the risk of inappropriate conduct by the management.*

*[The Finance Division] did not play a role in checking whether or not an accounting treatment at any of the Companies was inappropriate. ... it was found that persons in charge at the Finance Division themselves knew that inappropriate accounting treatment was being carried out but did not take any sort of action such as to point out or correct the situation.*

*despite the fact that, as a result of its audits, the Corporate Audit Division was actually aware that in several projects subject to its audits there was a possibility that inappropriate accounting treatments were being carried out ... no evidence was found that the Corporate Audit Division had made any indications, etc., in relation to such accounting treatment.*

*There were some projects where the Corporate Audit Division requested the improvement of some situations that were the cause of inappropriate accounting treatments (although the Division did not instruct the correction of any inappropriate accounting treatment itself), and although executives prepared improvement plans accordingly, there were not carried out. The Corporate Audit Division did not follow up such situations.*

*the Corporate Audit Division had inadequacies, and its control was not functioning sufficiently.*

#### **Governance**

*The inappropriate accounting treatment was carried out ... in an institutional manner with the involvement of corporate level management.*

*While Toshiba created an audit committee and appointed independent board members to it, the internal audit department never enjoyed a direct reporting line to the audit committee. Instead, the department reported to the company's president - with no routine access to the company's board of directors.*

## **Organisational culture**

*Certain top management at corporate level strongly insisted on the achievement of Challenges [profit and loss targets for each business] while suggesting possible withdrawal from the business.*

*A corporate culture existed at Toshiba whereby employees could not act contrary to the intent of their superiors.*

## **People**

### **Organisational Establishment**

*[There was a] lack of awareness and knowledge among top management about the appropriate accounting treatment. .... Those who were the top of the Companies did not have sufficient knowledge of accounting standards that are generally accepted as fair and appropriate.*

*it appears that an excessive reliance on the rotational staffing model left the internal audit department vulnerable in terms of resources and competency in accounting and in the company's ability to conduct effective audits.*

### **Processes and tools.**

*In some projects, inappropriate accounting treatments were undertaken on the grounds that Toshiba's accounting policy was inappropriate. In other projects, inappropriate accounting treatments were carried out on the grounds that the accounting policies specified at Toshiba were not appropriately applied.*

Investigation Report – Summary Version, Independent Investigation Committee for Toshiba Corporation, 20 July 2015.

[http://www.toshiba.co.jp/about/ir/en/news/20150725\\_1.pdf](http://www.toshiba.co.jp/about/ir/en/news/20150725_1.pdf)

<https://iaonline.theiia.org/blogs/chambers/2015/lessons-from-toshiba-when-corporate-scandals-implicate-internal-audit>

## **8.2 Appendix B – Case Studies of Good Performance Supported by Effective Organisational Capability**

### **Onagawa**

The Onagawa nuclear power plant in Japan was shaken by the earth quake in 2011 and was flooded, but the effects of these events were very different to those that occurred at Fukushima.

The biggest difference between the two plants is the safety margin for earthquakes and tsunamis. After the tsunami struck the Onagawa site still had access to external power lines and could use six of its eight emergency diesel generators. The maximum tsunami height had originally been assumed to be around three metres. The Fukushima plant was therefore built at a height of around ten metres, whereas Onagawa was built at approximately 14.8 metres. The maximum height of the tsunami was 13 metres and although the land dropped by one metre the Onagawa plant was protected by its 14.8 metre high location.

Consequently in the aftermath of the tsunami the plant was able to take in local residents who had lost their homes and shelter them for up to three months. Supplies were flown in by helicopter by the Vice President of the power plant owner. Two people with medical conditions were taken to hospital in the helicopter.

### **Governance and assurance**

#### ***Leadership***

Safety leadership has always been strong in Tohoku Electric Power Company (Onagawa owner) including the importance of protection against natural disasters. *By having an employee in upper management strongly advocating safety, a general prioritization for nuclear reactor safety formed within the company.*

#### **Governance**

The people on the ground at Onagawa power plant were given delegated responsibility to make decisions and handle the situation, with minimal reporting back to head office during the accident.

*Throughout the disaster, headquarters supported the operators at Onagawa NPS minute by minute. Supervisors, as well as chief engineers were sent to the main control rooms of the damaged nuclear reactors to make good emergency decisions. Information was sent accurately and in a timely manner to all levels of operations in order for the company to work collectively to resolve the situation.*

### **Organisational culture**

#### ***Organisational Learning***

*Tohoku Electric Power Company as a whole conducted bibliographic, inquiry, archaeological, and sediment-related surveys, as well as literary research on historical natural disasters in Tohoku to determine potential tsunami height.*

*Out of work hours, representatives of Tohoku Electric Power Company participated in seminars and panel discussions about earthquake and tsunami disaster prevention in nuclear energy held by Japan Nuclear Energy Safety Organization, where representatives were exposed to further information and prevention techniques in the nuclear department.*

The height of the plant was based on research on previous tsunamis. In 1987 the estimated tsunami height was revised upwards to nine metres, so the utility further reinforced the flood wall to protect the embankment with concrete blocks up to a height of 9.7 metres from the base. Other modifications had been made to the plant to implement lessons learned, in particular from earthquakes. Major seismic reinforcement was installed including in the emergency response room and computer room. Tohoku Electric learned from past earthquakes and tsunamis—including one in Chile on February 28, 2010—and continuously improved its countermeasures.

### **Safety Culture**

The safety culture at Onagawa is very strong and everyone understands their role in maintaining safety on site.

[The] *company culture* [is] *to prioritize citizen safety*

### **People**

#### **Organisational Establishment**

*Periodic training sessions to remind workers of extreme situations also allowed employees to stay poised during an actual disaster.*

The plant had conducted regular drills based on various accidents and disasters using a simulator identical to the main control room, therefore when the accident occurred staff were well prepared. During the accident staff were proactive in looking for opportunities to help and taking the initiative to avert situations.

#### **Processes and tools**

*By implementing strict protocols for when a disaster occurs, all workers were familiar with the steps that must be taken when either a tsunami warning was issued, or when a tsunami was approaching.*

<http://www-bcf.usc.edu/~meshkati/Onagawa%20NPS-%20Final%2003-10-13.pdf>

## **London 2012 Olympics**

The London 2012 Olympics is the only Olympics that has had no fatalities during the construction of the facilities to host the events.

### **Governance and assurance**

#### ***Leadership***

This safety culture was achieved by strong leadership and management for safety.

The appetite shown for health and safety by the senior management team was 'infectious' right through the workforce. Senior management regularly walked around the sites to understand what was happening on the ground and to praise good practices.

LOCOG Directors actively participated in the development of the Health and Safety Management System (HSMS) through their involvement in the LOCOG Tactical Safety Steering Group (a sub-group of the wider Director team), and in leading the work of their own Functional Areas.

A Contractor Safety Leadership Group was established.

### **Organisational culture**

#### ***Safety Culture***

The engagement of the workforce and contractors established a clear understanding of individual and collective responsibilities. The concept of everyone accepting responsibility for managing health and safety became widely accepted as a key building block in achieving a 'harm free environment'. This helped to develop the appropriate health and safety culture.

Health and safety and the HSMS were focussed on helping people to do exciting things safely rather than using health and safety as a reason to stop people from doing things.

#### ***Supply Chain***

The Health and Safety Management System (HSMS) was developed in collaboration with contractors and suppliers in an effort to capture best practice and to ensure 'ownership' by those organisations. It was made clear that everyone was working for LOCOG and that there were health and safety standards that were expected from all the people working on the sites.

The health and safety regulator was involved in the development and application of the HSMS. LOCOG were prepared to change requirements if they were not seen to be practical, this was a prerequisite in making sure that regulatory and management interventions were focused on the right issues.

### **Processes and tools**

A Health and Safety Management System (HSMS) was implemented by the London Organising Committee of the Olympic Games and Paralympic Games (LOCOG). The HSMS defined policies and procedures for health and safety, and was used to establish the required standards and arrangements within Functional Area health and safety plans. Applying a consistent approach to the identification of risks and development of management controls across all Functional Areas enabled individual plans to be integrated into venue specific health and safety plans.

The success of the programme was much to do with all parties being involved in the design of a HSMS that was tailored to the needs of the organisation.



A conference was held for all contractors to introduce them to the HSMS. The HSMS was also distilled as a guidance document entitled 'Working with LOCOG – Health and Safety Guidance' which was made available to all contractors via an extranet.

The guidance was kept simple and people followed the rules to prove to themselves and others that what they were doing was safe.

<http://learninglegacy.independent.gov.uk/themes/health-and-safety/index.php>

<http://learninglegacy.independent.gov.uk/documents/pdfs/health-and-safety/mr-h-s-management-system.pdf>

### **8.3 Appendix C - SDF Leadership and Management for Safety Principles**

The Safety Director's Forum has identified the key areas that it believes should be addressed in an organisation's approach to effective leadership and management for safety<sup>8</sup>.

1. The organisation has a clear vision which is supported by clear business objectives and develops goals and strategies for their delivery. It should be clear that as part of the vision and the objectives, safety is an overriding priority.
2. Policies and standards are established and implemented that support safety.
3. The organisation has clear values and associated behaviours that support safety and these are openly promoted and upheld throughout the organisation.
4. Leadership attributes at all levels throughout the organisation are clear and there is clear accountability for the delivery of the business requirements and the required safety performance.
5. A management system is developed that ensures all processes and procedures deliver the required standards of safety and quality performance, with safety being a primary consideration in decision making.
6. The organisational capability and resources support the required business strategy and associated safety requirements.
7. The management of the supply chain supports the delivery of safety and quality.
8. Key performance indicators are effectively utilised to manage the business and safety performance.
9. Oversight and challenge of organisational performance is in place and welcomed.
10. There is a clear culture of continuous improvement and learning and action for improvement is timely and effective.

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<sup>8</sup> "Safety" is interpreted as all forms of health, safety, quality, environmental protection and security, however it should be recognised that given the special nature of the potential nuclear hazard, nuclear safety should always be the overriding priority.

## 8.4 Appendix D – Organisational Capability Maturity Matrix

Maturity models are a way of assessing how well an organisation is doing with regard to its business processes that underpin aspects of its operations. Most recently within the nuclear industry maturity models have been applied to safety culture. In a similar manner an organisation's management of its organisational capability can be assessed through the use of maturity model such as the People Capability Maturity Model® (People CMM®). This approach is suggested as one way in which an organisation can evaluate its overall approach to organisational capability and to help guide an improvement programme. It is not developed further beyond the explanation in the following section but is included as an example of an approach that could be used.

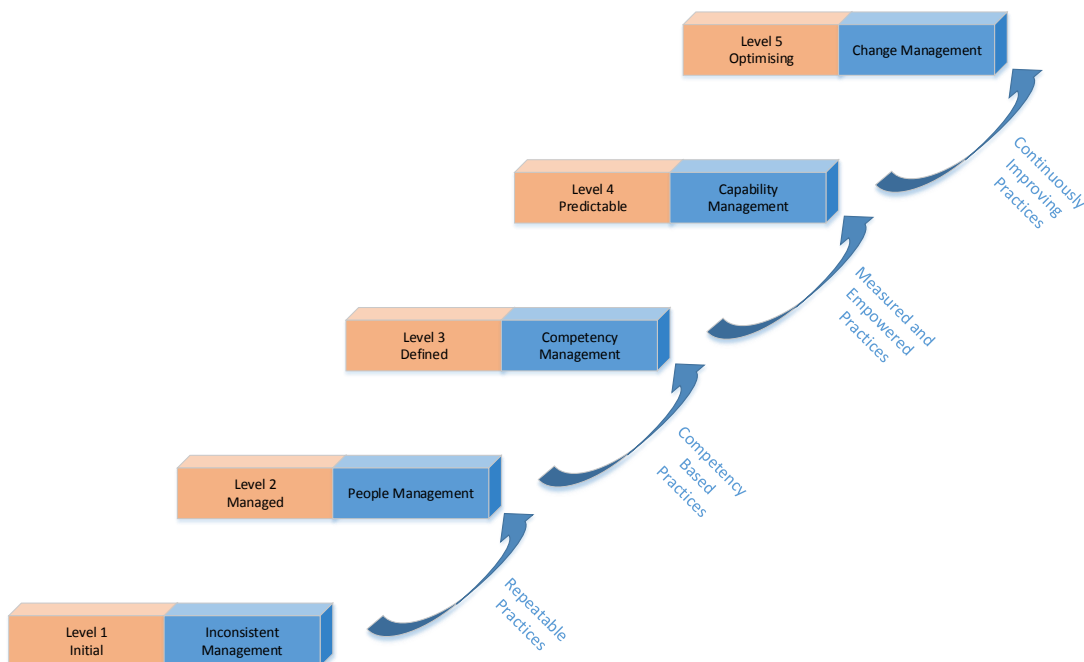
The People Capability Maturity Model® (People CMM®) is a tool that helps to successfully address the critical people issues in an organisation. The People CMM® is an organisational change model, designed on the premise that improved workforce practices will not survive unless an organisation's behaviour changes to support them. It can be used as a standard for assessing workforce practices and as a guide in planning and implementing improvement activities.

### Key Characteristics

The maturity framework integrates principles from three domains:

- the targeted domain of processes.
- total quality management practices.
- organisational change.

It consists of five maturity levels that establish successive foundations for continuously improving individual competencies, developing effective teams, motivating improved performance, and shaping the workforce the organisation needs to accomplish its future business plans (See figure below).



A maturity level represents a new level of organisation capability created by the transformation of one or more domains of an organisation's processes.

The method helps an organisation gain insight into its workforce capability by identifying the strengths and weaknesses of its current practices related to the People CMM®. The method focuses on identifying improvements that are most beneficial, given an organisation's business goals and current maturity level.

### **Demonstration**

Assessment of an organisation's level of maturity is based upon answers to questions asked at each level of maturity. Assessment can be done through a self-assessment questionnaire or by formal assessment to gain a formal rating of the organisation and allow it to benchmark itself against other organisations.

### **Further reading**

Further detail on Capability Maturity Modelling can be found at:  
[www.sei.cmu.edu/reports/01mm001.pdf](http://www.sei.cmu.edu/reports/01mm001.pdf)

## **8.5 Appendix E – Contributors**

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## 9 Glossary

Term	Definition
Competence	The combination of knowledge, qualifications and experience necessary for an individual to safely perform a specific role
Design Authority (DA)	The defined function of a licensee's organisation with the responsibility for, and the requisite knowledge to maintain the design integrity and the overall basis for safety of its nuclear facilities throughout the full lifecycle of those facilities. Design Authority relates to the attributes of an organisation rather than the capabilities of individual post holders
Intelligent Customer (IC)	In the context of nuclear safety, the organisation should know what is required, should fully understand the need for a contractor's services, should specify requirements, should supervise the work and should technically review the output before, during and after implementation. The concept of intelligent customer relates to the attributes of the organisation rather than the capabilities of individual post holders
Organisational capability	The collective attributes of the licensee entity that enable it to understand and control the hazards associated with its activities and to sustainably deliver its vision and mission safely and effectively
Organisational culture	A system of shared assumptions, values, and beliefs, which governs how people behave in organisations. These shared values have a strong influence on the people in the organisation and dictate how they dress, act, and perform their jobs
Organisational Resilience	The ability to respond to programme demands or other changes (both foreseen and unforeseen). A resilient organisation is one that is able to respond effectively when faced with uncertainty or change
Resilient Organisation	The collective attributes of the licensee entity that enable it to sustain suitable and sufficient resources to meet its business objectives and drivers safely and effectively (taking into account potential foreseen and unforeseen changes and events)
Safety culture	The assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, nuclear safety issues receive the attention warranted by their significance
SQEP	Suitably qualified and experienced personnel