



PROJECT ASSESSMENT REPORT			
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Nuclear Site Licence No:	Site Licence No: 97A		
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Hinkley Point C Construction

Specification under arrangements made under Licence Condition 19 Hold Point 2.2.10 – Receipt of First Major NSSS Shipment to Site

Project Assessment Report ONR-NR-PAR-17-001

Revision 0

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EXECUTIVE SUMMARY

Title

Specification under arrangements made under Licence Condition 19(1) for Hold Point 2.2.10 Receipt of First Major Nuclear Steam Supply System (NSSS) Shipment to Site for the Hinkley Point C nuclear power station

Action Requested

This report presents ONR's justification for specifying that NNB GenCo shall not commence Receipt of First Major NSSS Shipment to Site without the agreement of ONR.

Background

Nuclear New Build Generation Company (HPC) Ltd (NNB GenCo), the licensee, intends constructing a twin reactor EPR™ nuclear power station at Hinkley Point (HPC). The ONR "*Hinkley Point C – Construction Intervention Strategy for the UK EPR™*" sets out ONR's strategy for regulating the construction phase of the HPC project including the management expectations and framework for intervention planning.

Under its arrangements for compliance with LC19(1) NNB GenCo has divided the Hinkley Point C construction phase into stages separated by Hold Points (HPs) which represent the key project milestones where there is a step change in the risk of poorly conceived or executed construction or commissioning impacting upon nuclear safety. ONR intends to make appropriate use of primary or derived powers to permission the commencement and selected subsequent stages of the construction of HPC.

Assessment and inspection work carried out by ONR

The definition of the hold points used to separate the Hinkley Point C project into stages was the subject of dialogue between NNB GenCo and ONR that was informed by the experience of regulating construction of the Sizewell B Pressurised Water Reactor.

Matters arising from ONR's work

ONR's regulation of HPC involves the use of primary powers to specify only a selected subset of the stages of construction or commissioning, and differs significantly to the approach adopted for Sizewell B where the regulator issued a single specification requiring the licensee to seek its consent to commence each stage of construction or commissioning.

ONR has already used the primary powers contained in LC19(4) to specify that NNB GenCo will require ONR's consent to proceed beyond two major hold-points - HP 1.2.1 First Nuclear Safety Concrete and HP 1.2.2 Start of Nuclear Island concrete. ONR has also issued a licence instrument which granted NNB GenCo consent to proceed past Hold Point 1.2.1 and thus commence first pour of nuclear safety concrete. ONR has identified several other hold points that, in its view, separate stages of construction and commissioning that, if inadequately conceived or executed, represent a significant increase in risk to nuclear safety of the operating plant. ONR has advised NNB GenCo that for each of these stages it intends to use primary powers under the nuclear site licence to specify that NNB GenCo seeks its Consent to proceed.

Areva is manufacturing HPC's NSSS's primary circuit components using items fabricated by a range of suppliers including Areva Creusot-Forge (ACF) and Japan Steel Works (JSW). In recognition of the high integrity demanded of these components, and in accordance with its arrangements for compliance with LC19, NNB GenCo has introduced Hold Point 2.2.10: Receipt of First Major NSSS Shipment to Site.

In the light of recently identified performance shortfalls at Areva's ACF plant, ONR has informed NNB GenCo that it wishes to exercise enhanced regulatory scrutiny of its oversight of the AREVA manufacturing contract and that for the purposes of arrangements made by the licensee under condition LC19(1) attached to schedule 2 to Nuclear Site Licence 97A specify that the licensee shall not commence Receipt of First Major NSSS Shipment to Site without the agreement of the Office for Nuclear Regulation.

Conclusions

NNB GenCo's Hold Point 2.2.10 constrains the Receipt of First Major NSSS Shipment to Site. NNB GenCo has identified performance shortfalls in the production of components manufactured by ACF that have the potential to impact upon the quality and integrity of components it is manufacturing for HPC's NSSS. ONR has informed NNB GenCo that it wishes to exercise enhanced regulatory scrutiny of its oversight of the AREVA manufacturing contract. ONR should issue Licence Instrument LI50# exercising powers derived from arrangements made by the licensee for compliance with LC19(1) to specify that NNB GenCo shall not commence Receipt of First Major NSSS Shipment to Site without the agreement of the Office for Nuclear Regulation.

Recommendation

I recommend that the Superintending Inspector:

- considers the proposal contained in this PAR to exercise the derived power under the licensee's arrangements under 19(1) to specify that NNB GenCo shall not commence Receipt of First Major NSSS Shipment to Site without the agreement of ONR.
- if supportive of the proposal, signs the Specification identified as Licence Instrument LI510.

LIST OF ABBREVIATIONS

ACF	Areva Creusot-Forge
GLD	Government Legal Department (formerly Treasury Solicitors)
HOW2	(Office for Nuclear Regulation) Business Management System
HPC	Hinkley Point C
JSW	Japan Steel Works
LC	Licence Condition
LI	Licence Instrument
NIC	Nuclear Island Concrete
NII	Nuclear Installations Inspectorate
NNB GenCo	Nuclear New Build Generation Company (HPC) Ltd
NSSS	Nuclear Steam Supply System
ONR	Office for Nuclear Regulation
PAR	Project Assessment Report

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1 ACTION REQUESTED

1. This report presents the justification for ONR to exercise derived powers under arrangements made by the licensee for compliance with Licence Condition (LC) 19(1) to specify that the licensee shall not commence Receipt of First Major Nuclear Steam Supply System (NSSS) Shipment to Site, defined as Hold Point 2.2.10, without the agreement of the Office for Nuclear Regulation.

2 INTRODUCTION

2. Nuclear New Build Generation Company (HPC) Ltd (NNB GenCo), the licensee, is constructing a twin reactor EPR™ nuclear power station at Hinkley Point (HPC). The ONR “*Hinkley Point C – Construction Intervention Strategy for the UK EPR™*” (Ref 1) sets out ONR’s strategy for regulating the construction phase of the HPC project.
3. ONR has supplemented its strategy for HPC construction with “*Guidance for Early Construction Phase Activities up to ONR Consent to Nuclear Island Concrete*” (Ref 2). That document provides guidance to ONR’s topic leads to assist planning interventions and the preparation of topic specific assessment reports that will inform ONR’s collective judgement of NNB GenCo capability as it prepares to proceed beyond key construction hold-points.
4. ONR intends to regulate construction and commissioning of HPC using NNB GenCo’s arrangements for compliance with LC19 and LC21. Thus ONR will make appropriate use of primary or derived powers to permission both the commencement of construction or installation and commissioning as well as selected subsequent stages of construction and commissioning which NNB GenCo has separated by hold points.

3 BACKGROUND

5. A nuclear site licensee’s arrangements under LC 19(1) shall where appropriate divide the construction phase into stages. Under its arrangements for compliance with LC19(1) and 21(1) (Ref 3), NNB GenCo has divided the HPC project into stages separated by Hold Points (HPs) which represent the key project milestones where there is a step change in the risk of poorly conceived or executed construction or commissioning impacting upon nuclear safety.
6. The definition of the hold points used to separate the HPC project into stages was the subject of dialogue between NNB GenCo and ONR that was informed by the experience of regulating construction of the Sizewell B Pressurised Water Reactor (PWR). Table 1 reproduces NNB GenCo’s list of HPs for Unit 1 (Ref 4) which divide construction and commissioning into stages. The list is the subject of regular review that will permit both NNB GenCo and ONR to introduce additional stages to enhance the control/regulation of the project if deemed necessary.
7. For the regulation of HPC ONR looks to NNB GenCo to have effective and robust arrangements for managing the progress of construction and commissioning from one stage to the next. For HPC unit 1 ONR judges the following Hold Points separate stages of construction and commissioning that, if inadequately conceived or executed, represent a significant increase in risk to nuclear safety of the operating plant.
 - HP1.2.1 First Nuclear Safety Concrete (FNCS) - First placement of structural concrete for a nuclear safety related building on the HPC on site.
 - HP1.2.2 Nuclear Island Concrete (NIC) – Placement of structural concrete for the common raft.

- HP1.3.1 Start of Commissioning (non-active) – Energising the auxiliary transformer
 - HP1.4.1 Active Commissioning – Release for first reactor fuel on site
 - HP1.4.2 First Criticality – Release of the first approach to criticality
 - HP2.4.2 Synchronisation of plant operation with the grid.
8. ONR has advised NNB GenCo that for each of the above stages it intends to use primary powers under the nuclear site licence to specify that NNB GenCo seeks its Consent to proceed. ONR issued its first Specifications under LC19(4) (Ref. 5) in the form of Licence Instruments 504 and 505 which require NNB GenCo to gain the Consent of ONR before proceeding past Hold Point 1.2.1 (FNCS) and Hold Point 1.2.2 (NIC). ONR has also issued licence instrument 509 under LC19(4) (Ref 6) which granted NNB GenCo consent to proceed past Hold Point 1.2.1 and thus commence first pour of nuclear safety concrete.

4 REGULATORY CONSIDERATION OF THIS REQUEST

9. As explained above, ONR's regulation of HPC using primary powers to specify only a selected sub-set of the stages of construction or commissioning, differs significantly to the regulation of Sizewell B where Nuclear Installations Inspectorate (NII) issued a single specification requiring the licensee to seek its consent to commence every stage of construction and commissioning.
10. ONR sought Government Legal Department (GLD) advice on this alternative use of LC19 (4) and LC21 (4) to regulate HPC. GLD's response (Ref 7) agreed with ONR's interpretation of the license conditions and accepted its proposal to issue individual specifications requiring NNB GenCo to seek ONR consent to proceed with selected stages of the construction or commissioning.
11. ONR also recognises that it must retain the option to regulate additional stages as and when necessary. NNB GenCo's arrangements for compliance with LC19(1) and LC21(1) include derived powers which permit ONR to specify that it will not commence a particular stage of construction or commissioning without ONR's agreement. Thus at any stage of the of HPC project ONR has the option of using primary powers under the nuclear site licence, or alternatively the more flexible derived powers under the licensee's own arrangements, to secure appropriate and proportionate regulation of any or all of the stages listed in Table 1.
12. The subject of this PAR is a derived power construction hold-point for which ONR proposes to specify that NNB GenCo seeks its agreement to proceed.

4.1 USE OF DERIVED POWERS TO PERMISSION CONSTRUCTION ACTIVITY

13. Areva is manufacturing HPC's NSSS's primary circuit components using items fabricated by a range of suppliers including Areva Creusot-Forge (ACF) and Japan Steel Works (JSW). Many of these components are classified as high integrity components (HICs) that require NNB GenCo to establish a high level of confidence that they are fabricated to the appropriate quality and integrity standards commensurate with HPC's nuclear safety case. Quality and integrity is assured through supplier inspection and tests performed during manufacture and surveillance undertaken by NNB GenCo and its agents.
14. In recognition of the high integrity demanded of these components, and in accordance with its arrangements for compliance with LC19, NNB GenCo has introduced Hold Point 2.2.10: Receipt of First Major NSSS Shipment to Site which constrains the receipt of first major NSSS delivery to site, i.e. the reactor pressure vessel. The commentary for the hold point states:

“Site must be ready and capable to receive shipment. Components and records must be acceptable. Potential for damage or loss to occur during delivery, causing large schedule delay.”

15. The hold point is scheduled to be lifted on [REDACTED] with the hold point process commencing on [REDACTED]
16. In the light of the recently identified performance shortfalls at Areva’s ACF plant, ONR has informed NNB GenCo that it wishes to exercise enhanced regulatory scrutiny of its oversight of the AREVA manufacturing contract and that for the purposes of arrangements made by the licensee under condition LC19(1) attached to schedule 2 to Nuclear Site Licence 97A specify that the licensee shall not commence Receipt of First Major NSSS Shipment to Site without the agreement of the Office for Nuclear Regulation.
17. In accordance with the ONR Instruction *Preparation and Issue of Licence Instrument* (Ref 8), I have prepared Licence Instrument (LI) 510 to specify that the licensee shall not commence Receipt of First Major NSSS Shipment to Site without the agreement of the ONR. The draft LI follows the standard form set out in Ref 8, and is at Annex 1; a paper copy, ready for signature will be provided in the associated file along with this PAR and the completed Licence Instrument check-sheet.

4.2 LEGAL ADVICE

18. As previously discussed we have sought and obtained GLD’s agreement to the proposed use of the derived powers contained in LC19 to permission selected stages of construction (Ref 7). The proposed Licence Instrument follows the approved standard format of a derived power specification set out in the relevant ONR Instruction (Ref 8).

5 CONCLUSIONS

19. NNB GenCo’s Hold Point 2.2.10 constrains the commencement of Receipt of First Major NSSS Shipment to Site. NNB GenCo has identified performance shortfalls in the production of components manufactured by ACF that have the potential to impact upon the quality and integrity of components it is manufacturing for HPC’s NSSS. ONR has informed NNB GenCo that it wishes to exercise enhanced regulatory scrutiny of its oversight of the AREVA manufacturing contract. ONR should issue Licence Instrument LI50# exercising powers derived from arrangements made by the licensee for compliance with LC19(1) to specify that NNB GenCo shall not commence Receipt of First Major NSSS Shipment to Site without the agreement of the Office for Nuclear Regulation.

6 RECOMMENDATIONS

20. I recommend that the Superintending Inspector:
 - (i) considers the proposal contained in this PAR to exercise the derived power under the licensee’s arrangements under 19(1) to specify that NNB GenCo shall not commence Receipt of First Major NSSS Shipment to Site without the agreement of ONR.
 - (ii) if supportive of the proposal, signs the Specification identified as Licence Instrument LI510.

7 REFERENCES

- 1 Hinkley Point C. Construction Interventions Strategy for the UK EPR™. 23 March 2016. TRIM 2016/134216.
- 2 Guidance for Early Construction Phase Activities up to ONR Consent to Nuclear Island Concrete. July 2016. TRIM 2016/297853
- 3 NNB GenCo document: Define, Manage and release Key Hold Points. NNB-209-PRO-000025 Ver. 4.0. March 2015 TRIM 2016/392779
- 4 NNB GenCo document: Hinkley Point C Hold Point List. NNB-209-LST-000030, Version 6.0 dated April 2016 TRIM 2016/392768
- 5 Specifications for Construction Consents, ONR-NR-PAR-16-002 October 2016. TRIM 2016/378742
- 6 Hinkley Point C Licence Instrument 508 dated 6 March 2017, Commencement of First Nuclear Safety Concrete. TRIM 2017/92591.
- 7 Correspondence with Treasury Solicitors: July 2012, TRIM 2015/33776 and January 2015 TRIM 2015/36218
- 8 ONR Instruction NS-PER-IN-001 Revision 7, January 2016. *Preparation and Issue of Licence Instruments*

TABLE 1: HINKLEY POINT C UNIT 1: HOLD POINTS SEPARATING STAGES OF CONSTRUCTION OR INSTALLATION AND COMMISSIONING.

Hold Point	Title	Constrained Activities	Project Phase	LC
1.2.1	First Nuclear Safety Concrete	First pour of nuclear safety related concrete on site.	Construction or Installation	19
2.2.1	Start of Pumping Station	Begin major construction activity for the Pumping Station.	ditto	19
2.2.12	Pre-stressing Gallery	Pouring of concrete for the construction of the Pre-Stressing Gallery	ditto	19
2.2.13	Turbine Hall Raft and CRF Pipe Protection	Pouring of concrete for construction of the Turbine Hall	ditto	19
2.2.14	Launch of Tunnel Boring Machine	First movement of the Tunnel Boring Machine (TBM) following successful erection	Ditto	19
1.2.2	Nuclear Island Concrete	Pouring the common raft concrete	ditto	19
2.2.5	Turbine Pedestal Pouring	Pouring of the turbine pedestal concrete	ditto	19
2.2.10	Receipt of First Major NSSS Shipment to Site	Receipt of first Major NSSS delivery to site.	ditto	19
2.2.9	Commencement of Pre-Stressing Activities	Start of pre-stressing activities	ditto	19
2.2.8	Reactor Building Dome Lifting.	Reactor building dome lifting	ditto	19
2.2.11	Loading/Installation of First Major NSSS Component	Loading and installation of first major NSSS component	ditto	19
2.2.16	Start of Welding of the Main Components of the Primary Circuit on Site	Start of Welding of the Main Components of the Primary Circuit on Site	ditto	19
2.2.17	Release of Delivery of TXS Cabinets to Site	Delivery of the bulk shipment of TXS Cabinets to Site	ditto	19
1.3.1	Non-Active Commissioning	Start of Non-active Commissioning Phase First energisation of auxiliary transformer	Commissioning	21
2.3.2	Water into Fore Bay	Release of water into fore bay	ditto	21

2.3.3	Secondary System Hydro-test	Secondary hydro-test	ditto	21
2.3.4	NSSS Hydro-test	NSSS pressure test	ditto	21
2.3.6	Containment Testing	Start of containment testing	ditto	21
2.3.7	Start of Hot Functional Tests	Hot functional tests	ditto	21
2.3.8	First Steam to Turbine During Hot Functional Testing.	First steam to turbine during Hot Functional Testing.	ditto	21
1.4.1	Active Commissioning	Release for first reactor fuel on site. Start of Radioactive Commissioning Phase	ditto	21
2.4.1	Start of fuel loading	Fuel loading	ditto	21
1.4.2	First criticality	Release for approach to the first criticality.	ditto	21
2.4.2	Synchronisation of the main generator to the Grid under Nuclear Steam.	Synchronisation of main generator to the grid.	ditto	21

ANNEX 1: DRAFT LICENCE INSTRUMENT – RECEIPT OF FIRST MAJOR NSSS SHIPMENT TO SITE.

ONR Letter Headed Paper

Company Secretary
NNB Generation Company (HPC) Limited
40 Grosvenor Place
LONDON
SW1X 7EN

Direct Dial: 0203028 0078

Ref: [Insert relevant file/ part/ enc no.]

For the attention of [REDACTED]

Unique No:

Date: [Day Month Year]

Dear Sir

NUCLEAR INSTALLATIONS ACT 1965 (AS AMENDED)
Nuclear New Build Generation Company HPC) Ltd
NUCLEAR SITE LICENCE No: 97A
LICENCE INSTRUMENT No: [Insert Relevant No.]
SPECIFICATION UNDER ARRANGEMENTS MADE UNDER CONDITION 19(1)

TITLE: SPECIFICATION FOR RECEIPT OF FIRST MAJOR NUCLEAR STEAM SUPPLY SYSTEM SHIPMENT TO SITE.

The Office for Nuclear Regulation, for the purposes of arrangements made by the licensee under Condition 19(1) of Schedule 2 attached to Nuclear Site Licence No. 97A to control construction or installation, hereby specifies that the licensee shall not commence Receipt of First Major Nuclear Steam Supply System Shipment to Site, defined as Hold Point 2.2.10 in the document titled Hinkley Point C: Hold Point List, NNB-209-LST-000030, Version 7.0 dated 29 June 2017, without the agreement of the Office for Nuclear Regulation.

I am copying this letter to [REDACTED]

Yours faithfully

[REDACTED]

[Name of Inspector with Delegated Authority]
[Grade of Inspector with Delegated Authority]