



Progress on UKAEA's Response to the 1998 HSE/SEPA Audit of Dounreay

September 1999



Waste Receipt Assay Characterisation and Supercompaction facility being commissioned



New Sodium Disposal Plant during commissioning



Dounreay Fast Reactor pile cap during decommissioning

INTRODUCTION

A detailed Audit of the management of safety at UKAEA Dounreay was carried out by a joint Health and Safety Executive/Scottish Environment Protection Agency (HSE/SEPA) team in June 1998, and the report was published on 1 September 1998. The report contained 143 recommendations for action by the United Kingdom Atomic Energy Authority (UKAEA), including the preparation of an Action Plan. The Action Plan was published by UKAEA on 30 November 1998.

This progress report, jointly from HSE and SEPA, describes our view on the position reached by UKAEA in responding to the recommendations of the Safety Audit. We describe our arrangements for monitoring and closing out recommendations and then give an overview of progress, selecting specific recommendations for mention where these are of particular significance.

The situation at Dounreay at present is that some decommissioning work continues and several new projects have started. However, operations in the Fuel Cycle Area (FCA) remain shut down under direction from HSE, although a limited consent was given to allow movement of pre-prepared enriched uranium targets for medical isotope production. Safety justifications to formats agreed with both HSE and SEPA are awaited for the restart of FCA operations.

A recent development is that SEPA's new authorisation, granted under the Radioactive Substances Act 1993, for the continued disposal of radioactive waste from Dounreay, came into force in August 1999. This reinforces many of the Audit recommendations. The Dounreay Shaft, which was an authorised disposal site until August 1999, will now be regulated by HSE as a temporary store.

1998 HSE/SEPA AUDIT

The Audit in June 1998 was carried out by a multi-disciplinary team of Inspectors from HSE's Nuclear Installations Inspectorate (NII), its Field Operations Directorate (FOD), and an Inspector from the Scottish Environment Protection Agency (SEPA). Its main finding was that organisational changes made within UKAEA over the last four years had so weakened the management and technical base at Dounreay that it was not in a good position to tackle its principal mission, which was the decommissioning of the site.

When launching the Audit report on 1 September 1998, the Chief Inspector of Nuclear Installations commented that UKAEA needed to invest considerable effort, time and resources to bring Dounreay up to the standards which

HSE requires for continued operation of a nuclear installation, and to enable the site to be decommissioned safely and made safe for future generations.

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UKAEA ACTION PLAN

(NOVEMBER 1998)

UKAEA initially responded to the Audit by producing and publishing its Action Plan on 30 November 1998. At the launch of the Action Plan UKAEA explained that the recommendations had been subdivided into 6 themes:

Safety Management Systems Safety Culture Management and Organisation

Human Resources and Training Safety Cases Operational Strategy

The Operational Strategy theme has since been further subdivided into Fuels, Decommissioning and Radioactive Waste sub-themes. UKAEA formed dedicated teams to work on each theme.

At the time of the Action Plan launch HSE/SEPA welcomed the Action Plan as a good basis on which to go forward and, in particular, the shortened decommissioning timescales. HSE/SEPA also expressed the view that there remained areas where more detailed plans required developing, and that some other timescales - in particular for the production of safety cases - appeared rather long.

HSE/SEPA ARRANGEMENTS FOR MONITORING UKAEA'S PROGRESS

NII's UKAEA Inspection Unit is responsible for managing the regulatory response to the implementation of the UKAEA's Action Plan, in close liaison with SEPA and HSE's Field Operations Directorate who were also involved in the Audit. Certain of NII's Specialist Inspectors have been nominated to monitor the progress on UKAEA's response to recommendations within the specific UKAEA themes. They work closely with NII Site Inspectors, who are responsible for project managing any plant changes which may result from the Audit and inspecting for compliance with legal requirements.

Before HSE/SEPA agree to any recommendation being closed out or passing to the review stage (see right) the relevant Inspectors, including the appropriate Specialist Inspector and Site Inspector, have to assess the submission from UKAEA and make a positive recommendation to NII management.

A comprehensive database is being maintained by UKAEA, and is accessible to NII. Routine progress reports are generated from the database and are made available to HSE/SEPA when required. As NII has the agreement of UKAEA to introduce data onto the database that it considers important, it has not been considered necessary to duplicate the database within HSE or SEPA.

PROCESS FOR CLOSING OUT THE RECOMMENDATIONS

The aim of many of the Audit recommendations was to provide the basis for a programme of work which would strengthen UKAEA's management of safety system to enable it to better fulfill its duties as a nuclear licensee. Their implementation should result in improvements to the organisation, systems, procedures, work programmes, plant state, etc. which will then become part of the normal routine business. Therefore, although some recommendations can be closed-out by undertaking perhaps only one specific action, many will need time to become fully incorporated into routine UKAEA business.

The review stage is likely to last for at least 6 months

NII has accordingly agreed formally with UKAEA that certain recommendations should not be considered as closed-out

until they have been shown, through a process of review, to have the desired impact. The type of recommendations which will need to pass through a formal review stage are, for example, those where a new policy or strategy is needed or where UKAEA has been asked to review its current practice and to propose and implement changes. The review stage is likely to last for at least 6 months in order to provide sufficient experience to demonstrate that the new policy is well-founded or that the new arrangements are working and delivering the desired benefits. The close-out of these recommendations will only occur when UKAEA has demonstrated to the satisfaction of HSE/SEPA that the above conditions have been met and has provided evidence that sufficient resource will continue to be made available to maintain the improvement. HSE/SEPA believe that it is best to take a slow and cautious approach to the close out of recommendations so that we can be confident the intent has been fully met.

It can be seen that transferring recommendations into the review stage should be seen as a significant step towards close-out.

Even after a recommendation has been formally closed-out, continued surveillance by HSE/SEPA Site or Specialist Inspectors will take place as part of the routine regulatory inspection programme.

PROGRESS MADE BY UKAEA IN RESPONSE TO THE AUDIT RECOMMENDATIONS

General

Overall HSE/SEPA regard UKAEA's approach and progress on the Audit recommendations to be satisfactory at this stage. UKAEA shows strong commitment to the task, has committed major resources and has set up an appropriate management system to pursue the work.

Since the action plan was published HSE/SEPA have had extensive discussions with UKAEA. This has resulted in further clarification of the interpretation of certain recommendations and the bringing forward of some timescales. However, in some instances further consideration has led to a review of the response. Examples of this are the proposal to change the order in which future safety cases are submitted as a result of changed operational priorities; and delaying some work on electrical systems in the FCA because UKAEA realised that a more secure system could be developed than that originally proposed. HSE/SEPA accept that there will be instances when a change in the original response is desirable in the interests of safety or as a result of programme changes, and will monitor such situations closely.

As mentioned previously, HSE/SEPA recognise that although some recommendations can be closed out

fairly quickly, a large number cannot be considered complete for a considerable time. The position by the end of August 1999 was that 4 recommendations had been formally closed out, a further 4 had been essentially completed and had been moved into the review phase, and the responses to another 19 were with HSE/SEPA for assessment. 18 others were considered by UKAEA to be complete, and it was collating the evidence to support that view. Of the remaining 98, the large majority are considered to be on programme, and NII is aware of and accepts the reasons for the delays to the handful that were behind programme.

When UKAEA launched the Action Plan it was clear that a key to its success was the need to recruit around 70 new



Staff evacuating from the FCA through a Starburst gate during an exercise

The examples given below within each theme group illustrate both the progress made in some of the more significant

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engineering and scientific staff. UKAEA has worked energetically to seek recruits, and has been successful in meeting its numeric targets, although gaps remain in some specialist discipline areas.

areas and where work is complete. The number of the Audit recommendation is shown as (Rx).

A number of recommendations, whilst mainly targeted at Dounreay, apply equally to other parts of UKAEA, and are being implemented by UKAEA as a whole.



NII Site Inspector and Dounreay Head of Safety & Environment launching new Site Licence Booklet. (see text overleaf)

Safety Management Systems

UKAEA is developing its safety, quality and environmental systems into an integrated management system (R1&7). The main thrust of the exercise has been to strengthen the link from corporate top level documentation to the on site Management Systems Manual and lower level procedures and instructions. This has progressed within the agreed programme. Lower tier documents are being reviewed to remove duplication, inconsistencies and to ensure that they form the means of implementing the requirements of the developing integrated system.



New Starburst Evacuation Centre in operation during an exercise.

A significant element of this restructuring of the documentation system has been the development of statements which define UKAEA's arrangements for complying with the Nuclear Site Licence.

To help Dounreay staff understand the Nuclear Site Licence, a booklet was issued to all staff explaining the Licence Conditions, the terms used in the Licence, and what NII expects Licensees to have in place to ensure compliance with those Conditions. A separate booklet is now being considered to address the new SEPA authorisation. The NII Site Inspectors assisted in the presentational launches

of the new booklet at the UKAEA sites (see photograph of the Dounreay launch).

UKAEA's Internal Regulation Department staff levels have increased to the target complement, with 3 new recruits currently undergoing training and familiarisation (R2). NII considers this to be a positive step towards meeting UKAEA's aim of carrying out independent, authoritative inspections of safety practices and management on all its sites. The benefits will not be realised immediately, but UKAEA's action represents a significant investment in a suitably comprehensive health and safety system.



New 'Groundhog' beach monitoring vehicle

Additional staff have been recruited and trained to contribute to improved audit programmes (R8), and NII intends to monitor the quality and effectiveness of these integrated audits.

As part of a series of recommendations covering emergency preparedness (R85-87) UKAEA has developed and tested a site-wide response (known as Starburst) to a criticality event in the Fuel Cycle Area and has reinforced its arrangements for responding to emergencies. The photographs show the Starburst crash gate and new evacuation centres during an exercise. UKAEA has overcome early problems with this system, and NII has been satisfied with demonstrations of emergency preparedness during targeted exercises in 1999.

The new 'Groundhog' beach monitoring vehicle has now been put into operation (R122: see photograph). This vehicle covers the ground quicker and more effectively than the previous methods, allowing more extensive monitoring of local beaches. Fragments of irradiated nuclear fuel have continued to be found at Sandside Bay, near the Dounreay site.

Safety Culture

UKAEA has developed and implemented a number of initiatives to improve and further develop a positive safety culture. Improvements in safety culture can take time to become apparent, and the success of these initiatives will continue to be monitored by NII.

Positive aspects of safety performance measures have been introduced into UKAEA's Safety Performance Index, which prior to the audit was exclusively based on negative aspects (R6). This approach shows that UKAEA is now adopting a more proactive approach to health and safety.

A new and improved programme of safety tours has been implemented (R11), the main intention being to increase senior management's visibility on site. NII intends to monitor the effectiveness of the tours and the actions taken to address any observations which arise.

UKAEA has launched Phase 1 of its revised Drugs Policy. In October this will be followed by Phase 2, which introduces random testing (R105). UKAEA recognises both the deterrent effect of the policy and the need to assist staff with drug problems. UKAEA's response illustrates clearly its position on ensuring that staff are fit to carry out their duties.

Management and Organisation

UKAEA has now established an Engineering Group which is intended to provide an authoritative technical resource for the whole of Dounreay site (R15/31/36/40). Recruitment to the Group is underway, although the resources needed are still being refined in conjunction with development of the strategic site plan. The new Group will play a key role in ensuring that design standards, safety principles and codes of practice are identified and applied in a consistent way (R38).

Policy and guidance on the use and control of contractors on Dounreay site have been issued (R26/27/28/32) and a review of their effectiveness is underway.

A review of the organisational structure at Dounreay has been completed (R24) and a new structure has been put in place. Procedures supporting this structure are being developed. Implementation, and the working of the new organisation, will continue to be reviewed by NII.

A draft management of change procedure has been developed corporately by UKAEA (R25). Discussions between UKAEA and NII have taken place on the content of that procedure. However, further development will be needed in the light of a new Licence Condition which is intended to ensure that licensees develop and implement adequate arrangements to ensure that organisational change does not have an adverse effect on safety.

Human Resources and Training

UKAEA has made good progress in identifying the core skills and competencies which its staff must have in order for UKAEA to fulfill its safety-related duties (R14). The staffing levels and competence requirements needed to meet both current and projected work programmes on site have been analysed (R18), and the competencies of current employees have largely been identified (R19).

UKAEA is developing an enhanced version of its human resources information database which should enable a continuing comparison between the competencies needed and those currently available (R22). This will support better specification and control of staff recruitment and training. UKAEA's work in setting up a training and human resource infrastructure is encouraging.

A key step in the development of an integrated human resources management system is the strengthening of the Dounreay training function. A manager with responsibility for training has been identified, and two new training tutors have been appointed. However, one key training post still remains vacant, and NII is monitoring closely UKAEA's specification of, and recruitment to, this post.

Safety Cases

The process of producing safety cases to modern standard continues to develop within UKAEA (R92&95). The safety case for the Highly Active Liquor Storage, Treatment & Encapsulation Plant (D1208) was the first to be developed to the improved procedures (R128&129), and NII is presently assessing that safety case. UKAEA has accelerated the original programme for submission of safety cases, and NII has accepted UKAEA's request to change the order in which future safety cases will be submitted to reflect changed operational priorities.

Resources to produce safety cases have been increased (R94), and a number of initiatives have been introduced to ensure that safety cases are produced in a way which takes account of the needs of the plant managers (R93).

The Audit report recognised that UKAEA was not producing comprehensive Periodic Safety Reviews of its plants in accordance with modern practice. The dates by which future Periodic Safety Reviews of all UKAEA sites will be submitted to NII have been agreed with UKAEA (R95).



D9867 ventilation improvements



Lab 33 ventilation improvements (see text overleaf)

In addition to seeking the production of improved safety cases to modern standards, a number of recommendations in this theme sought to secure practical operational plant improvements. Some positive steps have been taken towards addressing these recommendations.

The first round of electrical earth testing and battery discharge testing has been completed, and the future periodic rolling programme is being developed (R113).

The Guaranteed Electrical Supply system has been improved (R115&116), although parts of that for the FCA are delayed because it was recognised during design work that improving the 11kV system rather than the 415V system, as originally intended, would result in a more secure system. Longer procurement dates for 11kV equipment have resulted in delays to UKAEA's Action Plan commitments.

Some improvements to the ventilation system for the High Alpha Waste Store (D9867) have been made (R137: see photograph). A ventilation system to modern standards has been designed and is due to be installed by June 2000.

Operational Strategy - Fuels

UKAEA has carried out work to enable a strategy for dealing with Prototype Fast Reactor (PFR) spent fuel to be established (R46). UKAEA has also started to characterise all the fuel liabilities on the whole Dounreay site (R39). An options document covering these aspects will be submitted to the Department of Trade & Industry in the near future. NII has been briefed on the work, but at this stage has not been appraised of the developing



D2001 cell face after renovation

detailed arguments. SEPA's new authorisation requires UKAEA to provide SEPA with a Best Practicable Environmental Options (BPEO) study of its decisions on waste management, including a specific study on the treatment of PFR fuel.

Operational Strategy - Decommissioning

Discussions have commenced on the development of the Dounreay Decommissioning Plan (R45).

A new ventilation system has been installed in the Chemical and Metallurgical Laboratories (D1200) Laboratory 33 (see photograph), and work is in progress to decommission the laboratory completely by 2004 (R55).

The new PFR Sodium Disposal Plant is nearing completion (see photograph at head of front page), and will then, together with its associated caesium removal plant, start to treat the bulk PFR sodium coolant, allowing its disposal. Plans are also being developed to treat, and then dispose of Dounreay Fast Reactor (DFR) main coolant and also the residue coolant in both PFR and DFR (R48&51).

Operational Strategy - Radioactive Waste

As part of the response to R59 the Remote Handling/Post Irradiation Examination Facility (D2001) cells have been cleared of much of the waste in them, a cracked cell window replaced, and the cell face renovated (see photograph).



A new waste assay system has also been installed and is being commissioned. WRACS (Waste Receipt Assay Characterisation and Supercompaction facility) is now undergoing active commissioning (see photograph at head of front page). Before WRACS begins routine operations UKAEA will, however, need to introduce a suitable and demonstrable Low Level Radioactive Waste (LLW) quality assurance regime.

UKAEA has initiated a study to establish and underpin the future strategy for the management of LLW from operations at Dounreay (R80). A LLW strategy for storage and disposal, together with the availability of suitable LLW stores, is essential if decommissioning is to progress at an acceptable rate. The issues of short-term LLW stores and a longer-term LLW disposal facility are being developed in parallel.

The flask compound has been cleared of waste and temporary storage containers, the area radiologically declassified, and a new policy established that prohibits temporary storage of such items outside of buildings (R139).

The scrap items stored in the open air in a radiation controlled area to the east of the site have been monitored, segregated and consigned to appropriate waste routes (R142: see photographs before and after clearing).

Future Reporting Intentions

Short written Quarterly Reports will continue to be given to the Dounreay Local Liaison Committee (LLC) by both the NII and SEPA Site Inspectors. The NII report can be accessed on HSE's Internet web site. The NII Site Inspector

and the SEPA Inspector will continue to provide oral reports to the Dounreay LLC at its 6-monthly meetings. In addition, NII/SEPA will produce annual progress reports of a similar format to this one.



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