

Hinkley Point C Construction

**Specification under arrangements made under Licence Condition 19(1):
Hold Point 2.2.20 - Start of First bulk Mechanical Electrical and HVAC (MEH) activity
[in the Nuclear Island] at Hinkley Point C Unit 1**

Project Assessment Report ONR-NR-PAR-19-001

Revision 0

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EXECUTIVE SUMMARY

Title

Specification under arrangements made under Licence Condition 19(1): Hold Point 2.2.20 - Start of First bulk Mechanical, Electrical and HVAC (MEH) activity [in the Nuclear Island] at Hinkley Point C Unit 1.

Action requested

This Project Assessment Report (PAR) presents the justification for the Office for Nuclear Regulation (ONR) to exercise derived powers under arrangements made by the licensee NNB Generation Company (HPC) Ltd. (NNB GenCo) for compliance with Licence Condition (LC) 19(1), to specify that the licensee shall not commence first bulk MEH activity in the Hinkley Point C Unit 1 Nuclear Island, defined as Hold Point 2.2.20, without the agreement of ONR.

Background

NNB GenCo, the licensee, is constructing a twin reactor EPR™ nuclear power station at Hinkley Point (HPC).

Under its arrangements for compliance with clause 1 of Licence Condition 19 “Construction or installation of new plant” NNB GenCo has divided the HPC construction and commissioning phases 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. In line with its *Strategy for the regulation of Hinkley Point C from JO to COD*, ONR will make use of primary or derived powers to permit the commencement of identified stages of the construction and commissioning of HPC; the start of first bulk MEH installation is one of those identified stages.

Regulatory considerations

Hold Point 2.2.20 constrains the start of first bulk MEH and is a major milestone for the project. The MEH programme involves electrical and mechanical installations encompassing around 4000 rooms, utilising 3500 workers. This will involve 380 km of pipework, with 1000s of welds and associated radiography, and 9000 km of cabling.

With work of such intensity and complexity there is a high risk to project schedule if it is not properly managed. With this risk in mind, NNB GenCo has adopted a novel approach through the formation of an Alliance with key supply chain partners to manage MEH delivery. ONR will have a clear interest in the maturity of the Alliance prior to the start of first bulk MEH installation, as well as in other indicators of NNB GenCo’s readiness to take such a major step.

The permissioning of the start of first bulk MEH is in line with ONR’s strategy for regulating HPC during construction. The hold point falls two years after ONR gave consent to the start of the Unit 1 nuclear island, and about a year before the next construction related permissioning point. The ONR EPR sub-division Board has agreed that permissioning this activity using derived powers under LC19 represents a suitable and proportionate use of ONR’s powers.

Conclusions

The future release of the first bulk MEH hold point will be a major milestone for the project. It marks a steep increase in the complexity of installation activities on the Unit 1 nuclear island, with multiple platforms covering a large number of rooms. Good control of these activities is essential and will represent a significant challenge to the licensee. It is therefore appropriate for ONR to take a close interest in the ability of NNB GenCo to ensure its contractors undertake the installation activities to a standard that will ensure nuclear safety in the operational plant. To this end, ONR has elected to place the first bulk MEH hold point justified in this PAR.

Placing this hold point and the subsequent ONR permissioning decision concerning its release is consistent with ONR’s strategy for regulating HPC during construction and commissioning, and the ONR EPR sub-division Board is satisfied that placing this hold point and its subsequent permissioning using derived powers, represents a suitable and proportionate use of ONR’s powers.

Recommendations

I recommend that the ONR Head of EPR Regulation:

- Considers the proposal contained in this PAR to exercise the derived power under the licensee's arrangements under Licence Condition 19(1) to specify that NNB GenCo shall not commence first bulk MEH activity in the Hinkley Point C Unit 1 Nuclear Island without the agreement of ONR.
- If supportive of the proposal, accepts this PAR and then signs the Specification identified as Licence Instrument LI 519.
- Signs this PAR approving its release for publication, after redaction where appropriate.

LIST OF ABBREVIATIONS

COD	Commercial Operation Date
EPR™	The generic design of pressurised water reactor submitted for GDA
GDA	Generic Design Assessment
GLD	Government Legal Department
HP	Hold Point
HPC	Hinkley Point C
HVAC	Heating, Ventilation and Air Conditioning
J0	End of construction of Unit 1 Nuclear Island Common Raft
LC	Licence Condition
LI	Licence Instrument
MEH	Mechanical, Electrical & HVAC
NNB GenCo	NNB Generation Company (HPC) Limited
NSL	Nuclear Site Licence
NSSS	Nuclear Steam Supply System
ONR	Office for Nuclear Regulation
PAR	Project Assessment Report

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1 INTRODUCTION

1. This Project Assessment Report (PAR) presents the justification for the Office for Nuclear Regulation (ONR) to exercise derived powers under arrangements made by the licensee NNB Generation Company (HPC) Ltd. (NNB GenCo) for compliance with clause 1 of Licence Condition (LC) 19 “Construction or installation of new plant”, to specify that the licensee shall not commence first bulk Mechanical Electrical and HVAC (MEH) activity in the Hinkley Point C Unit 1 Nuclear Island, defined as Hold Point 2.2.20, without the agreement of ONR.

2 BACKGROUND

2. NNB GenCo is constructing a twin reactor EPR™ nuclear power station at Hinkley Point (HPC). The ONR *Strategy for the regulation of Hinkley Point C from JO to COD* (Ref 1) sets out ONR’s strategy for regulating the construction and commissioning phases of the HPC project following the completion of Unit 1 nuclear island common raft.
3. As set out in the strategy document, ONR will regulate identified stages of construction and commissioning under licence conditions 19 and 21, making use of primary or derived powers as appropriate.
4. Licence Conditions 19(4) and 21(4) (Licence Condition 21 is “Commissioning”) require the licensee, where appropriate, to divide the construction and commissioning phases into stages. Under its LC 19 and LC 21 compliance arrangements 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.
5. NNB GenCo’s *Hinkley Point C Hold Point List* (Ref. 2) sets out a list of HPs for the construction and commissioning of Units 1 and 2, which are pertinent to the licensee’s LC 19 and 21 arrangements, as well as other, project-related hold points which are not directly related to construction or commissioning stages. The list is the subject of regular review and revision by the licensee.

2.1 ONR use of primary powers

6. 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 the Nuclear Installations Inspectorate (NII) issued a single specification requiring the licensee to seek its consent to commence every stage of construction and commissioning.
7. Before the start of HPC construction, ONR sought Government Legal Department (GLD) advice on this alternative use of primary powers under LC19 and LC21 to regulate HPC. GLD’s response (Ref. 3) agreed with ONR’s interpretation of the licence 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. ONR also recognises that it must retain the option to use primary powers to regulate additional stages as and when necessary.
8. Early in the project, ONR advised NNB GenCo that it intends to exercise primary powers under LC19(4) and LC21(4) requiring NNB GenCo to seek its consent to pass the following Unit 1 hold points:
 - HP 1.2.1 First Nuclear Safety Concrete (LC19)
 - HP 1.2.2 Nuclear Island Concrete (LC19)
 - HP1.3.1 Start of non-active commissioning (LC21)
 - HP1.4.1 Start of active commissioning (LC21)
 - HP1.4.2 First approach to criticality (LC21)

9. NNB GenCo has designated these as 'primary' hold-points reflecting its assessment of the change in nuclear safety (or other) risk posed by their release.
10. Currently ONR has specified the first two of these 'primary' hold points, both of which have passed. The next hold point for which ONR anticipates using primary powers will be HP 1.3.1, start of non-active commissioning.

2.2 ONR use of derived powers

11. NNB GenCo's arrangements for compliance with LC 19(1) and LC 21(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 HPC project ONR has the option of using primary powers under the Nuclear Site Licence (NSL), or alternatively the more flexible derived powers under the licensee's own arrangements, to secure appropriate and proportionate regulation throughout the construction and commissioning stages.
12. NNB GenCo has designated other construction and commissioning related hold-points in Ref. 2 as 'secondary' hold-points because it deems the change in risk posed by their release to be lower than for the primary hold-points. ONR has advised NNB GenCo that currently it does not intend to use primary powers to permission the stages represented by secondary hold points, but that it will exercise derived powers to permission one or more of the stages.
13. Currently, ONR has specified by a Licence Instrument (LI) two secondary hold-points for permissioning via derived powers using the licensee's arrangements for compliance with LC 19(1):
 - HP 2.2.1 Start of (Unit 1) Pumping Station (LI 508);
 - HP 2.2.10 Receipt of first NSSS components (LI 510).
14. ONR has indicated to NNB GenCo that it will also specify a derived powers hold point under LC 19(1) relevant to the installation of first bulk MEH systems, which is the subject of this PAR.

2.3 Extant HPC Licence Instruments

15. Table 1 provides the full list of HPC LIs. Previous specifications have all been under LC 19 and are LIs 504, 505, 508 and 510. LIs 504 and 505 are primary powers LIs and 508 and 509 are derived powers LIs. The derived powers LI which accompanies this PAR is LI 519.

3 REGULATORY CONSIDERATIONS

16. As discussed in Section 2.1 above, and in more detail in ONR's Strategy for the regulation of HPC (Ref. 1), ONR has adopted an approach to permissioning the project during the construction and commissioning stages which differs from that used for Sizewell B. This approach involves ONR permissioning only a limited number of stages, and is consistent with the *Regulators Code* (Ref. 4) which requires us to be proportionate and targeted in the application of our powers. ONR's overarching strategy for regulating HPC during construction and commissioning also follows ONR's principles for *Enabling Regulation* (Ref. 5).
17. The release of the first bulk MEH hold point is a major milestone for the project. The activity is currently expected to start around October 2020. At that point, civil construction work on Unit 1 nuclear island will have reached the point where a number of individual rooms are structurally complete and ready to hand over from the main civil contractor to the MEH teams. Once started, the first bulk MEH installation across both units takes place over a period of around 3 years, although detailed MEH system completions will continue well beyond that. The MEH programme encompasses:

- ~ 4000 rooms
 - ~ 3500 workers
 - 380 km of pipework
 - 1000s welds and associated radiography
 - 20,000 valves
 - 400 pumps 120 tanks
 - 9000 km of cabling
18. With work of such intensity and complexity there is a high risk to project schedule if it is not well-managed. With this risk in mind, NNB GenCo has adopted a novel approach through the formation of an 'Alliance' with key partners to manage the delivery of the whole MEH programme. ONR will have a clear interest in the maturity of the alliance prior to the start of first bulk MEH installation, as well as in other indicators of NNB GenCo's readiness to take such a major step.
19. The anticipated timing of the first bulk MEH milestone means that it will have been about two years since ONR's previous permissioning activity (the consent to start of Unit 1 Nuclear Island Concrete), and around a year before the next permissioned milestone (shipping of first NSSS components to site).
20. These factors were considered by ONR prior to signalling to NNB GenCo its intention to permission the first bulk MEH hold point, and the acceptability of this proposed intervention was confirmed at a meeting of ONR's EPR sub-Division Board on 24th July 2019 (Ref. 6).

4 PREPARATION OF THE LICENCE INSTRUMENT

21. In accordance with the ONR Instruction *Preparation and Issue of Licence Instrument* (Ref. 7), I have prepared Licence Instrument (LI) 519. The draft LI follows the standard form set out in Ref. 7, 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.

5 CONCLUSIONS

22. The future release of the first bulk MEH hold point will be a major milestone for the project. It marks a steep increase in the complexity of installation activities on the Unit 1 nuclear island, with multiple platforms covering a large number of rooms. Good control of these activities is essential and will represent a significant challenge to the licensee. ONR has a clear interest in the ability of NNB GenCo to ensure its contractors undertake the activities to an acceptable standard, which ensures nuclear safety in the operational plant. To this end, ONR has elected to place the first bulk MEH hold point justified in this PAR.
23. Placing this hold point and the subsequent ONR permissioning decision concerning its release is consistent with ONR's strategy for regulating HPC during construction and commissioning. In particular, ONR is only permissioning a small number of hold points under LC19. The first bulk MEH hold point falls two years after ONR gave consent to the start of the unit 1 nuclear island, and about a year before the next construction related permissioning point.
24. The ONR EPR sub-division Board has confirmed that it considers that placing this hold point and its subsequent permissioning using derived powers, represents a suitable and proportionate use of ONR's powers.

6 RECOMMENDATIONS

25. I recommend that the ONR Head of EPR Regulation:

- (i) Considers the proposal contained in this PAR to exercise the derived power under the licensee's arrangements under Licence Condition 19(1) to specify that NNB GenCo shall not commence first bulk MEH activity in the Hinkley Point C Unit 1 Nuclear Island without the agreement of ONR.
- (ii) If supportive of the proposal, accepts this PAR and then signs the Specification identified as Licence Instrument LI 519.
- (iii) Signs this PAR approving its release for publication, after redaction where appropriate.

7 REFERENCES

1. ONR Strategy for the Regulation of Hinkley Point C from J0 to COD; Revision 0, May 2019. CM9 2018/386500
2. NNB GenCo document: Hinkley Point C Hold Point List. NNB-209-LST-000030, Version 8.0 dated August 2018 CM9 2018/279734
3. Correspondence with Government Legal Department July 2012, CM9 2015/33776 and January 2015 CM9 2015/36218
4. The Regulators' Code.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/300126/14-705-regulators-code.pdf
5. ONR Guide to Enabling Regulation 'Holding industry to account and influencing improvements'; <http://www.onr.org.uk/documents/2018/guide-to-enabling-regulation-in-practice.pdf>
6. Minutes of ONR EPR sub division Board – 24th July 2019. CM9 2019/216200
7. ONR Instruction NS-PER-IN-001 Revision 8, January 2017. *Preparation and Issue of Licence Instruments* <http://www.onr.org.uk/operational/assessment/ns-per-in-001.pdf>

TABLE 1: Hinkley Point C Licence Instruments

Licence Instrument Number	Type of Licence Instrument	Primary/Derived Powers	Title	Date Granted	CM9 Refs:
LI500	APPROVAL	Primary	Approval under Licence Condition 13(2) of Hinkley Point C Nuclear Safety Committee Terms of Reference Superseded by LI 502	27 November 2012	2012/462314 LI 2012/459577 PAR
LI501	Not Used	-	Not Used	Not Used	Not Used
LI502	APPROVAL	Primary	Approval under Licence Condition 13(3) of Amended Hinkley Point C Nuclear Safety Committee Terms of Reference Superseded by LI 512	13 December 2013	2013/153978 LI 2013/152629 PAR
LI503	APPROVAL	Primary	Approval under Licence Condition 13(11) of Hinkley Point C Nuclear Safety Committee Terms of Reference (Urgent Safety Proposals) Superseded by LI 513	27 March 2014	2014/118722 LI 2014/119730 PAR
LI504	SPECIFICATION	Primary	Specification issued under Licence Condition 19(4) specifying that the licensee shall not commence First Nuclear Safety Concrete without the consent of ONR	10 October 2016	2016/393252 LI 2016/378742 PAR
LI505	SPECIFICATION	Primary	Specification issued under Licence Condition 19(4) specifying that the licensee shall not commence Nuclear Island Concrete without the consent of ONR	10 October 2016	2016/393252 LI 2016/378742 PAR
LI506	CONSENT	Primary	Consent issued under Licence Condition 5(1) for consignment of relevant matter (not being excepted matter or radioactive waste) to a suitably permitted facility	20 October 2016	2016/408704 LI 2016/396569 PAR
LI507	CONSENT	Primary	Consent issued under Licence Condition 5(1) for consignment of relevant matter (not being excepted matter or radioactive waste) to a laboratory (other than on or being a relevant site) for analysis, in samples of such quantity as is reasonably necessary to enable such analysis at such a laboratory	20 October 2016	2016/408704 LI 2016/396569 PAR
LI508	SPECIFICATION	Derived	Specification issued under Licence Condition 19(1) specifying that the licensee shall not commence Start of Pumping Station without the agreement of ONR	15 November 2016	2016/431158 LI 2016/427491 PAR
LI509	CONSENT	Primary	Consent issued under Licence Condition 19(4) to the commencement of First Nuclear Safety Concrete	06 March 2017	2017/92591 LI 2017/80484 PAR
LI510	SPECIFICATION	Derived	Specification issued under Licence Condition 19(1) specifying that the licensee shall not commence Receipt of First Major Nuclear Steam Supply System Shipment to Site, without the agreement of ONR	15 February 2018	2018/34223 LI 2018/33986 PAR
LI511	AGREEMENT	Derived	Agreement issued under Licence Condition 19(1) to the start of construction of the unit 1 pumping station	26 July 2018	2018/227090 LI 2018/92662 PAR
LI512	APPROVAL	Primary	Approval issued under Licence Condition 13(3) approving alteration or amendment to the Hinkley Point C Nuclear Safety Committee terms of reference	08 September 2018	2018/290924 LI 2018/224997 PAR
LI513	APPROVAL	Primary	Approval issued under licence condition 13(12) approving alteration of amendment of the Hinkley Point C Nuclear Safety Committee's arrangements for obtaining consideration, or advice on urgent safety proposals	08 September 2018	2018/290927 LI 2018/224997 PAR

Licence Instrument Number	Type of Licence Instrument	Primary/Derived Powers	Title	Date Granted	CM9 Refs:
LI514	AGREEMENT	Derived	Agreement under arrangements made under condition 20(1) to the implementation of modifications to the Hinkley Point C reference configuration design during the period of construction as described in <i>"Modification of the diverse openings on the fuel path, the fuel transfer tube and associated civil works to cope with the design basis analysis (DBA) of a gross failure"</i>	13 February 2019	2019/24580 LI 2018/272822 PAR
LI515	AGREEMENT	Derived	Agreement under arrangements made under condition 20(1) to the implementation of modifications to the Hinkley Point C reference configuration design during the period of construction as described in <i>"Dry store impacts on HK building"</i>	13 February 2019	2019/39514 LI 2018/272944 PAR
LI516	AGREEMENT	Derived	Agreement under arrangements made under condition 20(1) to the implementation of modifications to the Hinkley Point C reference configuration design during the period of construction as described in <i>"PS architecture modification"</i>	04 March 2019	2019/36584 LI 2018/273124 PAR
LI517	AGREEMENT	Derived	Agreement under arrangements made under condition 20(1) to the implementation of modifications to the Hinkley Point C reference configuration design during the period of construction as described in <i>"HVAC plateau redesign of DVL & DEL (RC1.2)"</i>	13 February 2019	2019/43309 LI 2018/271721 PAR
LI518	CONSENT	Primary	Consent issued under Licence Condition 19(4) to the commencement of unit 1 nuclear island concrete	08 November 2018	2018/349190 LI 2018/279657 PAR

ANNEX 1: DRAFT LICENCE INSTRUMENT

ONR Letter Headed Paper

[REDACTED]
[REDACTED]
NNB Generation Company (HPC) Limited
90 Whitfield Street
LONDON
W1T 4EZ

[REDACTED]
New Reactors Division
Office for Nuclear Regulation
Redgrave Court
Merton Road
Bootle
Merseyside
L20 7HS

Telephone: [REDACTED]
Email: [REDACTED]

Our Reference: 2019/xxxxx
Unique Number: HPC50xxxxN

Date: xxx 2019

Dear [REDACTED]

NUCLEAR INSTALLATIONS ACT 1965 (AS AMENDED)
NNB Generation Company (HPC) Ltd
NUCLEAR SITE LICENCE No: 97A
LICENCE INSTRUMENT No: LI 519
SPECIFICATION UNDER ARRANGEMENTS MADE UNDER CONDITION 19(1)

**TITLE: SPECIFICATION FOR THE START OF FIRST BULK MECHANICAL,
ELECTRICAL AND HVAC (MEH) ACTIVITY [IN THE NUCLEAR ISLAND] AT
HINKLEY POINT C UNIT 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 the construction or installation of new plant, hereby specifies that the licensee shall not commence First bulk Mechanical, Electrical and HVAC (MEH) activity [in the Nuclear Island] at Hinkley Point C Unit 1, defined as Hold Point 2.2.20 in the document titled Hinkley Point C Hold Point List, NNB-209-LST-000030, Version 8.0 dated August 2018, without the agreement of the Office for Nuclear Regulation.

I am copying this letter to [REDACTED]

Yours faithfully

[REDACTED]
[REDACTED]