



PROJECT ASSESSMENT REPORT			
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Site:	Hinkley Point C		
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Nuclear Site Licence No:	Site Licence No: 97A		
Licence Condition:	LC 19(1)		

Document Acceptance and Approval for Issue / Publication

Role	Name	Position	Signature	Date
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Hinkley Point C Construction

Specification under arrangements made under Licence Condition 19 Hold Point 2.2.1 - Start of construction of the Pumping Station

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EXECUTIVE SUMMARY

Title

Specification under arrangements made under Licence Condition 19(1) for Hold Point 2.2.1 (Start of the Pumping Station) for the Hinkley Point C nuclear power station

Action Requested

This report presents ONR's justification for specifying that NNB GenCo shall not commence construction of the HPC Pumping Station without the agreement of ONR.

Background

Nuclear New Build Generation Company (HPC) Ltd (NNB GenCo) intends to construct a twin reactor EPR™ nuclear power station at Hinkley Point C. The ONR *"Hinkley Point C – Construction Intervention Strategy for the UK EPR™"* sets out ONR's overall strategy for regulation of 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). These Specifications are identified as Licence Instruments LI504 and LI505.

The two hold-points specified in LI504 and LI505 are anticipated to be separated by approximately 20 months. Given the high nuclear safety-significance of the start of nuclear island construction, ONR judges that it is appropriate and proportionate to use the derived powers given by the licensee's arrangements under LC 19 to specify an additional, intermediate hold-point at which it can take stock of the HPC construction experience to date, and to assess the competence of NNB Genco and its contractors to continue to construction up to the nuclear island hold-point.

Construction of the Pumping Station is planned to start about 11 months after First Nuclear Safety Concrete. Although NNB Genco has identified other interim construction hold-points that ONR could have specified for permissioning, the timing of the start of Pumping Station construction and the complexity of its construction, make this the most appropriate point for ONR exercise its permissioning powers.

Conclusions

NNB Genco's Hold Point 2.2.1 constrains the commencement of construction of the HPC Pumping Station. ONR should issue Licence Instrument LI508 exercising powers derived from arrangements made by the licensee for compliance with LC19(1) to specify that NNB GenCo

shall not commence Start of Pumping Station, defined as Hold Point 2.2.1, without the agreement of the Office for Nuclear Regulation. This specification is provided in the proposed Licence Instrument 508.

Recommendation

I recommend that the Superintending Inspector consider the proposal contained in this Project Assessment Report to:

- exercise powers derived from NNB Genco's arrangements under LC19(1) to specify that NNB GenCo shall not commence the construction of the HPC Pumping Station without the Agreement of ONR; and
- if supportive of the proposal, sign the Specification identified as Licence instrument LI508.

LIST OF ABBREVIATIONS

FNCS	First Nuclear Safety Concrete
GLD	Government Legal Department (formerly Treasury Solicitors)
HOW2	(Office for Nuclear Regulation) Business Management System
HPC	Hinkley Point C
LC	Licence Condition
NIC	Nuclear Island Concrete
NII	Nuclear Installations Inspectorate
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 Start of Pumping Station, defined as Hold Point 2.2.1, without the agreement of the Office for Nuclear Regulation.

2 INTRODUCTION

2. Nuclear New Build Generation Company (HPC) Ltd (NNB GenCo), the licensee, intends to construct 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 will look 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 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. These require NNB GenCo to gain the Consent of ONR before passing Hold Point 1.2.1 (FNCS) and Hold Point 1.2.2 (NIC).
9. Following the decision of NNB GenCo's parent body (EdF SA) in July 2016 to proceed with the project and the UK Government's subsequent confirmation of its support, there is an increased certainty regarding the project timescales. Based on ONR's current knowledge of the indicative dates for the release of each of the above hold-points, there is expected to be a significant gap between HP 1.2.1 (FNCS) and HP 1.2.2 (NIC). ONR has therefore informed NNB GenCo that it intends permission a further construction hold-point, interim between HP1.2.1 and HP 1.2.2, using powers derived from the licensee's own arrangements under LC 19(1). This report sets out the justification for ONR specifying that additional hold-point.

4 REGULATORY CONSIDERATION OF THIS REQUEST

10. 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 NII issued a single specification requiring the licensee to seek its consent to commence every stage of construction and commissioning.
11. ONR sought Government Legal Department (GLD) advice on this alternative use of LC19 (4) and LC21 (4) to regulate HPC. GLD's response (Ref 6) 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.
12. 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 stage of construction or commissioning without ONR's agreement. Thus at any stage of the 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.
13. 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 PRIMARY AND DERIVED POWERS TO PERMISSION CONSTRUCTION

14. As discussed in the construction intervention strategy (Ref 1) ONR's interventions are aimed at gathering evidence to form a judgement on the capability of the NNB GenCo organisation and the effectiveness of its management arrangements:
- to comply with relevant safety and security legislation;

- to produce a safety case that will support NNB GenCo's request for ONR's permission to start safety related construction;
 - to ensure the continued evolution of a safety report that supports NNB GenCo's construction and installation programme;
 - to ensure that the design of safety related structures, systems and components (SSC) is compliant with the extant safety case;
 - to control procurement and manufacture activities; and,
 - to control construction and installation.
15. As the project proceeds stage-by-stage ONR will aim to gather the intelligence required to assess NNB GenCo's capability against these strategic objectives and judge whether they are ready to manage the increased risk to nuclear safety posed by the constrained activities and, if appropriate, grant consent (or give agreement) to proceed beyond the hold points.
16. NNB GenCo has designated HP 1.2.1 (FNCS) and HP 1.2.2 (NIC) as "Primary Hold Points" reflecting their view of the change in nuclear safety risk posed by their release. ONR concurred with NNB GenCo's view of the nuclear significance of these holds points and, as explained above, has chosen to exercise 'Primary Powers' under the licence to require NNB GenCo to seek ONR's Consent to proceed beyond each one.
17. Between the above primary hold points NNB GenCo intends to commence the following stages of construction:
- HP 2.2.2 Start of Offshore Works – Commencement of Offshore Construction Works.
 - HP 2.2.12 Pre-stressing Gallery – Pouring of concrete for pre-stressing gallery.
 - HP 2.2.1 Start of Pumping Station – Major construction activity for the pumping station.
 - HP 2.2.13 Turbine Hall raft and CRF Pipe Protection – pouring of concrete to turbine hall and pipe protection
18. NNB GenCo has designated these as "Secondary Hold Points" because it deems the change in nuclear safety risk posed by their release to be lower than for HPs 1.2.1 and 1.2.2. ONR has advised NNB GenCo that currently it does not intend to use primary powers to permission these stages but it will exercise derived powers to permission one or more of the stages.
19. Following the granting of consent for FNCS, ONR's implementation of its intervention strategy will aim to:
- gather intelligence to inform the decision to grant the second consent (NIC) described above;
 - define a targeted and proportionate assessment of NNB GenCo capability against relevant strategic objectives;
 - inform interim judgements on its management of the risks to nuclear safety posed by its execution of the activities unconstrained by ONR's consent for FNCS; and,
 - judge its readiness to manage the risks posed by the activities constrained by the successive secondary hold points listed above.
20. The current HPC project schedule indicates that the start of Nuclear Island Concrete would follow 20 months after FNCS. Both require ONR's consent to start, but the

safety significance and complexity of the Nuclear Island construction is significantly greater than the work leading up to it. In view of this, ONR will require to have particular confidence in NNB Genco's capability and readiness to go beyond Hold Point 1.2.2 (NIC).

21. In selecting a secondary hold-point between FNCS and NIC, ONR has taken into account the need to allow NNB Genco to progress sufficiently far with the project to gain experience and learning in order to demonstrate their capabilities to proceed further. A hold point too close to FNCS would not allow NNB Genco sufficient time to do this, while a hold-point too close to NIC would not allow ONR time to gather and consider the evidence it needs to permission its release in line with the project schedule.
22. ONR has therefore decided that the secondary Hold Point HP 2.2.1: Start of the Pumping Station would be the timeliest one to permission. It has the added advantage over other secondary construction hold-points in that the pumping station is a highly complex project which will provide a good opportunity for NNB Genco to demonstrate processes for ensuring its readiness to proceed with this work.
23. In accordance with the ONR Instruction *Preparation and Issue of Licence Instrument* (Ref 7), I have prepared Licence Instrument 508 (Ref 8) to specify that the licensee shall not commence Start of pumping Station 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

24. 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 6). The proposed Licence Instrument follows the approved standard format of a derived power specification set out in the relevant ONR Instruction (Ref 7).

5 CONCLUSIONS

25. NNB Genco's Hold Point 2.2.1 constrains the commencement of construction of the HPC Pumping Station. ONR should issue Licence Instrument LI508 exercising powers derived from arrangements made by the licensee for compliance with LC19(1) to specify that NNB GenCo shall not commence Start of Pumping Station, defined as Hold Point 2.2.1 without the agreement of the Office for Nuclear Regulation..
26. The regulation of any other stages of construction or commissioning will be the subject of separate Project Assessment Reports justifying the use of the appropriate primary or derived power via licence instrument specifications.

6 RECOMMENDATIONS

27. 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 construction of the HPC Pumping Station without the agreement of ONR.
 - (ii) if supportive of the proposal, signs the Specification identified as Licence Instrument LI508.

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 Correspondence with Treasury Solicitors: July 2012, TRIM 2015/33776 and January 2015 TRIM 2015/36218
- 7 ONR Instruction NS-PER-IN-001 Revision 7, January 2016. *Preparation and Issue of Licence Instruments*
- 8 Licence Instrument 508, Start of the Pumping Station TRIM 2016/431158

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	Commencement of construction. Placement of first nuclear safety concrete	Construction or Installation	19
2.2.1	Start of Pumping Station	Construction of pumping station	ditto	19
2.2.12	Pre-stressing Gallery	Placement of concrete for pre-stressing gallery	ditto	19
2.2.13	Turbine Hall Raft and CRF Pipe Protection	Placement of concrete for Turbine hall raft and CRF pipe protection	ditto	19
2.2.14	Launch of Tunnel Boring Machine	Tunnelling activities	Ditto	19
1.2.2	Nuclear Island Concrete	Placement of common raft concrete	ditto	19
2.2.5	Turbine Pedestal Pouring	Placement of concrete for turbine pedestal	ditto	19
2.2.10	First Major NSS Shipment to Site	Shipping of first major nuclear steam supply system component	ditto	19
2.2.9	Commencement of Pre-Stressing Activities	Start of pre-stressing main reactor containment building	ditto	19
2.2.8	Reactor Building Dome Lifting.	Dome lifting.	ditto	19
2.2.11	Loading/Installation of First Major NSSS Component	Loading/installation of first major NSSS component.	ditto	19
2.2.16	Start of Welding of the Main Components of the Primary Circuit on Site	Welding of the Main Components of the Primary Circuit	ditto	19
2.2.17	Release of Delivery of TXS Cabinets to Site	Delivery of TXS Cabinets to Site	ditto	19
1.3.1	Non-Active Commissioning	Commencement of commissioning. First energisation of auxiliary transformer	Commissioning	21
2.3.2	Water into Fore Bay	Release of water into fore bay	ditto	21
2.3.4	NSSS Hydro-test	NSSS pressure test	ditto	21
2.3.3	Secondary System Hydro-test	Secondary hydro-test		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	First steam to turbine.	ditto	21

	Testing.			
1.4.1	Active Commissioning	Commencement of radioactive commissioning Release for first reactor fuel on site	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 – CONSTRUCTION OF PUMPING STATION

ONR Letter Headed Paper

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

Direct Dial: 0151-951 [Ext]

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

For the attention of Chris Hamill

Unique No: [Insert relevant 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: LI508

SPECIFICATION UNDER ARRANGEMENTS MADE UNDER CONDITION 19(1)

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 Start of Pumping Station, defined as Hold Point 2.2.1 in the document titled Hinkley Point C: Hold Point List, NNB-209-LST-000030, Version 6.0 dated 25 April 2016, without the agreement of the Office for Nuclear Regulation.

I am copying this letter to .Nigel Cann, Hinkley Point C Programme and Construction Delivery Director.

Yours faithfully

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