



**HM NUCLEAR INSTALLATIONS INSPECTORATE**  
**BNFL SELLAFIELD AND DRIGG AND UKAEA WINDSCALE**  
**QUARTERLY REPORT FOR 1 JANUARY - 31 MARCH 2000**

**FOREWORD**

This report is issued as part of the Health and Safety Executive's commitment to make information about inspection and regulatory activities relating to the above sites available to the public. It is for distribution to members of the Sellafield Local Liaison Committee and covers activities associated with the regulation of safety at BNFL Sellafield and Drigg and UKAEA Windscale. These reports are distributed quarterly and will be available on the Internet. ( They can be found at <http://www.hse.gov.uk/nsd/nsdhome.htm>). Site Inspectors of HM Nuclear Installations Inspectorate attend LLC meetings and will be happy to respond to any questions raised there.

1. **INSPECTIONS**

HMNII Inspectors made a total of 69 visits to the Sellafield, Calder Hall, Windscale and Drigg sites during the quarter. This involved a total of 238 inspector days on site (see table 1 for details).

## 2. **ROUTINE MATTERS**

### 2.1 Emergency Arrangements

As reported previously HMNII has expressed significant concern at BNFL's failure to demonstrate adequate arrangements for the operation of Emergency Reception Centres (ERCs) across the Sellafield site, which are used to receive evacuees from areas on the site affected by an incident. BNFL has provided HMNII with a programme of work to address the issue, beginning with a fundamental review of ERCs, leading to the development and introduction of new arrangements during 2000. HMNII will be closely monitoring BNFL's delivery of this programme of improvements.

## 3. **NON-ROUTINE MATTERS**

### 3.1 Team Inspection of Operations at Sellafield

The HSE report of the team inspection on the subject of the control and supervision of operations at Sellafield was published on 18 February. Copies of the report have been supplied to members of the Local Liaison Committee and it is available on the Internet at <http://www.open.gov.uk/hse/nsd>. Shortly before the publication of the report, representatives of the workforce were comprehensively briefed on the content of the report. The report contained 28 recommendations and drew three main conclusions :

There is a lack of a high quality safety management system across the site, which is compounded by an overly complex management structure.

There are insufficient resources to implement even the existing safety management system.

There is a lack of an effective independent inspection, auditing and review system within BNFL. Without a vigorous independent inspection, auditing and review system, HSE does not see how BNFL can make acceptable and timely progress in delivering a high quality safety management system across the site.

The findings of the inspection and the conclusions drawn from it confirm the four common observations made by HMNII during its routine inspection activities prior to the team inspection, namely :

lack of consistency across the site,

inadequate control and supervision of operations,  
overloading of supervisors and middle managers,  
poor safety culture in many areas of the site.

On publishing the report, BNFL was required to respond to the 28 recommendation within a period of 2 months. ( Note BNFL subsequently published its response on 18 April).

### 3.2 Report on Falsification of Data in the MOX Demonstration Facility

On 18 February HSE published the report of its investigation into the falsification of pellet diameter data in the MOX Demonstration Facility (MDF). Copies of the report have been supplied to members of the Local Liaison Committee and it is available on the Internet at <http://www.open.gov.uk/hse/nsd>. Shortly before the publication of the report, representatives of the workforce were comprehensively briefed on the report. The report contained 15 recommendations and drew a number of conclusions, the main ones being :

In spite of the falsification of the quality assurance related data, HMNII is satisfied that the totality of the fuel manufacturing quality checks are such that the MOX fuel produced for Japan will be safe in use.

The events at MDF which were revealed during the course of the HSE investigation could not have occurred had there been a proper safety culture within the plant.

It was clear that some process workers falsified records of the diameter of fuel pellets taken for QA sampling. One example of falsification was found dating back to 1996.

The management of the plant allowed the practice of not following procedures and deliberately falsifying records to avoid doing a tedious task to continue for over three years and hence must share responsibility.

At the time of publishing the report, BNFL was required to respond to the recommendations within a period of two months. ( Note BNFL subsequently published its response on 18 April).

### 3.3 Incident Investigations

A number of incidents were investigated by HMNII inspectors during the quarter, details of some of these are included below. In general these were events which have already been reported in the Sellafield Newsletters. There was one event during the quarter which is likely to be included in a future edition of the HSE Quarterly Statement of Incidents.

### Waste Vitrification Plant Potential Overexposure Event

Further to previous reports concerning this event, HMNII is still considering the regulatory response to the overexposure. HMNII has been constrained by resource availability from concluding this matter earlier.

### Damage to Windscale Vitrification Plant Master-Slave Manipulators

HMNII has worked alongside the AEA Constabulary in investigating this apparent deliberate damage, which was discovered at the end of February. Five Master-Slave Manipulators (MSMs) on WVP Line 2 and one MSM on line 1 were found with their control cables severed, with malicious damage seemingly the most likely cause. HMNII views this incident particularly seriously, since it appears to involve deliberate damage to safety-related equipment. The event also has severe implications for safety culture on the plants concerned. The investigation continues at the present time. (This event is likely to be included in the HSE quarterly statement of incidents).

### Plutonium Contaminated Waste Assay Instruments

Towards the end of February 2000, BNFL informed HMNII that several instruments which are used to provide assay data for Plutonium Contaminated Waste in the Waste Retrieval and Decommissioning area had been found to be beyond their calibration date. HMNII carried out an immediate investigation of this event and concluded that whilst the assay instruments had in fact been maintained in accordance with the requirements of the maintenance schedule, the schedule did not adequately specify the calibration requirements. An Improvement Notice was issued requiring BNFL to review the technical requirements for calibration of these instruments and to update the maintenance schedule to put into effect these requirements. BNFL has also been asked to consider the site wide implications of this occurrence.

## 3.4 Waste Management

### B215 Highly Active Storage Tanks and Highly Active Liquor Strategy

HMNII's assessment of the revised safety case for B215, which is in the new format of a Continued Operations Safety Report (COSR) supported by an underlying Continued Operations Safety Case (COSC), has progressed throughout the quarter. Discussions have been held with BNFL on a number of points arising from the assessment to date.

Following the publication of HMNII's report entitled "The Storage of Liquid High Level Waste at BNFL Sellafield, An Updated Review of Safety", on 18 February 2000, discussions have been initiated with BNFL on the way forward. (The report is available on the Internet at <http://www.open.gov.uk/hse/nsd>.) The purpose of these discussions is to ensure that an appropriate "buffer stock" of high level liquid waste is agreed with BNFL, to which the storage tanks will need to be emptied by around 2015 and also that associated "stock reduction curves" are agreed. HMNII is considering using regulatory powers to secure the agreed "stock reduction curves", which are to be defined within the next six months.

### Waste Vitrification Plant "Trap Door" Event

Following the event in November 1998 involving a type of shield door (known on the plant as a trap door) in WVP, HMNII has continued to pursue two lines of inquiry with BNFL, one focusing on improvements to the plant itself and the other covering the general implications for the site. HMNII's concern arises from the potential for the shield door to not adequately protect a person from the hazards of a substantial exposure from a radiation source which could be present on the other side of the door.

On the specific implications for WVP, following regulatory pressure from HMNII, BNFL is advancing the improvement programme to bring the WVP shield doors up to BNFL's current corporate standards. The programme still extends over more than eighteen months, but priority has now been given to the higher safety significant shield doors.

#### Waste Vitrification Plant Blockages

HMNII has continued to monitor BNFL's progress in resolving these problems. During the quarter, BNFL finally cleared the blockage in WVP line 1, thereby enabling the simultaneous operation of both lines 1 and 2 for a short period in March. However, the 131 vitrified waste containers produced by BNFL during the twelve months ending of 31 March was well below half the production in recent years. This disappointing performance reinforces HMNII's concerns as articulated in the Liquid High Level Waste report which was published in February. HMNII is monitoring BNFL's use of a vitrification line washing strategy, which has recently been introduced in an attempt to reduce the likelihood of further prolonged line blockages

#### Waste Vitrification Plant Breakdown Cell

Waste disposal from the breakdown cell continues to be hampered by in-cell equipment failures. The quantity of waste removed from the cells in the year to the end of March 2000 was less than a third of that achieved in the previous year. HMNII is applying pressure on BNFL to rectify this disappointing performance, resulting in the enlargement of the teams charged with transferring waste out of the cells and into an engineered site store. HMNII will continue to monitor BNFL's progress on clearing the substantial backlog of accumulated waste.

#### Waste Vitrification Plant Line 3

HMNII has continued to inspect aspects of the inactive commissioning of the third vitrification line, which is programmed to enter active operations by the end of 2000

### 3.5 THORP

HMNII has continued to monitor the operation of THORP during the quarter, with particular reference to the coarse fines transfer system. BNFL has now successfully operated the new coarse fines transfer system in commissioning mode with PWR and BWR fuel and will shortly be submitting a report on its performance to date for

consideration by HMNII. BNFL will be making a few improvements to the system during a plant shutdown at the end of March, before using the system with AGR fuel and submitting a final report to HMNII on the commissioning of the system with all types of fuels. HMNII will then assess this report to reach a view on whether the system is suitable for routine operation for the reprocessing of all types of oxide fuel.

HMNII has also continued to monitor BNFL's operation of the highly active raffinate steam strip column, which as previously reported has suffered a deposition problem. The column continues to suffer from the deposition and BNFL will carry out a further washout during the shutdown at the end of March. BNFL is continuing to search for a permanent solution to this problem and HMNII is monitoring developments.

### 3.6 Sellafield MOX Plant (SMP)

BNFL is continuing with the uranium commissioning of SMP, with HMNII monitoring its progress. DETR continues to analyse the responses received during the further public consultation, which came to an end on 23 July 1999.

### 3.7 MOX Demonstration Facility (MDF)

As indicated above, the report of HMNII's investigation into the event in MDF involving the failure to carry out some quality checks on fuel pellet diameters was published on 18 February 2000. The plant remains shut down and before HMNII will consider giving agreement for the resumption of operations in MDF, BNFL will amongst other things, need to provide a satisfactory response to the 15 recommendations in HMNII's published report and submit an adequate safety case for the resumption of operations.

### 3.8 Decommissioning Plants

HMNII has been monitoring BNFL's progress with the inactive commissioning of the B41 waste storage facility decommissioning project, which has still to reach the stage of seeking HMNII agreement to commence active commissioning. As a result of this monitoring, HMNII has expressed doubts about the rigour of the safety case for Argon inerting of the building and has therefore issued a Specification under Licence Condition 13 requiring the Nuclear Safety Committee to be consulted on the adequacy of the design of the Argon inerting system. The BNFL Director of WM&D has also been required to investigate why BNFL's own systems had failed to detect this lack of rigour.

A new safety case for the B315 sludge settling tank, in the form of a Continued Operations Safety Report (COSR) was submitted to HMNII during March.

### 3.9 Plutonium Contaminated Material (PCM)

HMNII's monitoring of PCM retrievals from Drigg has continued. BNFL has made good progress with PCM retrievals from magazine 3 and building 720 during the quarter and has met its overall target for retrievals during 1999/2000.

A follow up conventional safety inspection of the Drigg facilities was carried out during the quarter as a result of the concerns reported during the quarter 4 1999 report. BNFL has made satisfactory progress in addressing the issues raised by HSE during this earlier inspection and no further issues were identified.

### 3.10 Calder Hall

In previous years, the successful management of periodic shutdowns at Calder Hall has utilised a significant amount of overtime, which has been accepted by staff because of the increased remuneration associated with it. In the light of the potential affects of the new contract of employment on the working of overtime, HMNII will be closely monitoring BNFL's management of the coming outages.

Revised terms of reference for the Calder Hall Nuclear Safety Committee were approved by HMNII on 31 March 2000. The revisions harmonise the terms of reference across Magnox power stations, enabling each of the safety committees to meet at the same time and place. For the first time, the committees for Magnox Electric power stations will meet alongside the committee for Calder Hall and Chapelcross. These changes are welcomed by both the licensee and HMNII, as they will improve the sharing of best practices and promote wider discussions on like issues.

### 3.11 UKAEA Windscale

HMNII has issued an agreement to UKAEA permitting the commencement of the decommissioning of the Windscale Advanced Gas Cooled Reactor hot box, this being a section of the reactor pressure vessel contents located above the reactor core. Most of the material arising from the decommissioning will be disposed of as low level waste to Drigg.

UKAEA has informed HMNII of problems with the chosen decommissioning method for Windscale Pile 1 and of its intention to carry out a full review of the available options. UKAEA expects that this will result in delays in the commencement of the actual dismantling work by up to three years. HMNII is concerned that delays have occurred in this important safety related decommissioning project, but understands the reason behind the decision. HMNII will monitor the UKAEA review process and subsequent design and implementation to ensure that UKAEA retains control as an intelligent customer and that sufficient measures are taken to avoid, as far as practicable, any similar problems arising in the future.

An inspection of UKAEA's electricity distribution and supply systems was carried out in February. No significant issued were raised, but a number of minor issues are being taken forward with UKAEA.

An Operations Review meeting was held with the UKAEA Directors on 17 March. This meeting is a routine forum for taking forward corporate issues between HMNII and UKAEA. Topics discussed at the recent meeting included the UKAEA safety management system, Dounreay audit recommendations on all UKAEA sites, Dounreay

resources, the future of AEAT's activities on licensed sites, AEAT's safety performance and the decommissioning quinquennial review.

### 3.12 Sealed Sources

Having previously extended the period for completion of improvements to the arrangements for the management of sealed sources, HMNII carried out an inspection of BNFL's arrangements at the end of the period allowed by the Improvement Notice. The inspection revealed that in a number of areas BNFL had failed to take all of the action necessary to meet the requirements of the Improvement Notice. During the inspection, evidence was collected in the form of documents, photographs and witness statements and HMNII is now considering the need for further regulatory action.

### 3.13 Criticality Arrangements

Following HMNII's identification in quarter 4 1999, of the absence of criticality alarms for persons near to plants with a criticality hazard, discussions have been held with BNFL to identify a timescale for the provision of adequate alarms and safety cases justifying the extent of their provision. BNFL had installed a temporary system for providing an alarm immediately following the recognition of the problem, but an unannounced inspection by HMNII found the system was not effective. BNFL has made some improvements to address this failing. It has also recently been ascertained that the impact of a criticality event may extend beyond the site boundary with possible impact on members of the public. HMNII has been unable to find written instructions within the site's emergency arrangements which provide details on dealing with members of the public off the site who may have been exposed if a criticality event took place. BNFL has responded to this concern by submitting a safety case using more conservative calculational techniques which would reduce the dose impact off the site. However, the revised dose impacts still remain above the new dose limits for members of the public for a distance from the site boundary. HMNII is considering this submission and whether formal action will be necessary.

### 3.14 Control of Major Hazard Regulations 1999

Discussions have been held with BNFL concerning compliance with the COMAH Regulations on the Sellafield site. Having completed its inventory of relevant substances, BNFL has determined that the quantities on site are such that it will be subject to the top-tier duties of the Regulations. Accordingly, BNFL is taking appropriate steps to comply with these duties including the preparation of a safety report.

## 4. REGULATORY ACTIVITY

#### 4.1 Enforcement action

Following its investigations into the event involving the spillage of a quantity of concentrated Nitric Acid in the Solvent Treatment Plant in March 1999, (see previous reports), HSE decided that it was appropriate to prosecute BNFL under Section 2(1) of the Health and Safety at Work Act and BNFL Engineering Limited under Section 3(1). (Note. The case was heard at Whitehaven Magistrates Court on 6 April 2000. BNFL and BEL pleaded guilty and the case has been referred to Crown Court for Sentencing)

As indicated above, an Improvement Notice was issued requiring WR&D to review the requirements for calibration of Plutonium assay instruments and to put into effect these requirements through the Maintenance Schedule.

#### 4.2 Licence Condition 36

This licence condition, which requires licensees to make and implement adequate arrangements to control any change to its organisational structure or resources which may affect safety, came fully into force on 1 April 2000. BNFL's arrangements for compliance with Licence Condition 36 have been received by HMNII and are being assessed.

F A Brookes  
HM Principal Inspector  
Nominated Inspector for Sellafield and Drigg

**TABLE 1**

**QUARTERLY RETURNS FOR**

**SELLAFIELD, CALDER HALL, DRIGG AND WINDSCALE**

**DURING THE QUARTER**

**1 JANUARY - 31 MARCH 2000**

	BNFL SELLAFIELD <sup>1</sup>	BNFL CALDER HALL <sup>2</sup>	BNFL DRIGG	UKAEA WINDSCALE
NUMBER OF VISITS	57	5	2	4
INSPECTION DAYS ON SITE	207	13	6	12
ENFORCEMENT ACTIONS <sup>3</sup>	1	0	0	0
Incidents in the quarter likely to be published in HSE's quarterly "Statement of Nuclear Incidents at Nuclear Installations"	1	0	0	0
CONSENTS, APPROVALS AND DIRECTIONS	0	2	0	0
LICENCE INSTRUMENTS	3	1	0	2

<sup>1</sup> The figures shown for BNFL Sellafield are those for BNFL's chemical plants. They do not include figures for the plants within the Electricity Generation Group (see note 2 below)

<sup>2</sup> The figures shown for BNFL Calder Hall are those for the plants on the Sellafield site operated by (or for) the Electricity Generation group, primarily Calder Hall nuclear power plant.

<sup>3</sup> An enforcement action may be a Direction issued by HSE under the nuclear site licence, an Improvement Notice, or a Prohibition Notice, or the laying of information in pursuit of a prosecution.

**TABLE 2****CONSENTS, APPROVALS AND DIRECTIONS ISSUED DURING THE QUARTER****1 JANUARY - 31 MARCH 2000**

DATE	DESCRIPTION	C/A No.
<b>BNFL Sellafield (Windscale Works and Calder Works ) - Nuclear Site Licence No. 31F</b>		
10/01/00	<b>CALDER HALL</b> : Licence Condition 13(2) and 13(11) - Approval of the terms of reference for the Reactor Nuclear Safety Committee and of the arrangements for the consideration of urgent safety proposals.	59
31/03/00	<b>CALDER HALL</b> : Licence Condition 13(3) - Approval of an amendment to the terms of reference for the Nuclear Safety Committee.	65

**TABLE 3****KEY LICENCE INSTRUMENTS ISSUED DURING THE QUARTER****1 JANUARY - 31 MARCH 2000**

<b>DATE</b>	<b>DESCRIPTION</b>	<b>LI No</b>
<b>BNFL Sellafield ( Windscale Works and Calder Works ) Nuclear Site Licence No. 31F</b>		
05/01/00	<b>SELLAFIELD</b> -Specification to carry out tests, inspections and examinations under Licence Condition 29 on the medium active liquor tank farm.	306
24/03/00	<b>SELLAFIELD</b> - Specification under Licence Condition 13 for the B4 safety case to be referred to the Nuclear Safety Committee for consideration and advice and the results of this to be furnished to HSE.	309

<b>UKAEA Windscale - Nuclear Site Licence No. 46A</b>		
28/03/00	<b>WINDSCALE</b> - Agreement to the commencement of the decommissioning of the WAGR hot box.	55