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Civil Nuclear Reactors Programme

NNB GenCo First Project Convergence Point at Hinkley Point C

Security, Safeguards and Conventional Safety

Progress Report-ONR- CNRP-PR-14-033
Revision 0
18 December 2014

EXECUTIVE SUMMARY

The Office for Nuclear Regulation (ONR) Cornerstone Progress Report has been produced to support the Project Inspector's first convergence point summary report for the Hinkley Point C project. This ONR Cornerstone for the Hinkley Point C project consists of Security, Safeguards and Conventional Safety workstreams.

This report presents a summary of assessments, interventions and engagement carried out in the Security, Safeguards and Conventional Safety workstreams leading up to the first convergence point and has been written to support the Project Inspector's summary report. The findings of these interactions inform ONR's judgement of the performance of NNB GenCo Ltd and its readiness to proceed with the project as outlined in ONR's Construction Intervention Strategy for the UK EPR.

The first project convergence point has been introduced prior to the start of construction by agreement between ONR and NNB GenCo, with the objective of exercising licensing and regulatory processes. The aim is to de-risk future key milestones/convergence points such as the first primary hold point for the pour of nuclear safety related concrete. This first convergence point will not permission or constrain any activities in respect of NNB GenCo and Hinkley Point C. Whilst convergence and hold points are primarily nuclear safety related, it is considered that input on the progress of Security, Safeguards and Conventional Safety related aspects of the project provides the Licensee with the opportunity to identify good practice or areas where improvements may be required.

This Cornerstone Report has drawn from individual topic leads' reports, inputs and comments. It should be noted that, at this stage of the project, interaction and engagement in the Conventional Safety/Fire Safety design and Safeguards topics has been limited. However, the extent of the engagement in these topic areas has been reflected in this report.

With regard to Security, engagement with NNB GenCo has been conducted on a regular basis both on site and at company offices in London. The engagement has included regular meetings with the NNB GenCo's Security Managers to discuss the development of security arrangements and the action taken to address the Generic Design Assessment (GDA) assessment findings. Regulatory inspections of the construction site security arrangements have also been carried out to ensure compliance with the approved Nuclear Site Security Plan. Overall, it was considered that the Licensee has made satisfactory progress in the Security topic stream.

ONR Safeguards have worked with NNB Genco and the European Commission (Euratom) safeguards inspectorate to devise and enable implementation of nuclear materials accountancy (NMA) and safeguards verification arrangements to ensure that UK safeguards obligations for the Hinkley Point C facility are met as effectively and efficiently as possible. There has been early engagement with NNB GenCo on the Basic Technical Characteristics (BTC) declaration and safeguards measures for verification and inspection at the facility and also engagement has taken place with safeguards counterparts in Finland and France on the arrangements for the EPRs at Olkiluoto and Flamanville.

In terms of Conventional Fire Safety, ONR has focussed on assessment of generic fire strategies and in particular on areas that depart from UK expectations in fire safety for building design. A range of documents and building plans were assessed to gain confidence that the dutyholder's final building design fire risk assessment would satisfy the requirements of the Regulatory Reform (Fire Safety) Order 2005. Although ONR expects further improvements in draft fire strategies before the final versions are produced, the documents provide acceptable examples of the application of optioneering and ALARP justification.

Conventional health and safety engagement and intervention on site (delivered by ONR warranted HSE Construction Division inspectors) has been limited because of minimal site works activity.

Overall, I consider that NNB GenCo have made satisfactory progress across all three work streams that make up this cornerstone. Although there is significant work still to be undertaken in the work streams, it is considered satisfactory progress has been made.

LIST OF ABBREVIATIONS

ALARP	As low as is reasonably practicable
BSL	Basic Safety level (in SAPs)
BSO	Basic Safety Objective (in SAPs)
CNS	Civil Nuclear Security (ONR)
CSA	Conceptual Security Arrangements
CSSP	Construction Site Security Plan
HOW2	(ONR) Business Management System
HSE	Health and Safety Executive
IAEA	International Atomic Energy Agency
LC	Licence Condition
NISR	Nuclear Industries Security Regulations 2003
NORMS	National Objectives, Requirements and Model Standards
NSSP	Nuclear Site Security Plan
ONR	Office for Nuclear Regulation
PCER	Pre-construction Environment Report
PCSR	Pre-construction Safety Report
PID	Project Initiation Document
PSA	Probabilistic Safety Assessment
PSR	Preliminary Safety Report
RGP	Relevant Good Practice
SAP	Safety Assessment Principle(s) (HSE)
SFAIRP	So far as is reasonably practicable
SSC	System, Structure and Component
TAG	Technical Assessment Guide(s) (ONR)
TSC	Technical Support Contractor
WENRA	Western European Nuclear Regulators' Association

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1 INTRODUCTION

1.1 Background

1. This Cornerstone Report presents a summary of assessments, interventions and engagement carried out in the Security, Safeguards and Conventional Safety workstreams leading up to the first convergence point and has been written to support the Project Inspector's summary report. The findings of these interactions inform ONR's judgement of the performance of NNB GenCo Ltd and its readiness to proceed with the project as outlined in ONR's Construction Intervention Strategy for the UK EPR.

2. The first project convergence point has been introduced prior to the start of construction by agreement between ONR and NNB GenCo, with the objective of exercising licensing and regulatory processes. The aim is to de-risk future key milestones/convergence points such as the first primary hold point for the pour of nuclear safety related concrete. This first convergence point will not permission or constrain any activities in respect of NNB GenCo and Hinkley Point C. Whilst convergence and hold points are primarily nuclear safety related, it is considered that input on the progress of security, safeguards and conventional safety related aspects of the project provides the Licensee with the opportunity to identify good practice or areas where improvements may be required.

1.2 Scope

3. The scope of this report covers topic streams A1 – Security, A2 – Safeguards and A3 – Conventional Health and Safety/Fire Safety Design. The findings are drawn from Topic Leads' reports and input.

1.3 Methodology

4. This Cornerstone Report has drawn from individual topic leads' reports, inputs and comments. It should be noted that, at this stage of the project, interaction and engagement in the Conventional Safety/Fire Safety design and Safeguards topics has been limited. However, the extent of the engagement in these topic areas has been reflected in this document.

1.4 Structure of Report

5. The report has been broken down into the three topic areas; Section 2 summarising the Security assessment report, Section 3 incorporating comments regarding the Safeguards topic stream and Section 4 summarising the Conventional Safety/Fire Safety design workstream. Overall conclusions and recommendations are documented at Section 5.

2 SECURITY

2.1 Position at licensing and significant developments

6. The outcome of the GDA was the production of a Conceptual Security Arrangement (CSA) and 13 Assessment Findings, relating to security. The licensee was required to put in place adequate resolution plans to address these findings. The key developments since licensing have been:

- Approval of the first issue of the Nuclear Site Security Plan (NSSP).
- Development of Site Security Organisation.
- Development of Phase A1 of the NSSP.
- Production of Resolution Plans for Assessment Findings.

2.2 Scope of Security Assessment Undertaken

7. The scope of the assessment undertaken in the Security workstream covers three main areas:

- Progress with Assessment Findings
- Development of, and compliance with, the NSSP
- Regulatory meetings between the Licensee and ONR.

Each of these areas are summarised below:

2.2.1 Progress with Assessment Findings

8. The GDA Step 4 Security Assessment Report (Ref 1) resulted in 13 Assessment Findings and identified the milestones by which the findings should be addressed. These milestones related to: First Structural Concrete, Nuclear Island Safety Related Concrete, Installation of the RPV and, for CBSIS related matters, before systems are delivered to Site.

9. The Licensee has forwarded seven Resolution Plans to ONR. Overall, the submitted Resolution Plans demonstrate that the Licensee are addressing the Assessment Findings in a satisfactory manner. Resolution to one Assessment Finding – Revalidation of Vital Areas, was still on-going at the time of the report with close liaison being maintained between the Licensee and ONR on this topic. The satisfactory completion of this work is considered important in ensuring satisfactory security arrangements are in place to protect key areas.

10. ONR is expecting the outstanding Resolution Plans by 31 December 2014

2.2.2 Development of, and Compliance with, the NSSP

11. In accordance with NISR 2003 (as amended) (Ref: 2), the Site submitted its first issue of the NSSP to ONR in mid-2013. The content of the NSSP was assessed against the NORMS document and was considered to satisfactorily reflect the required security arrangements. The first issue of the NSSP was approved in November 2013. The NSSP is developing as the construction site progresses and reflects the various states of the Site from construction through to operations. The NSSP has been broken down into phases that will eventually reflect an operational site with two reactors and an ISFS. It is recognised that the NSSP will continue to be developed, with further amendments and new issues submitted to ONR for approval as the Site develops.

12. The Licensee is required to conduct an annual review of the security arrangements and submit a report to ONR detailing the findings of the review. This review covered the reporting period 1 April 13 – 31 Mar 14. The report (Ref: 3) was submitted in April 2014 and it was considered that a comprehensive review had been carried out and the report satisfactorily reflected the state of security on site.

13. In addition to the Licensee's annual review, a Priority Table and Performance Assessment Report was produced for the CNS Programme Director, which was taken into account when producing the annual ONR report. The report concluded that there was clear evidence of good practice in the security regime. Any non-compliance has been minimal and only minor security improvements and/or amendments to the NSSP and supporting security documentation have been required in order to meet regulatory requirements.

2.2.3 Interventions and Compliance

14. The requirement to undertake regulatory inspections, including spot checks is detailed in the NISR 2003NORMS document (Ref: 4). A number of inspections have been

carried out to give assurance of compliance against the Construction Site Security Plan (CSSP) and, subsequent to approval, the NSSP. The findings of these inspections are documented in the following intervention reports:

- ONR-CNS-IR-13-125: Information Security and Site Security.
- ONR-CNS-IR-14-067: Site Security.
- ONR-CNS-IR-14-135: Security Force Response Exercise.

15. Overall there were no major issues found during the inspections. The Licensee has been responsive to the issues raised in reports.

2.2.4 Level 4 meetings between Licensee and ONR

16. Level 4 meetings have been scheduled on a monthly basis and, in the main, the schedule has been achieved. These meetings have provided the opportunity for the Licensee to provide progress reports on the development of security aspects of the Hinkley Point C construction and have allowed SMEs from CNEPE and SEPTEN to present overviews of the security aspects of the design.

2.3 Conclusions on Security

17. The security report presented a view on the Licensee's security arrangements and was based on the progress made in transitioning from the Construction to the Nuclear Site Security Plan and inspections carried out against the security arrangements detailed in those plans. It is also based on the progress of the Licensees response to the GDA Findings and interactions held at Level 4 meetings.

18. NNB GenCo continue to develop the security strategy for the operational site and have provided overviews of the arrangements that will be adopted. They have detailed their approach to security and the way in which the security arrangements are being developed. The NSSP was approved in November 2013 and the Licensee has demonstrated its commitment to reviewing the Plan and has since had a new issue of the plan approved.

19. Assessment findings are being addressed, and there has been constructive dialogue with regard to the Resolution Plans. Overall, it is considered that the licensee has demonstrated compliance with the Regulations, is progressing with responses to the GDA findings and is continuing to develop the security strategies for the operational Site. At this stage of the project, there are no security issues that would prevent the project progressing to the next stage.

2.4 Recommendations

20. The remaining six security Assessment Findings resolution plans are forwarded to ONR by 31 December 2014.

3 SAFEGUARDS

21. Nuclear safeguards are measures to verify that countries comply with their international commitments not to use nuclear materials (plutonium, uranium and thorium) from their civil nuclear programmes to manufacture nuclear weapons (*http://www.hse.gov.uk/nuclear/safeguards/index.htm*). The role of ONR Safeguards includes working with UK organisations subject to safeguards requirements and the international safeguards inspectorates of the European Commission (Euratom) and the International Atomic Energy Agency (IAEA) to ensure safeguards obligations for the UK are met in a proportionate manner.

22. Such safeguards work was not part of the Generic Design Assessment process. But ONR Safeguards' has worked since then with NNB Genco and the European Commission (Euratom) safeguards inspectorate to devise and enable implementation of nuclear materials accountancy (NMA) and safeguards verification arrangements whereby UK safeguards obligations for the Hinkley Point C facility are met as effectively and efficiently as possible. This has included:

- early formal submission to the European Commission by NNB GenCo of the preliminary information required by Euratom Safeguards Regulations (a so-called 'Basic Technical Characteristics, BTC, declaration) for the facility, followed by provision of a first draft of the full BTC declaration;

- Euratom/NNB GenCo/ONR discussion on the draft BTC documentation and detailed safeguards measures for verification and inspection at the facility, including specification of Euratom surveillance and sealing equipment (eg confirmation of equipment locations, technical requirements, contract arrangements for the installation work);

- continued ONR Safeguards contact with safeguards counterparts at the STUK Radiation and Nuclear Safety Authority in Finland regarding Euratom/IAEA safeguards arrangements for the Olkiluoto EPR, and with counterparts at the Comité Technique Euratom (CTE) for France on arrangements for the EPR under construction at Flamanville.

23. Engagement over the last year have been a function of overall project pace and timescales and also the Euratom assessment that the extent of safeguards engagement on Hinkley Point C remains significantly ahead of their experience with comparable projects elsewhere in Europe, but has included:

- exchange of information between NNB Genco, Euratom and ONR Safeguards to further clarify specifications and requirements for safeguards equipment, its installation and subsequent support; and

- NNB Genco provision and detailed ONR Safeguards comment on a further update to the draft BTC declaration, first formal submission of which to Euratom is now scheduled for March 2015.

24. ONR Safeguards is arranging a further face-to-face meeting with NNB Genco and Euratom to take place before the end of December 2014, the objectives for which are updating Euratom on the Hinkley Point C project generally and plans, therefore, for formal submission of the BTC declaration, and ensuring that arrangements for the installation and commissioning of safeguards equipment are properly recognised and incorporated into the overall project schedules.

4 CONVENTIONAL FIRE SAFETY DESIGN

4.1 Position at licensing and significant developments.

25. Conventional Fire Safety was not included in the Generic Design Assessment process. The project uses the ETC-F, German and French Nuclear Industry fire codes

developed by EDF, as a reference. This code uses different techniques compared to UK expectations to achieve safety.

26. ECT-F zones which are designed, primarily for structural fire protection for nuclear integrity, by assessing and controlling fire compartment specification, have no direct analogue in the UK. Studies were therefore undertaken to compare the life safety measures provided by ECT-F and the expectations of BS9999 for means of escape in case of fire and access and facilities for firefighting. In 2013 a document was produced, the 'HPC ETC-F Application Document', which collates the requirements of these two approaches into a single strategy.

27. The Regulatory Reform (Fire Safety) Order 2005 (RRO) prescribes the requirements for fire safety and is enforced on Nuclear Licensed Sites in England and Wales by the Office for Nuclear Regulation. The legislation places duties on the employer as 'responsible person', to carry out risk assessments and to implement measures to make the premises safe from fire. The RRO applies to each building on site individually and the requirements are applicable through the whole life of the building, from construction, through normal operation, periods of maintenance and during demolition. Although enforcement of fire safety in buildings through risk based functional requirements is significantly different to the permissioning regime associated with nuclear site licensing; overall safety on site depends on both nuclear safety and security and also includes adequate provision of life safety measures. The report does not support any permissioning decision but is primarily to allow ONR's current view of the position to be shared with the licensee.

28. Although the Building Regulations do not apply to most structures on a Nuclear Licensed Site, the benchmark for UK expectations for structural fire safety is described in the codes of practice for building design. Approved Document B to the Building Regulations, British Standard 9999 and British Standard 7974 represent the appropriate building design codes to inform the dutyholder's risk assessment for compliance with the Regulatory Reform (Fire Safety) Order 2005.

4.1.1 Scope of Assessment Undertaken

29. At this stage of the process, where the final design has not been confirmed and changes could occur before construction, a compliance inspection of detailed plans with prescriptive guidance is not practicable. Instead ONR has focused on assessment of generic fire strategies and in particular on areas that depart from UK expectations in fire safety for building design. The assessment has considered; -

- A high level statement of the fire strategy for the completed buildings which describes how the fire safety management arrangements and protective features will operate together to ensure life safety from fire.
- A description of method that will be used to identify all areas of departure from UK expectations for fire safety.
- Demonstration of optioneering to identify alternative methods of achieving an equivalent level of safety in the areas that do not meet UK expectations.
- Examples' demonstrating that the chosen fire safety solution has been subject to a sufficiently robust assessment process to ensure that remaining risks from fire are as low as reasonably practicable.

4.2 Out of Scope Items

30. The following items are outside the scope of the assessment.

31. Dangerous Substances Explosive Atmosphere DSEAR assessments

32. Detailed, final plans of each building which illustrate all fire safety measures. Sampling of final design is anticipated after all draft fire strategies are confirmed in 2015.

33. This report provides judgements as to NNB GenCo's current position; these are based on information and evidence I have obtained to date. The report does not support any permissioning decision but is primarily to allow ONR's current view of the position to be shared with the licensee.

34. The intended assessment strategy for Conventional Fire Safety is set out in this section. This identifies the scope of the assessment and the standards and criteria that have been applied. The assessment has been based on the following interventions:

35. Routine Level 4 topic meetings;

36. Assessment of key documentation; (see section 4)

4.3 Scope of Assessment Undertaken

In addition to differences between BS9999 and ETC-F, it was recognised at an early stage that due to constraints from other hazards (and their mitigation) within the some buildings such as radiation, flooding, security etc, elements of the fire strategy on the nuclear island need to differ from the recommendations of BS 9999. These requirements lead to EDF's development of a consistent strategy for managing departures through demonstration of examples of non-compliance which were discussed with ONR and refined over a series of meetings.

The key features of the agreed process for management of departures from the fire safety expectations of UK include; identify and prioritise each departure according to the risk gap from the expected standard. An optioneering process is then undertaken to identify a range of alternative fire safety measures, followed by a robust ALARP justification for the chosen final solution.

ONR assessed a range of documents and building plans to gain confidence that the dutyholder's final building design fire risk assessments would satisfy the requirements of the Regulatory Reform (Fire Safety) Order 2005. Particular attention was given to the assessment of management of departures from prescriptive compliance. Although ONR expects further improvements in the following draft fire strategies before the final versions are produced, the documents provide acceptable examples of the application of optioneering and robust ALARP justification; -

EPR Fuel Building	UKX-UK1421-AU-HKX-NOT-000227	General Fire Precautions
Safeguards Buildings	HPC-ECEIG-X-XX-CRX-NOT-000750	Fire Strategy Document
Nuclear Auxiliary Building	HPC-ECEIG-X-XX-CRX-NOT-000752	Fire Strategy Document
HXA HVL HVD Buildings	HPC-ECEIG-X-XX-CRX-NOT-000676	Fire Strategy Document
Construction Fire Strategy	HPC-NNBGEN-XX-000-STR-000003	Fire Strategy Document

4.4 Conventional Fire Safety Design Conclusions

37. NNB GenCo has made significant progress in developing draft fire strategy documents for the more challenging buildings on the nuclear island. The documents provide evidence of compliance with UK expectations for fire safety in building design where this is reasonably practicable and a robust process for developing equivalent levels of safety through alternative measures when code compliance is not suitable on the grounds of nuclear safety and security.

38. Considerable work remains outstanding on both the nuclear island and conventional areas; from confirming Company endorsement of the current draft fire strategy documents, producing plans of final design fire safety proposals to development of fire risk assessment documents. However at this stage of the project, fire safety is considered to be developed to an adequate level and is progressing satisfactorily.

5 OVERALL CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

39. I am satisfied with the progress that has been made in the areas of Security, Safeguards and Conventional Safety. The licensee has demonstrated that it is progressing in all topic areas covered in this report:

40. In area of security, the Licensee has demonstrated successful transition from Construction to Nuclear Site Security Plan and continues to develop its strategy for the operational site, whilst demonstrating overall compliance with the regulations.

41. In the area of Safeguards, the Licensee has demonstrated its commitment to ensure its nuclear materials accountancy and safeguards verification arrangements for Hinkley Point C are met by engagement with ONR Safeguards and Euratom.

42. In Conventional /Fire Safety Design, NNB GenCo has made significant progress in developing draft fire strategy documents for the more challenging buildings on the nuclear island. Although considerable work is still to be undertaken, fire safety is considered to be developed to an adequate level and is progressing satisfactorily.

6 REFERENCES

1. Generic Design Assessment Step 4 Report

2. Nuclear Industries Security Regulations 2003 (as amended)

3. HPC Annual Review of Security

4. NISR 2003 National Objectives Requirements and Model Standards for the Protection of Civil Licensed Nuclear Sites, Other Nuclear Premises and Nuclear Material in Transit.