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# Office for Nuclear Regulation

An agency of HSE

## **ASSESSMENT REPORT**

### **Civil Nuclear Reactors Programme**

#### **NNB GenCo: Hinkley Point C Pre-Construction Safety Report 2012 – Assessment Report for Work Stream D11: Integrated Management Systems**

Assessment Report: ONR-CNRP-AR-13-099  
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**EXECUTIVE SUMMARY**

This assessment report reviews those aspects of the Hinkley Point C Pre-Construction Safety Report 2012 (HPC PCSR2012) that falls within the scope of Work Stream D11 – Integrated Management Systems. Most of this material lies in HPC PCSR2012 Chapters 21 (Integrated Management System).

A final version of the Generic Design Assessment Pre-Construction Safety Report (GDA PCSR) issued in November 2012 formed the basis for issue by the Office for Nuclear Regulation (ONR) on 13 December 2012 of a Design Acceptance Confirmation for the UK EPR™ design. The GDA PCSR addressed only the key elements of the design of a single UK EPR™ unit (the generic features on “the nuclear island”) and excluded ancillary installations that a potential purchaser of the design could choose after taking the site location into account. Certain other matters were also deemed to be outside the scope of the GDA PCSR.

In contrast HPC PCSR2012 addresses the whole Hinkley Point C licensed site comprising the proposed twin UK EPR™ units and all ancillary installations. Some matters that were outside the scope of GDA PCSR are also addressed in HPC PCSR2012.

It is important to note that HPC PCSR2012 alone is not sufficient to inform a future ONR decision on whether to permission start of construction at Hinkley Point C nor further permissioned activities. NNB GenCo intends to submit a major revision to HPC PCSR2012 before seeking permission (consent) for Nuclear Island construction which will fully integrate the final GDA PCSR and will be supported by other documentation.

Following my assessment of PCSR 2012 I am broadly satisfied that NNB GenCo has a good understanding of the requirements of the GDA Integrated Management System assessment findings and is making significant progress in producing resolution plans, and their implementation where appropriate, to close out these GDA assessment findings.

This assessment also considers the adequacy of NNB GenCo’s arrangements, and their implementation, for the stage of development that NNB GenCo has reached at this point. It is recognised that the arrangements will continue to evolve as the project proceeds, and continuing ONR interaction with NNB GenCo is anticipated to gain assurance that the arrangements remain fit for purpose and that they are implemented effectively.

This assessment has been informed by a number of working level meetings plus a targeted intervention which took place in July 2012. The level 4 meetings provided a forum for dialogue and for influencing the development of NNB GenCo’s management systems compliance arrangements under nuclear site licence condition 17 (LC17).

NNB GenCo was able to demonstrate during the meetings and targeted intervention that their arrangements for compliance with LC17 have the essential elements of an effective management system as defined in international management system requirements for example, BS-EN-ISO 9001:2008 ‘Quality Management Systems – Requirements’ and IAEA standard GS-R-3 ‘The Management System for Facilities and Activities Safety Requirements’.

The on going dialogue ONR and NNB GenCo have had in support of this work over the past year has yielded positive benefits in terms of the approach adopted by NNB GenCo and the design of their arrangements.

This assessment, and our working level interventions and meetings, found the NNB GenCo management systems arrangements to be adequate for this stage of the project. Processes developed so far have started to be implemented and are controlled within the document control process. The assurance and business architecture processes have been developed and have started to be implemented. Although implementation is not yet fully mature NNB GenCo have made significant progress and have established key attributes of an effective management system.

To conclude, I am broadly satisfied that NNB GenCo's compliance arrangements for LC17. Management systems have adequately addressed the expectations of relevant international standards. The arrangements and implementation are still evolving, but outstanding issues have been recognised and there is a strong forward momentum within the company to carry this forward. This gives me confidence that NNB GenCo is sufficiently well advanced for this stage of the project.

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**LIST OF ABBREVIATIONS**

AF	Assessment Finding
AFCEN	Association Française pour les règles de conception, de construction et de surveillance en exploitation des matériels des Chaudières Electro-Nucléaires (French Association for the rules governing the Design, Construction and Operating Supervision of the Equipment for Nuclear Reactors)
ALARP	As low as is reasonably practicable
AR	Assessment Report
ASN	Autorité de Sûreté Nucléaire (French Safety Authority)
BMS	(ONR) How2 Business Management System
CEA	Commissariat à l'énergie atomique (Atomic Energy Commission)
DAC	Design Acceptance Confirmation
EPR	European Reactor
ESPN	Equipements to sous Pression Nucléaires (Nuclear Equipment under Pressure)
FANC	Federal Agency for Nuclear Control (Belgian Nuclear Regulator)
FMA	Fracture Mechanics Assessment
GDA	Generic Design Assessment
HIC	High Integrity Component
HPC	Hinkley Point C
HPC PCSR2012	Hinkley Point C Pre-Construction Safety Report 2012
HSE	Health and Safety Executive
IAEA	International Atomic Energy Agency
IEWG	Independent Expert Working Group
ILW	Intermediate Level Waste
IRSN	Institut de Radioprotection et de Sûreté Nucléaire (Institute of Radioprotection and Nuclear Safety)
ITPIA	Independent Third Party Inspection Agency
LC	Licence Condition
LLI	Long Lead Item
MDF	Material Data File
NDT	Non-Destructive Testing
NNB	NNB GenCo
NPE	Nuclear Pressure Equipment
NSSS	Nuclear Steam Supply System

**LIST OF ABBREVIATIONS**

ONR	Office for Nuclear Regulation (an agency of HSE)
OPEX	Operating Experience
PCSR	Pre-construction Safety Report
PWR	Pressurised Water Reactor
RCC-M	Règles de Conception et de Construction des Matériels Mécaniques des Ilots Nucléaires (Design and Construction Rules for the Mechanical Components of PWR Nuclear Islands)
RCC-MR	Règles de Conception et de Construction des Matériels Mécaniques des Installations Nucléaires applicables aux structures à haute température et à l'enceinte à vide ITER (Design and Construction Rules for the Mechanical Components of Nuclear Installations for High Temperature Structures and ITER Vacuum Vessel)
RD	Responsible Designer
RP	Resolution Plan (Addressing a GDA Assessment Finding)
RPV	Reactor Pressure Vessel
RSE-M	Règles de Surveillance en Exploitation des Matériels Mécaniques des Ilots Nucléaires (In-Service Inspection Rules for Mechanical Components of PWR Nuclear Island)
RWMD	Radioactive Waste Management Directive <a href="http://www.nda.gov.uk/recruitment/working-for-rwmd.cfm">http://www.nda.gov.uk/recruitment/working-for-rwmd.cfm</a>
SAP	Safety Assessment Principle(s) (HSE)
SEPTEN	Service Études et Projets Thermiques et Nucléaires; Electricité de France (EDF Department of Thermal and Nuclear Studies and Projects)
SG	Steam Generator
SSC	System, Structure and Component
TAG	Technical Assessment Guide(s) (ONR)
UK EPR™	EDF and AREVA UK Pressurised Water Reactor Design
WENRA	Western European Nuclear Regulators' Association

**TABLE OF CONTENTS**

1 INTRODUCTION..... 8

    1.1 Background..... 8

    1.2 Scope..... 8

    1.3 Methodology ..... 8

2 ASSESSMENT STRATEGY ..... 10

    2.1 Standards and Criteria ..... 10

    2.2 Safety Assessment Principles..... 10

        2.2.1 Technical Assessment and Inspection Guides..... 10

        2.2.2 National and International Standards and Guidance..... 10

    2.3 Use of Technical Support Contractors ..... 11

    2.4 Integration with other Assessment Topics ..... 11

    2.5 Out-of-scope Items ..... 11

3 LICENSEE’S SAFETY CASE ..... 13

    3.1 HPC PCSR2012 Material Assessed ..... 13

    3.2 GDA Assessment Finding Material Assessed ..... 13

        3.2.1 GDA Issues..... 13

        3.2.2 GDA Assessment Findings..... 13

        3.2.3 Other Items ..... 13

4 ONR ASSESSMENT ..... 14

    4.1 Scope of Assessment Undertaken..... 14

    4.2 Assessment of Hinkley Point C PCSR2012..... 14

        4.2.1 Head Document..... 14

        4.2.2 Head Document: Route Map ..... 14

        4.2.3 Chapter 21: HPC PCSR management framework, design development and use and QA arrangements..... 14

        4.2.4 Management Systems (IMS) to Dec 2012. (Section 3.1) ..... 14

        4.2.5 Integrated Management System - Assessment Findings to Dec 2012 ..... 15

        4.2.6 Integrated Management System development from Dec 2012 to Dec 2013 ..... 16

        4.2.7 Quality Assurance Department functions - Dec 2012 (section 3.2)..... 16

        4.2.8 Quality Assurance - Assessment Findings to Dec 2012 ..... 17

        4.2.9 Quality Assurance –development from Dec 12 to Dec 13..... 17

        4.2.10 General Quality Assurance Specifications (GQAS)..... 18

        4.2.11 Licensee Certificate –Dec 2012..... 18

        4.2.12 Assessment and Findings..... 18

        4.2.13 Licensee Certificate from Dec 2012 to Dec 2013 ..... 18

        4.2.14 Reports produced in 2012 and 2013 for IMS and Quality Assurance. .... 18

        4.2.15 Procurement Process (section 3.9) – Dec 2012..... 19

        4.2.16 Procurement Process assessment findings to Dec 2012 ..... 20

        4.2.17 Procurement Process from Dec 2012 to Dec 2013..... 20

        4.2.18 Reports produced in 2012 and 2013 for Procurement (Supply Chain). .... 21

4.2.19	Control of Manufacturing (Section 3.10) – Dec 2012 .....	22
4.2.20	Control of Manufacturing assessment findings to Dec 2012 .....	23
4.2.21	Control of Manufacturing from Dec 2012 to Dec 2013 .....	23
4.2.22	Reports produced in 2012 and 2013 for Manufacturing Inspection.....	24
4.2.23	Document and Records Management (Section 3.15) – Dec 2012.....	24
4.2.24	Document and Records Management assessment findings Dec 2012.....	25
4.2.25	Document and Records Management from Dec 2012 to Dec 2013.....	25
4.2.26	Reports produced in 2012 and 2013 for records management.....	26
4.2.27	Sub-Chapter 21.2 – Design development and use of HPC PCSR.....	26
4.2.28	Sub-Chapter 21.3- Management Framework, Design Development and Usage and QA Arrangements .....	26
4.2.29	Comparison with Standards, Guidance and Relevant Good Practice.....	26
5	CONCLUSIONS AND RECOMMENDATIONS .....	28
5.1	Conclusions .....	28
5.2	Recommendations.....	29
6	REFERENCES .....	30

**Tables**

Table 1:	Relevant Safety Assessment Principles Considered During the Assessment
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## 1 INTRODUCTION

### 1.1 Background

1 This report presents the findings of the assessment of that portion of the Hinkley Point C Pre-Construction Safety Report 2012 (HPC PCSR2012), [Ref. 1] that falls within the scope of Work Stream D11 – Integrated Management Systems.

2 Assessment was undertaken in accordance with the requirements of the Office for Nuclear Regulation (ONR) How2 Business Management System (BMS) procedure AST/003, [Ref. 2]. The ONR Safety Assessment Principles (SAP), [Ref. 3], together with supporting Technical Assessment and Inspection Guides (TAGs & TIGs), [Ref. 4], have been used as the basis for this assessment.

3 This assessment report (AR) has been written to support a summary Assessment Report that addresses whether HPC PCSR2012, [Ref. 1], demonstrates suitable progress towards meeting ONR's requirement for an adequate Pre-Construction Safety Report. To this end this AR provides guidance through assessment findings (AF), if appropriate, on matters that need to be addressed in the next revision of HPC PCSR.

### 1.2 Scope

4 The scope of this report covers Work Stream D11 – Integrated Management Systems (IMS); chapter 21 in the HPC PCSR2012, [Ref. 1]. Most of this material lies in HPC PCSR2012, chapter 21. Chapter 21 has new material from that provided in the Generic Design Assessment Pre-Construction Safety Report 2011 (GDA PCSR2011), [Ref. 5], assessed by ONR.

5 A final version of the Generic Design Assessment Pre-Construction Safety Report (GDA PCSR) issued in November 2012, [Ref. 6], formed the basis for issue by ONR on 13 December 2012 of a Design Acceptance Confirmation (DAC), for the UK EPR™ design.

6 In contrast, HPC PCSR2012 [Ref. 1] addresses the whole Hinkley Point C licensed site comprising the proposed twin UK EPR™ units and all ancillary installations. Some matters that were outside the scope of GDA PCSR are addressed in HPC PCSR2012, [Ref. 1]. As the generic features were addressed in the GDA process, attention during this assessment has been concentrated on specific documentation that has not been formally assessed by ONR previously. The remaining, generic documentation has been copied into the HPC PCSR2012, [Ref. 1], from the earlier March 2011 GDA PCSR, [Ref. 5], but this has now been superseded by the November 2012 GDA PCSR, [Ref. 6]. The generic documentation has only been revisited if recent developments have materially affected the case being made.

7 It is important to note that HPC PCSR2012, [Ref. 1], alone is not sufficient to inform a future ONR decision on whether to permission start of construction at Hinkley Point C nor further permissioned activities. NNB GenCo intends to submit other supporting documentation.

### 1.3 Methodology

8 The methodology for the assessment follows the requirements of the ONR process 'produce assessments' step in the nuclear safety permission process and in particular in relation to mechanics of assessment.

9 This assessment has been focussed primarily on the submissions given in HPC PCSR2012, [Ref. 1], relating to the IMS and its impact on nuclear safety. Material

presented in HPC PCSR2012, [Ref. 1], from the GDA PCSR2011, [Ref. 5], that has already been assessed by ONR as part of GDA has not been reassessed. Where ONR's subsequent assessment of the generic case resulted in significant changes to GDA PCSR2011, [Ref. 5], as given in the GDA close-out PCSR2012, [Ref. 6], these have been highlighted and are expected to be addressed by NNB GenCo in the next revision of the HPC PCSR. New material presented in HPC PCSR2012, [Ref. 1], has been reviewed for its relevance to the IMS as it affects nuclear safety.

- 10 This assessment allows ONR to judge whether the NNB GenCo submissions provide evidence, relating to the IMS, of adequate progress being made by NNB GenCo in the development of a PCSR to subsequently support permissioning of construction of a UK EPR™ at Hinkley Point C.

## 2 ASSESSMENT STRATEGY

11 My assessment strategy is set out in this section. This identifies the scope of the assessment and the standards and criteria that have been applied.

### 2.1 Standards and Criteria

12 The relevant standards and criteria adopted within this assessment are principally the Safety Assessment Principles (SAPs), [Ref. 3], internal ONR Technical Assessment and Inspection Guides (TAGs & TIGs), [Ref. 4], 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 and Inspection Guides

14 The main Technical Inspection and Technical Assessment Guides which have been used during this assessment are:

- NS-INSP-GD-017 'LC17 Management Systems' (Revision 02). TRIM 2012/186538.
- NS-TAST-GD-077 'Procurement of Nuclear Safety related Items or Services' (Revision 2) TRIM 2013/158482.
- NS-TAST-GD-049 'Licensee Core and Intelligent Customer Capabilities' (Revision 4) TRIM 2013/79464.
- NS-TAST-GD-033 'Licensee Management of Records' (Revision 3) TRIM 2013/82690.

#### 2.2.2 National and International Standards and Guidance

15 The management systems related international/national standards and relevant IAEA (International Atomic Energy Agency) standards reference levels are embodied and enlarged on in Ref. 7 & 8.

16 IAEA Safety Standards

- 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';

17 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';

**2.3 Use of Technical Support Contractors**

18 No technical support contractors were employed to support my assessment given in this report.

**2.4 Integration with other Assessment Topics**

19 Management systems are address within GS-R-3 'The Management System for Facilities and Activities' and BS-EN-ISO ISO9001 'Quality Management Systems – Requirements'. This report contains an assessment of the adequacy of NNB GenCo's management arrangements to comply with the requirements of Licence Condition 17 'Management Systems'. The adequacy of NNB GenCo's arrangements to comply with Licence Condition 17, Management Systems, covers all processes that will be implemented to manage the HPC project. HPC PCSR 2012 [Ref 1], Chapter 21.1 Management framework relating to the development and use of HPC PCSR, section 3.1 Management Systems.

20 Sample NNB GenCo processes have been assessed including the following:

- PCSR 2012, Chapter 21.1, section 3.2. Assurance process.
- PCSR 2012, Chapter 21.1, section 3.9. Procurement processes
- PCSR 2012, Chapter 21.1, section 3.10. Control of manufacture.
- PCSR 2012, Chapter 21.1, section 3.10. Document and records management.

21 The following topics have not been assessed in this report from PCSR 2012;

- Chapter 21.1 Sections;
  - 3.3 Licence condition compliance;
  - 3.4 Project hold points;
  - 3.5 Governance Committees;
  - 3.6 Architect engineer and responsible designer;
  - 3.7 Design authority organisation;
  - 3.8 Design process;
  - 3.12 Commissioning;
  - 3.13 Operational development;
  - 2.14 Decommissioning;
- Chapter 21.2 Design development and use of HPC PCSR;
- Chapter 21.3 HPC PCSR Quality assurance arrangements.

**2.5 Out-of-scope Items**

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

- Re-assessment of the PCSR presented by the Requesting Parties during the GDA of UK EPR™.
- Re-assessment of PCSR supporting documentation presented by the Requesting Parties during the GDA of the UK EPR™.

- Re-assessment of the closure of GDA Issues relating to structural integrity.

ONR has assessed all of the above previously in GDA Step 4 and GDA Issue close out assessment reports.

### 3 LICENSEE'S SAFETY CASE

#### 3.1 HPC PCSR2012 Material Assessed

23 Chapter 21 of the HPC PCSR2012 relates specifically to the IMS.

24 NNB GenCo has not provided its compliance arrangements for Licence Condition 17 management systems as a formal safety case; rather they have been presented as a suite of documentation to support the targeted intervention carried out in July 2012. That intervention, plus the series of working level meetings, has formed the basis for the overall assessment. Documents provided by NNB GenCo are recorded in the reference section 6 and are accessible to ONR on the NNB GenCo document management system.

#### 3.2 GDA Assessment Finding Material Assessed

##### 3.2.1 GDA Issues

25 There are no GDA Issues that apply to HPC PCSR2 Chapter 21.

##### 3.2.2 GDA Assessment Findings

26 The following GDA Step 4 Assessment Finding that requires resolution prior to the ONR permission milestone of nuclear island safety-related concrete (start of construction) is relevant to Chapter 21 of HPC PCSR2.

- **AF-UKEPR-QA-04:** The licensee shall make and implement adequate QA arrangements for managing and controlling design changes triggered by learning from experience activities during construction, including suitable records management arrangements to ensure the plant design documentation reflects as built status.

The following GDA Step 4 Assessment Finding that has a resolution (milestone) date of LLI and SSC procurement specifications is addressed in HPC PCSR2.

- **AF-UKEPR-QA-01:** The licensee shall make and implement adequate arrangements for the capture of the GDA submission documentation into their records management system, in order to support the further development of the PCSR.

27 The incorporation into NNB GenCo's documents management system of information adopted from the GDA PCSR and GDA design is in progress. When complete, this will fulfil this Assessment Finding. Sub-chapter 21.1 addresses document management. The technical review process identified in Sub-chapter 21.1, along with the plans for the design development and production of HPC PCSR2 CSJs and HPC PCSR3 presented in Sub-chapter 21.2, will enable NNB GenCo to fulfil the objective of this Assessment Finding.

##### 3.2.3 Other Items

There are no specific forward work activities identified as applicable to Chapter 21 except for the normal updating and augmentation of management and QA arrangements going into the next stages of the design and safety case development. This forward work activity is considered part of the normal course of company business and is not yet specifically defined.

## 4 ONR ASSESSMENT

28 This assessment has been carried out in accordance with ONR HOW2 process (Ref. 2).  
AST/003.

### 4.1 Scope of Assessment Undertaken

29 The assessment in this report is essentially a high level review of selected sub-chapters to check for consistency of the HPC PCSR2012 (Ref. 1) with the consolidated GDA PCSR2011, Ref. 5. In addition, where the final consolidated UK EPR GDA PCSR, Ref. 6, is significantly different from the consolidated GDA PCSR2011, Ref. 5, this has been reported but not discussed in detail.

30 The aim of my assessment was to confirm the adequate development of the NNB GenCo management systems and implementation of the developed assurance and business architecture departmental processes. The assessments of the management system arrangements sought assurance that adequate arrangements that meet international standards are in place for the activities being undertaken at this stage of the project. My review of processes covered the following: IMS development and implementation; assurance processes; procurement of goods and services; manufacturing inspection of Long Lead Items (LLI); document and records management.

### 4.2 Assessment of Hinkley Point C PCSR2012

#### 4.2.1 Head Document

31 The Head Document provides a high level route map and introductory commentary on the structure and claims in HPC PCSR2012, [Ref. 1].

#### 4.2.2 Head Document: Route Map

32 HPC PCSR2 Chapter 21 comprises the following three sub-chapters:

- Sub-chapter 21.1 *Management Framework Relating to the Development and Use of the HPC PCSR*,
- Sub-chapter 21.2 Design Development and Use of the HPC PCSR,
- Sub-chapter 21.3 HPC PCSR Quality Assurance Arrangements.

Chapter 21 provides an overview of the NNB GenCo management framework, the design development for HPC and the QA arrangements applied to HPC PCSR2 including the adopted parts of the GDA PCSR.

#### 4.2.3 Chapter 21: HPC PCSR management framework, design development and use and QA arrangements

33 Sub-Chapter 21.1 – Management Framework Relating to the Development and Use of HPC PCSR

#### 4.2.4 Management Systems (IMS) to Dec 2012. (Section 3.1)

34 Management systems generally called integrated management systems (IMS) as they cover all management systems requirements as identified in international management

systems requirements for example; GS-R-3 IAEI safety series [Ref 7]; BS EN ISO 9001. BS EN ISO 14001, BS OHSAS 18001, [Ref 8].

- 35 The working level meetings with NNB GenCo have provided updates on the development of the management system (MS). The relevant version of the management system manual reference; NNB-OSL-MAN-000004 version 2, [Ref 09], is a typical manual which generally meets the management system requirements identifying project document structure, accountability, authority and responsibilities along with the major processes (21 in total) which are required to run a project of this complexity. An audit trail has been identified from the manual to the main process document which in turn cascades down to a number of procedures and instructions that identify the detail of the individual process steps.
- 36 The integrated management system (IMS) tool (MEGA) was being populated with process procedures and is a very useful tool allowing easy access to processes and associated linked procedures, instructions and template data. Not all project documents will be controlled by this tool so business collaborator (BC) or its replacement will control other project documents, for example, drawings and technical procedures, quality plans etc.

#### **4.2.5 Integrated Management System - Assessment Findings to Dec 2012**

- 37 The Integrated management system will continually be developed for different phases of the project and will continually be improved based on user feedback and lessons learned from this and other industry projects. I recognise that at this time documented processes have been developed in a relatively short time in an atmosphere of project resource build up and changing organisational responsibilities. This phase is likely to continue for some time and may become more settled following the issue of the project implementation plan (PEP) towards the end of the year (2012) and early 2013. The interfaces between internal projects groups and the responsible designer have also been under development resulting in the issue of interface agreements. As a consequence, the management system processes as developed at this time have not been fully stressed; however, sufficient objective evidence has been available to confirm they exist, are adequate for the stage of the project and are being used.
- 38 The risk register entry reference, A27H, identified a risk if NNB GenCo fails to develop a coherent IMS. I consider that this risk is reducing as more processes are produced, approved and implemented, giving more clarity on process interfaces and the IMS structure.
- 39 From the level 4 meetings and the compliance inspections I have not found any systematic problems or major shortfalls in the documented management system or the processes that assurance and business architecture are responsible for. My assessment confirms that adequate systems processes are currently in place. Most processes have only recently been implemented and thus have not been exercised through a full cycle. As these are fully exercised, lessons will be learned that will need to be captured in the relevant process updates.
- 40 Recent interventions in connection with early forgings of NSSS components have not revealed any significant gaps in the associated NNB GenCo management system arrangements. A number of procedures have been produced, reviewed and approved by NNB GenCo that make up the LLI support processes and work control documents.

**4.2.6 Integrated Management System development from Dec 2012 to Dec 2013**

41 Following delivery of PCSR 2012 to ONR, NNB GenCo developed a Project Execution Plan which required consideration and resulted in several organisational changes. Changes in organisation structure resulted in changes in the documented management systems. The major change being the concept of corporate functional groups and specific project organisations for Hinkley Point C (HPC). A slow down in the project resulted from the re scheduling of the financial investment decision from mid year 2013 to a future date, and the project remains in this phase. Whilst a recruitment freeze was in place implementation of design processes, long lead item manufacture and project infrastructure continued.

42 The MEGA IMS tool has been populated with the completed processes to date and several initiatives are being implemented to improve the processes and the interface links. Rationalisation of process documents has been initiated to incorporate NNB GenCo documented processes and the interface documents into one project documented process. The project is currently in the middle of migrating their document control data base from Business Collaborator to Documentum which is the tool which will be used to control documents, for example; policies, manuals, procedures including native process control documents associated with the IMS and other lower tier instructional documents. This product will also be used to hold lifetime record packages.

**4.2.7 Quality Assurance Department functions - Dec 2012 (section 3.2)**

43 The Quality Assurance function is responsible for six processes as follows;

- Process Development & Process Implementation: – Documented in process procedures; NNB-FIN-PRO-000031 & NNB-FIN-PRO-000014 both version 2 [Ref 10 & 11]. These are well-written procedures which require, among other things, impact assessments identifying for example training requirements. Reviews of output processes by key stakeholders and interface groups are recorded on BC. Good compliance to this process was identified in my intervention.
- Self Assessment: - is adequately addressed in procedure, NNB-OSL-PRO-000026 version 2 [Ref 12] plus guidance document NNB-OSL-GUI-000163 version 1 [Ref 16]. A training package for each assessment is performed effectively as a pre job brief to prepare people in auditing techniques. These briefs are attended by a representative of the Independent Assessment, Challenge and Oversight (IACO) function. I consider this training to be very useful in promoting a consistent quality of self assessment.

There is an annual programme of self assessments of process areas plus capacity for reactive assessments as required. Self assessments are being done more or less to programme, with reports being recorded on business collaborator. The self assessment process is in its infancy and still has to be proved fully.

An important contribution to the success and continued effectiveness of any process is the way in which learning opportunities are captured and acted upon. Findings are currently being put into organisational learning reports on a system called OLIM. At present this is an immature process which requires time and continued use before evidence can be verified that identifies actions placed are adequately tracked to closure.

- Management Review: - Procedure NNB-OSL PRO-000027 version 1 [Ref 13] identifies the current process. A management review (MR) for 2011/12 has been completed which has served to provide an early demonstration of the process. The

scope of the MR needs developing to take account of the wider considerations referred in for example GS-R-3 and BS-EN-ISO 9001:2008. [Ref 7 & 8]. At the moment there is rightly a dominant focus on process development and not on procedural adherence, however future MRs need to consider these wider issues as the processes are stressed and become more mature.

- Independent Assessment Challenge and Oversight (IACO): - There is a procedure for carrying out independent assessments, challenge and oversight (IACO) NNB-OSL-PRO-000025 version 1 [Ref 14] which is being updated to take account of operating experience. There are two IACO programmes, one of which is aligned to the twenty one (21) major project processes with reserve capacity for reactive assessments; the other programme covering assessment of the Responsible Designer interfacing process implementation. Both programmes have been implemented, with several reports being witnessed by me, and are on currently on schedule. Again the independent assessment process is in its infancy and has not completed a full cycle yet.
- Management of Non Conformance: - This process is documented in procedure NNB-OSL-PRO-000028 version 2 [Ref 15]. Records of non conformances (NC) have been entered onto BC, however due to the stage the project is at there has been limited information so far on this subject. There are three categories of non conformance defined in the process; major, significant and minor. I judge this process to be adequate and fit for purpose.
- Independent Third Party Inspection Agency (ITPI) A management: - The management of the ITPIA is via a contract and thus a contract specification which defines the scope of deliverables of the contract and the interactions between each group. This is managed by the Manufacturing Inspection Department.

Objective evidence of inspection involvement on LLI has been witnessed and monthly progress contract meetings between NNB GenCo and the ITPIA - Lloyds-APAVE. Actions and identified non acceptance notes were reviewed for close out of the identified action. I consider the management of the ITPIA to be adequate. I have assessed the ITPIA delivery of their responsibilities as the compliance assessor of high integrity components for pressure equipment and find this to be acceptable.

#### **4.2.8 Quality Assurance - Assessment Findings to Dec 2012**

44 I have identified no formal findings that should be completed prior to a specific project milestone. Observations were noted which ONR will review during future interventions. These observations were relayed to NNB GenCo's assurance management during the intervention and working level meetings are progressing these towards close out.

#### **4.2.9 Quality Assurance –development from Dec 12 to Dec 13**

45 During this period, a re-organisation of the quality assurance department was implemented. ITPIA management was moved to the Manufacturing Inspection Department (MID) and is monitored in dedicated working level meetings and interventions on this subject. Self assessment oversight programming was moved to the Business Architecture group who have developed the process and the programming of the self assessment. The IACO function continues to complete their assessment and have developed their programme for 2014. I have witnessed the report outputs and consider them to be adequate. Sample assessments will be the subject of an intervention during 2014. A technical assurance group has been established within the quality assurance department that will ensure that the design intent of a product process or system is

monitored and maintained through manufacture, construction and commissioning. I have witnessed reports produced and consider these to be adequate. Sample observation of assessments will be the subject of interventions during 2014. Resource in the technical assurance group is limited due to the project slow down and the recruitment freeze. I will monitor resource build up as the project re energises when the financial investment decision is taken.

#### 4.2.10 General Quality Assurance Specifications (GQAS)

46 The general quality assurance specification (GQAS), [Ref 18] document identifies additional assurance requirements to those required by BS EN ISO 9001:2008 [Ref 8] for safety significant/non safety significant plant items and services. The relevant parts of GQAS are referenced in contract documents and thus become part of the contract requirements. No issues were identified with GQAS during this period. Cascade of GQAS requirements to contractors has been witnessed in the contract documents for safety significant plant items.

#### 4.2.11 Licensee Certificate –Dec 2012

47 The Licensee Certificate is referenced in ONR's TAG on 'Procurement of Nuclear Safety Related Items or Services' (NS-TAST-GD-077) and derives from a requirement in the ASME III standard. The French code RCC-M does not describe the owner's/licensee's responsibilities in the same manner as ASME III. NNB GenCo has produced a UK EPR RCC-M adaptation document [Ref 19] which gives a full picture of the arrangements to procure safety related items.

48 NNB GenCo has a limited scope Licensee Certificate for long lead item large forgings for the nuclear steam supply system (NSSS). An independent informed organisation that has experience of the nuclear power plant construction and the design codes relevant to that plant has issued this certificate on the basis of assessment of the management systems in place and their implementation. NNB GenCo is now considering how they can expand the scope of this to cover all the primary circuit pressure boundary components. The current certificate was issued by Bureau Veritas.

#### 4.2.12 Assessment and Findings

49 I do not consider there to be any ONR work stream findings in this area currently. Independent assessment by Bureau Veritas and the issue of findings for non conformances and shortfalls are considered to be helpful in shaping NNB GenCo processes and their implementation to ensure they are robust and fit for purpose.

#### 4.2.13 Licensee Certificate from Dec 2012 to Dec 2013

50 There has been no change throughout 2013 with the scope of the Licensee Certificate due to the slow down of the project pending corporate body investment decisions. Certificate scope will need to be expanded prior to implementation of processes beyond that of long lead item large forgings. This will be progressed in our normal interventions.

#### 4.2.14 Reports produced in 2012 and 2013 for IMS and Quality Assurance.

Report Reference:	TRIM reference:
IR (February 2012). ONR-NNB-GenCo-IR-12-006	TRIM 2012/163067
IR (April 2012). ONR-NNB-GenCo-IR-12-063	TRIM 2012/197285

IR (April 2012). ONR-NNB-GenCo-IR-12-87	TRIM 2012/211054
IR (May 2012). ONR-NNB-GenCo-IR-12-107	TRIM 2012/279144
IR (June 2012). ONR-NNB-GenCo-IR-12-112	TRIM 2012/315564
AR (July 2012). ONR-CNRP-AR-12-087	TRIM 2012/332993
IR (April 2013). ONR-NNB-GenCo-IR-13-005	TRIM 2013/181283
IR (July 2013). ONR-NNB-GenCo-IR-13-036	TRIM 2013/297181
IR (October 2012). ONR-NNB-GenCo-IR-13-059	TRIM 2013/394125

#### 4.2.15 Procurement Process (section 3.9) – Dec 2012.

- 51 Working level meetings with NNB GenCo have provided information on the development of the procurement processes and the interface with other support departments that are involved in the process that result in signature of contracts. A number of internal self and independent assessments have been completed out and an intervention by ONR was carried out in July 2012 to assess implementation of the process. This was an early intervention as no safety significant contracts had been issued by NNB GenCo at the time. Samples of implementation of the procurement process had to be taken across a diverse group of minor contracts that were at different stages in the procurement process leading up to invitation to tender (ITT).
- 52 The outcome of the internal and external assessments, including ONRs, identified that the procurement processes up to signature of contract were adequate. The approach and progress towards establishing adequate arrangements for the supply chain activities post contract award i.e. contract management, became the focus towards the end of 2012. Up to this date very little in the way of process development post contract award had taken place. For the list of procurement processes see [Ref 17]
- 53 Procurement organisational changes had been made as a result of the issue of the project execution plan (PEP). The function was split into two main parts; procurement, which manages the process up to the award of a contract, and commercial, which manages and supports the contract after contract award to the end of the defect liability period. Both groups report to a commercial director who is a member of the HPC project executive lead team.
- 54 The new Commercial Directorate team was established during this period and identified the procurement and commercial contract delivery framework which has six key elements:
- Common safety approach for both; plant and systems plus workforce safety,
  - NEC 3 and FIDIC contract management: “Real Time”,
  - Supplier management – interactive and dynamic,
    - 2<sup>nd</sup> and 3<sup>rd</sup> tier supplier qualification technical and quality compliance

- Final account strategy
- Advanced quality product planning
- Insolvency risk management mitigation
- Incentivisation

- Integration management – alignment of key dates and delivery performance between contracts,
- Contingency and risk management,
- Performance and control monitoring,

55 NNB GenCo has identified the different elements of the end to end contract life cycle and its management. The next phase for the commercial group will be to clearly define the end to end contract management process(s).

56 Training of staff in the use of the procurement process to contract issue was carried out and was essentially complete.

#### **4.2.16 Procurement Process assessment findings to Dec 2012**

57 I have not identified any formal findings that should be completed prior to a specific project milestone. Post contract award contract management processes are required prior to contract award to manage contract delivery. NNB GenCo's programme at this date showed sufficient time to enable these to be put in place. Actions and observations were noted which will be reviewed in future working level meetings and interventions. The actions and observations were relayed to NNB GenCo's procurement compliance manager during intervention and working level meetings.

#### **4.2.17 Procurement Process from Dec 2012 to Dec 2013**

58 During 2013 the final investment decision date was rescheduled for mid 2014. This resulted in a recruitment freeze and eventually lowering of the available resource on the project. Within procurement the non permanent support personnel was reduced. The core procurement team is now predominantly NNB GenCo permanent staff including expats from the French parent company. Development and training of the procurement core staff has taken place. No safety significant plant item contracts have been awarded.

59 Partly as a result of their own internal procurement assessments and feedback from potential contractors about the adversarial nature of the contracts, NNB GenCo has taken the opportunity to enhance their procurement processes and the generic contract structure. Its aim being to remove the uncertainty within the procurement processes and enable enhanced planning, increasing efficiency and safe delivery. I conclude this to be a positive approach that will enhance clarity for NNB GenCo staff and supply chain organisations supporting the Hinkley Point C project. NNB GenCo will present these developments to a wider ONR audience who interface with contract requirements in due course.

60 A supply chain conference held on the on 9<sup>th</sup> December 2013 at the Excel Centre, London, provided NNB GenCo with a platform to highlight the commercial opportunities available to, and safety requirements on the supply chain when supporting the Hinkley Point C project. I consider this a proactive approach to supplier engagement that impacts all potential tiers, and an effective method of supply chain oversight if incorporated as part of a complementary suite of other assurance and oversight activities.

- 61 Further work is required to establish NNB GenCo's supply chain policy and effective arrangements to mitigate the risks of non-conforming, counterfeit, fraudulent and suspect items entering the supply chain. NNB GenCo has indicated its plans to address the shortfalls and as such, I consider their absence will not cause a risk to the project in the short term given the current hold on future contracts until the investment decision is finalised.
- 62 NNB GenCo has established procurement process assurance arrangements, deployed through their Manufacturing Inspection Team, and the Independent Assessment, Challenge and Oversight function, to examine product and process compliance. I consider that the arrangements, as currently demonstrated, do not effectively identify learning information from the combined assurance activities. It is not clear how supplier performance information will be provided to the commercial or contract leads in a manner they could utilise to influence decision making, supporting continual improvement. I do not consider this shortfall a risk to the project in the short term and have asked NNB GenCo to review its learning arrangements for supply chain management and the procurement of safety significant goods and services.

#### 4.2.18 Reports produced in 2012 and 2013 for Procurement (Supply Chain).

Report Reference:	TRIM reference:
IR (January 2012). ONR-NNB-GenCo-IR-12-242	TRIM 2012/93920
IR (March 2012). ONR-NNB-GenCo-IR-12-039	TRIM 2012/156903
IR (April 2012). ONR-NNB-GenCo-IR-12-062	TRIM 2012/201813
IR (May 2012). ONR-NNB-GenCo-IR-12-088	TRIM 2012/219094
IR (July 2012). ONR-NNB-GenCo-IR-12-110	TRIM 2012/296623
AR (July 2012). ONR-CNRP-AR-12103	TRIM 2012/339418
IR (Oct 2013). ONR-NNB-GenCo-IR-12-199	TRIM 2012/455036
IR (January 2013). ONR-NNB-GenCo-IR-12-237	TRIM 2013/82889
IR (July 2013). ONR-NNB-GenCo-IR-13-035	TRIM 2013/292445
IR (Sept 2013). ONR-NNB-GenCo-IR-13-050	TRIM 2013/389270
IR (Dec 2013). ONR-NNB-GenCo-IR-13-076	TRIM 2013/473739

**4.2.19 Control of Manufacturing (Section 3.10) – Dec 2012**

- 63 The Manufacturing Inspection Team at this time comprised two sections; one responsible for contractor assessments and the other responsible for manufacturing surveillance. A third section was transitioning from the Assurance group to the Manufacturing Inspection Team associated with the conformity inspection of high integrity components by independent parties. The Manufacturing Inspection Team has developed processes to support their involvement with the parent company procurement of the LLI large forgings for the Nuclear Steam Supply System (NSSS). I have assessed these processes and ONR inspectors have accompanied NNB GenCo on sample assessments inspections. I consider the assessment and inspection processes involvement to be adequate and the implementation of these processes witnessed identified no systematic shortfalls at this time.
- 64 Supplier assessment and qualification process. Pre and post contract assessment of suppliers and the cascade of contract requirements to sub contractors have continued though this year. The programmed 2012 assessments were completed and a forward work schedule identified the assessment to be carried out in 2013 Q1 and Q2. Assessments are being completed as required to the current known programme. I considered that the resource available to meet the programmed schedule was low in the event that the financial investment decision was made, subsequently requiring substantial safety significant plant item procurement. However the financial decision was deferred to later in 2014 and adequate resource as a result was in place.
- 65 Manufacturing Inspection Team assessment findings are tracked to close out. Samples taken identify they are being closed out in reasonable timescales and before they impact on contract work.
- 66 Progress of Manufacturing Surveillance. Supplier manufacturing quality plans (or Follow up documents [FUDs]) produced by the supplier as a result of contract requirements, including assurance requirements identified in for example GQAS [Ref 18], are reviewed by the Manufacturing Surveillance Team for compliance to contract requirements and the inspections to be carried out. A level of NNB GenCo inspection is identified, any comments are resolved and quality plans are approved prior to work start. The manufacturing inspection team use the EDF SA CEIDRE manufacturing surveillance team to perform their inspections and have several NNB GenCo employees in long term training at CEIDRE for use on the UK EPR in the future. NNB GenCo performs random oversight inspections of the supplier and their inspection organisation. I sampled compliance to the approved requirements in sample records packages and in a visit to the forgemasters Creusot Forge (CF) and from my observations consider that adequate NNB GenCo inspection was being performed at that time.
- 67 High Integrity Components (HIC) and Conformity Assessment. The Independent Third Party Inspection Agency (ITPIA) Lloyds-Apave has carried out specific audits on the subject of hydrogen measurement and conducted annual assessments of Creusot Forge CF and Japan Steel Works (JSW).
- 68 Minor non-conformances were reported at this time. The ITPIA periodic contract meetings identified an increase in the number of Non-Acceptance Notes (NANs) raised and not closed out and a number of Requests for Information (RFI) that were outstanding. I have witnessed information requested by Lloyds-Apave ITPIA, assessments, inspections, contract meeting between Lloyds-Apave and NNB GenCo along with sample records. I am satisfied that Lloyds-Apave is performing its responsibilities as a HIC conformity
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assessor. I am also satisfied that attention is being applied to reducing outstanding NANS and RFIs and progress being tracked in the working level meetings.

#### **4.2.20 Control of Manufacturing assessment findings to Dec 2012**

69 I have identified no formal findings that should be completed prior to a specific project milestone. The Manufacturing Inspection Team is an experienced team and has brought their experience of working from the French fleet and on power station construction projects to the Hinkley Point C project. I am satisfied that they have developed processes and interface connections with other NNB GenCo functional teams and within the Responsible Designer organisation, along with suppliers in the supply chain.

70 The team is managed largely by expatriates from France who will time out of their secondments within the next two years. I see this as a potential risk as there is currently very little opportunity for progression management. This situation will be monitored within our periodic working level meetings.

#### **4.2.21 Control of Manufacturing from Dec 2012 to Dec 2013**

71 Manufacturing inspection processes have remained steady throughout the year with interventions and meetings probing implementation adequacy. I consider that the processes are adequate for the manufacturing phase of HPC. Sample record packages to support the End of Manufacturing Report for the manufacture of large forgings have been reviewed through the year and they did not fully meet ONRs expectations. Actions and correspondence is progressing the enhancement of the lifetime records. I do not consider these shortfalls a risk to the project currently.

72 The Manufacturing Inspection Team now forms part of the Engineering Directorate in accordance with the Project Execution Plan restructuring. The Manufacturing Inspection Team has been reorganised to take account of the Head of Manufacturing Inspection's retirement at the end of 2013 with the new head taking a dual role as functional head and manufacturing surveillance lead. A management of change assessment identifies and justifies this change in accordance with Licence Condition 36 requirements. I consider the proposed change to be adequate for this phase of the HPC project leading up to the financial investment decision. I will monitor the proposed changes and process implementation in subsequent working level meetings.

73 Assessments of preferred supplier's pre and post contract award by both the Manufacturing Inspection Team and NNB GenCo Independent Third Party Inspection Agency (ITPIA) are currently on schedule. I judge that this is an acceptable position and have observed good proactive interaction between the team and potential suppliers. The assessment findings issued to suppliers for action are being addressed on a reasonable timescale and closed out prior to contract award. I judge this to be an acceptable position.

74 The Manufacturing Inspection Team continues to review work process control documents for safety significant large forgings prior to use. End of Manufacturing reports are now being produced and submitted to NNB GenCo for review and acceptance. Whilst there is a document management system and staff who will administer project documents and records, there is not at present an overall project lifetime record strategy in place or an owner identified who is responsible for the process and defining the strategy. This has been raised with NNB GenCo as part of the records management working level meetings.

75 The HPC project Quality Directorate was introduced at the end of 2013 and will form part of this work stream going forward. The Quality Directorate and its organisational make up and limits of responsibility have not been fully identified as yet. I consider there is not a

risk to the project in the short term given the current hold on contracts until the investment decision is finalised. I will monitor the proposed changes and process implementation in subsequent level 4 meetings.

#### 4.2.22 Reports produced in 2012 and 2013 for Manufacturing Inspection.

Report Reference:	TRIM reference:
IR (March 2012). ONR-NNB-GenCo-IR-12-061	TRIM 2012/156867
IR (May 2012). ONR-NNB-GenCo-IR-12-093	TRIM 2012/253859
IR (June 2012). ONR-NNB-GenCo-IR-12-083	TRIM 2012/274027
IR (June 2012). ONR-NNB-GenCo-IR-12-123	TRIM 2012/259059
AR (July 2012). ONR-CNRP-AR-12102	TRIM 2012/339327
IR (July 2012). ONR-NNB-GenCo-IR-12-111	TRIM 2012/311406
IR (Sept 2012). ONR-NNB-GenCo-IR-12-187	TRIM 2012/403480
IR (Sept 2012). ONR-NNB-GenCo-IR-12-197	TRIM 2012/410655
IR (Oct 2012). ONR-NNB-GenCo-IR-12-198	TRIM 2012/447145
IR (Dec 2012). ONR-NNB-GenCo-IR-12-223	TRIM 2013/23315
IR (Feb 2013). ONR-NNB-GenCo-IR-12-236	TRIM 2013/99546
IR (April 2013). ONR-NNB-GenCo-IR-13-004	TRIM 2013/18136
IR (June 2013). ONR-NNB-GenCo-IR-13-024	TRIM 2013/277692
IR (Sept 2013). ONR-NNB-GenCo-IR-13-044	TRIM 2013/386778
IR (Nov 2013). ONR-NNB-GenCo-IR-13-066	TRIM 2014/8803

#### 4.2.23 Document and Records Management (Section 3.15) – Dec 2012

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The controlling documentation relating to document and records management was complete, issued and is being implemented. The migration of procedures from Business Collaborator (BC), the existing Electronic Document and Records Management System (EDRMS), to the Integrated Management System (IMS) is now complete. A compatibility check of documentation and arrangements for document and records management against the Project Execution Plan (PEP) has confirmed that they are fully aligned. The

records retention schedule is a 'live' document which is incorporated into the IMS. It continues to be developed and has been expanded to include environmental record requirements.

77 The operational training and information package for documents and records management has been rolled out and the current programme is scheduled to be completed December 2012. The training is being delivered at NNB GenCo headquarters and the satellite offices. The training being delivered and the change over from BC to 'Documentum' is an opportunity to complete the 'clean up' of documentation metadata and to introduce stricter disciplines in the use of the EDRMS.

78 The lists of deliverables and record schedules have still to be provided by the process areas owners; however the document management Team are confident that the EDRMS will contain the necessary information to enable the lists and schedules to be generated. Following delivery of the training and the preparatory work required for the migration of information from BC to 'Documentum' an acceleration is anticipated in the 'clean up' programme and delivery of lists and schedules from the process areas. I noted that discussions are continuing on the options for the interim physical records store in conjunction with other requirements for physical storage facilities, and will seek assurance in due course that the option eventually chosen complies with relevant standards and good practice.

#### **4.2.24 Document and Records Management assessment findings Dec 2012**

79 I conclude that NNB GenCo's progress in developing its arrangements for management of documents and records is satisfactory. Training is being delivered and the DMT are noticing improvements in staff interaction with the EDRMS from the trained areas. The training and preparation for the migration to 'Documentum' provide an opportunity to introduce improved disciplines for staff interaction with the EDRMS.

#### **4.2.25 Document and Records Management from Dec 2012 to Dec 2013**

80 I consider that the document management team is moving in the right direction in setting up the processes and the tools that will administer the documents and records once they have been received. The project team however does not as yet have an overall record strategy in place for the tagging and collation of record packages or a strategy and processes to manage these packages. It is my judgment that NNB GenCo will need to give priority to this matter and have in place strategy and processes prior to bulk contract issue.

81 Enterprise Content Management (ECM) project provides a configured documentation product solution called "Documentum" which improves; document and record storage functionality, user experience and storage and retrieval facilities for all appropriate parties. The first phase roll out of "Documentum" is complete, with the second wider roll out to be completed in the first quarter of 2014. I am satisfied that the ECM project continues to be well managed and resourced and that a robust structured approach is being adopted. The justification for the migration from the existing Business Collaborator document management product to 'Documentum' remains strong and the company continues to give the project a high priority. The switch over was demonstrated to be under control and I am of the opinion that it is the right thing to do.

82 The storage of solid samples and required test piece lifetime records need to be considered during 2014 so that tagging and archiving in a suitable store can be progressed

**4.2.26 Reports produced in 2012 and 2013 for records management.**

<b>Report Reference:</b>	<b>TRIM reference:</b>
IR (July 2012). ONR-NNB-GenCo-IR-12-175	TRIM 2012/315793
AR (July 2012). ONR-CNRP-AR-12-89	TRIM 2012/336058
IR (October 2012). ONR-NNB-GenCo-IR-12-196	TRIM 2012/416702
IR (December 2012). ONR-NNB-GenCo-IR-12-212	TRIM 2012/483172
IR (March 2013). ONR-NNB-GenCo-IR-13-245	TRIM 2013/114251
IR (June 2013). ONR-NNB-GenCo-IR-13-019	TRIM 2013/231124
IR (December 2013). ONR-NNB-GenCo-IR-13-096	TRIM 2014/18515

**4.2.27 Sub-Chapter 21.2 – Design development and use of HPC PCSR**

83 Not assessed by the quality management specialist. The document sets out the strategy for further updates to the Hinkley Point C (HPC) pre construction safety report (PCSR) in the context of developing the HPC reference design.

**4.2.28 Sub-Chapter 21.3- Management Framework, Design Development and Usage and QA Arrangements**

84 The document describes the quality assurance (QA) arrangements adopted by NNB GenCo to develop the HPC PCSR Version 2. It describes how information from the 2011 consolidated generic design assessment (GDA) [PCSR has been used within the HPC PCSR 2. It also describes how site-specific elements of the HPC PCSR 2012 were developed. As the 2011 consolidated GDA PCSR forms a key component of the HPC PCSR, this sub chapter describes both the GDA organisation management arrangements and the GDA QA arrangements that were used to develop, review and approve the 2011 consolidated GDA. This sub-chapter outlines the process by which NNB GenCo reviewed, accepted and approved the HPC PCSR 2012. I did not assess this chapter.

**4.2.29 Comparison with Standards, Guidance and Relevant Good Practice**

85 NNB GenCo's arrangements for Licence Condition 17 'Management Systems' have been assessed against the requirements of the standards and the associated guidance identified in paragraph 2 and section 6. Technical Inspection Guide for LC 17, T/INS/017 "Quality Assurance" was used to inform and guide the assessment.

86 I consider that NNB GenCo's processes are clearly defined and documented and have the essential features expected from a management system as defined in Technical Inspection Guide T/INS/017 'Quality Assurance'.

87 The requirement for a Licensee Certificate is identified in Technical Assessment Guide T/AST/077 'Procurement of Nuclear Safety Related Items or Services'. NNB GenCo has adequately met this expectation for this phase of the project.



## 5 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusions

88 NNB GenCo has presented a Pre-Construction Safety Report (PCSR) 2012 [Ref1] as a link between GDA and PCSR 3. The period this PCSR was presented was in the period leading up to the manufacture of LLI large forgings for the nuclear steam supply system (NSSS). The main focus in this period was on having suitable developed arrangements in place to support the early manufacture of these items.

89 This report presents the findings of ONR's assessment of NNB GenCo's compliance arrangements for Licence Condition 17 (LC17) 'Management Systems' as described in PCSR 2012 chapter 21. The assessment considers the arrangements themselves, which are described in process and procedural documentation; and the level of implementation up to the end of December 2012. The assessment has been based on the requirements set out in established standards and guidance including GS-R-3, BS-EN-ISO 9001 [Ref 3 & 4] and the ONR Technical Guide and inspection documents; T/AST/077 and T/INS/017 [Ref 4].

90 The assessment considers the adequacy of NNB GenCo's arrangements, and their implementation, for the stage of development that NNB GenCo has reached at this point. It is recognised that the arrangements will continue to evolve as the project proceeds, and continuing ONR interaction with NNB GenCo is anticipated to gain assurance that the arrangements remain adequate and that they are being implemented effectively.

91 NNB GenCo was able to demonstrate in meetings, surveillance visits and interventions that its arrangements for compliance with LC17 have the essential elements of management systems as defined in GS-R-3, BS-EN-ISO 9001 [Ref 7 & 8] and T/INS/017 [Ref 4]. The ongoing dialogue ONR and NNB GenCo have had in support of this workstream over the past year has yielded positive benefits in terms of the approach adopted by NNB GenCo and the design of the arrangements.

92 The HPC project is in its early phases and the arrangements are still being refined and developed. Implementation has not yet matured however NNB GenCo has made significant progress and has established adequate processes for their management system.

93 The HPC project lifecycle has a number of key phases such as: design, manufacture, construction, commissioning and operation, shutdown and decommissioning. NNB GenCo's LC17 management systems compliance arrangements will need to be continually reviewed and revised in order to cope with the varying demands of scale, complexity and technological challenges throughout the HPC lifecycle. As the project advances there will be increased users across a range of different geographical locations; ONR will seek assurance that arrangements continue to develop appropriate to project lifecycle and that they are implemented effectively.

94 Samples of specific licensee arrangements that form part of the management system have been assessed in this report, for example; quality assurance, supply chain procurement, manufacturing inspection and records management. I judge that adequate arrangements are in place to meet the PCSR 2012 claims and to support the manufacture of LLI and that these continue to be developed to meet a broader scope of contracts and project management arrangements when the corporate body makes the financial investment decision.

95 I consider that the workstreams assessed continue to have good open discussions on the subject of; integrated management systems, quality assurance, supply chain

procurement, manufacturing inspection, supplier assessment and management of records. Future interventions will sample processes responsibilities and implementation to support the wider project scope.

96 The over all IIS rating for Integrated Management Systems I considered to be a 3. Arrangement generally found to be adequate meeting guidance requirements with some areas of development and improvement.

## 5.2 Recommendation.

97 My recommendation is as follows;

98 **Recommendation 1:** I recommend that ONR should continue to monitor the development of NNB GenCo's Integrated Management System.

## 6 REFERENCES

1. NNB GenCo Submission of HPC PCSR 2012, Letter NNB-OSL-RIO-000322, ONR-HPC-20337N, 6 December 2012, TRIM 2013/16143.
2. ONR How2 Business Management System. Guidance on Production of Reports, AST/003 Revision 7, September 2013
3. Safety Assessment Principles for Nuclear Facilities. 2006 Edition Revision 1. HSE. January 2008. [www.hse.gov.uk/nuclear/SAP/SAP2006.pdf](http://www.hse.gov.uk/nuclear/SAP/SAP2006.pdf)
4. Technical Assessment Guides (TAGs). [www.hse.gov.uk/nuclear/tagsrevision.htm](http://www.hse.gov.uk/nuclear/tagsrevision.htm)
  - NS-INSP-GD-017 “LC17 Management Systems” (Revision 02). TRIM 2012/186538.
  - NS-TAST-GD-077 “Procurement of Nuclear Safety related Items or Services” (Revision 2) TRIM 2013/158482.
  - NS-TAST-GD-049 “Licensee Core and Intelligent Customer Capabilities” (Revision 4) TRIM 2013/79464.
  - NS-TAST-GD-033 “Licensee Management of Records” (Revision 3) TRIM 2013/82690.
5. UK EPR GDA Step 4 Consolidated Pre-Construction Safety Report, March 2011. Detailed in EDF and AREVA letter UN REG EPR00997N, 18 November 2011, TRIM 2011/552663.
6. Final Consolidated UK EPR GDA Pre-Construction Safety Report, March 2011. Detailed in EDF and AREVA letter REG EPR01470N, 30 November 2012, TRIM 2012/470151.
7. IAEA Safety Standards
  - 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”;IAEA. Vienna. 2000. [www.iaea.org](http://www.iaea.org).
8. 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”;

The following procedures can be found on NNB GenCo Business Collaborator (BC)

9. NNB-OSL-MAN-000004. Version 2. “Management Systems Manual”.
10. NNB-FIN-PRO-000031
11. NNB-FIN-PRO-000014
12. NNB-OSL-PRO-000026

13. NNB-OSL-PRO-000027
14. NNB-OSL-PRO-000025
15. NNB-OSL-PRO-000028
16. NNB-OSL-GVI-000163
17. Supply Chain Procurement Procedures.  
NNB GenCo procedures access via NNB GenCo Business Collaborator (BC)
  - NNB-PCP-PRO-000059 Procurement Route Indicator
  - NNB-PCP-PRO-000060 Procurement Overview
  - NNB-PCP-PRO-000062 Contract Kick-Off Meeting
  - NNB-PCP-PRO-000063 Sourcing and PPQ Preparation
  - NNB-PCP-PRO-000065 Supplier Pre Qualification
  - NNB-PCP-PRO-000066 Invitation to Tender
  - NNB-PCP-PRO-000067 Tender Evaluation
18. General Quality Assurance Specifications (GQAS) Doc reference UKGQAS ECUK1000053 (C)
19. RCC-M UK adaptation document NNB-OSL-SPE-000011

Table 1

## Relevant Safety Assessment Principles Considered During the Assessment

SAP No.	SAP Title	Description
MS.1	<p><b>Leadership and Management for Safety</b> Paragraph 51: The QMS should be based on national and international standards or other defined documents and should be reviewed periodically. Consideration should be given to the adoption of a single company wide management system ensuring that the principle of continuous improvement is maintained.</p>	<p><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.</p>
MS.2	<p><b>Leadership and Management for Safety</b> Paragraph 55: Processes and systems should secure and assure maintenance of the appropriate technical and behavioural competence of directors, managers and leaders and all other staff relevant to their safety roles and responsibilities.</p>	<p><b>Capable organisation</b> The organisation should have the capability to secure and maintain the safety of its undertakings.</p>
MS.3	<p><b>Leadership and Management for Safety</b> Paragraph 65: Active challenge should be part of decision making throughout the organisation. This may have different forms and functions in different areas, but all aspects of challenge should be part of an integrated process for the whole organisation, including the most senior levels of management. This should ensure that active challenge:</p> <ul style="list-style-type: none"> <li>a) occurs by design in all key decision making and for processes that may affect safety;</li> <li>b) does not originate solely from independent nuclear safety assessment or peer review;</li> <li>c) has a preoccupation with failure and actively looks for ways that things could go wrong;</li> <li>d) applies to technical/plant-based and management</li> </ul>	<p><b>Decision making</b> Decisions at all levels that affect safety should be rational, objective, transparent and prudent.</p>
EMC.17	<p><b>Engineering principles: integrity of metal components and structures: general</b></p>	<p><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.</p>

**Table 1**

Relevant Safety Assessment Principles Considered During the Assessment

SAP No.	SAP Title	Description
EMC.20	<b>Engineering principles: integrity of metal components and structures: general</b>	<p><b>Records</b></p> <p>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.</p>