

Summary Report: Improving Safety Culture During the Construction Phase of Nuclear New Build Projects

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Acronyms

Acronym / Abbreviation	Definition
CDM	Construction (Design and Management) Regulations
GB	Great Britain
IAEA	International Atomic Energy Agency
INPO	Institute of Nuclear Power Operators
NNB	Nuclear New Build
ONR	Office for Nuclear Regulation
UK	United Kingdom

1. Introduction

The United Kingdom's (UK) nuclear industry is in a period of growth with several nuclear new build (NNB) projects either underway or in the pipeline. These projects, along with other nuclear sector commitments, require large workforces and in relatively short timeframes. In the context of Hinkley Point C alone, there have been approximately 18,000 people working directly on the project and with 12,000 workers based on site, it is at present the largest construction site in Europe (Media Team, 2025). In addition to the scale of the workforce, high contractorisation, means that a significant number of workers will be employed across different organisations and many of whom having travelled from various countries around the world. As a result, different organisational and national cultures are required to work together which could pose potential challenges due to the presence of different languages and communication styles.

Therefore, traditional approaches to founding a safety culture, like those adopted throughout much of Great Britain's (GB) established nuclear industry, may not be appropriate or feasible for nuclear new build (NNB) sites for the reasons outlined above. However, the risks because of poor safety culture are high for onsite workers in terms of industrial accidents and for nuclear safety in terms of poor-quality standards.

As a result, the Office for Nuclear Regulation (ONR) has requested a scoping study to consider the following questions:

1. What has already been done and works effectively in relation to building a strong safety culture for NNBS, mega construction projects, or other comparable domains?
2. What are the gaps or challenges in developing a strong, homogeneous safety culture for NNBS in GB?
3. What actions could be recommended to enhance safety culture, safety performance and quality for NNBS in GB?

2. Methodology

2.1 Literature Review

A literature review was conducted to identify common factors in safety culture from NNBS and similar mega-projects from the construction industry. An initial broad search was conducted using PubMed, Scopus, Web of Science, Google Scholar and the Health and Safety Executive and Major Projects Association websites, to identify available literature and case studies. The literature search was limited to articles and reports published in English and were included in the review if they examined the relationship between any of the following: safety culture, safety performance, human factors, large scale construction projects, cross-cultural dynamics and nuclear power plants.

2.2 Interviews and Focus Groups

Semi-structured interviews were carried out with a purposive sample of 16 individuals working across a range of roles and organisations within the nuclear and construction industries. Roles included Nuclear and Safety Inspectors, Senior Construction Managers, Nuclear Safety Culture Specialists and a Human Factors Engineer. Interviews took place remotely via MS Teams and lasted approximately one hour. Interviews were recorded with the permission of the interviewee for further analysis whilst another researcher simultaneously made written notes of the key themes from the conversation.

Four focus groups were carried out in-person with 40 participants based at an NNB construction site. A wide variety of roles and individuals were selected to ensure views and experiences were captured across different levels and specialisms of the project. Each focus group lasted approximately one hour and fifteen minutes. Written notes were taken to capture key quotes and summarise experiences and

views relevant to the studies aims. Data collected from the interviews and focus groups were assessed using content analysis, a method which aims to identify themes from patterns of words and phrases. The identified themes are as follows:

- Managing Organisational Pressures
- Community and Ethos
- Learning Culture
- Leadership
- Understanding Nuclear Safety Culture During an NNBs Construction Phase

A summary of the results from the literature review, interviews and focus groups are discussed in section 3 below.

3. Discussion and Recommendations

This scoping review has identified several important factors for NNBs to consider during their construction phase. Findings suggest that the results from the interviews and focus groups support existing literature on safety culture, whilst also having identified potential challenges and areas requiring further consideration. The results from this study therefore aim to fulfil the following questions:

1. What has already been done and works effectively in relation to building a strong safety culture for NNBs, mega construction projects, or other comparable domains?
2. What are the gaps or challenges in developing a strong, homogeneous safety culture for NNBs in GB?
3. What actions could be recommended to enhance safety culture, safety performance and quality for NNBs in GB?

Both the literature review and qualitative research conducted within this study are discussed across the subsections below, with the aim of understanding how safety culture during the construction phase of NNB projects can be strengthened.

3.1 What has already been done and works effectively in relation to building a strong safety culture for NNBs, mega construction projects, or other comparable domains?

It is important to note, that many of the themes and sub themes identified through this study are already embedded into the comprehensive suite of documents on nuclear safety culture (International Atomic Energy Agency (IAEA), 2012; Institute of Nuclear Power Operators (INPO), 2010; The Royal Academy of Engineering, 2012). For instance, the INPO Report Principles for Excellence in Nuclear Project Construction (2010) identified 9 principles of excellence, most of which were also identified in the qualitative research results. For example, the principle '*Strong first-line supervision is key to success*' was identified in the theme 'Leadership', in which participants described leaders as "*worth their weight in gold*". Additionally, that '*Personnel are qualified for their jobs*' was discussed as integral to the project's success within the results sub-theme 'Capability and Competence'. Recommendations on these findings are also seen included within the Nuclear Construction Lessons Learned report by the Royal Academy of Engineering (2012). This observation therefore highlights that there is a great deal of effective and valuable guidance documentation at the disposal of NNB projects already at present. The following bullet points highlight themes identified from the focus groups and interviews that are also corroborated in literature or demonstrated in the mega-construction case studies explored during this report.

- a) **Realistic Timescales and Budgets:** Ensuring that timescales and budgets are realistic and achievable, whilst not undermining safety, was a consistent finding reported by most

participants. Participants believed that accidents take place because of pressures such as schedule and cost, which have a negative effect on people's behaviour and performance. This is not a novel finding, '*ensuring schedules are realistic and understood*' is one of INPO's (2010) 9 principles for excellence. Additionally, this approach was also identified as a cornerstone for the safety cultures at the London 2012 Olympic Park and Thames Tideway Tunnel case studies. For instance, the 'Right Way' safety programme for the Thames Tideway project, was designed with a clear and simple message that safety and wellbeing is a fundamental ethical responsibility and therefore should take precedence over organisational pressures (e.g., schedule and cost). This finding therefore demonstrates that NNB projects must consider organisational goals (e.g. schedules and costs) alongside quality and safety experts, to ensure that safety remains the utmost priority of the project.

- b) **Getting Things Right at the Start:** A prevalent quote used amongst participants was the phrase '*getting things right at the start*'. Similarly, representatives from all organisations involved in the Thames Tideway Tunnel project agreed that adopting excellence in '*getting the basics right*' was central to achieving their safety culture vision. These results indicate the importance of planning activities in building a strong foundation for a successful safety culture. This can also be seen reflected in the recommendations and safety principles identified within the INPO (2010) and Nuclear Lessons Learned (2012) reports, as well as being embedded into Construction (Design and Management; 2015) regulations. Moreover, participants also detailed the need for issues identified during the design phase to be proactively managed or eliminated before being passed on as an important factor to be considered as part of '*getting things right from the start*'. As a result, this observation indicates that planning is a cornerstone to a strong safety culture in NNB projects in which for example, strategies can be put in place to control identified risks before progressing into subsequent project phases.
- c) **Collaboration and Engagement:** Collaboration and engagement is well recognised in literature to positively affect an employee's intention to engage in safe behaviours and therefore result in an increased safety performance (Berglund et al., 2023; Tang, 2025, Xia et al., 2020). Strong workforce engagement was also employed during the Thameslink programme through briefs and two-way interactions which led to active participation in safety conversations, close calls, lost time reporting, fair culture, good practices and safety stand downs. Similarly, engagement was also attributed to the strong safety cultures present during the London 2012 Olympic Park and Thames Tideway projects. This is further evidenced from the results of the interviews and focus groups, in which participants believed that building trust and relationships with colleagues was essential. Moreover, that without engagement and collaboration, teams within the organisation or between organisations (i.e., contractors) will consequently work in silos. This was believed to negatively impact safety behaviours on site, for example, non-compliance and/or behavioural inconsistencies between teams. Further, that working in silos can result in workers losing sight of the '*bigger picture*' that organisations are trying to achieve. NNB projects should therefore consider the collaboration and engagement of its workforce as crucial to achieving positive safety performance on an NNB site.
- d) **Championing Health, Safety and Wellbeing:** An organisations commitment to championing an employee's health, safety, and wellbeing, beyond the minimum legal requirements, has been recognised to positively affect safety performance and attitudes (Xia et al., 2020; Geoghegan, 2012). The London 2012 Olympic Park project is a notable example in that the Olympic Delivery Authority took account for the health of its employees, contractors, and subcontractors, by offering occupational health services to all workers on site. Participants from the interviews and focus groups discussed that current NNB projects in the UK are employing these practices by providing workers with access to healthcare (access to on-site nurses and GPs); other relevant factors discussed were access to transport and accommodation. Ensuring that the workforce felt respected and valued was a key part of this discussion, as well as the importance of creating

a sense of community for the workforce. Extending genuine care to an individuals' wellbeing and demonstrating respect for their communities can therefore be observed as a significant contributing factor to a strong safety culture of an NNB project; and should be considered in accordance with the project's safety and organisational objectives.

- e) **Accountability:** Accountability was a subtheme identified from the interviews and focus groups within this report as it was considered part of the 'golden thread', ensuring ownership and responsibility throughout the project. It was identified that without clear lines of accountability, processes can become overly complex, ultimately resulting in a negative impact upon safety culture. When exploring individual accountability in particular, participants felt that it was difficult to address and stop poor working behaviours under 'no blame' safety cultures. The Nuclear Construction Lessons Learned report by the Royal Academy of Engineering (2012) examined six nuclear construction projects and identified similar findings which lead to the following recommendation to be raised; 'An agreed industry-wide framework for industrial safety should be developed covering expectations, rules, rewards, and consequences to ensure consistent, predictable and first-class safety performance.' Empowering employees to take ownership of their own work and safety was also considered critical within literature (Tang, 2025). These findings demonstrate that projects should encourage task ownership as well as 'blame free' reporting of genuine mistakes to ensure overall systemic improvement however, processes should also ensure that individuals are held accountable for reckless or poor working behaviours.
- f) **Reporting and Learning from Safety Events:** A strong reporting and learning system is considered integral to the success of an NNB safety culture. The lessons learned report by the Royal Academy of Engineering (2012) made the following recommendation, 'A just and open reporting system should be put in place with its use publicised, reports investigated, feedback given, and the overall system monitored'. Nevertheless, the IAEA Safety Report Series (2012) acknowledged that embedding learning and feedback was a challenge to nuclear power plant projects. An example of a successful reporting and learning system was identified when exploring the Thameslink Programme case study. The project encouraged the reporting of safety events alongside fair and positive investigation, providing the workforce with timely feedback. Partnered with strong collaboration between the workforce and management, this resulted in a growing awareness and confidence that their efforts were making a real difference to the project. Similar findings were also identified on the London 2012 Olympic Park project, demonstrating that reporting and learning systems can be successful on mega-construction projects.

From the interviews and focus groups, participants understood and agreed the benefit of having such systems to understand the systemic causes of events rather than blaming individuals. However, participants reported that this is often not carried out effectively as a sizeable amount of safety events becomes difficult to manage, prioritise, action, and provide feedback on. Further identifying that this can lead to an inconsistency in top-down messaging. The Thameslink project identified feedback as a crucial communication tool that not only drives health and safety behaviours but also improves workforce engagement. Therefore, this observation indicates that the establishment of mechanisms to encourage and manage reporting can be successful in identifying risks and areas of improvement in mega construction projects such as NNBs. However, such processes must also be strongly promoted by leadership and include methods in which to exchange feedback.

- g) **Safety Training:** Safety related training has been identified as a key component influencing construction safety climate and safety performance across literature (Perlman et al., 2014; Berglund et al., 2023; Tang, 2025, Xia et al., 2020). Additionally, it is also recognised as fundamental to the success of nuclear safety programmes within industry guidance (INPO,

2010; IAEA, 2012) and raised as a recommendation within the Nuclear Construction Lessons Learned report (2012); *'A systematic approach to training should be taken to provide confidence that all personnel are trained and competent.'* Participants within this study concurred that training was essential to promote the desired behaviours, values, and attitudes of the organisation to the workforce. Further, that supporting new leaders with training can have positive results on worker engagement. However, it was also identified that more training could be offered to the on-site workforce. Participants also discussed the benefit of strong inductions and daily briefs as key methods for reinforcing information and setting clear behavioural standards and expectations. Immersive inductions, alongside clear and simple messaging was advocated by the Thames Tideway project as a means of creating a strong starting position and reference point for safety conversations throughout the project. Safety training, including activities such as inductions and daily briefs, can therefore be observed as an effective means in which to positively influence and encourage safety behaviours and performance of workers on NNB projects.

- h) **Management and Leadership:** Management and leadership consistently emerges as a significant determinant of safety performance in most industrial sectors, including both the construction and nuclear industries (Berglund et al., 2023; Tang, 2025, Xia et al., 2020; Simmons, McCall & Clegorne, 2020) and are seen stipulated within relevant guidance and legislation documentation (INPO; 2010; IAEA; 2012; CDM; 2015). Understanding the different levels of leadership as well as leadership styles (e.g., participative, transactional and transformational) was also identified as key. For instance, Flin and Yule (2004) concluded that senior managers have the most influence on an organisation's safety culture compared to supervisors and middle managers and so need to demonstrate a visible commitment to safety. Similarly, a transformational style of leadership was considered the most effective to achieving positive safety outcomes (Clarke, 2013; Mullen & Kelloway, 2009). The Thameslink programme formed an executive safety leadership team and hosted interviews with a range of staff to understand how they viewed the safety leadership style of key managers and leaders on the project, to reflect on the effectiveness of their safety commitment.

Nevertheless, in a systematic review of safety leadership, all leadership styles (except passive) demonstrated having a positive impact on safety performance indicators, and that leaders should select the most appropriate leadership style dependant on the different organisational contexts (Ta, Kim & Gausdal, 2022). This view was echoed by participants within this study. It is therefore considered important for all levels of leadership to receive training on the different leadership styles, and how to use them effectively depending on the situational context. Participants from the interviews and focus groups discussed values such as trust, integrity, and respect as well as behaviours such as positive role-modelling and strong visibility as factors determining a good leader. A leaders' commitment to safety, and their engagement with the workforce, can positively influence the desired safety behaviours and attitudes seen on-site. Sentiments which are also echoed from the London 2012 Olympic Park and Thames Parkway projects. This observation demonstrates that leaders have a significant impact over the safety performance of the workforce on an NNB site and are therefore integral to the success of the project's safety culture. Further, that these effects can be strengthened by offering training to new leaders as well as wider training on the different leadership styles and ultimately setting high performance standards and expectations across all levels of leadership and management.

3.2 What are the gaps or challenges in developing a strong, homogeneous safety culture for NNBs in GB?

The points discussed below, highlight themes identified from this study that present a potentially significant challenge to NNB projects during their construction phase and therefore require further understanding.

- a) **Competence and Resourcing:** The UK is currently constructing its first NNB in over thirty years in which finding a large quantity of highly skilled workers, with experience of working within the nuclear industry, was reported as a particular challenge by participants. Competence and resourcing is a known foundation to the success of any construction or nuclear project, as is seen reflected in relevant legislation e.g., CDM regulations (2015). The importance of competence and capability of the duty holder organisation, people hired to complete the work, as well as third parties supporting the project was a significant point of discussion throughout the interviews and focus groups. However, throughout the conversations three challenges became apparent that require additional consideration.
1. Following a thirty-year break in the UK nuclear construction industry, how can the skill gap be closed to the magnitude required for future NNB mega-construction projects? It is important to consider that this issue may be mitigated as more NNB projects are constructed within the UK, as the level of skill and experience increases within the industry.
 2. As indicated by one participant *“Being selective at the start and then nurturing and developing that supply chain is vital.”* However, when working with many contractors, partnered with high turnover rates, how can consistency of competency be managed and ensured effectively by third parties or by the duty holder organisation?
 3. Finally, during the construction phase of an NNB, what is the ideal allocation of capability and competence between construction and nuclear professionals? Throughout the interviews and focus groups, a significant proportion of individuals believed that NNB construction projects were more heavily weighted towards nuclear competence, resulting in a shortage of construction specialist knowledge. Moreover, similar results were also identified during the design phase, in which participants believed that constructability was not sufficiently considered throughout the process.

Due to these challenges remaining unanswered, further investigation into ensuring the correct capability and competence on an NNB site would be beneficial, particularly as the UK is expected to construct more NNB projects over the coming years.

- b) **Contractor Management and Engagement:** Participants within this study proposed that contractors need to be more embedded into projects, for instance, receiving the same training courses as well as access to the same systems and information as workers from the duty holder organisation. Further, that strong engagement, communication and collaboration with contractors was required to successfully create a positive safety culture. Conversely, results from the literature review discuss the importance of contractor autonomy, and that subcontractors should be able to take initiative e.g., be responsible for familiarisation and training as well as practices and norms (Odewald & Gotcheva; 2015). An example of this, is the London 2012 Olympic Park project where Tier 1 contractors were empowered to develop their own processes and systems and drive their own performance, which was identified to promote ownership and encourage worker engagement. Further to this, a participant from this study when discussing the uniformity of culture on NNB construction projects described it as *“achieving the impossible”*. The challenge identified requiring further clarification, therefore, is how do duty holders appropriately engage, share and collaborate with subcontractors to build a strong safety culture whilst not diminishing their autonomy or ownership on the project.
- c) **Engaging Multicultural Workforces:** Participants from this study discussed that it can be difficult to achieve consistency of safety behaviours and beliefs within large multinational workforces, because of different languages or cultural perceptions to safety. However, participants also discussed difficulties with intracultural communications for example, between different genders, age groups and specialisms on-site. During the literature review, there was

evidence to suggest that societal values can impact an individual's attitude towards safety (Spangenberg et al., 2003), yet, irrespective of nationality, workers were less likely to take risks if they perceived a positive commitment to safety from their managers (Mearns and Yule, 2009). Studies on multicultural teams in construction (Ochieng et al.; 2010; Ochieng, 2013; Shepherd et al.; 2021) identified that trust, communication, empathy, and awareness of leadership can be effective when developing large multicultural teams. Additionally, a study on Spanish, Italian and British construction workers (Shepherd et al.; 2021) recommended on-site training, digitalised materials, role modelling and training of soft skills (e.g., hazard awareness and cross-cultural communication) to support the collaboration and engagement of multicultural workers. Whilst fulfilling competency requirements is an essential and legislative obligation of the project (e.g., CDM regulations, 2015), there remains a lack of research understanding the impact of large multicultural teams in construction and NNB projects, with one article reporting it as a 'topic that remains underexplored' (Shepherd et al., 2021). More understanding is therefore required to identify opportunities for improvement, and to maximise the potential of large multicultural teams, particularly on an NNB construction site where safety is considered a fundamental priority.

- d) **Learning from Other Industries:** Participants from this study discussed that it was rare for companies to incorporate learning from other industries. It is important to consider that for proprietary and competitive reasons, organisations across other industries may not always be open to sharing information. This is acknowledged in the IAEA safety series report (2012) that lessons learned from non-nuclear industries are not usually included in databases capturing information on design, construction and commissioning. As a result of this, how can an NNB project:
1. Effectively collate information from other industries,
 2. Manage a conceivably large number of data entries,
 3. Interpret learnings from events which may not be reflective of the high standards of the nuclear industry,
 4. Share feedback with the workforce that is meaningful whilst not overloading workers with information.

Therefore, whilst there is an observable opportunity for NNB projects to apply learning from other industries, the method in which this can be done effectively is yet to be understood.

- e) **Conflicting Management Priorities:** Managers on mega construction and NNB projects are trained to understand that safety and quality are the top priority and a cornerstone to the project's safety culture. In practice however, the success of achieving this is often constrained by the pressure on managers to also achieve business objectives, for example, cost and scheduling goals. This was identified to result in inconsistent messaging throughout all levels of management, creating a sense of frustration and confusion for the workforce. Participants from the focus groups also reported that supervisors on one project were financially rewarded when they achieved organisational goals, which was believed to have a negative effect on the team's safety performance. Alternatively, when key performance indicators are driven by safety objectives for example, teams are given a targeted number of safety reports to complete, learning has become almost impossible to do due to the high number of recorded safety observations. Nevertheless, participants agreed that an individual's commitment to safety should be considered during the leadership selection process, and that new leaders should be trained on how to deal with conflicting safety and business objectives. However, whilst there is a common agreement that safety must be the ultimate priority, there is limited evidence on what has been successful previously (from literature or case studies) on effectively managing the negative impact of organisational pressures on the safety and wellbeing of the workforce. This is therefore an area that requires better understanding and further consideration, particularly when creating the processes and standards that will define an NNB projects safety culture.

- f) **Defining Nuclear Safety During the Construction Phase of an NNB Project:** Throughout the interviews and focus groups, participants were divided on what nuclear safety looks like during the construction phase of an NNB, and two predominant points of discussion became apparent.
1. How relevant is nuclear safety during the construction phase of an NNB?
 2. What is nuclear safety during the construction phase of an NNB?

Some participants believed that nuclear safety was integral across all phases of a nuclear power plant project, and that it is best defined by a high-quality work to ensure the safe running of the plant, and protection of operators and civilians in the future. As a result, participants suggested alternative terms such as ‘Nuclear Quality Culture’ or ‘Nuclear Quality Commitment’. On the other hand, some participants believed that whilst the plant is not operational and there is no active nuclear material on-site, it is predominantly a construction project. Further to this, that the organisation needs the appropriate competence and capability to carry out the construction work, which was considered significantly different from nuclear competence. Overall, participants agreed that the *“picture can be quite murky”* due to the often-conflicting messaging between conventional and nuclear safety cultures, resulting in an overcomplicated and ambiguous safety culture, lacking a clear definition. One participant referred to the topic as a *“red herring”* and that fundamentally both cultures (conventional and nuclear) come down to the same behaviours and is better defined as a *“a culture of doing the right thing”*.

This highlights a significant challenge to NNB projects in that, how can the organisation train and effectively communicate the importance of nuclear safety, or perhaps as suggested by participants, explicitly quality, if there is not a simple, established message. A message which needs to be embedded into the project from the start (i.e., prior to the beginning of the construction phase) that also works in harmony with construction and conventional safety regulations, practices, and processes. More investigation is therefore required to understand the most appropriate and effective approach to defining, creating, and embedding a strong safety culture during the construction phase of an NNB.

3.3 What actions could be recommended to enhance safety culture, safety performance and quality for NNBs in GB?

The following recommendations are based on the findings from this study which identified opportunities in which safety culture and performance could be enhanced during the construction phase of NNBs.

1. **Reflecting on the Results from This Study:** Duty holders and regulating bodies may benefit from reflecting on the discussion points raised in sections 5.1 and 5.2 of this document alongside current processes, practices, documentation, and regulation, to identify potential areas for improvement, and opportunities to better promote existing methodologies and approaches.
2. **Pride:** Pride is an underexplored trait during the construction phase of an NNB and within the wider construction industry in general. Participants from the interviews and focus groups believed that invoking a sense of pride in workers on NNB projects was important for workers to appreciate the scale and significance of the project. Additionally, pride was believed to have a significant positive impact on the safety performance of workers on the London 2012 Olympic Park project. From this, there is evidence to suggest that pride is an important factor to consider regarding safety performance during NNB and mega-construction projects. Duty Holders should therefore consider exploring ways of promoting a greater sense of connection between the project and its workforce and how it could be incorporated into its safety culture strategy.
3. **Simple and Unambiguous Messaging:** Unclear and inconsistent messaging was highlighted to have a negative impact upon safety behaviour and safety performance throughout all themes identified within this study. As a result of unclear messaging, it was identified that teams often

resulted to working in silos or failed to process messages due to being overloaded. The results from this study therefore suggest that safety culture values, expectations, and behaviours should be simplified to a small number of key capabilities, to reduce the risk of overloading the workforce with information and to improve knowledge retention. This is supported by evidence identified in the literature review from the Thames Tideway Tunnel project, which used a clear and simple message as the foundation for its 'Right Way' safety culture programme. Duty holders should therefore reflect on their safety culture strategy and consider how their safety messaging could be simplified and refined. Further, regulating and legislative bodies supporting NNB projects should reflect and explore if improvements could be made to current practices (e.g., guidance and legislation) to best support duty holders in achieving the simplification of safety culture messaging on NNB construction sites.

4. **Sharing NNB Construction Phase Learning for Future NNB Projects:** The UK is currently constructing its first NNB in over thirty years with further sites also projected. Whilst there is a legal obligation for duty holders to report certain types of accidents or risks to the health or safety across the site, it does not stipulate a specific reporting system for general learning during the pre-operational phases of a nuclear powerplant. As raised in section 5.1 above, the IAEA Safety Report Series (2012) recognised that embedding learning and feedback can be a challenge and often fails to capture experiences during the plant's preoperational phases. Additionally, that even when systems are put in place, they are often not accessible or interconnected with other processes or systems on-site. There is therefore an opportunity for relevant regulating and legislative bodies to reflect on current reporting requirements during the construction phase of an NNB project and identify areas in which learning from pre-operational phases can be better integrated into and across NNB projects.

4. Limitations and conclusions

4.1 Limitations

It is important to note that this study had some limitations. Firstly, it must be acknowledged that the interview sample used could be considered biased due to the higher number of Safety and Nuclear Safety Inspectors interviewed compared to other roles. Additionally, although a wide variety of workers were included within the focus groups, 'on the ground' workers were not accessed within this study. Therefore, this should be considered when reflecting on the results of the report and could be an area for future research, to use a superior sample that more accurately presents the entire function of an NNB. Secondly, the validity of data cannot be assumed due to the nature of qualitative research, particularly as participants were not selected at random, the data is therefore not able to be generalised to the workforce population of NNBs. A larger sample size and use of mixed methods (i.e., qualitative and quantitative measures) could assist with building reliability and validity of any future research.

4.2. Conclusion

In summary, many themes have been identified as key facets to safety culture within NNBs (i.e., leadership, training, organisational learning, planning and collaboration); however, many challenges to implement such approaches were also identified. Due to the size and complexity of NNB projects, such challenges require meaningful and purposeful action to be overcome. Nevertheless, it is vital that the approach to nuclear safety culture during the construction phase of an NNB is established collectively with conventional safety culture, to best support in creating a clear and homogenous safety culture objective.

Note: This is a summary document only. Please refer to the original report for references and further details.