

Corporate Governance for Safety

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The Office for Nuclear Regulation (ONR) periodically undertakes assessments of licensees' corporate governance for safety. These assessments examine purpose and leadership, board composition, director responsibilities, opportunity and risk, remuneration, and stakeholder relationships and engagement. Where an ONR inspector finds shortfalls in meeting legal requirements, the inspector may take enforcement action, however, inspectors often adopt an enabling approach, providing advice and guidance to influence improvements in board effectiveness and corporate governance arrangements, as they relate to nuclear safety. This paper provides insights into corporate governance for safety good practices, drawing upon both the author's experiences of the corporate governance practices he has encountered throughout his career (both as a practitioner and as a regulator), and those outlined in ONR's corporate governance for safety guidance. This paper may interest board members, aspiring members, senior leaders, legal counsels, company secretaries, safety professionals, auditors, and regulators.

Introduction

ONR is the UK's independent nuclear regulator, with the legal authority to regulate nuclear safety, civil nuclear security and safeguards, and conventional health and safety at the 35 licensed nuclear sites in Great Britain (GB). This includes the existing fleet of operating reactors, fuel cycle facilities, waste management, and decommissioning sites, as well as other licensed and, in part, authorised defence sites, together with the regulation of the design and construction of new nuclear facilities. ONR also regulates the transport of civil nuclear and radioactive materials by road, rail, and inland waterways (ONR, 2024a).

Under provisions set out in the Nuclear Installations Act 1965, ONR can only grant a nuclear site licence to a body corporate, known within the nuclear industry as a 'licensee'. Each licensee has a board of directors who collectively are accountable for ensuring that the licensee establishes, implements, and maintains nuclear safety standards. Boards of directors discharge their accountabilities through a framework of corporate governance. But what is corporate governance and how does it relate to safety?

The Financial Reporting Council (FRC) defines corporate governance as the system by which boards of directors direct and control their companies (FRC, 2018a). Corporate governance has a key role to play in ensuring safe nuclear outcomes. For example, well-structured corporate governance arrangements can provide checks and balances in the operations of a company that help ensure that workers at all levels give adequate attention to safety. Evidence that such arrangements are in place provides confidence in 'defence in depth' at the corporate level commensurate with the scale of the nuclear hazard (ONR, 2023).

Unfortunately, investigations into incidents and accidents in the UK and overseas have indicated that other matters may divert experienced and otherwise competent directors from giving adequate attention to the most significant hazards and the risks that they pose to the business (ONR, 2023). It is therefore important that ONR gains confidence that licensee boards provide effective governance of safety, demonstrate the necessary level of competence to understand the safety risks the company is managing, and devote an adequate amount of time to safety matters. ONR gains such confidence by having a team of specialist inspectors who undertake assessments of licensees' corporate governance for safety. Where an inspector finds shortfalls in meeting legal requirements, the inspector may take enforcement action (ONR, 2024b). More often, the inspector adopts an enabling approach, providing advice and guidance to influence improvements in board effectiveness and corporate governance arrangements, as they relate to nuclear safety.

ONR has published guidance to aid its inspectors in making regulatory judgements as to the adequacy of a licensee's corporate governance for safety (ONR, 2023). ONR has structured its guidance to reflect the structure of The Wates Corporate Governance Principles for Large Private Companies (figure 1) published by the FRC, however this is not an endorsement of that guide over any other. ONR acknowledges that other corporate governance guides also exist, such as the UK Corporate Governance Code, and it is for each licensee to determine which code they choose to adopt.

In 2023, ONR commissioned research which concluded that there are gaps in research and literature on corporate governance and its relationship with safety performance; for example, research has not yet established how good corporate governance leads to good safety performance. The research did, however, conclude that poor corporate governance appears to contribute to poor safety performance (HSE, 2023). Notwithstanding this, in the author's opinion good corporate governance has a key role in securing good safety outcomes.

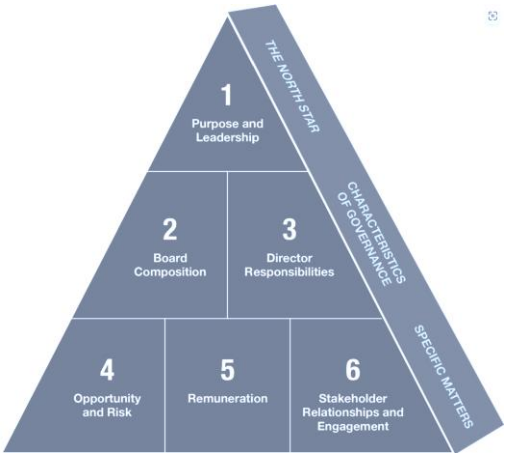

Figure 1. The six Wates Principles shown as a pyramid. © Financial Reporting Council Ltd (FRC). Adapted and reproduced with the kind permission of the Financial Reporting Council. All rights reserved.

In his paper the author aims to address some of the gaps in the literature by providing insights into corporate governance for safety good practices, drawing upon both his experiences of the corporate governance practices that he has encountered throughout his career (both as a practitioner and as a regulator) and those outlined in ONR's corporate governance for safety guidance.

The author has structured the remainder of this paper upon the six Wates Principles and will explore each, as they relate to safety.

Purpose and Leadership

"An effective board develops and promotes the purpose of a company, and ensures that its values, strategy and culture align with that purpose." (FRC, 2018b, p.11).

Setting Direction and Encouraging the Desired Behaviours

Boards of directors must consider nuclear safety when setting direction. Boards of directors should also ensure that they give safety prominence in their company's purpose, values, and strategy, as the hazard and risk profile of the company calls for. Having a well-developed purpose helps companies articulate their business model, strategy, operating practices, and approach to risk (ONR, 2023). It can also help the board of directors to communicate to the workforce and other stakeholders the importance that it places upon safety.

In recent years, stakeholders have criticised Boeing's board of directors for neglecting its safety oversight duties (Sucher & Gupta, 2021). An analysis conducted by this paper's author of the frequency with which the term 'safety' appears in Boeing's annual reports before and after the tragic losses of two of its 737 Max flights in October 2018 and March 2019 may offer an insight into how safety featured in the minds of Boeing's most senior leaders. For example, before the tragic losses in late 2018 and early 2019, the term 'safety' appeared between five and ten times in each year's report (figure 2), whereas following the tragic losses, the term 'safety' features much more prominently, peaking at 82 mentions in the 2019 annual report – the first published following the tragic losses. Notably, Boeing dedicated the first 12 pages of the 2019 annual report to safety. With the benefit of hindsight, this simple but insightful analysis illustrates that safety did not feature as prominently as perhaps it should have in Boeing's 'corporate narrative' in the years preceding the loss of its two 737 Max flights.

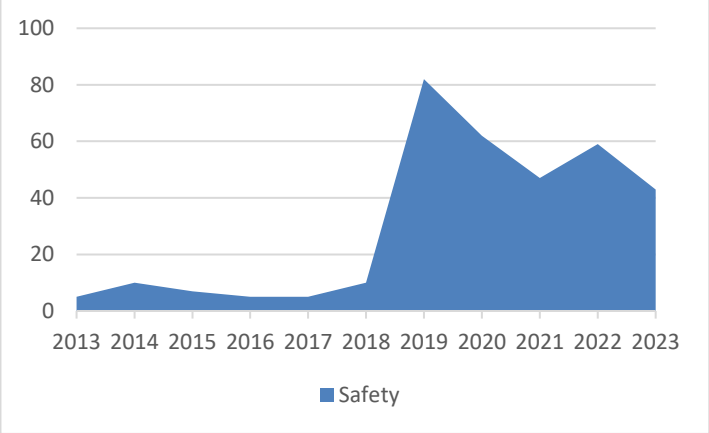

Figure 2. Frequency of the term 'safety' in Boeing's annual reports

It is also interesting to see how Boeing's espoused purpose has changed since losing its two 737 Max flights (figure 3). In 2018, Boeing's purpose statement omitted safety (Boeing, 2018), while Boeing's current purpose statement refers to *"safety and sustainability"* and *"an unwavering commitment to transparency in all that we do"* (Boeing, 2024a). Since the losses of its two 737 Max flights, safety now features prominently in Boeing's purpose statement and the wider 'corporate narrative', and at a level that the hazard and risk profile of the company calls for. What we can learn from this example is that purpose, strategy and the wider 'corporate narrative' can provide insights into what a board of directors truly values and the culture of the company.

Boeing's Purpose Statement 2018

"Our purpose and mission is to connect, protect, explore, and inspire the world through aerospace innovation. We aspire to be the best in aerospace and an enduring global industrial champion." (Boeing, 2018)

Boeing's Purpose Statement 2024

"Boeing's mission is to protect, connect and explore our world and beyond. Every day, we are dedicated to carrying out our mission – safely and sustainably. With revitalized spirit and an unwavering commitment to transparency in all we do, we are transforming to be a better, stronger Boeing, propelled by the spirit of innovation that has been our hallmark for more than a century." (Boeing, 2024a)

Figure 3. A comparison of Boeing's purpose statements

A board of directors should also ensure that values and culture are aligned with the company's purpose and support the delivery of its strategy. Boards normally approach this by establishing a set of corporate values, often documented in a values statement, which articulates the principles that the board believes will shape the behaviours that it wishes to see in the workforce. Whilst these values may reflect what the board values and its vision for company culture, these espoused values may not reflect what the workforce truly values. It is therefore incumbent upon directors to lead by example and promote the desired culture, ensuring that the espoused values over time become ingrained into the company culture,

eventually becoming the lived values that the workforce embraces. Indeed, the guidance to the UK Corporate Governance Code notes that: *"The chief executive has primary responsibility for setting an example to the company's workforce and for communicating to them the expectations in respect of the company's culture"* (FRC, 2024, para. 72). Boards should give safety prominence in a company's values statement, as the hazard and risk profile of the company calls for.

Monitoring the Culture

Once a board of directors has set the direction and made efforts to align the values and culture to the purpose and strategy, it should assess and monitor the culture. Boards may choose to do this by commissioning self and independent assessments of the organisational culture, or they may commission more targeted assessments focused on safety culture. Boards may also find the results of employee engagement surveys to offer useful insights into the attitudes and beliefs of the workforce. Besides these formal assessments, the most important method that a board can use for monitoring the culture is to have its members go onto the site and speak with the workforce themselves without management being present. This is most effective when a director goes out alone, meets with workers on a one-to-one basis (or with a small group of workers) at their place of work, dedicates time to building rapport with the workers, and actively listens to hear perspectives on working life first-hand. This activity suits the days preceding a board meeting, as directors can discuss their findings with their fellow directors at the main board meeting or one of its sub-committees.

Arrangements for Raising Safety Concerns

A company must have arrangements to enable the workforce to raise concerns in confidence, and if they wish, anonymously (FRC, 2018a), and the board should take the lead in establishing these (FRC, 2018b; ONR 2023). Of course, arrangements for raising concerns are only effective if the workforce feels safe to raise concerns without fear of personal consequence and is confident that leaders will act upon any concerns raised: these are both fundamental components necessary to achieve a strong safety culture within Great Britain's nuclear industry (Siegl et al., 2023). It is, therefore, incumbent upon directors to assure themselves that the arrangements for reporting concerns, which will naturally encompass safety concerns, are adequate and effective. Directors should consider what action they can take to evaluate whether the workforce feels safe to report concerns and has confidence that leaders will act upon any concerns raised. Directors can approach this by going out onto the site and seeking the views of the workforce on the efficacy of the arrangements for raising concerns. Directors should consider this activity part of their wider responsibility to monitor the culture.

Board Composition

"Effective board composition requires an effective chair and a balance of skills, backgrounds, experience, and knowledge, with individual directors having sufficient capacity to make a valuable contribution. The size of a board should be guided by the scale and complexity of the company." (FRC, 2018b, p.13).

Skills, Knowledge, and Composition of the Board

At the point at which ONR issues a nuclear site licence, ONR expects the board of the applicant company: (1) to comprise an appropriate mix of suitably qualified and experienced executive and non-executive directors who will act in the interests of the licensee company; and (2) not to be dominated by representatives of the parent company or joint venture shareholders (ONR, 2021). The UK Corporate Governance Code goes further and includes a provision that at least half the board, excluding the chair, should be non-executive directors whom the board considers to be independent (FRC, 2018a). Whilst listed companies are the intended users of the UK Corporate Governance Code, several (non-listed) licensee companies have embraced its provisions. Indeed, UK Government Investments (UKGI) which acts as a shareholder representative for, and leads the establishment of, the UK government's most complex and commercial arm's length bodies (ALBs) on behalf of sponsor departments encourages its ALBs, several of which are licensees covering a large portion of GB's nuclear industry, to follow the UK Corporate Governance Code (UKGI, 2022).

Typically, boards comprise an independent chair, two executive directors (a chief executive officer and a finance director) and several non-executive directors. Occasionally, ONR will encounter boards with a third executive director: often a chief operations officer or equivalent. ONR is also aware of a few licensee companies which have complex ownership models and whose boards do not reflect these traditional approaches. ONR does not prescribe how a board should compose itself. However, ONR considers the UK Corporate Governance Code to represent good practice and encourages licensee companies to adopt the principles set out in the Code, particularly regarding board composition. Notwithstanding this, ONR expects (ONR, 2023) that licensee boards shall:

1. Retain an appropriate combination of skills, backgrounds, experience, and knowledge that promotes accountability and incorporates objective thought, which provides a constructive challenge to achieve effective decision-making.
2. Collectively demonstrate a high level of understanding relevant to the company's business needs and stakeholder interest.
3. Have a size and structure appropriate to meet the strategic needs and challenges of the company and enable effective decision-making.
4. Appoint independent non-executive directors to offer constructive challenges.

ONR recognises the value that expertise from other industries brings and encourages diversity of thinking amongst board members. However, in the author's opinion, other industry expertise should always complement nuclear-qualified/experienced board members and not be a substitute for them. With Boeing, where stakeholders had criticised its board for neglecting their oversight duties as they relate to safety (Sucher & Gupta, 2021), Sir Tim Clark, the President of Emirates, one of Boeing's largest clients, said the crisis-stricken US aircraft maker should ensure its new chief executive

has engineering experience to restore safety standards: *"To fix Boeing's issues the company needs a strong engineering lead as its head coupled to a governance model which prioritises safety and quality"* (Financial Times, 2024). On 31 July 2024, Boeing's board of directors announced they had appointed Kelly Ortberg as Boeing's new President and CEO, effective 08 August 2024 (Boeing, 2024b). Ortberg is a respected aerospace veteran with a degree in mechanical engineering, and this is: *"…notable in part because his predecessor, an accountant, has been accused of being hyper-focused on profit and out of touch with Boeing's core engineering culture"* (CNN, 2024).

ONR expects licensees to put in place comprehensive induction programmes for new board members so that they can gain sufficient knowledge of the site's context, complexity, and hazard and risk profiles, to enable them to make informed decisions.

Quality of the Board Discussions and Deliberations

At board meetings, the chair should promote open debate, facilitate constructive discussion, and ensure all directors have appropriate timely information for such discourse (FRC, 2018b; ONR, 2018b). When observing board meetings or their subcommittees, ONR's inspectors will look to establish how the discussion unfolds and how decision-making is independently challenged. In their book *Disaster in the Boardroom: Six Dysfunctions Everyone Should Understand*, Gerry Brown and Randall S. Peterson list six boardroom dysfunctions present to an extent in every company (Brown and Peterson, 2022):

1. Distended Boards – *Cultural Amplification*. Culture intensifies, becoming exaggerated and dysfunctional or misdirected.
2. Conforming Boards – *Groupthink*. Identity threat causes directors to go along with others and not raise legitimate concerns.
3. Bureaucratic Boards – *Rule-Bound Culture*. Extreme focus on rules and processes results in the board ignoring or sidelining content or ideas.
4. Bystander Boards – *Diffusion of Responsibility*. Key players point to everyone else regarding problems; no one takes responsibility.
5. Imbalanced Boards – *Missing Key Voices*. Lack of diversity of background, specific required knowledge, etc., affect board decisions and actions.
6. Subordinated Boards – *Lack of Independence from Management*. Independent directors are not, in fact, independent from the executive.

Inspectors look out for these six cultural warning signs when undertaking assessments of licensees' corporate governance for safety.

Managing Changes to Board Composition

The Nuclear Installations Act requires ONR to attach conditions to the nuclear site licenses it issues to body corporates (the 'licensee'). When a person contravenes a licence condition, the licensee and the person who committed the contravention are guilty of an offence, as set out in section 4(10) of the Act (Nuclear Installations Act, 1965). One of these licence conditions, Licence Condition 36, requires the licensee to make and implement adequate arrangements to control any change to its organisational structure or resources, which may affect safety (ONR, 2017). ONR's guidance to its inspectors' notes that: *"This applies to changes at all levels in the organisation including the very top of the organisation (i.e., the Board or Executive team), where changes in the composition and knowledge of either of these teams can have a potentially significant influence over nuclear safety."* (ONR, 2024c). ONR therefore expects changes to board composition to be subject to the licensee's management of change arrangements.

A board will normally establish a nominations committee to manage changes to its composition and ONR has found that these committees often develop their own arrangements for managing such changes. Notwithstanding this, ONR expects a nominations committee's arrangements for controlling changes to the board to be broadly consistent with the principles set out in ONR's organisational change guidance and the licensee's management of change arrangements. This ensures that the licensee fully considers the nuclear safety implications of a proposed change, and both recognises and suitably controls the risks arising from inadequate assessment and implementation of the change (ONR, 2024c).

Director Responsibilities

"The board and individual directors should have a clear understanding of their accountability and responsibilities. The board's policies and procedures should support effective decision-making and independent challenge." (FRC, 2018b, p.15).

Governance Arrangements and Committee Structures

An effective board sets out policies and practices that govern the internal affairs of the company, including matters relating to the authority, accountability, role and conduct of directors. These policies and practices should establish clear lines of accountability so that the board and individual directors understand their accountabilities and responsibilities, supporting effective decision-making (FRC, 2018b; ONR, 2023). The author notes that one good practice that he has come across is a comprehensive corporate governance manual which articulates how the licensee's corporate governance arrangements work in practice. This manual explains how the licensee's management system interfaces with various formal governance documents, such as the Articles of Association and the Scheme of Delegations and provides a comprehensive overview of the board subcommittees and how these interact with executive committees. Having such a document demystifies the topic

of corporate governance; it also enables a licensee to demonstrate to stakeholders, including its regulators, that it understands corporate governance and its role in securing safe nuclear operations.

Most boards establish one or more subcommittees to enable the effective conduct of the board's business. These typically include an audit and risk committee, a remunerations committee, and a nominations committee. Given the significance of the nuclear hazard, most licensee boards form a subcommittee that considers safety, often alongside the environment and security. The author has found that such a committee is most effective when its membership consists of only independent non-executive directors, one of whom will chair the meetings. These safety subcommittees enable boards to conduct a much deeper focus on safety matters than may be possible during a main board meeting.

Managing External Factors that Have the Potential to Impact Nuclear Safety

Where another corporate body owns a licensee company, whether as a subsidiary of a group parent or as a shareholder in a joint venture company, ONR expects the parent company to adopt a strategic role. For example, oversight of business planning and monitoring the performance of its subsidiary. At the point that ONR grants a site licensee, ONR expects the licence applicant to demonstrate that this relationship will not be detrimental to safety or affect the licensee's legal responsibilities. Post-licensing, ONR expects the parent company to continue to recognise and support the case made to it by its subsidiary for acquiring the site licence (ONR, 2017). ONR has outlined its expectations of parent companies in its publication, *Licencing Nuclear Installations* (ONR, 2017), which include:

1. The parent company should not usurp the licensee's authority over the day-to-day operation of the prescribed installations.
2. The licensee must have the authority to operate in a way that maintains safety - for example, it must have the autonomy to shut down, stop operations or take any other actions necessary to ensure safety without recourse to the parent company.
3. The strategic control of funding and other resources controlled by a parent company should not impede a licensee's access to adequate resources to meet its safety obligations, including decommissioning.
4. Representatives of the parent company or joint venture shareholders should not dominate the board of the licensee company.
5. The parent company should not be able to divert or dilute the technical skills and experience available to and needed by the licensee to maintain safety without putting agreed alternatives in place.

Group-wide decisions made by a parent company, without adequate consultation with the licensee, could have nuclear safety implications. This may be because the parent company does not understand the nuclear context or regulatory environment in which the licensee operates. The risk of this occurring may be greater in licensees whose parent companies have diverse non-nuclear portfolios, particularly those where the licensee may be the only nuclear business in the parent company's portfolio. Where ONR inspectors see evidence of parent company decisions adversely impacting nuclear safety, they will first bring this to the licensee's attention; they may also consider engaging with the parent company if they believe this to be appropriate. Fortunately, this is a rare occurrence: the parent company/licensee relationship is often beneficial to safety.

Quality of Information to Enable Informed Board Decision-Making

Boards should establish formal and robust internal processes to ensure systems and controls are operating effectively, and that the quality and integrity of information provided to it is reliable, enabling directors to monitor and challenge the performance of the company, and make informed decisions (FRC, 2018b; ONR, 2023). A board may rely on information sources which include key performance indicators, workforce data, and stakeholder engagement feedback (ONR, 2023).

All boards monitor lagging safety performance indicators (SPIs) such as the Occupational Safety and Health Administration's (OSHA) Total Recordable Incident Rate (TRIR), the number of RIDDOR[1] occurrences in each period, % of maintenance not conducted on time, or the number of failures of safety systems. Whilst lagging measures have their uses, they only provide information on past performance: they do not predict future performance. As such, a framework of SPIs, which comprises only lagging measures, is unlikely to offer sufficient insights into safety performance. Some boards have recognised the limitations of solely monitoring lagging measures and have addressed this by developing a suite of leading measures to sit alongside the lagging measures.

In the author's opinion, boards of directors should give careful thought to what are the most important leading SPIs. The risk register and the safety cases are the obvious starting point for such discussions. Well-thought-out leading SPIs can be predictive of future performance and where such leading indicators relate to the efficacy of the most critical protective systems associated with the greatest hazards, the board and others in the organisation can use these indicators to identify early warning signs of danger, enabling them to take preventative action. Boards may also ask executive management to develop leading SPIs for areas where they want to see improvement; boards can then monitor these until they satisfy themselves that the responsible person(s) has made the required improvements – an effective means for a board to hold executive management to account. Using leading indicators alongside lagging indicators provides for a more complete picture of a company's nuclear safety performance.

The author has also found that on occasions boards of directors can be presented with an overly simplified view of safety performance, by assigning a red-amber-green (RAG) status to broad categories such as 'conventional safety' or 'nuclear safety.' In the author's opinion, using RAG statuses for broad categories is only effective if board members can drill down

[1] The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013.

to understand why executive management has assigned a broad category a particular colour. For example, some boards have access to business intelligence dashboards or a printed booklet of trended data to view subordinate SPIs which enables them to gain insights into the factors driving the overall performance. Whilst board members need to maintain a strategic overview of safety performance, executive management should provide them with sufficient detail to enable them to challenge performance and make informed decisions.

Both GB's nuclear industry and the UK's Health and Safety Executive have published extensive guidance on the development and use of SPIs (Safety Director's Forum, 2016; Health and Safety Executive, 2006). Boards should ensure that executive management has considered these guides when establishing the framework of SPIs used throughout the organisation, as ultimately it will be a subset of these SPIs that the board will monitor.

Of course, executive management provides boards with more information than just SPIs to enable them to make informed decisions. Board papers and supporting information should be accurate, clear, comprehensive, and up to date. They should contain a summary of the content of the paper and articulate what they require from the board members. For example, is it a decision paper, or is it for information? Board members should also receive papers in ample time (ONR, 2023).

Opportunity and Risk

"A board should promote the long-term sustainable success of the company by identifying opportunities to create and preserve value and establishing oversight for the identification and mitigation of risks." (FRC, 2018b, p.17).

Risk Appetite and Principal Risks

The Institute of Risk Management (IRM) defines risk appetite as: *"…the amount and type of risk that an organisation is willing to take to meet their strategic objectives"* (IRM, 2024). Companies will have different risk appetites depending on their sector, purpose, vision, and culture, and these appetites may also change. ONR's inspectors will examine a licensee's risk appetite statement to judge whether the licensee has set the risk appetite for safety risks appropriately. For example, ONR would expect to see a licensee being *averse* to any failure to reduce the risk of harm from ionising radiation to the public or employees to a level as low as reasonably practicable. We may, however, expect some licensees, particularly those undertaking decommissioning activities, to be *open* to short-term risk increases to secure overall hazard and risk reduction. Indeed, in this latter case, a more conservative risk appetite may cause a licensee to either not undertake or delay decommissioning, leaving future generations to deal with much greater risks resulting from deteriorating and degrading legacy facilities. ONR would also expect to see a licensee being *averse* to risks with a high conventional safety impact, because of the potential for injury or loss of life.

It is important that a licensee establishes a risk appetite that supports both near-term and long-term safety outcomes, and that once established, all board members, executive management and employees make decisions that reflect it. ONR's inspectors will seek to understand how a board communicates its risk appetite to ensure that all persons working for the company are aware of it and can therefore consider it when making decisions which may affect safety outcomes.

A principal risk is a risk or combination of risks that can seriously affect the performance, prospects, or reputation of a company (ONR, 2023). Because of the inherent nature of the hazards associated with nuclear technology, it is likely that for some licensees, nuclear safety risks will be principal risks. ONR will seek to confirm that licensees include risks arising from nuclear technology in their opportunity and risk frameworks and are managing them accordingly.

The board should establish an internal control framework with clearly defined roles and responsibilities for those involved. This may include developing risk management systems, determining principal risks, agreeing on how the monitoring and management of principal risks should occur, agreeing over what timeframe the likelihood of the incidence or magnitude of the impact of principal risks should be reduced, establishing clear internal and external communication lines on the identification of risk factors, and agreeing a monitoring and review process. The board should also establish expectations for risk reporting, risk decision-making, and escalating concerns (ONR, 2023).

Consideration of Safety Risk in Decision-Making

ONR expects boards of directors to consider safety during their decision-making and to keep safety at the forefront of their oversight (ONR, 2023). They should give safety a high priority and this should be evident in all their decision-making. Boards of directors should ensure that they have collected and considered all relevant data and opinions, respecting and encouraging the contribution of those with divergent views. They should not delay safety decisions unnecessarily (ONR, 2020).

Boards should recognise and resolve conflicts between safety and other business goals. Their decisions affecting safety should also cater to the potential for error, uncertainty, and the unexpected. Those taken in the face of uncertainty or the unexpected should be appropriately and demonstrably conservative. Besides risk appetite, boards of directors should consider the following factors when making decisions which may affect safety (ONR, 2020):

- The quality and sufficiency of the information.
- The significance of uncertainties.
- The questioning of assumptions.
- Exploration of all relevant scenarios that may threaten safety.
- The range of options to minimise risk in the short and long term.
- The criteria and standards that they should apply.

Maintaining Oversight of, and Challenging, Safety Performance

A key role of a board of directors is to maintain oversight of, and challenge, safety performance. Boards do this through their frameworks of governance. For example, by considering significant safety matters at main board meetings and forming board subcommittees to consider a broader range of safety matters in more depth.

In the author's opinion, one of the most effective ways a board member can maintain oversight of safety performance is by going out onto the site/plant and looking for themselves. This is pertinent to those nuclear assets which may give rise to a principal risk and is well-suited to the day(s) immediately preceding a main board meeting (or a meeting of a board subcommittee). If the board has access to SPIs related to the efficacy of the most critical protective systems associated with the greatest hazards, board members can go onto the site/plant and test that the information presented in an SPI reflects the actual operational status. This way, the board members can gain assurance that the SPI information is accurate, and they can develop a greater understanding of the nuclear operations. Board members may also wish to visit the locations of significant near misses and accidents, to check that management has adequately implemented preventative or corrective actions and that these are delivering the expected safety benefits. In undertaking such activities, a board member will naturally interact with several people out on the site/plant; this will enable them to get a sense of the culture, values, attitudes, and behaviours in the areas they visit.

Remuneration

"A board should promote executive remuneration structures aligned to the long-term sustainable success of a company, taking into account pay and conditions elsewhere in the company." (FRC, 2018b, p.19).

Effects of Remuneration Structures on Behaviour and Decision-Making

A wide variety of factors interacting in complex ways influence human behaviour (Schmidt, 2005) and this includes financial incentives (Baddeley, 2017). Boards of directors recognise this, so they implement remuneration structures with targets to incentivise executive management to achieve business goals. In recent years behavioural economics has emerged as a science exploring the relationship between economic incentives and behaviour (The University of Chicago, 2024), and in 2009 the HSE commissioned research to explore the role that behavioural economics may have in improving workplace safety outcomes (HSE, 2009). Notwithstanding this, the relationship between financial incentives, behaviour and safety outcomes remains a complex area, and in the author's opinion both the nuclear industry and its regulator, ONR, would benefit from further research which could underpin industry-specific guidance on this topic.

When boards of directors set executive remuneration structures, they will invariably need to balance outcomes, such as programme delivery, with the achievement of safe conditions. Boards of directors can find it challenging to achieve the right balance and even when they have set a reasonable remuneration framework, unintended consequences can materialise. On occasions, the author has found that boards of directors have set targets to reduce the OSHA TRIR or the number of RIDDOR-reportable events. Whilst well-intentioned, targets of this nature can lead to employees or contractors under-reporting events or intentionally miscategorising them. The author has found targets related to RIDDOR-reportable events to be problematic, leading to poor behaviours such as managers having protracted discussions about whether an incident should be reportable under RIDDOR when it is self-evident that it meets the reporting criteria, creative interpretations of 'work-relatedness' to avoid reporting, and encouraging injured employees to return to work to undertake their normal work duties to ensure reporting thresholds are not met. The author recommends that boards avoid linking such metrics to executive remuneration.

Setting targets can divert attention away from other business goals; similarly setting a safety target can divert attention away from other safety goals. For example, if a board of directors sets a target to reduce the OSHA TRIR, but sets no other safety-related targets, then this will incentivise management to drive down the OSHA TRIR, but they may not put the same energy into improving aspects of safety such as process/nuclear safety. The Baker Panel levied this criticism at BP in its report into the events which led to the 2005 Texas City Refinery explosion, noting that whilst performance contracts and variable pay programmes in BP's US refineries included metrics for personal safety, they did not contain metrics that would act as a significant and positive incentive for ensuring process safety performance (Baker et al., 2007).

Before setting targets and linking them to remuneration, boards of directors should carefully consider the many ways in which targets may influence behaviour. The author recommends that boards of directors adopt a structured approach to such consideration and seek support from an occupational psychologist or a behavioural economist.

Stakeholder Relationships and Engagement

"Directors should foster effective stakeholder relationships aligned to the company's purpose. The board is responsible for overseeing meaningful engagement with stakeholders, including the workforce, and having regard to their views when taking decisions." (FRC, 2018b, p.21).

The Board's Relationship with ONR

An ONR inspector's assessment of a board's corporate governance of safety is an opportune time for both parties to take stock and consider the nature of their relationship. Whilst ONR's inspectors will interact routinely with the licensee's senior leaders, management, and workers, interactions with non-executive board members may not happen outside corporate governance assessments. Both parties should consider what opportunities exist to have more frequent and meaningful engagement on nuclear safety matters. For example, non-executive directors may benefit from hearing ONR's perspectives on the safety performance of the company directly from ONR, and they may wish to invite ONR to a main board meeting or a board subcommittee meeting. At such a meeting, ONR could, for example, present its rationale for the dutyholder attention level assigned to the site, allowing both parties to engage in a meaningful debate. This enhances corporate governance by enabling a board of directors to hear the views of a regulator directly, with no filtering of the messages, which can sometimes occur as information passes through an organisation to its board of directors.

The Board's Engagement with its Local Community

Boards should ensure that there are channels to receive feedback from discussions with stakeholders (FRC, 2018b; ONR, 2023) including local communities. Each major licensed nuclear site has a local liaison committee (LLC) or site stakeholder group (SSG), run by the licensee, that is attended by local authorities, trade unions, interested local groups and members of the public (ONR, 2024d), and in the author's opinion one of the most effective ways that a board of directors can receive feedback from their local community, is by board members periodically attending these LLCs/SSGs to receive the feedback directly.

Each board member is, by their appointment, a nuclear leader, and as such has a key role to play in improving public understanding of nuclear risks and developing public trust in nuclear technology. Attendance at LLCs/SSGs can give board members the opportunity and platform to do this.

The Board's Engagement with its Workforce

Boards of directors oversee meaningful engagement with the workforce and should consider their views when making decisions. Such dialogue helps boards understand the effects of company policies and practices, predict future developments and trends, and re-align strategy (FRC, 2018b; ONR, 2023). Whilst ONR does not prescribe how boards of directors should oversee meaningful engagement with the workforce, the UK Corporate Governance Code, which applies to listed companies, expects boards of directors to adopt one, or a combination, of the following methods: a director who has been appointed from the workforce; a formal workforce advisory panel; or a designated non-executive director.

The author has found that an effective way for board members to engage with the workforce is by having two or three non-executive directors meet with a group of workers to hear their ideas and concerns directly. This is well-suited to the day(s) immediately preceding a main board meeting (or a meeting of a board subcommittee) and can serve several purposes:

1. It enables board members to have direct meaningful engagement with workers.
2. It enables board members to understand the effect of company policies and practices on the workforce.
3. It provides board members with insights which may inform the decisions they make at the board meeting.
4. It provides board members with insights which may help them predict future developments and trends, and to re-align strategy.
5. It enables board members to explore the culture, values, attitudes, and behaviours in the workplace.
6. It may enable board members to uncover a significant concern that would otherwise have gone unreported.

Concluding remarks

Research commissioned by ONR concluded that poor corporate governance appears to contribute to poor safety performance (HSE, 2023) and in the author's opinion the reverse is also true: good corporate governance has a key role to play in securing good safety outcomes – and in all major hazard sectors, not just nuclear. The author hopes that Hazards 34 attendees find the insights outlined in this paper useful when seeking to improve their corporate governance practices, as they relate to safety, regardless of which major hazards sector they work in. Interested parties wanting to learn more about how ONR conducts its regulatory oversight of corporate governance for safety should direct their enquiries to contact@onr.gov.uk.

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