

## **HEALTH AND SAFETY EXECUTIVE - NUCLEAR DIRECTORATE**

### **HM NUCLEAR INSTALLATIONS INSPECTORATE**

#### **HARTLEPOOL AND HEYSHAM 1 PERIODIC SAFETY REVIEW**

### **PROJECT OVERVIEW REPORT OF NII FINDINGS AND DECISION ON CONTINUED OPERATION**

#### **Summary**

- 1 The Health and Safety Executive's (HSE) Nuclear Installations Inspectorate (NII) has completed its assessment of the second Periodic Safety Reviews (PSR) for the Hartlepool and Heysham 1 nuclear power stations. The main conclusion is that the PSR did not fully meet NII's expectations for a periodic safety review as there were shortcomings both in the quality and the scope of information that is required by the UK regulatory system. Nevertheless, the issues arising are not immediate concerns for nuclear safety and it is appropriate that operation should be allowed to continue whilst a remedial programme of work is progressed for each station.
- 2 The conclusions from NII's assessment have been described and communicated to British Energy Generation Ltd. (BE), the licensee, via a Decision Letter to each of the relevant Station Directors.
- 3 This Project Overview Report gives some background to the regulatory decision. It explains the list of NII findings requiring substantive work from the licensee and puts it into context with other ongoing work at the two stations.

#### **Background**

- 4 Continuous day to day monitoring and inspection are important aspects for ensuring safe operation of nuclear installations. However international best practice recognises an additional review is also necessary that periodically considers the safety of the whole installation against modern safety standards and requirements. Within the UK, PSRs conducted by the nuclear site licensees meet this requirement and the periodicity is normally ten years.
- 5 The PSR aims to:
  - i) confirm that the plant is adequately safe for continued operation;
  - ii) identify and evaluate any factors which might limit the safe operation of the plant in the foreseeable future; and
  - iii) assess the plants' safety standards and practices and introduce any improvements which are reasonably practicable.
- 6 The first two aims are fulfilled by a re-examination of the safety case for the plant to confirm that it is still valid and will remain so up to the next review. As part of this examination, any life limiting features are identified and their safe remaining lives either

conservatively predicted (particularly where they may ultimately dictate the safe working life of the station).

- 7 The third aim is achieved by a comparison with current standards and re-analysis using up to date methodologies where appropriate.
- 8 NII's task is to ensure that the licensee carries out a comprehensive PSR and that the appropriate corrective actions and/or safety improvements are implemented within a reasonably practicable timescale. Although NII may conclude that the PSR provides an adequate basis for managing nuclear safety for a further ten years, continued operation will depend upon satisfactory results from further in-service and periodic inspections over that period.
- 9 Thus PSRs provide confidence in, but are not the sole means of ensuring, continued safe operation. Should any safety-related factors emerge subsequently that may raise questions on the continuing validity of the safety case, NII would require the licensee to resolve the issue. If the NII is not satisfied with the licensee's response, it has extensive powers under the licence to require any necessary changes, and can direct that the plant be shut down until it is satisfied that it can be operated safely. This process gives confidence that relevant safety issues will be identified and resolved as plants age.
- 10 The requirement on the licensee to conduct periodic reviews is derived from Licence Condition 15 (LC 15), which is attached to all nuclear site licences. The licensee's arrangements for complying with LC 15 include processes for undertaking both major (10 year) and minor (periodic maintenance outage) periodic reviews, and the checking and approvals processes to be used prior to issue to NII. BE's arrangements include a forward programme of PSR submissions. Under these arrangements, both Hartlepool and Heysham 1 were due to submit a PSR at the end of 2007 for NII assessment against a planned Decision Date of January 2009.

### **BE's submission of PSRs for Hartlepool and Heysham 1**

- 11 BE submitted the PSRs at the end of February 2008, two months later than originally planned. There were reasonable grounds for the delay. At the time of submissions both stations had been shutdown for remedial work on their boiler closure units (BCU). The BCU project was a major modification of the closure units and led to a revised safety case. It resulted in outages of more than a year at both stations and considerable loss of both output and revenue to British Energy. Given the commercial significance and the national significance of the loss of generation, NII viewed the delay in submission of the PSR as acceptable. This also applied to some later delays in PSR-related projects due to resource difficulties, where staff who were key to these projects were also involved in the BCU project.
- 12 The PSRs are extensive documents. In each case 57 review documents were provided in total. A list of reports is provided as Table 1. The PSR documentation is hierarchical. There are five "top tier" summary documents. These are:
  - Chapter 1 - Adequacy of Nuclear Safety Case Statement
  - Chapter 2 - Operations and Safety Performance
  - Chapter 3 - Systems, Structures and Components
  - Chapter 4 - Safety Analysis
  - Chapter 5 – Internal and External Hazards
- 13 Chapter 1 has no specific supporting references because it is an overview document which provides a summary of the adequacy of the nuclear safety case. In effect, all the

rest of the main review reports are supporting reports to Chapter 1. The remaining submissions support the top tier documents, so that there are four supporting reports to Chapter 2, covering different aspects of operations and safety performance, twenty-four supporting references to Chapter 3 giving information on Systems, Structures and Components, their engineering justification, operational performance and condition, and eight supporting reports to Chapter 4 describing different aspects of safety analysis, including fault studies, radiological consequences, worker risks and the probabilistic risk assessment. Internal and external hazards are covered in Chapter 5 and the supporting review reports, but the issues feed into the Chapter 4 summary document as well as into Chapter 5.

- 14 Providing a report of the size and scope delivered was a considerable undertaking. BE supplemented their station-based and central teams with a considerable amount of additional resource provided from contractors. All reports were subject to internal review processes prior to submission and to an independent review from BE's Safety and Regulatory Division – the Independent Periodic Review Assessment.
- 15 The outcomes from the BE review included a number of shortfalls and improvement points. These were summarised in Chapter 1 of the PSRs for each station. The work elements to rectify the shortfalls or implement the improvement points are called PSR Identified Corrective Actions (PICAs) by the licensee. These were classified as follows:
  - Type A: A nuclear safety shortfall which requires further work.
  - Type B: A minor nuclear safety shortfall/potential safety enhancement which requires further work.
  - Type C: A shortfall previously identified and progressing under an existing work programme.
- 16 For both stations BE concluded<sup>1</sup> that:

*The outcome of this second PSR differs markedly from PSR<sup>2</sup> in terms of the nature of the shortfalls identified. PSR1 identified a significant number of issues that resulted in major programmes of plant modifications. This has not been the case for PSR2 where the majority of shortfalls are not related to plant modifications. As well as this the safety significance of the shortfalls identified has been much lower. The consolidated outcome of the review is that there are no Type 'A' (high safety significance) issues identified. The review has identified a total of 128<sup>3</sup> shortfalls for Hartlepool and 130 for Heysham 1 which are of the lesser Type 'B' (medium safety significance) category. The full table of Type 'B' shortfalls is presented in Appendix B. Not only are the numbers of medium safety significance shortfalls similar for both stations but also their percentage distribution by type (e.g. ageing, procedural, scope etc.) is almost identical. The conclusions that follow are conditional on the resolution of the shortfalls identified and apply to both stations:*

---

<sup>1</sup> This is a quote from Chapter 1 of the periodic safety review, which was also presented to the stations' nuclear safety committee.

<sup>2</sup> PSR1 refers to the first PSR carried out for the AGR stations – submitted in 1997. The second PSR for these stations, sometimes referred to as PSR2 is the subject of this project overview report.

<sup>3</sup> The numbers of shortfalls increased from those quoted – issues raised by BE's Safety and Reliability Division in their checking processes were added to the PICA programme after Chapter 1 was finalised.

- Overall, the findings of PSR have confirmed that Hartlepool and Heysham 1 adequately meet current standards. Consequently only a small number of shortfalls, ~12% relate to standards issues, and the majority of these relate to the completion of assessment work.
- Shortfalls associated with ageing issues are ~25% of the total. Furthermore there is the ongoing need to update integrity assessments at the appropriate time to maintain the safety case to 2019. These assessments will be managed via the ageing management processes described in this paper.
- Of the remaining shortfalls, these fit into the following categories:
  - ~15% of the shortfalls are associated with non-ageing related, analytical based changes to safety cases.
  - Around 12% of the shortfalls are concerned with Maintenance Schedule issues.
  - Around 7% of the shortfalls are plant modification related with a further ~7% associated with changes to documentation/procedures.
- PSR2 recognises that there are a number of major plant issues that will require management over the PSR2 period, including: the graphite core lifetime; the boiler closure unit safety case; increased boiler pressure drop; the risk of boiler tube leaks; and, increasing hot box dome temperatures. The PSR project has recognised these are major areas of ongoing work, and each are managed by appropriate project arrangements and subject to oversight by appropriate working groups. With respect to the first two issues, namely the graphite core and BCU safety cases, PSR2 recognises the need to present interim reviews, in order to update the safety case position. Other issues affecting the boilers, namely boiler pressure drop and boiler tube leaks, are subject to a number of ongoing project management and oversight arrangements, including the Boiler Lifetime Group, the Boiler Assessment Working Group and Project Safety Review Group. The safety significance of increasing hot box dome temperatures is managed by demonstrating compliance with temperature limits controlled by the Technical Specifications. The investigation and proposed management of the commercial risk associated with this issue is also subject to an ongoing EC programme. ..
- The overall safety case has been reviewed against the Nuclear Safety Principles and the risks shown to be ALARP, recognising that the work required to reduce risks and resolve existing and new shortfalls is being undertaken on timescales appropriate to their safety significance. These ongoing reviews will also incorporate case specific ALARP assessments. On that basis it is concluded that all reasonably practicable steps have been or are currently being taken to reduce risks.

Overall, the findings of the PSR have confirmed that Hartlepool and Heysham 1 adequately meet current safety standards. A review of the safety case and safety management systems for the stations has been conducted. It is concluded that, subject to resolution of the shortfalls and the continuing programme of test and inspection that underpins the normal operation of the Stations, adequate systems and processes are in place to maintain the case for safe operation of Hartlepool and Heysham 1 for this Periodic Safety Review period to December 2019, noting that completion of the next PSR will be in 2018.

- 17 BE's arrangements require that they make progress on implementing their findings whilst NII are assessing the periodic review. The expectation within their arrangements is that all safety significant PICAs should normally be programmed to be completed by the NII

Decision Date. Exceptions to this are allowed for long-lead items, and of items requiring implementation at a reactor shutdown, etc., when a safety justification must be produced for any delays past the Decision Date. BE had some difficulty with resources during this period, since both stations had major work programmes underway to return the stations to operation following resolution of the BCU closure issues. Despite this NII judged that reasonable progress was made on the PICA implementation programme, and the majority of PICAs of medium safety significance were completed prior to the NII Decision Date. This included all PICA deliverables which NII identified as necessary to allow the stations to return to service.

- 18 BE have maintained a Project Team to manage and monitor the PICA implementation phase. There are team members both at station and at BE's corporate HQ, since PSR activities have taken place at both locations. This team has provided support at station during NII station visits on PSR-related issues. Station visits have shown that both Hartlepool and Heysham 1 stations have taken "ownership" of their own periodic reviews and of the resulting work programme.

### **NII assessment of Hartlepool and Heysham 1 PSRs**

- 19 NII nuclear inspectors carried out a detailed assessment of the submissions. Up to sixteen inspectors were used, each covering their area of expertise. Assessment reports or notes were produced covering Graphite, Health Physics/Radiological protection, Internals Hazards, Fault Studies/Fuel Fault Studies, , Radioactive Waste Management, Civil Engineering/Externals Hazards, Mechanical Engineering of key systems, structures and components, Structural Integrity of systems, structures and components, Control and Instrumentation, Electrical, Safety Management, Human Factors, and Probabilistic Safety Analysis (PSA).
- 20 Many of the inspectors visited stations to inspect plant and better understand the PSR submissions and programme of work. Assessment inspectors also examined some of the identified references to the main review submissions, where these proved necessary for their assessment sample and strategy.
- 21 During the assessment NII decided to delay the decision on the Periodic Safety Reviews by three months, from 31st January 2009 to 30th April 2009. NII's decision was made because of a number of factors, but largely because of the constrained resources within NII and high priority emergent issues, such as the Hartlepool and Heysham 1 BCU safety case, and restart assessment.
- 22 In assessing the PSR, the nuclear inspectors followed NII guidance. This included NII's Technical Assessment Guide "Periodic Safety Reviews (PSRs)" (T/AST/050, available on NII's website). They also used other NII technical guidance, as appropriate and in particular NII's Safety Assessment Principles (SAPs) as the basic standard against which to judge the acceptability of the safety review (also available via NII's website).
- 23 NII's SAPs include some key messages on the Regulatory Background; the principles of So Far as Is Reasonably Practicable (SFAIRP), As Low As Reasonably Practicable (ALARP) and As Low As Reasonably Achievable (ALARA), Proportionality and the relevance to facilities built to earlier standards. In the case of the latter, NII recognises that:

*... The extent to which the principles have been satisfied must also take into account the age of the facility or plant. For facilities that were designed and constructed to standards that are different from current standards the issue of whether sufficient measures are available to satisfy ALARP considerations will be judged case by case.*

## Summary of findings from NII specialist assessment

- 24 Although the PSR2 submissions provided good information on the operating experience of the plant and its reliability, there were some areas where the inspectors considered that BE's review had not always been carried out to the required depth.
- 25 NII inspectors in most cases tried to resolve these differences with BE. Some initial findings were indeed agreed to be misunderstandings or miscommunications, and these were closed out after exchange of information. Other NII findings had already been identified by BE and were already on the programme of work (PICA programme). However there remained a significant number of areas which in NII's view required additional work by BE.
- 26 At the end of the assessment phase of the PSR, NII drew up an Action Plan. This constituted those findings for which resolution could only be achieved by BE undertaking a programme of work. An Action Plan for the two stations is appended to this Project Overview Report, along with a commentary on why NII have raised the issue for resolution.
- 27 The Hartlepool and Heysham 1 PSR was one of a family of PSR projects, which represent the second PSRs for each of the AGR stations (the AGR PSR2 programme). Some of the NII findings from previous AGR PSR2 submissions are generic issues, with significance across the fleet. BE have recognised these, in the main, by ensuring these issues form part of their PICA programme. NII continue to monitor these programmes both at a generic level, and specifically for Hartlepool and Heysham. Examples of these wider generic projects include:
- Review Control and instrumentation (C&I) against modern standards, especially for the fuel route.
  - Improvements to BE presentation of ALARP summaries to accompany the PSR, as required by NII's guidance for periodic review.
- 28 The relative significance of the Action Plan to other parts of BE's PSR-related work programme is discussed later.

## Summary of NII project-level considerations

- 29 As well as the specific findings by NII's nuclear inspectors, there were a number of project-level considerations that fed into the regulatory decision. Some of these were derived from taking an overview across the specialist comments. Other considerations came by examining BE's PICA programme, their own findings and the progress during the year, others from relating PSR to other current programmes of work.
- 30 It became apparent that many assessment comments arose from mismatches between NII expectations and the PSR as submitted.
- 31 In particular NII assessors had expected the review to be complete and self-standing, whereas BE's practice is to carry out a review to identify shortfalls – many of the shortfalls therefore require further studies before conclusions are reached, leading to the "final submission" to NII being at a different level of maturity from NII expectations. Not all these work programmes will be completed to PSR programme dates. The forward work programme therefore leads to several key areas of the PSR, such as additional hazard reviews, taking place after the PSR decision-making process.

- 32 NII assessors had expected the PSR to be a more effective strategic look-forward in areas of plant ageing and future integrity cases. This comment particularly applies to integrity cases for steel structures. This is not a direct safety issue, since extant integrity and safety cases extend well into the PSR period, and the periodic safety review does provide confidence that integrity will be managed through the period, Nevertheless, NII's view of the PSR is that it can include an integrated decision making process between safety, integrity, plant lifetime and obsolescence. This is more likely to lead to better decisions, and provide opportunist safety improvements.
- 33 The negative aspects described above are being addressed by a PSR improvement project. BE are developing an improved process that will draw on existing processes for plant and system health, processes to ensure safety case currency, reviews of staffing levels and competence, etc. The intention to improve BE's living processes throughout the ten year period between PSRs, and integrate PSR with BE's processes for corporate investment and stewardship. This will allow the PSR to become a more strategic overview and will also mean that it is less intrusive on normal business, but improve corporate ownership of the PSR. BE have commenced this improvement project, with a view of delivering improvements before the next PSRs for these stations. NII are monitoring and engaging with the project as required.
- 34 At a project level it was also possible to identify positive aspects of BE's periodic review projects for Hartlepool and Heysham 1, including:
- Many of the main review submissions give good information on the operating experience of the plant and its reliability.
  - As for previous AGR PSR2 submissions. BE's PSR review process shows evidence of effective in-house checks and balances.. BE's Safety and Regulation Division (SRD) had carried out an internal review and identified a number of issues with the PSR main reviews prior to submission to NII. These were added to the overall PICA programme.
  - BE's central PSR project team maintained a central focus on quality and provided reporting mechanism to BE management and NII on the progress on work programmes arising, which improved communication and internal decision making through the project.
- 35 NII also had interactions with station staff through the PSR assessment period:
- Both stations were visited by a number of inspectors during the project. NII staff were given good support from staff at both stations (including from the station PSR team) to allow them to carry out their assessment.
  - Stations have shown good awareness of the PSR issues and ownership of their periodic review, both at inspection visits to station and also in participation in progress meetings and project meetings with NII.

### **Consolidated work programme**

- 36 NII have reviewed all findings from inspectors carrying out detailed technical assessments. The judgement has been made none require immediate station shutdown. It is therefore acceptable for station operation to continue whilst the work programme is carried out.
- 37 NII has also decided that BE should determine relative priority between competing projects. If NII-identified issues were given priority over BE-identified issues these may be

delayed, and that this may be detrimental overall to safety. NII therefore has required BE to develop work programmes for each station in which NII's Action Plans are addressed in a timely manner, but without adversely affecting the delivery of other safety improvements.

- 38 The resulting "consolidated work programmes" therefore reflects BE's views on practicable work programmes to address both their own shortfalls and improvements and also the findings within NII's Action Plans. NII have accepted BE's assurance that these programmes can be carried out without adverse effects on other safety-related work. In addition, BE have committed to provide funding and resource such that the work programmes can be delivered.
- 39 NII's Decision on the Hartlepool and Heysham 1 PSRs is based upon acceptance of these consolidated work programmes but also on holding BE to the delivery of these commitments. BE was therefore asked to develop a process by which they would monitor the progress on the consolidated work programme and report this to NII. BE has proposed such a process. NII judges that this process is capable of generating the information that NII requires.
- 40 On the basis of all the issues summarised in this Project Overview Report, NII has decided that the shortfalls do not warrant formal enforcement action at present, but that BE's performance in discharging the work programme will be closely monitored, and any slippage will be reviewed against options for further enforcement actions.

## **Conclusions – the Decision as expressed to the licensee**

- 41 The bases for NII's decision, as outlined in the Decision Letters, were as follows:
- NII views the current PSR submissions as having some shortcomings both in the quality and the scope of information that is required by the UK regulatory system.
  - Despite this, NII concluded that the issues arising from its PSR assessment are not immediate concerns for nuclear safety and that it is appropriate that normal station operation should continue whilst a remedial programme of work is progressed for each station.
  - An Action Plan has been sent to each station covering the major NII findings.
  - BE has responded with a comprehensive programme of work which covers the items on the Action Plan and also work to complete BE's own shortfalls and improvements as identified in the PSR.
  - BE has developed a process by which NII can monitor progress on the PSR work programmes during the next few years.
  - NII's view is that the current periodic review will not be complete and adequate until the end of this work programme.
  - NII's decision is to accept the work programme as a baseline against which progress will be monitored. Any significant slippage on any aspect of the work will be reviewed against options for future enforcement action.

## Table 1: Reports making up the PSR2 submissions for Hartlepool and Heysham 1 Power Stations

*The titles of the reports are given in the following tables.  
Some were joint submissions, i.e. identical reports for Hartlepool and Heysham 1*

ID	Title
Chapter 1	Adequacy of Nuclear Safety Case Statement:
Chapter 2	Operations & Safety Performance
Chapter 3	Systems, Structures & Components
Chapter 4	Safety Analysis: (all reviews are joint)
Chapter 5	Internal & External Hazards
R2.01	Review of Operation
R2.02	Safety Management Systems
R2.03	Radiological Protection and Monitoring
R2.04	Emergency Planning Arrangements
R3.01	Fuel Handling
R3.02	Core Systems
R3.03	Control Rods
R3.04	Secondary Shutdown System
R3.05	Hot Box Dome Structure
R3.06	Core Support Structure
R3.07	Core Restraint
R3.08	Guide Tubes
R3.09	Boilers
R3.10	Gas Circulators
R3.11	Prestressed Concrete Pressure Vessel
R3.12	PCPV Penetrations and Liner
R3.13	Pressure Vessel Thermal Shield
R3.14	Primary Coolant System
R3.15	Secondary Coolant Systems
R3.16	Main Cooling Water and Auxiliary Systems
R3.17	Reactor Safety Circuits (including RSSE)
R3.18	Control and Instrumentation Equipment
R3.19	Radioactive Waste Handling
R3.20	Steam Pipe-work
R3.21	Electrical Supplies
R3.22	Ventilation Systems
R3.23	RSSE. This is termed the Post Trip Logic (PTL) or Post Trip Distribution (PTD) system and is covered in 3.17.
R3.24	Civil Structures

**Table 1: (continued)**  
**Reports making up the PSR2 submissions**

R4.01	Fault Based Safety Assessment
R4.02	Transient Analysis
R4.03	Radiological Consequences
R4.04	Shutdown Safety Case
R4.05	Internal and External hazards – now covered in Ch.5.
R4.06	PSA
R4.07	SBERGs
R4.08	Worker Risk
R5.01	Fire
R5.02	Steam Release
R5.03	Hot Gas Release
R5.04	Cold Gas Release
R5.05	Missile Impact
R5.06	Dropped Loads and Lifting Equipment
R5.07	Internal Flooding and Corrosive Fluid Release
R5.08	Internal Toxic Gas Cloud
R5.09	Vehicular Impact
R5.10	Seismic
R5.11	Wind Loading
R5.12	External Flooding
R5.13	Aircraft Impact
R5.14	Industrial Hazards
R5.15	Extreme Ambient Temperatures
R5.16	Electro-Magnetic Interference
R5.17	Lightning
R5.18	Drought and Biological Fouling

**Table 2: Hartlepool and Heysham 1 Action Plan**  
(Arising from NII Findings)

<b>NII tracking no.</b>	<b>Commitment (summarised)</b>	<b>Background to Action Plan item</b>
H1H/2.03/01	BE to develop a forward strategy for possible future vessel entries to ensure exposures during entries are restricted so far as reasonably practicable.	Although at present no entries are planned, NII would like some consideration in advance of the need for an entry. Forward planning is important to ensuring that exposures to workers are restricted so far as reasonably practicable.
H1H/3.00/01	BE to propose a forward programme of structural integrity safety cases for the full PSR period.	A programme will allow NII to gain confidence that all integrity cases are produced sufficiently in advance, and also that BE are accounting for risks in their programme.
H1H/3.00/02	BE to carry out a maintenance review of Hartlepool nuclear safety significant maintenance facilities.	BE's PSR identified a number of cases in which maintenance practices had led to plant issues, particularly some in which foreign materials had not been adequately excluded. NII's assessor visited several facilities on the stations and required BE to look at maintenance practices elsewhere.
H1H/3.01/01	BE to provide appropriate Human Factors analysis of 12 administrative controls identified in the PSR and not previous justified in PSR1. This analysis should be proportionate to the human reliability claim, as BE's corporate processes.	BE are committed to completing this analysis shortly. NII linked this to the PSR to provide monitoring of completion.
H1H/3.01/02	BE to issue the Fuel Route Safety Case Visibility Documents and the Consolidated Fuel Handling Safety Case by the end of 2009 calendar year	NII view the improved documentation as being valuable, particularly for operational decision making at stations.
H1H/3.01/03	BE Fuel Route PSR and PICA commitments to be completed as shown in the Fuel Route Transformation Map 2008/2011 presented at the Fuel Route Enhancements Review Meeting.	NII raised this finding to provide a link between the PSR and this improvement project for the Fuel Route and its safety case.
H1H/3.02/01	BE to confirm the graphite interim reviews will be undertaken and reported in December 2010, December 2013, and December 2016.	Graphite core integrity is kept under close scrutiny throughout the PSR period by licensee and by NII. NII also require that the scope of the graphite interim review should include a more detailed review, justification and demonstration of the adequacy of the ageing management strategy for Hartlepool and Heysham 1 graphite cores.

<b>NII tracking no.</b>	<b>Commitment (summarised)</b>	<b>Background to Action Plan item</b>
H1H/3.02/02	BE to provide a committed programme to secure a significant improvement in the extent of trepanned sample data from Hartlepool and Heysham 1 to include testing of archived material and increased sampling at periodic shutdowns.	The NII assessor wishes BE to recognise uncertainties by improvements to the amount of data to be analysed.
H1H/3.02/03	British Energy to develop a safety case for a range of crack morphologies that bounds reasonably foreseeable defect configurations, to include defect clusters, and to report this in a Category 1 safety case.	NII are seeking improvements in graphite integrity predictive capabilities.
H1H/3.06/02	BE to consider whether there are any loading conditions on the Core Support Structure, either at-power or off-load, where the lower toughness of the peripheral regions of the Core Support Plates becomes significant in determining their integrity.	BE are improving their safety case for the Core Support Plate. This NII finding recognises an uncertainty at the time of submission.
H1H/3.18/01	BE to produce a suitable and comprehensive programme for the phased reinforcement and/or replacement of the DPS at HYA and HRA.	BE are looking “fleet-wide” at DPS (Data Processing System) replacement and/or reinforcement. This finding is to provide a link between the generic issue and a station-specific programme of work.
H1H/3.18/03	BE to produce a suitable programme for the replacement of relevant C&I-based systems, in line with the company’s C&I ageing management guidelines. The programme should identify the C&I-based systems that are to be addressed and give timescales for this work.	BE are looking “fleet-wide” at ageing management of C&I systems. This finding is to provide a link between the generic issue and a station-specific programme of work.
H1H/3.19/01	BE to submit a programme for the preparation of Radioactive Waste Management Cases in line with the joint regulatory guidance on the management of higher activity radioactive waste.	BE have a programme of work to update radwaste safety case, but additionally NII/EA have provided joint regulatory guidance on the management of higher activity radioactive waste. This finding is to link the two issues and provide a future programme to be monitored by NII.
H1H/3.24/02	BE are reviewing the wind load justification to confirm operational wind load capacity.	In the view of the NII assessor, the PSR submission required a small amount of additional work, which will be provided by the programme requested.
H1H/3.24/03	BE to complete additional work to review the assessment of brick panel structures (accidental factors not appropriate in current analysis).	See above

<b>NII tracking no.</b>	<b>Commitment (summarised)</b>	<b>Background to Action Plan item</b>
H1H/3.24/04	BE to complete additional work to review roof structure subject to snow loading.	See above NII assessor wished BE to extend their existing analysis to cover two issues; to confirm that the relevance of the roof loading specification used and to reanalysing civil structures to account for drift loading (if appropriate).
H1H/3.24/06	BE to reanalyse structures against wind loads, taking account of a revised model of the effects of dominant openings on internal wind pressures may be underestimated.	See above
H1H/4.00/01	BE to provide evidence of how they have satisfied themselves that the basis of the Human Factors assessments from PSR1 remain valid.	BE are committed to completing this analysis shortly. NII linked this to the PSR to provide monitoring of completion.
H1H/4.06/02	BE should develop a robust Living PSA programme to manage improvements and updates to the PSA including but not limited to the internal hazards and internal event audit findings highlighted by the NII. [combination of lower-tier findings]	NII carried out a detailed audit and review of the PSA (Probabilistic Safety Assessment) that constitutes part of the PSR. This provided a list of issues that NII would like BE to address. BE provide 3-yearly Living PSA updates. NII have asked for a programme of work for the next update to include all significant findings from NII's review of this latest PSA issue.
H1H/5.02/01	The adequacy of the process adopted for the review of the Steam Release Safety Cases for Hartlepool and Heysham Power Stations should be investigated and corrective action taken to adequately assess the current safety case.	NII were not content with the PSR main review covering the Steam Release hazard. BE are committed to a comprehensive review that will reach maturity in 2010/2011.
H1H/5.03/01	The adequacy of the process adopted for the review of the Hot Gas Release Safety Cases for Hartlepool and Heysham Power Stations should be investigated and corrective action taken to adequately assess the current safety case.	NII were not content with the PSR main review covering the Hot Gas Release hazard. BE are committed to a comprehensive review that will reach maturity in 2010/2011.