

INTERVENTION REPORT

LOCATION AND PURPOSE OF INTERVENTION:	EDF Energy – Nuclear Generation Ltd – Hinkley Point B Planned Intervention
INSPECTOR(S) TAKING PART IN INTERVENTION:	[REDACTED] – [REDACTED] (2.1, 2.2, 2.3, 2.5 & 2.6) [REDACTED] – [REDACTED] (2.4 only)
DATE(S) OF INTERVENTION:	10 th – 12 th December 2013.

PRINCIPAL STAFF SEEN

The roles of principal staff seen, including those from licensees or other government departments (for example, the Environment Agency) seen during the visit.

Report Section	Organisation	Role	Name
2.1	EA NGL	[REDACTED]	[REDACTED]
2.2	ONR NGL	[REDACTED]	[REDACTED]
2.3	NGL	[REDACTED]	[REDACTED]
2.4	NGL	[REDACTED]	[REDACTED]
2.5	NGL	[REDACTED]	[REDACTED]
2.6	NGL	[REDACTED]	[REDACTED]

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P = planned, RUP = reactive unplanned

A) SYSTEM/STRUCTURES Based INSPECTION RATINGS

Complete this section only where a System/Structures-based Inspection takes place. If Licence Condition not applicable, enter "n/a".

Report Section	System/Structures Based Inspection Details	Plan Name	Licence Condition	Rating	P/ RUP
n/a	No system inspections on this visit				
Overall Judgement that the System/Structure meets the requirements of the safety case and is adequate. Please enter Yes or No in the box provided.				n/a	

B) INTERVENTION RATINGS

Complete this section only where applicable, e.g. for a compliance inspection or assessment where the duty holder's arrangements are being rated. If not applicable, enter "n/a". Complete Part A in respect of System/Structures-based Inspection

Report Section	Intervention Details	IIS Code	Plan Name	Licence Condition / Topic	Rating	P/ RUP
2.1.1	Planned Compliance	n/a	Hinkley Point B IIS	LC32: Accumulation of radioactive waste	3	P
2.1.2	Planned Compliance	n/a	Hinkley Point B IIS	LC34: Leakage and escape of radioactive material and radioactive waste	3	P
2.2	Planned Compliance	n/a	Hinkley Point B IIS	LC11: Emergency Arrangements	3	P
2.3.1	Planned Compliance	n/a	Hinkley Point B IIS	LC22: Modification or experiment on existing plant	3	P
2.3.2	Planned Compliance	n/a	Hinkley Point B IIS	LC21: Commissioning	3	P
2.4	Planned Compliance	n/a	Hinkley Point B IIS	LC28: Examination, inspection, maintenance and testing	3	P
2.5	Planned Compliance	n/a	Hinkley Point B IIS	Information exchange	n/a	P
2.6	Planned Compliance	n/a	Hinkley Point B IIS	Meeting with NIOS	n/a	P

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1 EXECUTIVE SUMMARY

1.1 Purpose of intervention

- 1 The purpose of this intervention was to undertake 6 licence condition compliance inspections and exchange information on site and ONR activities.
- 2 The work was carried out in line with the planned inspection programme contained in the Hinkley Point B Integrated Intervention Strategy (IIS).

1.2 Interventions carried out by ONR

- 3 The following interventions were carried out:
 - I carried out compliance inspections against licence condition 32 (accumulation of radioactive waste), 34 (leakage and escape of radioactive material and radioactive waste), 11 (emergency arrangements), 22 (modification or experiment on existing plant) and 21 (commissioning). An ONR Civil Engineering Specialist Inspector carried out a compliance inspection against licence condition 28 (examination, inspection, maintenance and testing). The inspections were based on sampling of the compliance arrangements that were in place, implementation arrangements, inspection of plant records, events and inspection of plant.
 - I held a series of information exchange meetings with site personnel.

1.3 Explanation of judgement if safety system not judged to be adequate.

- 4 No safety system inspections were carried out on this visit.

1.4 Key findings, Inspector's opinions and reasons for judgements made

- 5 My inspection, carried out under LC32, considered the procedures, processes and buildings on site for handling and storing radioactive waste. I also reviewed the inventory of material held on site. Overall I was content that site was following its procedures and that it had good processes in place. I noted that station had achieved its goal of having <50 m³ of disposable radioactive waste on site, and that enhancement had been made to the condition of the waste disposal facility. I therefore assigned an IIS rating of - 3 (adequate) to this inspection.
- 6 My inspection, carried out under LC34, considered the procedures on site for identifying and controlling radioactive leaks (ie a loss of a contaminated gas or liquid from its primary barrier). I noted that good progress had been made with the site approach to LC34 and the use of the Asset Management System to co ordinate the work. Further enhancements of the station arrangements with regard to LC34 were being made and I will continue to engage with site on this matter. Overall I judged that adequate arrangements had been demonstrated and I therefore assigned an IIS rating of - 3 (adequate) to this inspection.
- 7 My inspection, carried out under LC11, considered the arrangements regarding the planning and execution of level 1 emergency demonstration exercises. I judged that site was following its procedures, that feedback from previous exercises and audits had been absorbed and that a suitably challenging scenario for the next joint level 1 exercise

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(safety and security) was being developed. I therefore assigned an IIS rating of – 3 (adequate) to this inspection.

8 My inspection, carried out under LC22, considered the arrangements for the modification to the station steam supply and distribution plant referred to as the Vaporiser Auxiliary Boiler Plant. I reviewed a number of procedures and safety submissions that had been made as part of the modification process. Overall, I was satisfied that suitable processes were in place to provide assurance that the modification was being adequately managed. I therefore assigned an IIS rating of - 3, (adequate) to this inspection.

9 My inspection, carried out under LC21, considered the arrangements for the commissioning of the new station steam supply and distribution plant referred to as the Vaporiser Auxiliary Boiler Plant. The inspection involved scrutiny of arrangements for compliance with licence condition 21, project arrangements, overall progress with the project and a review of the key technical matters. Overall, I was satisfied that suitable processes were in place to provide assurance that the commissioning and testing activities to steam supply from the Vaporiser Auxiliary Boiler Plant were being adequately managed. I therefore assigned an IIS rating of - 3, (adequate) to this inspection.

10 This inspection, carried out under LC28 by an ONR Civil Engineering Specialist Inspector witnessed the tendon stressing activities carried out on the Reactor 4 pressure vessel, and the arrangements that were being followed for compliance with LC28. The Inspector considered that adequate procedures were being followed and that suitable records had been retained during the tendon stressing activities. He therefore assigned an IIS rating of - 3 (adequate) to this inspection.

11 Finally I held information exchange meetings with station staff on a range of topics including a recently reported event with the reactor cooling water system, flask transportation, ongoing fire brigade strike action, failed fuel stringer 3T39, preparations for the interim outage, future ONR inspections and discussions with a Nuclear Inspection and Oversight inspector on key topics on site.

12 The intervention was performed in line with ONR's guidance requirements (as described in our technical inspection guides, which can be found at http://www.hse.gov.uk/nuclear/operational/tech_insp_guides/index.htm) in the areas inspected. Further information on intervention ratings is available at <http://www.hse.gov.uk/nuclear/operational/inspection/gins0800/table1-iis.pdf>.

1.5 Conclusion of intervention

13 There are no findings from this inspection that could significantly undermine nuclear safety. No actions were raised during this inspection.

1.6 Recommendations

14 The planned interventions set out in the Integrated Intervention Strategy for Hinkley Point B remain valid and will be followed for future inspections.

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15 During the annual review of safety earlier in the year, the Station Director presented the station ambitions, vision and business plan for the coming year, in particular for the station to be “fit to run to 2013 and beyond”. This was underpinned by the “0-7-35” initiative to:

- Keep safe – 0 harm to people, plant, environment and public
- Keep generating – greater than 7TWh
- Keep investing in people and plant – costs sub £35/MWh

16 During my visit I noted that station had achieved one of its key objectives by reaching the 7TWh generation milestone. I was advised that the zero harm target had been challenged by three conventional safety incidents (a slip/trip/fall, a cut hand and an incident with a moving vehicle). The financial target had also been achieved.

2.1 Radioactive Waste Inspection

17 This intervention was carried out by the nominated site inspectors from the Environment Agency and ONR as a joint inspection on 10th December 2013. The Licensee was represented by the Environmental Safety Group Head, two Environmental Safety Engineers, the Environmental Safety Team Leader, the Work Management Group Head and a member of the Barnwood Radioactive waste team.

18 ONR guidance on LC32 (NS-INSP-GD-032 Revision 2) and LC34 (NS-INSP-GD-034 Revision 2) was reviewed prior to the inspection. This useful advisory guidance was applied in a targeted and proportionate manner.

2.1.1 LC32: Accumulation of Radioactive Waste Rating - 3 (Adequate)

19 The LC32 inspection included a discussion on the radioactive inventories on site and an inspection of the Combined RadioActive Waste Disposal (CRAWD) facility.

20 As part of the inspection I reviewed two key documents:

- HINB/MCP/016/01 Rev 04: Management of radioactive solid waste and radioactive oil, which identified the processes and responsibilities for the management of these materials at Hinkley Point B, and
- HINB/DI/TET/16/1 Rev 013: Management of radioactive solid low level waste and radioactive oil. This defined processes for the collection of waste from the plant, receipt at the CRAWD, storage, clearance of items for free release, calculation of activity in the waste, radioactive waste oil, recycling of material, disposal of materials, quality checks and despatch of material from site.

21 A number of related Work Instructions (eg W/I 607/2347: Radioactive waste reception at the CRAWD) were also scrutinised.

22 During the CRAWD inspection I noted that:

- There were much reduced levels of waste in all areas of the CRAWD, and significant improvements had been made in the combustible and non combustible stores. I also noted that much of the radioactive waste in the CRAWD facility was processed and ready for disposal.

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- Significant reductions in the amount of contaminated oil held in tanks in the CRAWD had been achieved (around 6m³ currently compared to 40m³ in July 2013). The disposal route for this waste was via incineration at Hythe and the despatch of this material had become a routine activity on site.
- Around 12 m³ of sludge from the AETP reception tanks remained in storage within the CRAWD in banded stillages. This is discussed later in this section.
- Evidence that improvements to plant following an event at the CRAWD in September 2012 (CR768001) had been implemented were noted, particularly the enhancements to ensure prominence of HEPA (High Efficiency Particle Air) filter performance data.
- The condition of the building had also been improved following work on the roof and water drainage systems, and additional improvements were planned. These improvements will be helped by the additional space that has now been generated.

23 I judged that there had been significant improvements in the CRAWD in the past year, and site attributed this to three main factors:

- Establishing a dedicated team at the CRAWD and recognising the importance of the work.
- Significant investment by the station to improve processes, facility condition and disposal rates.
- Early engagement of the Environmental Safety Engineers with plant to enhance the use of clean disposal routes for some items thus minimising material transfer to the CRAWD.

24 As noted above there was around 12m³ of sludge held in the CRAWD and I sought clarification of its origin and the plans for its disposal. The site response was that:

- The sludge originated from the Active Effluent Treatment Plant (AETP) reception tanks and is now stored in drums held in stillages within the CRAWD.
- The sludge was of low specific activity. Disposal routes were being investigated and the intention was to dispose of the sludge promptly when a suitable route and funding had been secured.
- I was advised that measures to reduce future sludge accumulations were being considered and that the station intent was to dispose of the sludges in a timely manner rather than continue to accumulate them in the CRAWD.

25 A batch of unsorted LLW had been sent to an off site company as part of a trial to evaluate a new potential disposal route. The EA reviewed the process against the best available technology criteria. Further discussions on this and a review the outcome of the trial are planned.

26 The station had previously produced a resourced plan to reduce waste holdings on site to <50 m³ by the end of 2013. At the time of my inspection the volume of disposable radioactive waste on site had dropped to just below 43 m³, representing a significant achievement by station.

27 Overall I judged that station was following its procedures and that it had satisfactory processes in place. I noted that station had achieved its goal of having <50 m³ of disposable radioactive waste on site, and that enhancement had been made to the

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CRAWD facility and working practices. I therefore assigned an IIS Rating of - 3 (adequate) to this inspection.

2.1.2 LC34: Leakage and Escape of Radioactive Material and Radioactive Waste Rating - 3 (Adequate)

- 28 Licence condition 34 requires the licensee to control and contain radioactive material and waste so that it cannot leak or escape from its control or containment. NGL defines a radioactive leak as a loss of a contaminated gas or liquid from its primary barrier (excluding controlled discharges compliant with a radioactive substances permit or authorisation).
- 29 NGL now uses its Asset Management System (AMS) to record and manage its leaks, and this process has been strengthened recently by adding the requirement to specifically code radioactive leaks. This change has been reinforced through the use of two Organisational learning briefs:
- Hartlepool A/R829144: Application of radioactive leak flag within AMS (September 2013), which advised that the pressure vessel cooling water, reactor ancillaries cooling water and the buffer storage tubes cooling water should be treated as radioactive, and any leaks on these systems should be flagged as such within AMS.
 - InfoComm IC-19-13 : LC34 changes to compliance arrangements (November 2013) which details the new arrangements that require, where practicable, all systems containing potentially mobile radioactive material or radioactive waste to have primary and secondary containment, maintenance inspection and testing regimes, leakage detection systems and regimes to ensure those systems are functional.
- 30 I reviewed the radioactive leak schedule work request list (10th December 2103) which contained 12 leaks. I noted that:
- Four leaks were marked as complete.
 - One leak (10419209) was reported as being worked on whilst this inspection was being carried out. The scheduled date for the work was 11th December 2013.
 - A new radioactive leak had been identified within AMS and corrective action had been scheduled.
- 31 I did not visit the leak sites on plant, but the system appeared to be functioning adequately and had captured and addressed a new radioactive leak. I judged that further enhancement of the system may be required, but overall it appeared to be a useful process and a strengthening of the management system for radioactive leaks on site.
- 32 I noted that a Condition Report (00826336) had been raised by site following a previous radioactive waste inspection (July 2013) recommending that the leak schedule at Hinkley Point B should be able to identify radioactive leaks. The CR was raised on 17th July 2013 and was considered at the daily screening meeting a few days later. This resulted in the issue of the infoComm noted above and the use of flags to indicate radioactive leaks.
- 33 I also noted that during a previous inspection (July 2013) a leak was identified in the basement of the Active Effluent Treatment Plant that was not identified on the leak schedule. I asked for an update on this leak:

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- Water from the leak site had been analysed and found to be consistent with heavily diluted pond water, believed to have originated from the flask wash process.
- The leak was identified before the new AMS based system was introduced and did not therefore appear on the new leak schedule.
- The work is subject to a restoration and repair project under Work Order Card 10292571. This work includes work within the flask wash down bay (which is believed to be the origin of the leak), a full pressure test of the drain pipework and refurbishment of the tiled floor area to seal any potential leak site. The last refurbishment in this area was in 2010 and the new work is planned for the middle of 2014.

34 I had requested a discussion with station regarding a recent civil engineering review of cooling pond condition and leakage risks, following LC28 inspections. Unfortunately this could not be arranged during my visit but I will follow up on this during my January visit to site.

35 Overall, I was encouraged by the progress that had been made with the site approach to LC34, the improved use of the AMS tool and that work was planned to address the leak in the AETP basement. I judged that further enhancement of the site arrangements to with regard to LC34 arrangements could be made and I will continue to interact with site on this matter. Overall I was of the view that adequate arrangements had been demonstrated and I therefore assigned an IIS rating of – 3 (adequate) to this inspection.

2.2 LC11: Emergency Arrangements Rating - 3 (Adequate)

36 This intervention was carried out by the nominated site inspector and the ONR Hinkley Point B site security inspector on 10th December 2013. The purpose of the intervention was to review the status of emergency level 1 arrangements, progress any issues from previous exercises/meetings and to discuss the future level 1 demonstration exercise objectives. Detailed minutes of the meeting will be prepared by NGL in due course. The Licensee was represented by the Emergency Preparedness Engineer and the Assistant Emergency Preparedness Engineer, Quality Management Group Head, training department and the Emergency Planning Group, Barnwood.

37 ONR guidance on LC11 arrangements (NS-INSP-GD-011 Rev 02) explains that one of the full exercises carried out on site will be chosen by ONR as the level 1 demonstration exercise. The purpose of this exercise is to seek assurance that the licensee's emergency arrangements and its emergency response personnel have the capability to deal effectively with emergencies having both on and off-site consequences. This intervention was aimed at learning from past level 1 exercises and agreeing a suitable and challenging scenario and date for the next level 1 demonstration exercise.

38 Prior to the intervention I reviewed HINB/MCP/026/01 Rev 008: Emergency Exercise Arrangements, which described the process for conducting an annual emergency exercise programme to test the station emergency organisation and the readiness of individual participants to deal with incidents and nuclear emergencies. Section 4.4 of that document related to level 1 exercises and highlighted the need to discuss the draft scenario with the ONR inspector and formally agree it at an Exercise Review Meeting. This intervention satisfies that requirement.

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- 39 Details of the scenario are not openly discussed before the exercise, but what can be disclosed is that the next level 1 emergency exercise at Hinkley Point B will take place on Tuesday 1st July 2014 and will be codenamed "BOSON". It will be a joint nuclear and counter terrorism demonstration exercise. The nominated ONR site inspector has further details of the proposed exercise scenario and will share these with the ONR inspection team at an appropriate point (the agreed detailed scenario will be sent to ONR shortly before the agreed exercise date).
- 40 The ONR security inspector and CNC (Civil Nuclear Constabulary) voiced some reservations about the details of the scenario and it was agreed that these will be reviewed at another meeting early in 2014.
- 41 An agenda for the Exercise Review Meeting was issued well in advance of the meeting and this systematically addressed key matters such as:
- Actions from the last ERM and level 1 exercises "BINGO" (nuclear safety) and "BEACON" (counter terrorism).
 - Review of emergency arrangements performance for 2012/13.
 - Emergency arrangements audits carried out since last meeting.
 - Provisional dates for level 1 exercises 2014 – 2016 (nuclear safety and counter terrorism).
- 42 During the meeting I also noted:
- The formal level 1 exercise for 2014 has been deferred to July in order to avoid clashes with the planned interim outage for 2014, and the statutory outages in future years. In order to maintain confidence in the emergency arrangements ONR has requested the opportunity to witness a shift exercise at the end of January 2014 and to see a demonstration of the muster arrangements around the time of the interim outage. The arrangements to satisfy these requirements are progressing.
 - A level 2 exercise for Hinkley Point B is being arranged for November 2014.
 - The ERM considered if representation from Hinkley Point C station should be invited to future meetings.
 - Station has decided to defer its request for ONR approval of the Emergency Plan until the latter part of 2014, when input from the Japanese Earthquake Resilience project will also be incorporated.
- 43 Overall I was satisfied that NGL was following its arrangements regarding the planning and execution of level 1 demonstration exercises. It was evident that feedback from previous exercises and audits had been absorbed and a challenging scenario for the next joint level 1 (safety and security) was well developed. I therefore assigned an IIS rating of – 3 (adequate) to this inspection.

2.3 Vaporiser Auxiliary Boiler Plant

- 44 This intervention was carried out by the nominated site inspector on 11th December 2013. The purpose of the intervention was to review the status of the project and carry out compliance inspections against the licensee's arrangements for LC22 (modification or experiment on existing plant) and LC21 (commissioning). The Licensee was represented

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by the Nuclear Safety Engineer, the System Owner, the Responsible Engineer and the Nuclear Safety Group Head.

- 45 In 2002 a set of consolidated plant modifications to the station CO₂ supply and distribution plant were proposed to enhance plant availability and improve the level of redundancy so that the plant would better satisfy the safety case claims and required plant reliability. The project involved the modification of existing plant and the installation and commissioning of three new, seismically qualified and failure tolerant package steam boilers and associated systems. The new steam supplies were designated the Vaporiser Auxiliary Boiler Plant (VABP).
- 46 The current position is that the VABP has been built and installed on site and commissioning had begun. I had visited the VAPB with the System Engineer on several occasions throughout 2013 to review progress. My last visit was in November 2013, so on this occasion I opted not to inspect the plant but instead to review the arrangements that were in place to control the modification and commissioning operations.
- 47 The requirements for enhancements to the steam supply were first identified during the PSR1 (Periodic Safety Review) so the completion of this modification is a significant milestone for the station.

2.3.1 LC22: Modification or Experiment on Existing Plant Rating - 3 (Adequate)

- 48 I met with the Nuclear Safety Engineer to discuss the modification process in general and raised some specific questions with the Nuclear Safety Group Head. The inspection involved scrutiny of arrangements for compliance with licence condition 22, project arrangements, overall progress with the project and a review of the key technical matters.
- 49 The VABP is well described in section 3.14.01 Rev 016 and 3.20.09 Rev 016 of the Living Safety Case Documentation. The three VABP provide a seismically qualified supply of steam to the CO₂ vaporisers in order to improve the security of supply of CO₂ to the reactors and support claims made in the Boiler Tube Failure Safety Case.
- 50 I reviewed the following guidance documents as part of the inspection:
- ONR Nuclear Safety Technical Inspection Guide NS-INSP-GD-022 Rev 02; LC 22: Modification or experiment on existing plant.
 - The allocation of responsibilities for compliance with the nuclear site licence conditions at Hinkley Point B, contained in HINB/MCP/001.
 - Company Specification (BEG/SPEC/DAO/020 Rev 002: Modification Process) which defines the roles, responsibilities and processes for the categorisation, clearance and monitoring of modifications or experiment proposals
 - The Hinkley Point B Management Control Procedure for the control of modifications and experiments (HINB/MCP/021 Rev 048). This document defines key roles and responsibilities and provides details of the process to be followed on the Hinkley Point B site, including consideration of potential interactions with the A and C sites, amendments to station documentation and clearance routes.
- 51 It was not surprising to find that this was a large project that has run for over ten years and encompassed over 200 documents. NGL has effectively divided the overall project into a number of distinct phases, including:

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- Definition of outline safety case requirements - Paper of Intent
- Design intent and implementation strategy.
- Enabling modifications to build and install the new system.
- Justification for tie in with existing systems.
- Testing and commissioning.
- Safety case justification for interim handover into routine operations.
- Removal of existing interim boilers.
- Installation and commissioning of final fuel supplies (in space generated by previous step).
- Safety case justification for final handover into routine operation.

52 The system is currently undergoing testing and commissioning.

53 ONR is not required to issue an agreement to this modification for the following reasons:

- The Paper of Intent (Engineering Change (EC) 323630) was proposed and justified as a Category 2 modification with no automatic requirement for ONR Permissioning. In fact no Category 1 papers were involved in this project.
- The VABP was deemed to be a replacement for the existing Interim Boilers, but with seismic withstand.
- The modifications described in the Paper of Intent did not change the principles of the safety case claims on CO₂ supply and did not involve any changes to assumptions on the integrity of pipework or welds.

54 I reviewed EC323630: Nuclear Safety Requirements Specification - Safety Case Approach and Outline. This clearly presented the main aims of the modification, provided a status of the plant condition and the basis of the intended safety case (in the claims and evidence format). In particular it:

- Identified the key nuclear safety issues to be the adequacy of the final CO₂ system to meet the claimed protection against faults and hazards, and to demonstrate that station risk during the interim period was ALARP.
- Identified various safety cases that would be affected by improvements to the CO₂ supply and distribution system.
- Identified which PSR items would be closed out on completion of the work.
- Presented the basis of the intended safety case.

55 I reviewed EC336384: Design intent and implementation strategy which provided a very useful summary of the EC structure clearly showing the phases of the work and the interlinkage between them. All of the ECs had been categorised to determine if inadequate conception or execution could lead to an increase in risk of a radiological hazard, and as noted above, all were judged to be Category 2 or less.

56 I reviewed EC337191: New Vaporiser Boiler Plant – Test and Commissioning Arrangements which defined the scope of the current activities and is considered further in section 2.3.2.

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57 Overall, I was satisfied that suitable processes were in place to provide assurance that the modification to steam supply from the VAPB was being adequately managed. I therefore assigned an IIS rating of - 3, (adequate) to this inspection.

2.3.2 LC21: Commissioning

Rating - 3 (Adequate)

58 I met with the System Owner and the Responsible Engineer to discuss the commissioning process and raised some specific questions with the Nuclear Safety Group Head. The inspection involved scrutiny of arrangements for compliance with licence condition 21, project arrangements, overall progress with the project and a review of the key technical matters.

59 As part of the LC22 inspection reported in section 2.3.1, I reviewed EC336384: Design intent and implementation strategy. At the time of this inspection the remaining phases of the project were:

- EC337191: Testing and Commissioning.
- EC335286: Safety case justification for interim handover into routine operations.
- Interim handover.
- EC337192: Removal of interim package boilers and conversion of the tanks to kerosene.
- EC337194: Installation and commissioning of final fuel supplies.
- EC343277: Safety case justification for final handover into routine operations.
- Final handover.

60 At the time of this inspection the testing and commissioning was in progress and a “soak test” had begun, the purpose of this was to demonstrate over a 30 day period, that the new plant could satisfy the safety case requirements and that the new arrangements were satisfactory. The safety case justification for interim handover into routine operations (EC335286) was undergoing internal verification.

61 I reviewed additional documents as part of the inspection:

- ONR Nuclear Safety Technical Inspection Guide NS-INSP-GD-021 Rev 03; LC 21: Commissioning.
- The allocation of responsibilities for compliance with the nuclear site licence conditions at Hinkley Point B (HINB/MCP/001).
- The Hinkley Point B Management Control Procedure for the testing and commissioning (HINB/MCP/021/11 Rev 010). This document defines key roles and responsibilities and provides details of the process to be followed on the Hinkley Point B site, and provides a good outline of the process to be followed and the organisational requirements, including the Testing and Commissioning Panel (T&CP) and the Project Safety Review Group (PSRG).
- New Vaporiser Auxiliary Boiler Plant – Test and Commissioning Arrangements (EC337191) that defines the scope of the testing and commissioning work. It also defined work that was not covered in the scope of work, but will be carried out separately (ie EC335286, 337194 and 343277 of the above list).

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- T&CP Commissioning Test Schedule (CTS). Vaporiser Auxiliary Boilers: CO₂ Supply Enhancement (HPB/CTS/EE0308/01 Rev 001). The purpose of this document was to provide a complete set of commissioning test requirements to form part of an auditable trail of evidence to support the safety case and equipment handover for routine operations. The CTS divided the commissioning into 16 stages and defined the test requirements for each stage.
- Quality Plan, Vaporiser Auxiliary Boiler Quality Plan for Boiler 7 (HPB/QP/PD/EE308/019 Rev 001). The other two units were tested and commissioned identically but this QP was selected randomly for inspection. The QP activities for 7 of the commissioning stages for new auxiliary boiler 7 had been signed off up to the point of allowing T&CP release of auxiliary boiler 7 for commissioning on 6th November 2013.

62 I confirmed that a suitable T&CP had been established. The VABP System Owner had been appointed as the T&CP Chairman to:

- Oversee the detailed testing and commissioning activities.
- Ensure commissioning documentation was available prior to testing and commissioning taking place.
- Provide a report to the PSRG recommending that the plant is fit for return to service.
- Arrange for project review meetings to be held when required. I sampled the CO₂ Vaporiser Auxiliary Boilers T&CP minutes for the meeting held on 21st November 2013. The meeting was judged to be quorate and reviewed previous actions, documentation (including Quality Plans) updates to ECs, changes to Technical Specifications and other station documentation. The meeting also considered the functional testing programme, input from the commissioning team, training, Maintenance and Testing Schedule requirements, the soak test and liaison with the PSRG. It also provided a listing of issues to be resolved before, during and after the soak test.

63 I confirmed that a PSRG had been established. The Nuclear Safety Group Head had been appointed as the PSRG Chairman to:

- Take responsibility for the testing and commissioning arrangements for compliance with LC21.
- Oversee the commissioning procedures, plant completion procedures and test reports, and if acceptable, ratify the documents for implementation.
- Specify conditions under which the plant could be put into service.
- Provide approval to the station Operational Safety Review Committee (OSRC) for endorsement.
- Arrange project review meetings as required. I sampled the CO₂ and steam enhancement PSRG minutes for the meeting held on 19th November 2013. The meeting was judged to be quorate, reviewed the status of previous actions, safety cases and EC status. It also provided an overview of the commissioning/functional testing programme and defined acceptance criteria for the soak test.

64 At the time of the inspection the soak test had begun and was scheduled to run for 30 days. The aim of this test was to gain confidence in the running arrangements for the

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boilers and to monitor performance against routine Working Instructions and the proposed Technical Specifications. The interim handover will require the T&CP Chairman to report to the PSRG that the outcome of the soak test has been reviewed by the T&CP and to report on whether in his SQEP view the plant has met the requirements to be claimed available for safety duty. The PSRG will then have opportunity to clarify any points from the test and decide if it is appropriate to proceed to interim handover or what further action is required.

65 Overall, I was satisfied that suitable processes were in place to provide assurance that the commissioning and testing activities to steam supply from the VAPB were being adequately managed. I therefore assigned an IIS rating of - 3, (adequate) to this inspection.

66 I will continue to monitor progress with this important project during my routine site inspection duties.

2.4 LC28: Examination, Inspection, Maintenance and Testing Rating - 3 (Adequate)

67 This intervention was carried out by the ONR Civil Engineering Specialist Inspector on 10th December 2013. The Licensee was represented by the Reactor Systems Engineer, the Appointed Examiner for the PCPV (Pre-stressed Concrete Pressure Vessel) and the Tendon Stressing Contractor.

68 The purpose of the intervention was to witness tendon stressing activities carried out on the Reactor 4 pressure vessel and to check the Licensee's compliance with its maintenance arrangements. The inspection has been reported separately (TRIM 2013/466625) but a summary of the key points is provided below for completeness:

- The Licensee's documents and procedures were inspected for the PCPV (tendon) maintenance and inspection activities and were being followed on plant.
- The System Engineer explained that the Licence Condition 28 requirement to undertake adequate maintenance and inspection was written into the site's Maintenance, Inspection and Test Schedule, Reference HINB/MS/03, Revision 022. An extract of Section 3.1 of this document was tabled, and an item marked Index Reference MS/03/01/02/01 entitled 'Tendon and anchorages' was seen as the relevant entry. The controlling Work Order Card for the tendon work (WOC 10277926) which covered this campaign of tendon maintenance and inspection work was inspected, as was the procedure to control those activities. The ONR Civil Engineering Specialist Inspector was shown Work Instruction number 169/0304/Revision 6 and noted that Step 10 of this procedure contained the requirement to 'Recheck tendons for tension losses'. The ONR Civil Engineering Specialist Inspector concluded that the procedures and documents were adequate.
- The intervention will form part of ONR's assessment of the Licensee's claims on the adequacy of the reactor pressure vessel after its next statutory maintenance outage, and will inform ONR's judgment on its consent to return Reactor 4 back into operation.
- During the inspection, some water was noted in the lower stressing gallery which the licensee considered to be due to condensation. The licensee intends to install humidity measuring devices around the lower stressing gallery to confirm this.

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69 Overall, licence condition 28 requires the licensee to make and implement adequate arrangements for the regular and systematic examination, inspection, maintenance and testing of all plant which may affect nuclear safety. The ONR Civil Engineering Specialist Inspector considered that this had been adequately demonstrated for the tendon stressing activities seen during the site visit. He was also satisfied that the procedures were being followed and that records were being kept. He therefore assigned an IIS rating of - 3 (adequate) to this intervention.

2.5 Information Exchange Meetings

2.5.1 INF1 2013/391 – Reactor Cooling Water

70 Whilst I was on site I was informed by the Technical and Safety Support Manager of an incident that had been reported to ONR via form INF1 (an ONR form for communicating incidents on the site). It concerned an incorrect valve alignment on the Reactor Cooling Water (RCW) system.

71 The background to the event was as follows. During preparations for valve testing on the RCW system it was found that a valve (3/RCW/44) was closed when its normal position should be open. The valve alignment omission was traced back to 20th November 2013 when maintenance work was carried out but the valve was not re-opened after being locked shut. The plant was aligned in accordance with the independent verification check but this did not include the setting of this valve. There were no immediate consequences but the misalignment could have affected RCW supply following a loss of a supply leg. A Technical Specification (TS) entry was made and subsequently exited when the valve was moved to its correct position. The licensee has begun an investigation to determine the cause of the event.

72 The timeline and categorisation of the event was as follows:

- The event was discovered on 4th December 2013 and was categorised as NPE30A (discovery that safety related plant is in an inappropriate configuration or duty) and this was due for reporting to ONR within a week.
- On 10th December 2013 the event was re categorised by NGL as NPE06B (Technical Specifications non-conformance event and was assigned a provisional INES (International Nuclear Event Scale) rating of 0 - no safety significance. The incident was reported to ONR within a day via INF1 2013/391. This NGL report also recommended reporting to Environment Agency (EA)/Scottish Environmental Protection Agency (SEPA), Media and Ministerial reporting via the Department for Environment and Climate Change (DECC).
- On 17th December 2013 I was informed that the INES rating had been raised and re categorised by NGL as an INES 1 – anomaly event.

73 I discussed the event with the Technical and Safety Support Manager and the Nuclear Safety Group Head. These communications continued after I returned from site. The key points were:

- I queried why an INES 0 event – no safety significance - had been reported to EA/SEPA, Media and DECC. I was directed to NGL document SRD/PROC/IN/002 rev 006 (NGL, Safety and Regulation Division Nuclear Inspection and Oversight – Dealing with Events), section 4.1 paragraph 4. This provided NGL guidance on

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dealing with events and in particular, reporting to DECC. It listed a number of reporting criteria (that do not seem to apply to this event) but also indicated that consideration should be given to other high profile events that are not covered by the criteria.

- I asked about the safety implications for the plant and was referred to the Hinkley Point B Living Safety Case Document 3.16.01: Reactor Cooling Water system. This states that the safety function of the RCW is to provide a sea water heat sink to the Pressure Vessel Cooling Water (PVCW) and Reactor Auxiliaries Cooling Water (RACW) systems during at power and post trip operation. The PVCW and RACW systems in turn remove excess heat from the PVCW and gas circulators to maintain them within safe operating limits. The RCW system also provides cooling to the Pond Cooling Secondary system.
- I asked about operational limits and controls on plant availability and was referred to the Hinkley Point B Technical Specification 5.5.2 (Reactor Cooling Water) and the associated Commentary. LCO 5.5.2 states that the RCW heat exchanger inlet bus main shall be operated "COMMONED", meaning that the connecting valves between the Reactor 3 and Reactor 4 systems are opened by a pre determined amount. LCO 5.5.2 Condition E details the required action if the RCW heat exchanger inlet bus main is not "COMMONED". This LCO also allows intentional entry and details what actions need to be taken before entry.
- Technical Specification LCO 5.5.2 indicates that a surveillance to confirm that the RCW heat exchanger inlet bus main is being operated as a "COMMONED" system, covering both reactors is required. The required frequency for this surveillance is shiftily and I asked why the incorrect valve alignment had not been spotted earlier. I was directed toward Hinkley Point B Power Station Technical Specifications Surveillance Schedule HINB/SCHED/TECHSPEC/001/INTRO, Section 4: Demonstration of Compliance. This states that shiftily and daily surveillances are carried out using the following sources of information:

- Interference/non interference with plant configuration.
- Indications in the CCR (central control room) and on the plant.
- DPS (data processing system) and hard wired alarms in the CCR.

The DAP (Duly Authorised Person) is required to use the available sources of information to consider whether there is any reason to believe the plant is not available. If there is no reason to believe the plant is unavailable then the surveillance is declared as met. My understanding is that the valve in question is a manually operated valve that does not provide an indication to the CCR.

- Finally I asked what action the Licensee plans to take. I was advised that an investigation had begun and this will be an Adverse Condition Investigation (ACIN) with Rigour, meaning that the outcome of the investigation will be considered on site by the Corrective Action Review Board (CARB). The target completion date for the investigation is 16th Jan 2014 and site will provide me with a copy of the report when it is available.

74 This is the first INES 1 event on the site for some time. I will continue to interact with the licensee, review the investigative report when it is available and follow up on this event as

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required by ONR procedures (eg ONR Incident notification and reporting process, ONR-OPEX-IN-001 Revision 3).

2.5.2 INF1 2013/38 – Flask Event

- 75 Whilst I was on site I was informed by the Technical and Safety Support Manager of an incident that had been reported to ONR via form INF1. It concerned a recent incident involving a flask transport anomaly that occurred at Crewe railway sidings.
- 76 A flatroll carrying a fuel flask that had been dispatched from Hinkley Point B rolled a short distance and was stopped by security gates. On being notified by the railway company, and in the absence of definitive information, site conservatively advised the initiation of RADSAFE, and Springfields provided a Level 2 response at the scene. There was no damage to the fuel flask nor the flatroll. The licensee temporarily stopped transport of flasks by rail while an investigation was carried out; this is now complete and transports have resumed. ONR transport is aware of the incident and has been involved in the response. I do not intend to take any further action on this matter.

2.5.3 Ongoing Fire Brigade Strike Action

- 77 This was discussed with the Technical and Safety Support Manager. The Fire Brigades Union has now announced its decision to continue its industrial action. NGL and ONR have discussed the likely impact on sites. A Corporate response has been provided by NGL and Hinkley Point B has produced a Business Continuity Management Report (HINB/R/TQZ/010: Proposals to mitigate the effects of potential for fire and rescue service industrial action). This provides guidance to site and additional options to enhance the on site response to a fire and reduce the likelihood of an event occurring.
- 78 I discussed this with the TSSM ahead of the industrial action planned for Friday 13th and Saturday 14th December. The TSSM stated that he had recently chaired a meeting of the station Fire Contingency Preparation Group following a review of work plans. This group consisted of TSSM, Work Management Manager, Fire Safety Coordinator, Emergency Preparedness Engineer, Operations, Work Week Manager and NIOS. He confirmed that site had activated its Business Continuity plan for the planned fire industrial action HINB/R/TQZ/010. From this the following was confirmed:
- Devon and Somerset Fire and Rescue Service (D&SFRS) have their own arrangements in place to ensure they could still respond to an incident on site. An appliance would be available in the Bridgwater area during times of industrial action as well as Nether Stowey and Williton. The site Emergency Preparedness Engineers had been in contact with D&SFRS officers.
 - Separately, the station had developed a robust on site response capability which was not reliant on the D&SFRS.
 - A review of the work plan over this period had been performed to ensure that no hot working activities or confined space entries were planned during the hours of the strike.
 - Station has confirmed with Operations and Chemistry that there would not be any chemical deliveries over this period, including fuel oil deliveries.

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- Station has reinforced with personnel the need to take personal responsibility for adopting behaviors which will minimise the likelihood of a fire occurring and to challenge others to do the same.
- Operations have been asked to perform increased plant walk downs of high risk areas during the strike period. (eg due to load changes and refueling).

79 I consider this to be a well thought out, robust and well developed response to the on going situation and I will continue to interact with the station as appropriate.

2.5.4 Discussions with Nuclear Safety Group

80 I met with the Nuclear Safety Group Head to review a number of topics, the key matters being:

- Station had identified the potential failed fuel stringer in channel 3T39 and plans were being made to remove it in the next refueling batch imminently (at the time of my visit the reactor power was being reduced in readiness for the start of refueling). It was stressed that it will take some time for the reactor to return to equilibrium condition so that a judgment can be made on whether the core was free of leaking fuel.
- The preparations for the interim outage (start 14th February 2014) continue. The outage scope has now been agreed and as this will involve a period of air ingress into the core. A safety case for operation with failed fuel was being developed as a prudent contingency that could be deployed if failed fuel was found to still be present in reactor 3 at the time of the outage. A number of activities will be undertaken during the interim outage:
 - Undertake graphite inspection of at least 18 fuel channels.
 - Exchange two gas circulators with re-barred machines.
 - Examination half of the remaining inlet guide vane couplings not previously examined.
 - Various control and instrumentation component replacements.
 - Various replacements of valve, pipework etc..
- The inspection plan for my January visit was discussed, as were arrangements required for other inspections such as conventional safety, COMAH and human factors inspection of aspects of the boiler tube failure safety case.

2.6 Meeting with NIOS

81 I met briefly with the Nuclear Inspection and Oversight inspector to discuss recent events on site including steam leak repairs, preparations for the interim outage, reporting and categorisation of incidents on the site, and the outcome of the recent fire review. I intend to meet with NIOS routinely when I am on site.

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3 ACTIONS

3.1 Actions Raised During This Intervention

No.	Action	Who	Completion / Review Date

3.2 Actions Closed and Other Relevant Actions

No.	Action	Who	Completion / Review Date
n/a			

3.3 Candidate Issues

No.	Candidate Issue	Category	Importance	Who	Completion / Review Date
n/a					

3.4 Issues Closed and Other Relevant Issues

No.	Issue	Category	Importance	Who	Completion / Review Date
n/a					

4 REGULATORY NUCLEAR INTERFACE PROTOCOL (RNIP)

82 RNIP behaviours were observed at all meetings and, indeed, in all of my other dealings with station during this visit, but a formal RNIP report was not raised.

5 LEADERSHIP AND MANAGEMENT FOR SAFETY

83 NGL staff seen during the inspection all demonstrated a positive attitude and were open in terms of the information provided.

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REPORT APPROVAL AND SIGN-OFF

Note: Documents must be finalised on TRIM when signed-off / approved for issue.

Revision	Name	Responsibility	Executive Summary Approved by SI	Date
0A	[REDACTED]	[REDACTED]		January 2014
0	[REDACTED]	[REDACTED]		January 2014

VERSION CONTROL

Revision	Date	Description Of Change
0A	January 2014	1st draft
0		1st issue

CIRCULATION LIST

Electronic copy unless stated otherwise, e.g. if enforcement action is being considered hard copy records may be needed.

Organisation	Name / Responsibility	Date
Office for Nuclear Regulation	[REDACTED]	09 January 2014