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PROGRESS REPORT			
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**Civil Nuclear Reactors Programme**

**NNB GenCo: First Project Convergence Point at Hinkley Point C  
Report for Organisational Capability cornerstone**

Progress Report ONR-CNRP-PR-14-036  
Revision 4  
19 December 2014

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### EXECUTIVE SUMMARY

This report presents the assessments findings of the Organisational Capability (OC) cornerstone progress assessment of NNB GenCo's development its organisational capability for the Hinkley Point C (HPC) project since licensing in August 2012. It summarises the detailed assessments from the specific organisational capability workstreams along with inputs from most other workstreams on resourcing and intelligent customer capability issues in their particular topic. The main purposes of this report are to share ONR's overall judgement of the development of NNB GenCo's Organisational Capability since licensing with NNB GenCo, and provide a clear view as to the 'gap' between the current position and that expected at the first consent point.

The report covers the following three main areas:

- developments in this NNB GenCo's overall organisational capability since licensing;
- consideration of the NNB GenCo's Shadow Hold Point (SHP) process as related to aspects of organisational capability;
- the current state of progress of NNB GenCo's organisational capability against ONR's expectations for the topic at the First Consent Point.

At Licensing ONR judged (Refs. 13 to 16) that NNB GenCo had achieved a satisfactory state of capability and had credible plans for the further development of NNB GenCo for the immediate phases post licensing.

Since licensing NNB GenCo has continued to develop its organisation and arrangements both to match the activities being undertaken, and to prepare for the early stages of nuclear construction permissioned at the first and second consents envisaged in 2015 and 2016. It has introduced two major Category A changes; one to re-structure the organisation for project delivery; the second to constrain the organisation due to the delay in a financial investment decision releasing funding for the major construction and procurement activities. This latter change has presented considerable challenge for NNB GenCo in maintaining momentum during an extended period of considerable uncertainty.

#### 1. Developments in Organisational Capability since licensing

##### ***Overall Nuclear Safety Summary***

I consider that NNB GenCo has established appropriate arrangements and capability to match ONR's expectations for nuclear safety advice and challenge. The key features are:

- The Design Authority (DA) has a high level of competence, and is generally providing satisfactory intelligent customer (IC) control over the Responsible Designer (RD) and other supplier activities;
- An nuclear safety committee that is operating effectively
- An Assurance function that is performing well and is now close to the necessary resource level.

I judge that NNB GenCo has established and is implementing satisfactory arrangements for ensuring an appropriate level of IC capability for all potentially safety related areas across the project.

NNB GenCo currently has a good safety culture and has taken very positive measures to develop a strong site safety culture. It is continuing to develop measures to further develop its safety culture and means to monitor the safety culture both at site and within the project team. It is also taking measures to ensure key supply chain partners also have a suitable safety culture.

##### ***Overall Organisational Capability Development & Knowledge Management Summary***

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I consider that NNB GenCo has established satisfactory management of change (MoC) arrangements. It has implemented two very significant changes since licensing. These have generally been well implemented and managed, maintaining a strong focus on ensuring nuclear safety. It has maintained and updated an appropriate nuclear baseline to match the changes in the project. NNB GenCo has been appropriately resourced to this point for the activities undertaken.

On training & competence, I consider that NNB GenCo has established and is now effectively implementing arrangements to ensure staff are competent for roles and suitable training and development is provided. I consider the arrangements match the expectations for compliance with Licence Condition (LC)10 and also support LC12 compliance.

I judge that NNB GenCo has established appropriate project management arrangements; incorporating learning from Flamanville 3 and other nuclear and major construction projects. It has developed a suitable IMS that supports intended PM arrangements for each phase of project.

NNB GenCo is clearly committed to learning from both internal and external experience. It has clearly sought to bring learning into the project in many ways. It has also established effective internal learning processes and it also has developed plans for its knowledge management strategy. Its OLIM<sup>‡</sup> tool is being used as a key means of capturing and tracking learning. OLIM and other OL processes will require further development to match site needs when considerable site activities commence.

I judge that NNB GenCo has established appropriate management systems for documents and records for this point in the project.

### ***Overall Procurement and Supply Chain Summary***

I judge that NNB GenCo has established a range of embedded arrangements across the project to deliver quality, however it has yet to develop a suitable set of overarching arrangements to ensure delivery of quality across the project. It has now determined its overall approach and in principle this seems to match ONR's expectations

NNB GenCo has established a satisfactory Supply Chain policy and management approach. The commercial organisation has been resource limited and post-FIDD<sup>§</sup> this will need to increase to match the level of procurement activity. NNB Gen Co has also established appropriate management system arrangements for supplier audit and inspection of suppliers for the current stage of the project

Overall I consider that NNB GenCo has established all the key foundations for successful supply chain management post-FIDD; however the level of resource and the implementation of effective quality management arrangements will need to increase considerably to match the needs of both the first and particularly second consent point.

### ***Summary against LC36 requirements***

I conclude that NNB GenCo has maintained adequate human resources and management of change arrangements to satisfy LC 36 requirements for this point in the project.

## **2. Consideration of the Shadow Hold Point**

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<sup>‡</sup> OLIM = Organisational Learning and Non-Conformance Management  
<sup>§</sup> FIDD = Financial Investment Decision Date

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My overall judgement is that the SHP process included a satisfactory consideration of key OC aspects relevant to that hold-point. I would expect similar relevant OC criteria to be included in future major hold points, particularly for the first and second consent points. Overall I consider that the SHP process was effective and robust. Generally appropriate and satisfactory evidence was provided for each criteria and the Assurance function concurrence gave confidence in the independent controls relating to HP release.

### **3. Comparison of Current Position to Expectations at the First Consent Point**

My overall view is that that the current position is close to the position expected at the first consent point. However it will need to increase resourcing in key areas to match activities required for, and permissioned by, the first consent point. This will include both consideration of NNB GenCo's readiness for post-permissioned construction activities; and for key activities running in parallel. Key areas of particular interest are:

- Continued increase in Assurance function resource in key specialist areas;
- Effective DA IC role and surveillance of the RD – to support the lean Assurance model; this is likely to be enabled by the Owner's Engineering function being fully effective;
- Development of the OL tools and processes to make them suitable for large scale on-site activities;
- Readiness of procurement and supply chain management processes.

### **4. Recommendations**

There are no recommendations arising from this report. All areas for future interest and monitoring identified are encompassed by the existing intervention plans to the second consent point in 2016.

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### LIST OF ABBREVIATIONS

AF	Assessment Finding
ALARP	As low as is reasonably practicable
BC	Business Collaborator
BDR	Basic Design Reference
BSL	Basic Safety level (in SAPs)
BSO	Basic Safety Objective (in SAPs)
BMS	(ONR) How2 Business Management System
C&I	Control and Instrumentation
CSJ	Construction Safety Justification
DA	Design Authority
DMT	Document Management Team
ECI	Early Contractor Involvement
FA3	Flamanville 3
FID	Financial Investment Decision
FIDD	Financial Investment Decision Date
FIDIC	Federation Internationale Des Ingenieurs-Conseils
HIC	High Integrity Component
HSE	Health and Safety Executive
IACO	Independent Assessment Challenge and Oversight
IAEA	International Atomic Energy Agency
IC	Intelligent Customer
IMS	Integrated Management System
ITA	Independent Technical Assessment
ITPIA	Independent Third Party Inspection Agency
IWS	Integrated Work Schedule
KM	Knowledge Management
LC	Licence Condition
LRQA	Lloyds Register Quality Assurance
MDT	Multi-Disciplinary Team
MoC	Management of Change
NCFSI	Non-conformance, Counterfeit, Fraudulent, Suspected Item
NEC	New Engineering Contract
NSC	Nuclear Safety Committee
OC	Organisational Capability
OE	Owner's Engineering
OLIM	Organisation Learning and Incident Management

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ONR	Office for Nuclear Regulation
PCER	Pre-construction Environment Report
PCSR	Pre-construction Safety Report
PDD	Project Definition Document
PEP	Project Execution Plan
PID	Project Initiation Document
PM	Project Management
PSA	Probabilistic Safety Assessment
PSR	Preliminary Safety Report
QA	Quality Assurance
QM	Quality Management
RC	Reference Configuration
RD	Responsible Designer
RGP	Relevant Good Practice
RPV	Reactor Pressure Vessel
SAP	Safety Assessment Principle(s) (HSE)
SFAIRP	So far as is reasonably practicable
SG	Steam Generator
SHP	Shadow Hold Point
SSC	System, Structure and Component
TAG	Technical Assessment Guide(s) (ONR)
TSC	Technical Support Contractor
UI	User Inspection
WENRA	Western European Nuclear Regulators' Association

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**Table(s)**

Table 1: Relevant Safety Assessment Principles Considered During the Assessment

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### 1 INTRODUCTION

#### 1.1 Background

1. This report presents the assessment and intervention findings for the first project convergence point of the construction phase of the Hinkley Point C project for the overall Organisational Capability cornerstone theme. Convergence points are milestones in the Hinkley Point C project at which ONR records its collective judgement of the performance of NNB GenCo's and its readiness to proceed with the project as outlined in ONR's Construction Intervention Strategy for the UK EPR™ (Refs 1 & 2). It should be noted that this 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 licensee 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 at the start of the construction phase. This first convergence point will not permission or constrain any activities in respect of NNB GenCo and Hinkley Point C.
2. In its role as Owner, Licensee and Intelligent Customer for the Hinkley Point C project, NNB GenCo has presented its Management Expectation Document (Ref. 3) and supporting documentation (Refs 4 to 7) covering its acceptance strategy for the first project convergence point. The aim of these documents is to demonstrate that NNB GenCo understands the content, completeness and robustness of the design Reference Configuration 1 (RC1 and RC1.1) at the start of the detailed design phase of the HPC project. These reports (Refs 3 to 7) form part of an evidence pack to support its claim to have completed these acceptance activities.
3. This progress is one of four cornerstone summary progress reports presenting ONR's collective view of the adequacy of NNB GenCo's performance and development as a licensee in the following three areas:
  - Design and safety case, including the acceptability of Reference Configuration 1 (RC1), NNB GenCo's readiness for full LC20 arrangements, and an assessment of progress on its timely production of Construction Safety Justification (CSJ-01) and Pre-Construction Safety Report (PCSR-3);
  - Organisational capability, covering the development of NNB GenCo as a capable and competent licensee in its current state and its development towards readiness for start of construction;
  - Licence Compliance, including the development and status of NNB GenCo licence condition compliance arrangements and its implementation of the Nuclear Site Licence forward work plan
  - Security, Conventional and Fire Safety, covering the development of NNB GenCo's arrangements to meet national security requirements, and for conventional and fire safety issues related to both the design and on-site activities.

#### 1.2 Scope

4. This report on Organisational Capability complements the other cornerstone reports to give ONR's overall view on progress to date. It is based on the progress reports that cover the individual OC workstreams:

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- D1 Design Authority
- D2 Knowledge Management
- D3 Organisational Development and Management of Change
- D4 Project Management
- D5 Internal Regulator Capability
- D6 Governance
- D7 Nuclear Safety Culture
- D8 Intelligent Customer
- D9 Organisational Learning
- D10 Engineering Directorate
- D11 Integrated Management Systems (IMS)
- D12 Documents, Records, Authorities and Certificates
- D13 Quality Management
- D14 Procurement/Supply Chain
- D15 Supplier Audit & Manufacturing Inspection

5. It also covers the workstream C9 on Training and Competence. The individual workstream progress assessments cover the position from Licensing in 2012 to mid-October 2014 and this report focusses on providing a view on the position at mid-October. This summary also uses insights from the safety case and licence compliance workstreams (B1-24 and C1-13)

### 1.3 Methodology

6. The assessment was undertaken in accordance with the requirements of the Office for Nuclear Regulation (ONR) How2 Business Management System (BMS) procedure PI/FWD (Ref. 8). The ONR Safety Assessment Principles (SAP) (Ref. 9), together with supporting Technical Assessment Guides (TAG), (Ref. 10) have been used as the basis for this assessment.
7. This assessment has been focussed primarily on:
- developments in NNB GenCo's Organisational Capability development since licensing;
  - consideration of the NNB GenCo's Shadow Hold Point process as related to aspects of Organisational Capability;
  - the current state of progress within NNB GenCo of its overall Organisational Capability against ONR's expectations for the topic at the First Consent Point
8. This report provides my 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.

### 1.4 Structure of Report

9. The structure of the report is as follows. In Section 2, the strategy adopted for this Organisational Capability assessment is set out. Section 3 summarises the position at Licensing in December 2012 for this workstream as well as key developments that have occurred since then up to autumn 2014. My assessment of these developments and the current position is presented in Section 4. My conclusions and recommendations are presented in Section 5.

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### 2 ASSESSMENT STRATEGY

10. The intended assessment strategy for Organisational Capability is set out in this section. This identifies the scope of the assessment and the standards and criteria that have been applied. It contributes to, and is consistent with the overall HPC assessment strategies and guidance (Refs 1 & 2). The assessment has been based on the individual workstream progress assessments that have been informed by the following interventions:

- Routine Level 4 topic meetings;
- Dedicated interventions into particular topics;
- Cross-cutting interventions;
- Assessment of key documentation.

11. I have also sought information from my colleagues and their individual workstream progress reports to help build up the overall judgements in this assessment.

#### 2.1 Standards and Criteria

12. The relevant standards and criteria adopted within this assessment are principally the Safety Assessment Principles (SAP), Ref. 9, internal ONR Technical Assessment Guides (TAG), Ref. 10, relevant national and international standards and relevant good practice informed from existing practices adopted on UK nuclear licensed sites. The key SAPs and relevant TAGs are detailed within this section. National and international standards and guidance have been referenced where appropriate within the assessment report. Relevant good practice, where applicable, has also been cited within the body of the assessment.

#### 2.2 Safety Assessment Principles

13. The key SAPs applied within the assessment are included within Table 1 of this report.

##### 2.2.1 Technical Assessment Guides

14. The following Technical Assessment Guides have been used as part of this assessment (Ref. 10):

- NS-INSP-GD-017 LC17 Management Systems (Revision 02).
- T/AST/027 Training and assuring personnel competence
- NS-TAST-GD-033 Licensee Management of Records
- NS-TAST-GD-048 Organisational Capability Rev 4, March 2013
- NS-TAST-GD-049 Licensee use of contractors, and intelligent customer capability
- NS-TAST-GD-065 Function and Content of the Nuclear Baseline Rev 2, May 2013
- NS-TAST-GD-072 Function and Content of a Safety Management Prospectus
- NS-TAST-GD-077 Procurement of Nuclear Safety Related Items or Services
- NS-TAST-GD-079 Licensee Design Authority Capability
- NS-TAST-GD-080 Nuclear Safety Advice and Challenge
- NS-INSP-GD-017 'LC17 Management Systems (Revision 02).

##### 2.2.2 National and International Standards and Guidance

15. The following international standards and guidance have been used as part of this assessment (Refs 11 and 12):

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- Western European Nuclear Regulators' Association. Reactor Harmonization Group. WENRA Reactor Reference Safety Levels
  - GS-R-3 'The Management System for Facilities and Activities Safety Requirements';
  - GS-G-3.1 'Application of the Management System for Facilities and Activities';
  - GS-G-3.5 'The Management System for Nuclear Installations Safety Guide';
  - Maintaining the Design Integrity of Nuclear Installations throughout their Operating Life. INSAG 19. IAEA
  - IAEA-TECDOC-1510, Knowledge Management for Nuclear Industry Operating Organisations, October 2006
16. Management System Requirements
- BS-EN-ISO 9001:2008 'Quality Management Systems – Requirements';
  - BS EN ISO 14001:2004 'Environmental Management Systems - Requirements';
  - BS OHSAS 18001 'Safety Management Systems – Requirements'
  - PAS99:2012 'Specification of common management system requirements as a framework for integration
17. The Technical Assessment Guide T/AST/033 incorporates the key aspects of these standards.

### **2.3 Use of Technical Support Contractors**

18. No technical support contractors have been used in this assessment.

### **2.4 Integration with Other Assessment Topics**

19. This progress assessment has been based on inputs from all the Organisational Capability workstreams (D1-D15) and from many of the safety case and licence compliance workstreams. These workstreams have all been in a position to gain insights into aspects of NNB GenCo's Organisational Capability and I have used both the workstream progress reports and discussion with my colleagues to help form my overall judgements.

### **2.5 Out of Scope Items**

20. There are no out of scope items.

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### 3 POSITION AT LICENSING AND SIGNIFICANT DEVELOPMENTS

#### 3.1 Position at Licensing

21. The position at Licensing on the key aspects of NNB GenCo's Organisational Capability is given in Refs. 13-16. This can be briefly summarised as follows.
22. LC 36 Organisational Capability – NNB GenCo had demonstrated that its arrangements for compliance with Licence Condition 36 in respect of providing and maintaining adequate financial and human resources, and control of changes to its organisational structure which may affect safety, have the essential elements for demonstrating organisational capability as defined in Safety Assessment Principle MS.2 'Capable Organisation' and Technical Assessment Guides T/AST/048, and T/AST/065, and the international standard GS-R-3 'The Management System for Facilities and Activities' (see Refs. 9 and 10).
23. NNB GenCo's organisational capability and associated arrangements had adequately addressed the requirements of paragraphs 65 to 69, 72 to 83, and 98 of ONR guide 'Licensing Nuclear Installations', and other relevant standards. This included consideration of:
  - Governance arrangements
  - Organisational structure
  - Nuclear safety advice and challenge
  - Intelligent customer capability
  - Design Authority
24. Additionally arrangements for other key aspects of Organisational Capability were deemed adequate for Licensing with satisfactory plans for continued development. This included:
  - Arrangements for training and competence assurance – for LC10 compliance and to match the expectations of TAG T/AST/027 Training and assuring personnel competence (Ref. 10)
  - Arrangements for compliance with LC12 'Duly Authorised and Other Suitably Qualified and Experienced Persons' (Ref. 10).

#### 3.2 Significant Developments since Licensing

25. Since Licensing there has been significant development and growth of NNB GenCo's organisation to match the HPC project demands, and to prepare for the start of the major construction phase. Notable developments have included:
  - Growth of the Assurance function – the Internal Regulator IACO and ITA teams
  - Re-organisation of NNB GenCo in preparedness for project delivery
  - Expansion of the HPC site team to match the early preparatory site activities
  - Progression of the design and safety case to establish a clear reference design for the HPC EPR
  - Early contractor interactions – to establish relationships and develop detailed plans for construction and commissioning – building in learning from FA3 and major construction projects
  - The expansion of the Engineering organisation to establish a clear project management team and creation of Owners Engineering team
  - Development of detailed project management approach – matrix Area and Works programmes

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### **Significant Changes**

26. Significant changes have been subject to NNB GenCo's Management of Change arrangements (Ref 33). This has included two significant (Category A) changes to its organisation in 2013:
- Enactment of the HPC Project Execution Plan (PEP) (Ref. 20), which is on-going; and
  - re-alignment of the organisation with financial investment requirements (Ref. 21) - essentially constraining the development of the organisation due to the delay in the financial investment decision (FID) and focussing its activities on consolidation of the HPC design and supporting safety case development.
27. The delay in the anticipated FIDD also led to the temporary closure of the HPC site with re-mobilisation to continue preparatory works resuming in March 2014.
28. The HPC PEP has included a number of subordinate organisational changes, including:
- introduction of matrix working, through multi-disciplinary teams (MDTs) led by project and programme managers in the Pre-Construction Planning Directorate;
  - realignment of activities between the Design Authority (nuclear safety design acceptance) and the Engineering Directorate (design process ownership); and
  - introduction of a Quality Assurance Directorate.
29. NNB GenCo has published a structure for the MDTs (aligned to the programme / project structure) and established MDTs for the site enabling works programme. The realignment of activities between the Design Authority and Engineering Directorate is proceeding more slowly than originally anticipated but is following a controlled process of updates to relevant procedures; build-up of competent resource in the Owner's Engineering team and handover readiness checks. Introduction of the Quality Assurance Directorate is the least well developed aspect of the PEP and (as at October 2014) the MOC documentation was in the process of internal approval.
30. The financial realignment was implemented in September 2013 and entailed a significant reduction in the size of NNB GenCo's organisation, mainly non-embedded contractors, linked to the postponement of site construction activities.
31. In October 2013 the UK government and EDF announced that it had reached commercial agreement on the key terms of the proposed investment contract for HPC. As part of this, EDF announced its intention to deconsolidate the HPC project, i.e. that it would no longer be the majority equity partner. This may entail further organisational change (as yet undefined) depending on the intentions of the new minority partners - AREVA, China General Nuclear Corporation (CGN), China National Nuclear Corporation (CNNC) and others.
32. In 2014 NNB GenCo commenced work to update its resourcing strategy, nuclear baseline and vulnerability analysis. The update to the resourcing strategy comprises an analysis of resource demand over the project lifecycle and associated supply 'pipelines', e.g. recruitment, secondment etc. NNB GenCo also updated its management of change procedure (NNB-HRE-PRO-000001) in 2014.

### **Other notable points**

33. Since licensing in August 2012 NNB GenCo has evolved its relationship with its Responsible Designer (RD), namely the relevant parts of EDF SA involved in the design, safety case production, and wider project support. This has allowed NNB

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GenCo and the RD to clarify roles, responsibilities and ways of working. Due to the major role the RD has in the HPC project the effectiveness of this relationship is important to the overall success of the HPC project, including assurance of safety in all phases of the project.

34. NNB GenCo has undertaken a considerable degree of early contractor engagement (ECI<sup>\*\*</sup>) both to develop relationships with potential major partners and also to supply chain bring experience of other major contracts, including experience of the Flamanville 3 (FA3) construction. This engagement has provided useful inputs into construction planning and management arrangements.
35. The delay in FIDD has created considerable challenges for NNB GenCo particularly for maintaining momentum during a period of considerable uncertainty. The challenges have included:
  - Maintaining high levels of competence in the organisation whilst constraining its size;
  - Ensuring it maintains a proper focus on nuclear safety during changes
  - Planning for future resourcing
  - Constraining and temporarily stopping activities until judge appropriate e.g. site activities, and planned ECI activities
36. There have been a variety of key audits to judge the state of readiness of the project. These have included major audits by EDF SA and an independent review in 2013 commissioned by the HPC project director to provide assurance and expert insights into the state of readiness of the HPC project
37. The period since Licensing has allowed ONR to monitor and engage with NNB GenCo as it has developed and expanded its organisation in the period. It has allowed ONR to gather evidence of the effectiveness of the arrangements and plans put in place at Licensing.
38. The delay in FID has meant that NNB GenCo has focussed on consolidating the design and safety case prior to commencement of construction. This has limited the development of many parts of the NNB GenCo organisation so necessarily it limits the scope of ONR's assessment of NNB GenCo.

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<sup>\*\*</sup> ECI = Early contractor involvement

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### 4 ONR ASSESSMENT

#### 4.1 Scope of Assessment Undertaken

39. The scope of the assessment covers three main areas:

- developments in this NNB GenCo's overall organisational capability since licensing;
- consideration of the NNB GenCo's Shadow Hold Point process as related to aspects of organisational capability;
- the current state of progress of NNB GenCo's organisational capability against ONR's expectations for the topic at the First Consent Point

40. It is one of the four main cornerstone areas identified in section 1.1 Design and safety case; Organisational Capability; License Compliance; and Security that collectively give ONR's overall judgements on NNB GenCo at this point of the HPC project.

41. This assessment is limited to consideration of the general level of NNB GenCo's organisational capability and their potential impact on nuclear safety and how well they match ONR's expectations from the relevant SAPs and TAGs (Refs. (9 and 10). Technical issues relating to either the design and safety case, or license compliance are considered in the respective cornerstone reports.

#### 4.2 Assessment of developments since Licensing

42. This sub-section provides a summary of the individual OC workstreams based on each of the individual workstream progress reports. I have grouped them into the following three themes:

- Key nuclear safety topics
- Organisational Capability Development & Knowledge Management
- Procurement and Supply Chain

Section 4.3 then provides a summary of the overall position including commentary on notable strengths and areas of future interest for ONR's engagement with NNB GenCo.

##### 4.2.1 Key Nuclear Safety Topics

43. This sub-section summarises the findings from the workstreams that cover key nuclear safety aspects explicitly identified in the TAGS (see section 2.2.1). There are key expectations on:

- Nuclear safety advice and challenge
- Licensee design authority capability
- Intelligent customer capability
- Nuclear safety culture

44. These aspects are essential foundations for a licensee to ensure adequate control over all phases of project activity from design through to construction, commissioning and operation.

##### *Internal Regulator*

45. My assessment of the 'Internal Regulator' has been based on specific Level 4 interactions with NNB GenCo on development and activities undertaken by Assurance function's IACO and ITA teams, including examination of procedures and review of a

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selection of IACO and ITA assessments undertaken. It has also been based information gained from other workstreams, and close consultation with my colleagues in the safety case workstreams and site inspector. They have undertaken specific consideration of IC capability in their own workstreams and I have used this to inform my own overall judgements.

46. The IACO programme of planned assessments is clearly well conceived and aims to examine all key active parts of the business. It has included license compliance, safety issues, MoCs, and Shadow Hold Point concurrence activities. The IACO team has matched the anticipated programme of assessments for 2014 to the current time.
47. All of the IACO assessments I and colleagues have reviewed are detailed, insightful and have clearly been instrumental in helping to evolve and improve key processes. Observations and Areas for Improvement are clearly identified and progressed; they are included, and tracked in the OLIM system. Additionally the IACO presence at site has undertaken considerable assessment work; playing a clear contribution to safety at the HPC site.
48. ITA has been resource limited for a considerable period; despite this it has undertaken a considerable level of technical assessment of DA and RD activities, processes and safety significant issues. I judge that the ITA programme has clearly focussed on key technical issues that pose safety significant challenges and project risks (e.g. diversity, classification, HVAC<sup>††</sup>).
49. My review of significant ITA assessments of the BDR and RC1 acceptance process – of high quality, have probed key aspects of both process and technical details; key findings raise similar issues to those stemming from ONR's design and safety case workstreams. Information from safety case colleagues supports this judgement on the quality of ITA assessments.
50. The ITA team has been strengthened to include specialist competence in key areas (notably Civil engineering, C&I, and marine engineering) for the Construction Safety Justifications (CSJs) and PCSR3. This should allow them to undertake a wider range of detailed technical assessments. A notable area that remains to be strengthened is Structural Integrity; additionally the ITA function needs to encompass the Human Factors work that will increase to PCSR3 and the second formal consent point.
51. My overall judgement is that the ITA function has and is performing its role well. It has been significantly limited due to the size of the team but this has progressed considerably to the current position. The increase in resource and wider expertise will allow it to provide probing technical challenge into key areas – particularly civil engineering area which is important for CSJs and to support early construction activities.
52. The IACO and ITA teams have now reached their planned resource and skills profile for this point – and have a steady increase in resource planned to the end of 2015. The resource is currently reliant on several short term contractors though it is envisaged that this will change to a more robust long term arrangement.
53. I consider that the acceptability of NNB GenCo's 'lean' model for the internal regulator is in large part dependent on the DA in demonstrating an acceptable level of oversight, advice and challenge over the design and safety, particularly for activities undertaken by the RD and its suppliers. At this point I consider that further confidence is needed to underpin this model, primarily over the performance and resourcing within the DA.

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<sup>††</sup> HVAC = Heating, Ventilation and Air-conditioning

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54. Overall I consider that the IACO and ITA functions have demonstrated a high level of effectiveness and competence of to date given their resource constraints until the current position. This provides a key part of the independent nuclear safety advice and challenge expected from a licensee.

### ***Design Authority***

55. The DA has a key role in assuring nuclear safety during all phases on the HPC project; and the expected capabilities of a DA are given in both ONR and IAEA guidance (Ref 10 and 12). The DA forms a key part of NNB GenCo's nuclear safety advice and challenge function; and plays a key role in providing IC capability over the RD's extensive role in the development of the design and safety case.
56. The safety case workstreams provide a more detailed consideration of many elements of the DA and the processes it plays a key role in. I have used information from my colleagues, my own interventions and examinations, and my examination of the Safety Directorate's ITA reviews of BDR, RC1 and Shadow Hold Point (SHP) concurrences to form the following overall view:
- The DA is staffed with a combination of very experienced nuclear professional staff and younger, technically competent staff that collectively form an effective DA capability;
  - It has demonstrated that the processes and DA engagement with the RD have been satisfactory to deliver the major design configuration milestone RC1 with a satisfactory level of oversight over the RD;
  - There appear to be a small number of specialist areas where the DA resources are challenged in providing sufficient oversight, especially for areas where there are significant technical issues still to resolve – notably C&I, Internal Hazards, Equipment Qualification and Human Factors.
57. The DA has benefitted from secondments between NNB GenCo and its RD; and the inclusion of experienced EDF SA with experience of RD and French fleet. This strengthens the understanding within DA of both the EPR design and RD processes and capability. I regard this as a considerable strength in enabling the DA to fulfil its DA IC role
58. I note that both ITA assessments and internal reviews have identified areas where processes should be improved to provide more effective oversight of the RD activities – and that these are being addressed. This evidence of continuous improvement should lead to enhanced DA and OE oversight of RD and supply chain activities.
59. I note that the ITA reviews of BDR and RC1 acceptance indicate the DA is performing well; this is further supported by views expressed by ONR safety case workstreams.
60. I consider that post-FID there are the following vulnerabilities and challenges:
- The competence of some technical disciplines in the DA is dependent on key experienced individuals either providing support to less experienced staff, or as singletons – consequently this creates a potential vulnerability. I note that NNB GenCo has contingency plans to address such vulnerabilities;
  - There is a general challenge to increase resources in the DA and particularly OE to match the future schedule. Making the OE fully effective will be important to allow the DA to focus on its own specific role and reduce the burden on it;

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- Effective oversight by the DA over RD and the supply chain on nuclear safety is important to underpin the 'lean' model of internal regulator adopted by NNB GenCo.
61. My overall judgement is that the DA is technical competence and is generally providing an effective design authority role, and adequate control over the RD's nuclear safety related activities. There are a limited number of areas that are likely to required strengthening.

### ***Governance – Nuclear Safety Committee***

62. The focus of my assessment has been on NNB GenCo's NSC. Based on interventions in 2014, including observation of an NSC, I judge the committee to be functioning effectively, providing appropriate challenge and insight on nuclear safety matters. It has considered several significant safety issues and its views appear well founded and match ONR's expectations. Its membership includes UK and French independent members with very extensive experience of both UK and French PWR operating and safety case practices.
63. The NSC processes are being refined following self-assessment reviews; this is evidence of continual learning and improvement to match the project needs. The NSC conduct and processes have been satisfactory to date and provide a key element of nuclear safety advice and challenge within NNB GenCo. The increase in project activity post-FID may require some evolution of the NSC to match the likely increase in project pace.

### ***Governance general***

64. The overall governance arrangements are described in the HPC project manual (Ref. 26). Key committees include:
- The HPC project board and HPC lead team
  - MODEM (Monitoring and Decision Making) on proposed design and manufacturing issues and changes
  - Change committee
  - Project Review Meeting
  - PRODEM (Procurement Decision making)
  - DACC (Design Assurance Coordination Committee)
  - Hold Point Panel
  - Nuclear Safety Committee
65. Since licensing, NNB GenCo has implemented the HPC Project Execution Plan which introduced four new executive committees - the HPC Project Board, Operational Development Committee, Integrated Management System Committee and Skills Committee. I judge this to be a positive development and will use future interventions to assess their functioning and impact in practice.
66. NNB GenCo has been operating several key governance processes including those shown above. Information from ONR interventions across a wide range of workstreams indicates that these are performing satisfactorily. The Shadow Hold Point process has been an opportunity to gain evidence on the performance of the HPP and hold point process. This is considered further in this report (section 4.4) and in the License Compliance cornerstone report.
67. NNB GenCo's project director commissioned an independent a project readiness review in 2013 which I consider to be a good practice. This provides further confirmation of the adequacy of the current governance.

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68. NNB GenCo is revitalising its risk management processes. Also, NNB GenCo has maintained its company manual, management systems manual and delegation of authority manual up-to-date with changes since 2012. NNB GenCo has however chosen not to update its management prospectus as it considers that its governance arrangements are adequately represented in the revised company manual.
69. My overall judgement is that NNB GenCo has established effective governance arrangements to match the current phase of the project; and that these arrangements are working satisfactorily.

### ***Intelligent Customer capability***

70. NNB GenCo has established a clear approach for ensuring staff are aware of IC expectations and those with key explicit IC roles are adequately competent and are aware of their responsibilities. I note the following key features that contribute to this:
- The nuclear baseline
  - Revision of the role and training profiles – setting the level for an IC role to be at Level 3 in the competence framework and more clearly defining the relevant knowledge, experience and skills required
  - A focus on ensuring that competence assessments are being completed and monthly metrics are being used to ensure all parts of the NNB GenCo organisation reach an acceptable level of completion
  - IC expectations are included in foundation training for staff and more detailed training has been provided for those with explicit IC roles on the nuclear baseline.
71. The project delivery approach via MDTs creates requirements to ensure that there are clear processes for ensuring that IC requirements and roles are established for each phase of a discrete project. NNB GenCo has established clear processes for IC oversight of contractors and suppliers. Notable procedures include:
- Conduct Project Initiation, NNB-PCP-PRO-000204
  - Project Brief, NNB-PCP-PRO-000497
  - Project Definition Document, NNB-PCP-PRO-000498
  - Project Quality Plan template (NNB-PCP-TEM-000509)
72. Within the MDTs the project manager has the overall responsibility for ensuring that a project MDT has the necessary composition to fulfil its IC roles at each stage of the project. I note that project managers have IC practitioner in their set of required competences and receive training on IC expectations.
73. I consider that NNB GenCo has established satisfactory arrangements for ensuring individuals with specific IC roles are appropriately competent and aware of their IC role.
74. NNB GenCo has established many processes within its overall IMS that enable and ensure that it undertakes adequate IC control over its contractors and suppliers. In addition to the key processes identified in section 4.2.1. above, ONR interventions across many workstreams have examined key processes relating to:
- Design requirements specification, design review and acceptance from the RD
  - Procurement and supply chain management (see workstream D14)
  - Manufacturing inspection (see workstream D15)
  - Incorporation of modifications into the HPC design

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75. I consider that NNB GenCo appears to have developed an extensive set of procedures to enable it to adequately discharge its IC role. To date the effectiveness of these procedures have not been fully tested; the main areas that have been related to the design and safety case development. Many workstreams e.g. Procurement and Supply Chain (D14); Structural Integrity (B17) indicate positive IC processes and implementation over key procurement and supply chain activities. Concerns have been identified on the current IC capability position for a limited number of areas within the DA (see section above). These are C&I, Internal Hazards, Equipment Qualification and Human Factors C&I
76. The main areas of nuclear safety significant activity since Licensing have been on:
- development and consolidation of the UK EPR design via BDR<sup>##</sup> to the RC1 configuration
  - development of the safety case notably addressing GDA Assessment Findings (AFs) and incorporation of modifications
77. This has provided considerable evidence on the performance of NNB GenCo's IC arrangements that cover these activities. From ONR assessment of these activities, along with on-going dialogue with my colleagues, I judge that:
- NNB GenCo has established effective processes to implement an appropriate level of IC control over the design and safety case development processes;
  - It has generally provided an appropriate level of competent resource to undertake the key IC activities however there are a limited number of specific discipline areas where the resourcing, primarily within the DA, appears to be inadequate to be fully effective.
78. I expect NNB GenCo will continue to develop its IC capability post-FID to extend to the increase in activity and expansion of the organisation to match the project activities. This will use the basic arrangements that have been put in place to date.

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

79. NNB GenCo's expectations on nuclear safety are set from the top, through its nuclear safety policy, and implemented via a strategy which focuses on nuclear construction excellence. The strategy includes engagement with the supply chain on nuclear safety through a safety culture maturity assessment which will inform continual improvement plans.
80. NNB GenCo has made positive developments in its nuclear safety culture since granting of the HPC nuclear site licence. NNB GenCo has focussed its efforts towards construction with a clear and compelling strapline 'Safety and quality today - nuclear safety for a lifetime'. Beneath this it has established the behaviours it expects of managers, supervisors and frontline construction workers and is reinforcing this through deployment of trained coaches. As part of its five point safety culture development plan, NNB GenCo has run workshops with its earthworks and civils contractors (management teams) on nuclear construction excellence which received positive feedback and identified commitments for working together on the HPC site. It has also established a supervisors' forum to reinforce the importance of the supervisors' role. The conclusion of my assessment is that NNB GenCo has established a good nuclear safety culture, benefitting from the established nuclear safety culture of its parent organisation (EDF Energy), and put in place the foundations of a strong nuclear safety culture at the HPC site.

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<sup>##</sup> BDR = Basic Design Reference

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81. Internally NNB GenCo's culture has benefited from the predominance of nuclear-experienced EDF Energy and EDF SA secondees working on the project. NNB GenCo is also piloting leadership training in Q4 2014 aligned to its expectations on nuclear safety culture. I consider, however, that there is still more work for NNB GenCo to do to assess and develop its own nuclear safety culture, particularly for Qube-based personnel. NNB GenCo has not yet put in place nuclear safety culture development programmes across its organisation, equivalent to that for the HPC site. NNB GenCo's ACE<sup>§§</sup> nuclear team, chaired by the Safety Director, has played an important role in driving nuclear safety culture development, but (as at October 2014) did not yet have representation from all relevant departments, e.g. engineering and quality, which will have an increasingly important role to play in project delivery.
82. NNG GenCo has included a nuclear safety culture assessment in safety related (Class 1) contract placement and has established a quality working group with suppliers to understand common findings from NNB GenCo audits on quality and how to address them in a consistent way, which I consider good practice. Engagement with the RD however on nuclear safety culture remains at an early stage.
83. NNB GenCo's challenge is to maintain and enhance its nuclear safety culture as its organisation grows and project delivery pressures potentially increase. Whilst understandably focussing on the HPC site, NNB GenCo will also need to ensure that it maintains a healthy culture across all its functions, including its interactions with the RD (EDF SA's Nuclear Engineering Division).
84. The conclusion of my assessment is that NNB GenCo has established a good nuclear safety culture, benefitting from the established nuclear safety culture of its parent organisation (EDF Energy), and put in place the foundations of a strong nuclear safety culture at the HPC site.

### **Overall Nuclear Safety Summary**

85. I consider that NNB GenCo has established appropriate arrangements and capability to match ONR's expectations for nuclear safety advice and challenge. The key features are:
- The Design Authority has a high level of competence, and is generally providing satisfactory IC control over the RD and other supplier activities;
  - An NSC that is operating effectively
  - An Assurance function that is performing well and is now close to the necessary resource level.
86. I judge that NNB GenCo has established and is implementing satisfactory arrangements for ensuring an appropriate level of IC capability for all potentially safety related areas across the project.
87. NNB GenCo currently has a good safety culture and has taken very positive measures to develop a strong site safety culture. It is continuing to develop measures to further develop its safety culture and means to monitor the safety culture both at site and within the project team. It is also taking measures to ensure key supply chain partners also have a suitable safety culture.
88. I consider that the DA and Assurance will need to increase resource levels to match post-FIDD project demands, but are close to matching expected requirements for the first consent.

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<sup>§§</sup> ACE = Achieve Nuclear Construction Excellence

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89. The acceptability of NNB GenCo's 'lean' assurance model is dependent on evidence of continued satisfactory oversight of the supply chain (particularly the RD) by the DA, and this is likely to be in part dependent on OE becoming fully resourced and effective post-FIDD.

### 4.2.2 Organisational Capability Development & Knowledge Management

90. This sub-section summarises the findings from other workstreams that broader aspects of the development of NNB GenCo's organisational capability and knowledge management. There are key expectations on:

- Training and assuring personnel competence
- Licensee management of records
- Organisational capability – including adequacy of human resourcing and management of change
- The nuclear baseline
- Organisational learning

91. All of the workstreams in this section play an important part in ensuring NNB GenCo has the necessary capability to achieve a high level of nuclear safety. Procurement related workstreams are considered in section 4.2.3.

#### ***Organisational development and Management of Change***

##### *Management of Change*

92. ONR has assessed the Category A organisational changes relating to the PEP restructuring and financial realignment that constrained the project prior to FIDD. ONR also assessed the supporting documentation for these changes which was formally submitted in March and August 2013 respectively under NNB GenCo's LC36 compliance arrangements.
93. In the case of both the PEP and financial realignment changes, ONR considered (Refs 20 and 21) that NNB GenCo had presented an adequate case for the changes, subject to satisfactory implementation of the activities and actions identified in its implementation plans. ONR therefore concluded that the changes need not be subject to formal permissioning.
94. In the case of the PEP changes, ONR's assessment recommended that there should be follow-up interventions on:
- i. the subordinate organisational changes (to ensure that they do not degrade nuclear safety); and
  - ii. NNB GenCo's processes for independent monitoring and review of the change.
95. These aspects were addressed by ONR in routine Level 4 meetings during 2013 and 2014. In particular, ONR assessed (Ref 22) the restructuring of Design Authority and Engineering Directorate (itself a Category A change) and concluded that the licensee had made an adequate case for the change, which (as at October 2014) was in the process of implementation. As regards monitoring and review of the PEP changes, ONR found that NNB GenCo had adequate arrangements in place, including independent assessment by Safety Directorate. NNB GenCo plans to complete a post-implementation review of the PEP changes by 23 October 2014.

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96. ONR has undertaken similar monitoring of the financial re-organisation MoC and this has confirmed that NNB GenCo's arrangements for managing major changes are adequate. The post-implementation reviews have been satisfactory and the changes largely fully implemented. Demonstration of completion of this change is anticipated in October 2014.

### *Adequacy of resourcing*

97. The financial realignment MoC constrained many areas of planned organisational growth within NNB GenCo with a focus on design and safety case development. It also revised the nuclear baseline as part of the MoC. ONR has monitored NNB GenCo's resourcing against its baseline and this indicates a high overall percentage of filled 'red' and 'amber' posts (respectively 84% and 89% as at July 2014). However interventions by ONR in 2014 have indicated that there appear to be some resource 'pinch' points in NNB GenCo's organisation which are either constraining current activity or may constrain activity in the period post FID. In general ONR's monitoring across all the workstreams has not indicated any significant areas of under resource for the activities being undertaken.
98. NNB GenCo is undertaking a major resourcing exercise against the planned schedule of work throughout the project phases to start of operation. This baseline will help inform ONR's continued monitoring of resources post-FID. The delay in FID represents a continuing challenge to NNB GenCo in maintaining its organisational capability. This may become apparent in the period post FID when project activity accelerates and further demand is placed on critical skill groups. This will be an area of focus for ONR in future interventions in this workstream.
99. ONR has not so far assessed the adequacy of resources within the Responsible Designer's organisation, but I understand that this is a current focus area for NNB GenCo's Engineering Director. ONR will follow-up on this to test how NNB GenCo is assuring itself of the availability of necessary resources from DIN<sup>\*\*\*</sup> to support the HPC project post FID.

### *LC 36 compliance*

100. NNB GenCo updated its management of change procedure (Ref. 33) in 2014 and I am satisfied that this now adequately addresses ONR's expectations as per NS-TAST-GD-048 Revision 4 (Ref. 10). I am also broadly satisfied with NNB GenCo's application of LC36 compliance arrangements since licensing.
101. NNB GenCo has established the necessary human resources for this point in the project. They will inevitably need to increase post-FIDD to match the changing needs of the project phases.
102. There has been no explicit consideration of the adequacy of the financial arrangements by ONR since licence grant. However ONR notes the very extensive government department oversight of the financing arrangements of the HPC project.

### ***Training and Competence***

103. My overall assessment of the developments on training and competence management since licensing is that NNB GenCo has continued to extend its overall arrangements appropriately to match the expansion of the NNB GenCo organisation, including the site team. I note that expansions to the organisation have been predominantly by recruiting in individuals who are largely fully competent for their role – this has limited

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<sup>\*\*\*</sup> EDF SA Nuclear Engineering Division (Responsible Designer)

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training needs; training 'in post' is acceptable. The generation of new role and training profiles will need to continue to match the development of the project organisation during each phase.

104. NNB GenCo has substantially increased the completion of competence assessments and essential training across all functions in NNB GenCo (generally greater than 80). I judge that the metrics that have now been established provide an effective means on monitoring and managing training and competence assessments.
105. I judge that the HPC site team has demonstrated a pro-active and robust approach to ensuring site training and competence both within the NNB GenCo staff and contractor partners. Notable are the appointment of a site training manager – responsible for site training and competence arrangements.
106. I also note that key roles (e.g. on project management; construction; Design Authority and Owners Engineering) have been filled with highly experienced individuals bringing major construction project and nuclear (UK, French and wider international) experience with them. I regard this as an important strength in helping to establish the necessary levels of competence and intelligent customer capability into NNB GenCo.
107. Overall I consider that the training and competence arrangements and implementation to be satisfactory for this point in the project. They form a suitable basis for effective management of training and competence for the next phases of the project to at least the second formal consent point.

### ***Engineering***

108. My assessment has primarily focus on Owner's Engineering (OE) – the HPC site inspector is engaging with the site organisation. OE is intended to provide overall co-ordination of design and safety case activities by the RD including procurement and engineering. Other parts of the Engineering organisation are looked at in other sub-sections notably project management in the following sub-section.
109. My observations and judgements on OE are:
  - There has been a delay in developing OE to the anticipated position; recruitment has progressed more slowly than envisaged;
  - There is a structured process for orderly transfer of work from DA to OE as each part of OE is developed;
  - All processes with OE involvement have been established; these are being implemented progressively when all key requirements are in place;
  - I consider the OE to be a key part of NNB GenCo's organisation potentially providing a key co-ordination role for all of the detailed design development work undertaken by the RD; this should reduce the burden on the DA and allow it to function on its key role as guardians on nuclear safety.
110. The OE needs to have an effective organisation to undertake the very considerable design process activities that will be envisaged at and beyond the first consent point. At this point I consider that the OE needs to staff up to match the expected work it should be undertaking. Failure to achieve an effective OE is likely to place considerable additional demands on the DA and threaten its ability to perform its DA IC role adequately.

### ***Project Management***

111. NNB GenCo has established clear project management arrangements; this is evidenced in part by the Project and Construction manuals (Refs 26 and 29) which

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provide a key summary for staff information. Many parts of these arrangements and implementation of the PEP model are only now being implemented. Consequently there is limited evidence to date of effective implementation.

112. I consider that the PM procedures are being implemented where appropriate; this has included production of project definition documents (PDDs) for all current projects – PDDs back-fitted to pre-existing projects.
113. A key element of the project and programme delivery is the creation of appropriate MDTs. The initial programme and project MDTs are being established – key roles for nuclear safety include:
- The programme and project manager role responsible for ensuring an MDT is adequately comprised to fulfil its IC role;
  - Inclusion of appropriate DA specialists for all projects with nuclear safety significant aspects;
  - Inclusion of a quality person (when staffed up) to ensure quality requirements appropriately considered.
114. To date these PM arrangements are only recently being implemented, consequently there is limited use to be able to gauge full effectiveness. To date the early earthworks activities indicate that the arrangements are being effectively implemented.
115. In principal the PM arrangements appear satisfactory to address all necessary aspects of nuclear safety in each key project phase (design & safety case, procurement, construction etc.). This judgement will need to be confirmed as the arrangements are fully tested. Key areas of interest are:
- How the interactions between the programmes are co-ordinated and managed
  - The effectiveness of the process for resolving issues arising at site with nuclear safety relevance
  - The resourcing of the MDTs to ensure they provide an effective IC capability for all safety significant aspects of the discrete project delivery

### ***Organisational Learning***

116. My consideration of organisational learning has been based on SAP MS.4 on Learning (Table 1) and ONR's position statement on OL (Ref. 30) that has been shared with NNB GenCo. This looks for an organisation that has three components:
- Leadership and cultural aspects for learning in place
  - Diverse sources of learning identified and used
  - Learning opportunities realised through managed change
117. I consider NNB GenCo's decision in 2014 to establish a Steering Group on organisational learning, and carry out a thorough review of its approach to this topic, to be a positive one. The improvement priorities identified by the group align with the shortfalls in learning processes observed in ONR's interventions in March and May 2014.
118. NNB GenCo's work to develop a vision and strategy for organisational learning (and gain Board level endorsement of this) is welcome. The document shown to me - to be revised - aligns with ONR's expectations in focussing not just on the processes and tools for learning but also individuals' behaviours, starting with those at the top.
119. In interventions since 2012, I have also found evidence of a healthy approach to learning across NNB GenCo, for example:

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- Lesson learnt exercises, e.g. on early construction activities (11 kV / jetty boreholes / earthworks trial pits) and management of organisational change;
  - On-going staff secondment programme to and from EDF SA;
  - Early contractor involvement with potential major construction partners;
  - Recruitment of individuals who can bring learning from other large construction projects, e.g. the Olympics and Heathrow Terminal 5;
  - Incorporation of modifications from Flamanville 3 (FA3) in the HPC reference design configuration;
  - Challenge and insight provided by the independent members of the NSC;
  - Learning brought through contract organisations, e.g. SOFINEL; and
  - Strong engagement and pro-active role of departmental organisational learning champions.
120. I consider NNB GenCo's decision to establish a separate technical screening process for learning from EDF SA (and other sources) to be a positive development. However this process is at an early stage and has a backlog of FA3 learning reports to address.
121. NNB GenCo is taking a logical approach to its interface with contractors on organisational learning. However this work is also at an early stage and needs to match the planned ramp up in site activity, in particular the acceleration of civil construction works after Q1 2015. The HPC site has engaged strongly in the organisational learning process since re-opening and is using event reviews and screening to inform necessary corrective action and provide feedback to the workforce.
122. NNB GenCo has continued the development and implementation of its OLIM<sup>†††</sup> tool. It uses this tool as the main vehicle for capturing operational experience from all sources, as well as the primary means for recording and tracking findings from reviews including self-assessments, and Assurance function assessments. Consequently ONR regards that effectively implementation of OLIM is a key element to ensure many aspects of continued learning.
123. From ONR monitoring of the implementation of OLIM I judge that it is an effective process for its intended use; however there remain challenges that will need to be addressed:
- Ensuring full implementation of the tool across all parts of NNB GenCo
  - Ensuring OL tools and processes are developed to match the needs of major site activity
124. Overall I judge that NNB GenCo has embraced organisational learning, and has established very extensive means of seeking and adopting learning into the project from major internal nuclear and construction projects. The OLIM tool is an important vehicle for managing much of the detailed learning. It has developed to a position where it is operating effectively for current needs, however further development and wider implementation will be needed to match post-FID activities.

### ***Integrated Management Systems***

125. NNB GenCo has continued the development of its Integrated Management System (IMS) and IMS portal development and improvement is the responsibility of the business architect group. Procedures are developed as a joint collaboration between the functional expert assigned by the Process Owner, who provides the technical content, and a Business Process Architect who provides the process development expertise. Procedures are developed to a common standard in a process modelling tool, which ensures procedures integrate together correctly and enables linking to a

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<sup>†††</sup> OLIM = Organisational Learning and Non-Conformance Management

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library of requirements such as; standards, regulations and licence conditions among others. The develop procedures are published on the IMS Portal once formally reviewed and approved.

126. An IMS committee chaired by the project director is now well established and has been proactive in the production and improvement of the IMS processes.
127. The IMS portal has been populated with the completed processes to date and several initiatives are being implemented to improve the processes and their interface links. The IMS now has all necessary processes completed that are anticipated to be needed for the next construction phases on the project.
128. The project has changed document management data base in this phase from Business Collaborator to Documentum which is the tool that controls the native master documents and user documents. Documentum will also be used to hold lifetime record packages resulting from, project implementation and contracts associated with the procurement of plant items and services. The introduction of Documentum has been undergoing detailed implementation and has largely been completed.
129. An E-learning module accessible on the IMS portal was launched in May 2014; IMS training is mandatory for all staff following an IMS committee recommendation. Completion rates are now at the 80% plus levels with those that have not completed are being targeted via departmental heads.
130. An ISO 9001 Quality Management Systems second stage assessment has been carried out by Lloyds Register Quality Assurance (LRQA). Certification has been recommended by LRQA with positive feedback in the assessment closing meeting. The scope of the certification covers, "Develop and manage delivery of a fleet of safe, reliable new nuclear power stations". The schedule of locations include; Qube, Barnwood, HPC, SZC<sup>†††</sup>, Leiston Office and Mallard Court. Approval certificate (Ref 31). This provides additional independent evidence on the adequacy of the NNB GenCo's IMS.
131. Overall I consider that NNB Gen Co have established appropriate management system arrangements for the current stage of the project which will be an adequate basis for the first consent point. I expect NNB GenCo's integrated management system process arrangements to further improve by the time of the first consent point having applied the learning from their implementation, operational experience, and the completion of 'golden thread' assessment for higher level documents.

### ***Knowledge Management***

132. At the point of licensing ONR considered that NNB GenCo had a well-developed strategy and approach to Knowledge Management (KM), which should provide for knowledge to be extracted from the Responsible Designer (RD), captured and exchanged throughout the Design Authority (DA) (Ref 16). As at December 2012, NNB GenCo had developed a specification for a collection of social media tools in the DA (the 'KM Hub') by way of a pilot for the rest of the organisation. This work was under the direction of an appointed KM Lead (then the Nuclear Technology Manager).
133. I judge that NNB GenCo's decision in 2013 to focus on development of a wider KM strategy (rather than further development of the DA KM software tools) is appropriate to the current stage of the HPC project. The KM strategy enables NNB GenCo to

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<sup>†††</sup> SZC= Sizewell C

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establish its holistic approach to KM throughout the lifecycle of the HPC project of which social media tools (of the like those so far developed in DA) may be part of the solution.

134. The above approach aligns better with ONR's expectations for KM (as per the SAPs and TAGs) and international guidance (IAEA-TECDOC-1510, Ref. 12). For example, in addition to IT aspects, the KM strategy now addresses:
- Cultural aspects of KM, i.e. the need promote and reinforce positive behaviours in preserving and sharing knowledge, starting from the top;
  - External benchmarking, including with the RD and wider EDF group;
  - Engagement with the supply chain; and
  - The need for proper resourcing of KM activities, driven from the needs of each part of the organisation, with suitable measures of success.
135. The new KM strategy complements the capture of explicit knowledge in documents and records by addressing implicit and tacit knowledge. I consider it good practice that the KM strategy is being sponsored at senior level in NNB GenCo by the Pre-Operations Director, whose team will be one of the main future beneficiaries of an effective approach to KM.
136. The draft KM strategy has been shared with ONR and amended in the light of observations made. I consider it acceptable at this stage of the HPC project, pre financial investment decision (FID), that NNB GenCo's KM strategy is at draft stage.
137. ONR's assessment of KM in NNB GenCo overlaps with the workstream on organisational learning (see separate workstream progress report). Evidence from this workstream indicates NNB GenCo's attention to knowledge transfer, e.g.:
- the continuing use of staff secondments to and from EDF SA (expected to increase back to ca. 10% of NNB GenCo's organisation post FID);
  - recruitment of individuals with major construction project experience;
  - enhancement of quality of learning from FA3 via a new technical screening process led by the Head of Owner's Engineering; and
  - early contractor involvement, designed to capture learning from FA3 contractors in HPC project planning.
138. In a project readiness review commissioned by NNB GenCo in 2013 (Ref. 32), NNB GenCo identified an issue relating to data connectivity and configuration control among project partner organisations which is potentially a risk to KM requirements both during construction and later operational phases. NNB GenCo recognises this risk and is taking action to address it through project 'Boost'.
139. I conclude from my assessment that NNB GenCo's approach to KM is basically sound, having evolved from a 'bottom up' approach of development of pilot social media tools in the Design Authority to a 'top down' holistic KM strategy, embracing all parts of the organisation and the full project lifecycle.

### ***Documents, Records, Authorities and Certificates***

140. Quality management systems documents have been viewed during our level 4 interactions along with support guidance documents; I have found these to be adequate. Periodically these are updated to improve them generally in relation to implementation feedback and post assessment findings. Additionally higher level strategy documents have been produced for, documents and records, and for physical records/test peices. Over the next period up to the first permissioning point these will need to be developed and implemented.

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141. Production of a record schedule has started with a schedule being produced from the responsible designer for their scope of work. The development of the schedule to encompass other departments is being managed and facilitated by the document management team.
142. I consider that NNB Gen Co are making progress and have established appropriate management system arrangements for document, records, authorities and certificates for the current stage of the project.
143. The document management team (DMT) resource has been steady and I judge sufficient for the current project position. The DMT forms part of the engineering directorate organisation and is the responsibility of the engineering director. Currently NNB GenCo is considering outsourcing the document management resource. This will be an area for future monitoring; if the DMT is outsourced, an appropriate intelligent customer capability will need to be retained within the licensee organisation.
144. The project has changed a key document management data base in this phase from Business Collaborator to Documentum which controls corporate documents. The Engineering Plant and Facilities Management (EPFM) hold project documents. The migration to Documentum has experienced some issues. NNB GenCo has taken a serious proactive stance in dealing with these issues and satisfactory progress is being made.
145. The exchange mechanism that allows suppliers and EDF SA support groups to deliver documents to the project for uploading into Documentum is now live with test and trials being carried out uploading documents onto the system. A pilot study with one supplier, KIER-BAM, will access the system via the HPC site. The functionality of the up loader will undergo testing prior to access roll out to other contractors post contract placement.
146. I consider improvements have and will continue to be made in the period up to the first permissioning point. I consider improvements and their implementation on the project is looking more positive to that found in early 2014.
147. NNB GenCo has established a programme of internal and external assessment which I consider to be to be an important part of any quality management system particularly for large projects like HPC. An integrated work schedule identifies the main elements to be delivered up to mid 2015.
148. The internal assessments scheduled for Q4 2014 that will include document and records management are;
- LC06 SHP review carried out by the licensing group.
  - Self Assessment carried out by the document management group on themselves.
149. The document and records management processes and their implementation have been assessed by external organisations with minor actions being identified;
- Licensee Certificate – Assessment was carried out by Bureau Veritas (BV) and was an annual check to continue the phase 1 limited scope certification. One opportunity for improvement (OFI) was made on the associated resource and backlog of data recorded on the control system.
  - Quality management certification to BS EN ISO 9001-2008 - looks at Management systems processes and their implementation. Assessment was carried out by Lloyds Register Quality Assurance (LRQA). No findings were identified on document management.

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150. I expect NNB GenCo's documents, records, authorities and certificates management to further improve by the time of the first consent point having applied the learning from their shadow hold point arrangements. I expect key elements to be established for the first consent for example; record schedule, project process and tagging data for records.
151. Overall I consider that NNB Gen Co are making progress and have established appropriate management system arrangements for document, records, authorities and certificates for the current stage of the project.

### ***Overall Organisational Capability Development & Knowledge Management Summary***

152. I consider that NNB GenCo has established satisfactory MoC arrangements. It has implemented two very significant changes since licensing. These have generally been well implemented and managed, maintaining a strong focus on ensuring nuclear safety. A has maintained and updated an appropriate nuclear baseline to match the changes in the project. NNB GenCo has been appropriately resourced to this point for the activities undertaken.
153. On training & competence, I consider that NNB GenCo has established and is now effectively implementing arrangements to ensure staff are competent for roles and suitable training and development is provided. I consider the arrangements match the expectations for compliance with LC10 and also support LC12 compliance.
154. I judge that NNB GenCo has established appropriate project management arrangements; incorporating learning from FA3 and other nuclear and major construction projects. It has developed a suitable IMS that supports intended PM arrangements for each phase of project. There is limited experience to date to determine effectiveness of MDT approach – but I judge that in principle the approach appears appropriate and matches approaches used successfully on other major construction projects.
155. NNB GenCo has clearly sought to bring learning into the project in many ways. It has also established effective internal learning processes (e.g. self-assessments, IACO assessments). It also has developed plans for its KM strategy. Its OLIM tool is being used as a key main means of capturing and tracking learning. The OL tools and processes will require further development to match site needs when considerable site activities commence.
156. The position on Documents and Records is improving; I judge that NNB GenCo has established appropriate management systems for this point in the project.

### **4.2.3 Procurement & Supply Chain**

#### ***Quality Management***

157. NNB GenCo's overall approach for QM is summarised in the QM section of the Project Manual (Ref. 26). There is an overarching message of 'right first time' and the approach is to embed aspects of QM throughout the project processes. Key roles are identified:
- Project managers and MDT members – responsibly for establishing, maintaining and enacting a project quality plan

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- Quality director – responsible for the development and implementation of the QM arrangements
  - Head of QM arrangements – responsible for overseeing the development of the QM framework for the project
  - Head of Assurance – responsible for providing NNB GenCo senior staff with assurance that safety, health, environment and quality matters are appropriately dealt with (including compliance with relevant regulations and standards)
158. Since Licensing NNB GenCo has been reviewing and revising its approach to QM in response to concerns raised by ONR on the lack of clarity on establishing a clear 'golden thread' of quality across the project. NNB GenCo has recently shared their views on further development of its approach to QM following benchmark reviews with major projects including Flamanville 3, Crossrail, Olympic Park and Terminal 5. This has also included learning from notable quality related incidents in UK major projects. ONR is awaiting further information on the development and implementation of the revised arrangements.
159. To date ONR is satisfied that activities undertaken to date have given adequate attention to quality matters, however a more robust set of arrangements need to be established for the future phases of the project. This is a key area of ONR interest.

### ***Procurement/Supply Chain***

160. ONR have had routine engagements with NNB GenCo since Licensing. The engagements have continued to cover the development of NNB GenCo's procurement processes since licensing but have placed increased emphasis on the effectiveness of arrangements for SCM and the cross organisation activities aimed at ensuring NNB GenCo's supply chain delivers to the specified intent right first time.
161. ONR's assessment of NNB GenCo's arrangements can be summarised under the following key areas:
- Supply Chain Policy (SCP)
  - Supply Chain Engagement
  - Organisation & Capability
  - Contract Management and Procurement Process Development
162. NNB GenCo has developed their SCP (Ref. 34) during 2014. This sets out the principles and standards to be implemented to satisfy regulatory and commercial requirements from procurement, construction and commissioning through to commercial operations. The policy applies to all of the activities undertaken by NNB GenCo that effect the supply chain with regards to the design, specification, support and monitoring of health and safety, quality, environment, sustainability, security and operational requirements, the selection of suppliers, contract placement and contract management.
163. The SCP identifies NNB GenCo's objective to protect against Non-Conforming, Counterfeit, Fraudulent and Suspect Items (NCFSI) entering their supply chain. NNB GenCo have established awareness courses to highlight the risks of NCFSI since licensing and have targeted attendance of key staff (i.e. procurement staff, project managers and engineers). Their approach has been developed under influence from the ONR to demonstrate how they will mitigate the risks of NCFSI entering their supply chain at any level and learn from recent international nuclear industry experience on

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the issue (i.e. South Korean nuclear industry falsified cable records). I consider their approach appropriate and am satisfied that NNB GenCo plan to maintain a focus on mitigating the risks of NCFSI entering their supply chain.

164. I consider the endorsement of the policy in August 2014 as an important step in the development on NNB GenCo's supply chain management (SCM) arrangements. NNB GenCo has established a cross directorate team to drive implementation of the policy.
165. NNB GenCo has enhanced their engagement with their supply chain, both potential and provisional, since Licensing. They have held significant events in London, Paris and local to the HPC site to identify future commercial opportunities and highlight the high safety and quality standards required for all tiers of suppliers included in the project supply chain.
166. I consider this type of wider liaison, as part of a scheduled plan throughout the lifecycle of the project, an essential part of on-going engagement with the wider project supply chain and a key requirement if the project is to consistently communicate issues to, and receive feedback from its supply chain tiers on areas of risk that may impact nuclear safety.
167. NNB GenCo have identified that the commercial organisation, as currently resourced is not sufficient to meet the predicted SCM and procurement process demands of the project and as such NNB GenCo are examining resourcing options and developing a plan to address the capability challenges on a positive investment decision. NNB have identified that the resourcing plan will include ensuring an appropriate balance between permanent NNB staff and contracted resource.
168. The recruitment of the required capability is essential to effective SCM and procurement process success. The project will not conclude their resourcing plans until the final investment decision is taken as the decision could influence their potential resourcing options. I consider the Commercial Department's potential capability shortfalls an area of risk and while it is not currently impacting performance given the project delays. I will ensure that the issue is subject to on-going review as part of this work stream and the ONR's organisational capability work stream.
169. NNB GenCo have utilised delays in the project investment decision to review and enhance their contract templates removing anomalies between the NEC<sup>§§§</sup> & FIDIC<sup>\*\*\*\*</sup> contract types. They have adopted the CEMAR contract administration toolkit to manage contract risks that could impact safety, quality, time and cost.
170. NNB GenCo have implemented enhancements to their procurement processes since licensing to address findings from an independent review, security review and examination of process efficiency. Overall I am satisfied that NNB have established adequate management system arrangements to administer contracts and procure products and services.

### ***Supplier Audit and Inspection***

171. This covers two main areas:
  - Manufacturing Surveillance
  - High Integrity Components (HIC) and Conformity Assessment Services

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<sup>§§§</sup> NEC = New Engineering Contract

<sup>\*\*\*\*</sup> FIDIC = Federation Internationale Des Ingenieurs-Conseils

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172. The manufacturing team have been lead reviewers for supplier produced quality control documents. Documents have been reviewed and approved by the project prior to start of manufacture. Suppliers and NNB GenCo/CEIDRE<sup>††††</sup> have implemented their inspection commitments with objective evidence of compliance being found in the end of manufacturing reports for the phase completed.
173. The majority of the early long lead items forgings have been finished for the steam generator (SG) and the reactor pressure vessel (RPV) The Japan Steel Works forgings have been shipped to France with 80% of the interim manufacturing reports being reviewed and approved by NNB GenCo. Currently Creusot Forge end of manufacturing reports are being issued for review.
174. For the Balance of Plant (BOP) inspection work has been very much involved in the pre contract support phase with engagement with potential suppliers on manufacturing inspection interface, process and issues.
175. The manufacturing inspection team's role at the construction site has not been developed yet. When there is more clarity on this ONR consider a presentation be made to the wider ONR work stream and inspection groups.
176. I am satisfied that the inspection of manufactured parts produced by suppliers is being managed adequately by NNB GenCo. Going forward areas to be reviewed are; how identified issues or non-conformances are approved by the licensee and re inspected if required, the availability of resource for assessment and inspection of suppliers may be an issue post FID.
177. NNB GenCo conformity assessment services proposal with CEIDRE/EDF User Inspectorate (UI) are on-going; formal proposals and quality management systems changes have been received and are under review. The UI have been used on FA3 in this role and would be involved in non HIC components for pressure systems.
178. I am satisfied that HIC components are being inspected by the ITPIA and that there is objective evidence of this inspection. The management of independent inspection services is being carried out adequately by NNB GenCo.
179. My overall judgements on supplier audit and inspection are:
  - I consider that NNB Gen Co have established appropriate management system arrangements for supplier audit and inspection of suppliers for the current stage of the project.
  - I expect NNB GenCo's supplier audit and inspection process arrangements to further improve by the time of the first consent point having applied the learning from their arrangements.
  - NNB GenCo have sufficient capability to manage the project's for supplier audit and inspection process demands, however NNB GenCo have identified that they require enhanced resource capability to achieve their predicted supplier audit and inspection challenges.

### **Overall Procurement and Supply Chain Summary**

180. I judge that NNB GenCo has established a range of embedded arrangements across the project to deliver quality, however it has yet to develop a suitable set of overarching arrangements to ensure delivery of quality across the project. It has now determined its overall approach and in principle this seems to match ONR's expectations. ONR now expects that there will be rapid development and implementation of this approach.

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<sup>††††</sup> CEIDRE = Centre d'Expertise et d'Inspection dans les Domaines de la Realisation et de l'Exploitation

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181. NNB GenCo has established a satisfactory Supply Chain policy and management approach. The commercial organisation has been resource limited and post-FIDD this will need to increase to match the level of procurement activity.
182. I consider that NNB Gen Co has established appropriate management system arrangements for supplier audit and inspection of suppliers for the current stage of the project. The resourcing and capability will need to increase by the time of the first consent point having applied the learning from their arrangements.
183. Overall I consider that NNB GenCo has established all the key foundations for successful supply chain management post-FIDD; however the level of resource and the implementation of effective QM arrangements will need to increase considerably to match the needs of both the first and particularly second consent point.

### 4.3 Notable Strengths and Key Areas of Future Interest

184. This section highlights some noted 'strengths' and positive attributes of NNB GenCo's overall organisational capability relating to nuclear safety, and also points to some key areas of future ONR interest. All topics encompassed by this cornerstone report will continued to be monitored as part of ONR's overall intervention strategy for the HPC project (Ref. 1).

#### 4.3.1 Strengths

##### *Management of change and delay to FIDD*

185. NNB GenCo has faced considerable challenge from the extended delay to FIDD and the considerable uncertainty this has created. From ONR's interventions it appears that NNB GenCo has managed this period well, maintaining a strong focus on nuclear safety and essential IC capability.
186. It has taken considerable steps to engage with its staff, and to maintain potential 'reach back' to staff seconded out of the organisation due to the constraints. There has been an almost inevitable turnover of staff, but NNB has developed contingency plans and relationships for ensuring contractor support for key areas. It has maintained an acceptable overall level of capability for all the current active areas of the project.
187. The effective management of this period helps provide confidence in NNB GenCo's leadership and its ability to manage change, giving due attention to nuclear safety matters.

##### *Level of overall competence & nuclear safety culture*

188. The period since licensing has given ONR the opportunity across all workstreams to consider the levels of competence in NNB GenCo, and gauge its overall nuclear safety culture. As indicated in sub-sections 4.2. NNB GenCo has successfully achieved a high level of competence across all workstreams that contribute to the successful achievement of nuclear safety.
189. This level of competence stems largely from the recruitment of highly experienced nuclear, construction and project management professionals into NNB GenCo. This has brought a very considerable level of nuclear design and safety, and major project expertise into NNB GenCo. Most of these individuals are in influential leadership and line management roles and able to provide considerable support to less experienced

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staff. At this point NNB GenCo has achieved a high overall level of competence for the project activities.

190. Similarly NNB GenCo's nuclear safety culture has benefited considerable from this seeding in the organisation of staff from both EDF SA and EDF NGL. This has established a strong foundation for the development of a strong nuclear safety culture within NNB GenCo. It has built on this to create at this point firm foundations for a similarly strong nuclear safety culture on the HPC site.

### ***Learning***

191. Section 4.2. covers both organisational learning and knowledge management. NNB GenCo has undertaken considerable efforts to learn from major nuclear projects in the UK and internationally. This includes learning from the two main European EPR projects at FA3 in France and Okiluto 2 in Finland. The relationship with the RD and inclusion of major contract partners with experience in these projects assists considerably in securing effective learning from these projects. It has also sought to secure learning from successful major UK construction projects (e.g. Olympic Park, Terminal 5, and Crossrail).
192. Much of this learning is achieved by bringing in individuals with considerable experience, and using knowledge gained in the planning and development of processes and activities. Other learning processes have been established including self-assessments, external audits as well as the Assurance function assessments. OLIM provides a useful tool for helping to ensure there is an effective means for recording and tracking issues.
193. Overall it is clear that NNB GenCo has made extensive efforts in securing learning from both external sources as well as effective internal continuous improvement processes

### ***Assurance team performance***

194. The resource level of the Assurance function (ITA and IACO teams) has been an area of concern for ONR for some time. NNB GenCo has made considerable efforts to strengthen the IACO and ITA teams and has now reached a broadly acceptable level for the current position. Despite the resource concerns, the actual performance of both the IACO and ITA teams since licensing has been very commendable. They have undertaken a considerable scope of assessments, and these have been of high quality and provide effective challenge to the project. The SHP concurrences have been a noted strength of the hold point process.

### **4.3.2 Key Areas of Future Interest**

195. Section 4.5 below provides a more detailed list of ONR expectations on aspects of organisational capability for the first consent point. This section highlights areas of particular interest and potential importance.

### ***Future resourcing***

196. The financial re-organisation MoC significantly constrained the envisaged development of NNB GenCo. Post-FIDD NNB GenCo will need to expand its organisation to match the overall project schedule. This will create considerable challenge in securing competent specialists and integrating them into NNB GenCo. Most ONR workstream assessments indicate a similar position – satisfactory resource levels for the current

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phase of project activity but with a need for increased resource to match ONR expectations for the first and particularly second consent. Key areas of interest for ONR include:

- Design Authority and Owners Engineering
- Assurance function
- Quality and procurement/supply chain functions
- Site team – supervision of contractors

### ***Procurement & supply chain***

197. Section 4.2.3 indicates that the current position is generally satisfactory however due to the constraints on the project activities pre-FIDD there has been very limited activity to date. As post-FIDD there will be a progressive very considerable increase in procurement and supply chain activity, this will be a key area of immediate ONR interest to gain evidence of, and confidence in NNB GenCo's arrangements. Quality management will be a particular area of interest.

### ***DA performance and RD resourcing***

198. There is considerable design and safety case development required both for CSJ01 for the first consent, and PCSR3 linked to the second consent. Consequently continued satisfactory DA performance is essential. The resource levels in the DA are based on assumptions of the RD's ability to deliver very considerable design and safety case development work to very tight timescales. Consequently the competence and capacity of both the DA and RD are closely linked. DA resources would have to increase to make up for any limitations within the RD. As a contract has yet to be signed between NNB GenCo and the RD this remains an area of some uncertainty.
199. A key enabler for satisfactory DA performance is effective function of the OE. The PEP MoC created the OE to remove work from the DA to allow it to focus on its key nuclear safety role. The OE has not yet become fully staffed and effective; this is likely to be a key enabler to allow the DA with its current resource level to perform effectively.

### ***The 'Assurance' Model***

200. ONR has some reservations about the 'lean' assurance model that NNB GenCo has adopted that establishes a relative small Assurance function and will be seeking further evidence that this model is satisfactory for the next phases of the project (to second consent).
201. ONR regards evidence of continued effective DA oversight of the RD and wider supply chain as being vital for to support NNB GenCo's 'lean' model of Assurance. The recent evidence around RC1 acceptance suggests the in principle this model is acceptable – however it is likely to be put under greater challenge due to anticipated increase in activities. Strengthening the DA in key specialist areas (identified in section 4.2.1) will be needed. Effective site surveillance is another area to be demonstrated.

## **4.4 Consideration of the Shadow Hold Point process**

202. I have considered two aspects related to the SHP. The first is on the inclusion of criteria relating to aspects of OC as part of the MED and SHPRD; the second is on the

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overall hold point process as part of NNB GenCo's arrangements for controlling site and project activities.

### 4.4.1 Organisational Capability criteria included in the Shadow Hold Point

203. NNB GenCo included a wide range of criteria related to aspects of organisational capability in its MED for the SHP. This included:
- Overall resourcing and nuclear baseline
  - Organisational learning
  - Contractor management arrangements
  - Implementation of management of change
  - Competence assessments
  - Suitable IMS and relevant procedures
204. I regard the inclusion of such criteria as being appropriate and good practice. The criteria selected and scope they encompassed generally matched the areas of key OC interest for ONR. OC progress reports have commented in the detailed criteria, with a general comment that some need be made 'SMARTER' and this will be considered in NNB GenCo's post SHP learning.
205. IACO and ITA teams contribute to concurrence assessments – essential covering similar scope to the MED criteria and providing an independent control as to whether the Assurance function is satisfied that a hold-point can be lifted. I regard this element of the hold point process as being a strength. The SHP demonstrated the value in these arrangements with the Assurance function with holding completion of the concurrence until certain key items were completed.
206. My overall judgement is that the SHP process included a satisfactory consideration of key OC aspects relevant to that hold-point. I would expect similar relevant OC criteria to be included in future major hold points, particularly for the first and second consent points.

### 4.4.2 Hold Point Process

207. The hold point process is considered in more detail in the Licence Compliance cornerstone report. Overall I consider that the SHP process was effective and robust. Generally appropriate and satisfactory evidence was provided for each criteria and the Assurance function concurrence gave confidence in the independent controls relating to HP release.
208. NNB GenCo had not reached the anticipated level of development envisaged in some of the MED criteria; however it demonstrated an appropriate approach to maintaining a disciplined use of the hold point processes, whilst releasing the SHP to allow full learning from construction of the mock-up to proceed. I consider that this was appropriate and helps to demonstrate both its commitment to learning and to maintaining a disciplined approach to project management.

### 4.5 Judgement of the current position compared with expectations for the First Consent Point

209. My overall view is that NNB GenCo satisfies ONR's expectations against LC 36 (1) on adequacy of human resource at the current point. However it will need to increase resourcing in key areas to match activities required for, and permissioned by, the first consent point. This will include both consideration of NNB GenCo's readiness for post-

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permitted construction activities; and for key activities running in parallel. Key areas of interest are shown further below and have been discussed previously in section 4.2 and 4.3 above:

- Assurance and DA roles in nuclear safety advice and challenge
- Programme and project management – MDTs are functioning effectively
- Safety culture – at site and within NNB GenCo; approaches working; means of monitoring
- Supply chain processes resourced, and tested
- QA arrangements in place – and evidence working in project delivery (MDTs)
- Nuclear baseline updated to match post-permissioning demands; and resource plans for all key nuclear safety significant areas
- Continued satisfactory operation of NSC and governance processes
- Organisational learning – OL tools and processes are suitable to support extensive site activities
- Documents & records – system demonstrated to match functional requirements
- Continued confidence in application of IC capability arrangements – to match expansion in organisation

210. For first consent I consider that the current position is close to the required position for all the above – generally difference relates to continued development/expansion to match increased activity post-FIDD. Particular areas of interest:

- Continued increase in IACO and ITA resource in key specialist areas
- Effective DA IC role and surveillance of RD – to support lean Assurance model; this is likely to be enabled by OE being fully effective
- Development of the OL tools and processes to make them suitable for large scale on-site activities
- Readiness of procurement and supply chain management processes
- Overall resourcing across many areas of NNB GenCo to match the anticipated requirements (numbers and level of competence) for the Integrated Works Schedule (IWS) plan for post-consent activities.

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### 5 CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Conclusions

211. This report presents the findings of the ONR Organisational Capability cornerstone progress assessment of NNB GenCo's development for the HPC project since granting a nuclear site licence in August 2012. These conclusions cover the following three main areas:

- developments in this NNB GenCo's overall organisational capability since licensing;
- consideration of the NNB GenCo's Shadow Hold Point process as related to aspects of organisational capability;
- the current state of progress of NNB GenCo's organisational capability against ONR's expectations for the topic at the First Consent Point.

212. The main purposes of this report are to share ONR's overall judgement of the development of NNB GenCo's Organisational Capability since licensing with NNB GenCo, and provide a clear view as to the 'gap' between the current position and that expected at the first consent point.

#### 5.1.1 Developments in Organisational Capability since licensing

213. My conclusions are made against the three grouped themes that have summarised the detailed progress assessments from each of the Organisational Capability workstreams (see section 1.2).

#### ***Overall Nuclear Safety Summary***

214. I consider that NNB GenCo has established appropriate arrangements and capability to match ONR's expectations for nuclear safety advice and challenge. The key features are:

- The Design Authority has a high level of competence, and is generally providing satisfactory IC control over the RD and other supplier activities;
- An NSC that is operating effectively
- An Assurance function that is performing well and is now close to the necessary resource level.

215. I judge that NNB GenCo has established and is implementing satisfactory arrangements for ensuring an appropriate level of IC capability for all potentially safety related areas across the project.

216. NNB GenCo currently has a good safety culture and has taken very positive measures to develop a strong site safety culture. It is continuing to develop measures to further develop its safety culture and means to monitor the safety culture both at site and within the project team. It is also taking measures to ensure key supply chain partners also have a suitable safety culture.

217. I consider that the DA and Assurance will need to increase resource levels to match post-FIDD project demands, but are close to matching expected requirements for the first consent.

218. The acceptability of NNB GenCo's 'lean' assurance model is dependent on evidence of continued satisfactory oversight of the supply chain (particularly the RD) by the DA, and this is likely to be in part dependent on OE becoming fully resourced and effective post-FIDD.

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### **Overall Organisational Capability Development & Knowledge Management Summary**

219. I consider that NNB GenCo has established satisfactory MoC arrangements. It has implemented two very significant changes since licensing. These have generally been well implemented and managed, maintaining a strong focus on ensuring nuclear safety. A has maintained and updated an appropriate nuclear baseline to match the changes in the project. NNB GenCo has been appropriately resourced to this point for the activities undertaken.
220. On training & competence, I consider that NNB GenCo has established and is now effectively implementing arrangements to ensure staff are competent for roles and suitable training and development is provided. I consider the arrangements match the expectations for compliance with LC10 and also support LC12 compliance.
221. I judge that NNB GenCo has established appropriate project management arrangements; incorporating learning from FA3 and other nuclear and major construction projects. It has developed a suitable IMS that supports intended PM arrangements for each phase of project. There is limited experience to date to determine effectiveness of MDT approach – but I judge that in principle the approach appears appropriate and matches approaches used successfully on other major construction projects.
222. NNB GenCo is clearly committed to learning from both internal and external experience. It has clearly sought to bring learning into the project in many ways. It has also established effective internal learning processes and it also has developed plans for its KM strategy. Its key OLIM tool is being used at the main means of capturing and tracking learning but will require further development to match site needs when considerable site activities commence.
223. I judge that NNB GenCo has established appropriate management systems for documents and records for this point in the project.

### **Overall Procurement and Supply Chain Summary**

224. I judge that NNB GenCo has established a range of embedded arrangements across the project to deliver quality, however it has yet to develop a suitable set of overarching arrangements to ensure delivery of quality across the project. It has now determined its overall approach and in principle this seems to match ONR's expectations. ONR now expects that there will be rapid development and implementation of this approach.
225. NNB GenCo has established a satisfactory Supply Chain policy and management approach. The commercial organisation has been resource limited and post-FIDD this will need to increase to match the level of procurement activity.
226. I consider that NNB Gen Co has established appropriate management system arrangements for supplier audit and inspection of suppliers for the current stage of the project. The resourcing and capability will need to increase by the time of the first consent point having applied the learning from their arrangements.
227. Overall I consider that NNB GenCo has established all the key foundations for successful supply chain management post-FIDD; however the level of resource and the implementation of effective QM arrangements will need to increase considerably to match the needs of both the first and particularly second consent point.

### **Summary against LC36 requirements**

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228. I conclude that NNB GenCo has maintained adequate human resources and management of change arrangements to satisfy LC 36 requirements for this point in the project.

### 5.1.2 Consideration of the Shadow Hold Point

229. My overall judgement is that the SHP process included a satisfactory consideration of key OC aspects relevant to that hold-point. I would expect similar relevant OC criteria to be included in future major hold points, particularly for the first and second consent points.

230. Overall I consider that the SHP process was effective and robust. Generally appropriate and satisfactory evidence was provided for each criteria and the Assurance function concurrence gave confidence in the independent controls relating to HP release.

### 5.1.3 Comparison of Current Position to Expectations at the First Consent Point

231. My overall view is that that the current position is close to the position expected at the first consent point. However it will need to increase resourcing in key areas to match activities required for, and permissioned by, the first consent point. This will include both consideration of NNB GenCo's readiness for post-permissioned construction activities; and for key activities running in parallel. Key areas of interest are shown further below and have been discussed previously in section 4.2 and 4.3 above:

- Assurance and DA roles in nuclear safety advice and challenge
- Programme and project management – MDTs are functioning effectively
- Safety culture – at site and within NNB GenCo; approaches working; means of monitoring
- Supply chain processes resourced, and tested
- QA arrangements in place – and evidence working in project delivery (MDTs)
- Nuclear baseline updated to match post-permissioning demands; and resource plans for all key nuclear safety significant areas
- Continued satisfactory operation of NSC and governance processes
- Organisational learning – OLIM suitable to support extensive site activities
- Documents & records – system demonstrated to match functional requirements
- Continued confidence in application of IC capability arrangements – to match expansion in organisation

232. Particular areas of interest:

- Continued increase in IACO and ITA resource in key specialist areas
- Effective DA IC role and surveillance of RD – to support lean Assurance model; this is likely to be enabled by OE being fully effective
- Development of the OLIM process to make it suitable for large scale on-site activities
- Readiness of procurement and supply chain management processes

## 5.2 Recommendations

233. There are no recommendations arising from this report. All areas for future interest and monitoring identified are encompassed by the existing intervention plans to the second consent point in 2016.

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**Table 1**

Relevant Safety Assessment Principles Considered During the Assessment

SAP No	SAP Title	Description
MS.1	<b>Leadership</b>	Directors, managers and leaders at all levels should focus the organisation on achieving and sustaining high standards of safety and on delivering the characteristics of a high reliability organisation.
MS.2	<b>Capable organisation</b>	The organisation should have the capability to secure and maintain the safety of its undertakings.
MS.3	<b>Decision Making</b>	Decisions at all levels that affect safety should be rational, objective, transparent and prudent.
MS.4	<b>Learning from experience</b>	Lessons should be learned from internal and external sources to continually improve leadership, organisational capability, safety decision making and safety performance.
EMC.17	<b>Examination during manufacture</b>	Provision should be made for examination during manufacture and installation to demonstrate the required standard of workmanship has been achieved.
EMC.18	<b>Third party inspection</b>	Manufacture and installation operations should be subject to appropriate third-party independent inspection to check that processes and procedures are being carried out as required.
EMC.20	<b>Records</b>	Detailed records of manufacturing, installation and testing activities should be made and be retained in such a way as to allow review at any time during subsequent operation.