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WINDSCALE NUCLEAR POWER DEVELOPMENT LABORATORIES

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THE ORGANISATION AND AUDITING OF SAFETY MANAGEMENT AT THE
WINDSCALE NUCLEAR LABORATORIES (WNL) OF THE
UNITED KINGDOM ATOMIC ENERGY AUTHORITY (UKAEA)

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THE FUNCTIONS AND ORGANISATION OF WNL

1. The Windscale Nuclear Laboratories are situated on the British Nuclear Fuels plc Sellafield Site but are independently managed and operated by the United Kingdom Atomic Energy Authority (UKAEA) staff. These consist of approximately 530 personnel of whom 60% are professional, scientific, supervisory and administrative grades and 40% are industrial grades (ie plant operators, tradesmen and health physics surveyors), thus reflecting the research and development nature of the establishment. The executive responsibility for the management of WNL resides with the Head of Laboratories who is responsible to the Director of the Fuel and Engineering Technology Directorate of the Northern Division of the UKAEA.

2. The work of the Laboratories is as follows:-

- (a) Development of plutonium fuels for the UKAEA's fast reactor programme.
- (b) Post-irradiation examination of reactor fuels associated with the AGR, Water Reactor and Magnox Reactor programmes under various agreements with British Nuclear Fuels plc, the UK Electricity Generating Boards and other interested bodies.
- (c) Radiochemical work associated with the development of methods for the treatment of radioactive wastes, mainly on behalf of BNF plc, and also the adsorption of iodine on charcoal.

- (d) The operation of heat transfer and fluid flow facilities, a CAGR out-of-pile testing rig and engineering and instrument development work.
- (e) The development and application of techniques for the dismantling of the Windscale Advanced Gas-Cooled Reactor, which ceased operation in 1981.

In terms of health and safety these activities represent a broad spectrum of potential hazards in both the radiological and non-radiological fields.

OVERALL RESPONSIBILITIES FOR HEALTH AND SAFETY

3. The responsibility for the health and safety of personnel employed at WNL, or present within the building and site areas which make up the UKAEA enclave within the British Nuclear Fuels plc Sellafield Site, is vested in the Head of Laboratories, WNL.

4. Formal liaison on safety matters at senior management level between WNL and BNF plc is achieved by the Head of Laboratories' membership of the BNF plc North West Area Safety Committee. This body is the senior safety committee for BNF plc operations in the North West area and is structured according to conditions set down in the BNF plc nuclear site licence. It is through this committee that the Head of Laboratories formally discharges his additional responsibilities to the BNF plc Sellafield Site Director for the safety of those WNL buildings that could effect the safety of the site and District.

5. In respect of WNL buildings in which the potential hazards are such as could, in an accident, cause a site or District emergency, the overall responsibility for emergency arrangements rests with the BNF plc Director of Operations. For these WNL buildings the Head of Laboratories is required to ensure compliance with the emergency procedures laid down by BNF plc and which are required by the BNF plc nuclear site licence. Thus WNL emergency arrangements form an integral part of the overall emergency arrangements for a Site or District Emergency situation.

SAFETY POLICY AT WNL

6. The basic objective of WNL safety policy is to ensure the health and safety at work of WNL employees, the health and safety of contractors and other visitors to the Laboratories and those members of the public who may be affected by the work of the Laboratories.

7. It is a fundamental principle of safety policy that all WNL employees are responsible to the Head of Laboratories, via the normal management chain of command, for the safety of operations under their control. A key post in ensuring the maintenance of safety standards and the adoption of safe systems of working is that of the Building Manager, appointed for each of the major laboratory buildings. The Building Manager is a professional engineer or scientist who has specific safety responsibilities as part of his terms of reference in the management of a building's facilities.

8. Safety communications are fostered between management and employees at all levels. These communication chains include Trade Union and Staff Association representatives and in particular Safety Representatives (who are appointed for the various work areas, under the terms of a statutory regulation, by the Trade and Staff Associations).

9. Communications on safety matters are formally maintained by means of:-

- (a) attendance by the WNL Safety Manager at fortnightly meetings of the WNL Research Managers Meeting at which safety features as a regular item of agenda.
- (b) an annual presentation of health physics data, concerning the Post-Irradiation Examination facilities, to the Fuel Examination Executive meeting at WNL
- (c) the work of the two Safety Committees described below
- (d) an annual report on safety in the Laboratories which is presented to the

Northern Division Board of Management, UKAEA, and subsequently included within the UKAEA's annual report on health and safety. (This latter report is received by consultants, to the UKAEA, who are members of the Medical Research Council and the National Radiological Protection Board respectively.)

10. WNL is generally subject to the Health and Safety at Work etc Act (1974) and the various Regulations and Codes of Practice associated with the Act. In the area of radiological safety WNL is subject to standards defined in 'Guidance Notes (formerly Code of Practice) for the Protection of Persons exposed to Ionising Radiations in Research and Teaching'.

11. WNL, as part of the UKAEA, is exempted from licensing under the Nuclear Installations Act and thus is not required to have such formalised safety procedural arrangements as specified in the BNF plc Sellafield Site Licence. There is a legal requirement however that for radiological safety, equivalent standards to those obtaining on an N.I.I. licensed site will apply. At WNL this is achieved by use, where appropriate, of common or similar procedures to those in use at BNF plc Sellafield.

SAFETY ORGANISATION

12. The organisation of safety at Windscale Nuclear Laboratories has three 'arms':

- (a) The WNL internal safety organisation
- (b) Safety committees and the 'Authority to Operate' system
- (c) Independent inspections by the Authority (SRD) and government inspectorates.

WNL Internal Safety Organisation

13. The WNL Laboratory Safety Manager leads a health and safety section which provides (a) advice to all levels of staff in the Laboratories on matters of

radiological and non-radiological safety and (b) an operational health physics monitoring service to the Laboratories.

14. In the implementation of these services WNL management use the services of the BNF plc Site Safety and Medical Services Department to supplement its own health physics and safety organisation in the following areas and functional capacities:

- (a) Personal external and internal dosimetry services, and monitoring of the environment external to the UKAEA enclave.
- (b) Criticality Safety: The checking of nuclear safety assessments, operational clearance certificate relating to WNL and the inspection of working areas to which these certificates apply.
- (c) Fire Safety: Fire Brigade emergency services and fire prevention in an advisory and inspectorate capacity.
- (d) Medical Services: Statutory medical examination of personnel and maintenance of records, first-aid, surgery and ambulance services.

15. Other safety related BNF plc services used by WNL are those for the disposal of solid and liquid radioactive wastes. The discharge of gaseous radioactive waste occurs in consultation with BNF plc and appropriate government inspectorates. An Inspector of the Ministry of Agriculture, Fisheries and Food visits WNL regularly concerning its aerial discharges.

16. There are regular 'walkabout' safety inspections of work areas by small teams, led by a member of the Laboratory Safety Assessment Committee, which comprise the safety representative(s) for the work area, two members of staff from other work areas within WNL, and the Building Manager. Any observed deficiencies in safety procedures are recorded and remedial actions reported to the Joint Health and Safety Committee (paragraph 21 below).

Safety Committees and the 'Authority to Operate' System

Laboratory Safety Assessment Committee

17. The functions of the committee is as follows:

- (a) To assess
 - (i) the nature and degrees of hazards associated with the WNL operations both inside and outside the Laboratories and,
 - (ii) the adequacy of the design and operational safeguards provided to protect the operators, other on-site personnel and the general public.

On the basis of such assessments, the Chairman acting for the Head of Laboratories and in consultation with him as necessary, decides whether or not to issue an 'Authorisation to Operate' without which no experimental facility is allowed to operate.

- (b) To discuss abnormal occurrences within the Laboratory and elsewhere and in particular to interpret the application to WNL of recommendations arising from reports of incidents and committees of investigation.
- (c) To examine the local aspects of proposed or issued regulations, codes of practices etc, whether from government, AEA, BNF plc or other sources and to make recommendations.

18. The Laboratory Manager (a senior professional scientist responsible for the technical administration of the Laboratories) is Chairman of the Laboratory Safety Assessment Committee. The Committee comprises mainly professional WNL health and safety staff and members of professional and scientific staff, who possess particular specialist knowledge of the work in the Laboratories, with the addition of three representatives from organisations external to WNL (viz the Process Technology and Safety Directorate, Northern Division, UKAEA; the Safety and Reliability Directorate (SRD), UKAEA; and the BNF plc Sellafield Site Safety Services Department).

19. The safety of WAGR decommissioning is considered by a separate safety committee, chaired by a senior member of BNF plc Sellafield management; the Safety and Reliability Directorate is also represented on this committee.

20. The ATO system mentioned in (a) is an essential part of the control of safety. No new facility can be operated and no alterations can be made to an existing facility without the submission of a safety assessment to the Laboratory Safety Assessment Committee for approval. After a stipulated period of not less than two years, ATO's are reviewed and a report on the review, with a request for renewal of the ATO, is presented to the Laboratory Safety Assessment Committee.

WNL Joint Health and Safety Committee

21. This committee, which is chaired by the Head of Laboratories, comprises management and Staff Association and Trade Union representatives. The terms of reference of the committee are:

- (a) to keep under review the health and safety arrangements of the UKAEA of significance to WNL employees, and
- (b) to report to the WNL Whitley Committee and Local Joint Industrial Committee (these committees also comprise management representatives and representatives of Staff Associations and Trade Unions respectively).

Inspection of WNL's Operations

22. The work of WNL is checked by inspectors (external to WNL) from within the UKAEA and from government regulatory and inspectorate bodies. The Head of Laboratories receives reports of these inspections which include:

- (a) Nuclear Safety (criticality) inspections of work areas, which are subject to the conditions of an operational (criticality) clearance certificate, by a member of the Safety and Reliability Directorate. (the Director of SRD is responsible for advising the Chairman of the UKAEA on safety matters). Each certificate is inspected once per year.

- (b) Inspections relating to radiological and non-radiological saf by an Inspector of the Health & Safety Executive (at WNL a member of the Nuclear Installations Inspectorate) appointed under the Health and Safety at Work etc Act 1974.
- (c) Inspections by an Inspector of the Ministry of Agriculture, Fisheries and Food, appointed under the Radioactive Substances Act 1960, concerning discharges of radionuclides to the atmosphere and liquid discharges.
- and (d) Consultation with a Radiochemical Inspector of the Department of the Environment concerning the authorisation of the disposal of solid radioactive waste.

INDEPENDENT INTERNAL SAFETY AUDITING OF FACILITIES AND PROCEDURES

23. In addition to the above arrangements whereby WNL is inspected by members of WNL and persons from organisations external to WNL, a policy decision was made by the UKAEA in 1981 that the Safety and Reliability Directorate, UKAEA, should undertake independent audits at UKAEA establishments. The first of these audits was carried out at WNL, in 1982, in the Post-Irradiation Examination Facility, B14.

Objectives and Scope of an Audit

24. A basic objective of a safety audit is to provide the Head of Establishment with an independent and reasoned assessment of the adequacy of safety related factors which have a bearing on the overall safe operation of the selected facility. Fundamental to an audit and therefore an essential feature of the preliminary site audit is an understanding of the following establishment arrangements:

- (a) The manner and extent to which the Head of Establishment has delegated the execution of his responsibilities for safety management within his establishment.
- (b) The extent to which these responsibilities are defined and understood by the various management levels.

- (c) The means by which the Head of Establishment is assured that the appropriate safety standards and procedures have been defined and promulgated throughout the site.
- (d) The measures by which the Head of Establishment is assured that standards are enforced and continually maintained.

25. The examination of the site-wide aspects falls within two broad areas which together make up the total approach to the site's safety management, viz:-

- (a) The means adopted to provide safety clearance of facilities and control operations.
- (b) The arrangements for the general management of radiological and non-radiological safety.

Composition of the Auditing Team

26. An audit team is currently made up of four members, three from SRD and one from a UKAEA Establishment other than that at which the audit is being undertaken.

A member is selected on the basis of his managerial and technical experience related to the type of work carried out in the facility under examination. The representatives are two members of that branch of SRD whose safety advisory duties are directly relevant to the facility under examination, with the senior member being the team leader. The third SRD representative is selected on the basis of his safety advisory experience in a field not directly related technically to that being investigated. The team leader is responsible for the organisation and conduct of the audit and the contents and findings of the audit report. Whilst the exact make-up of the team is not fixed it is felt that these numbers and the experience of members outlined probably represent the most reasonable compromise between wide knowledge and unwieldy size.

Auditing Procedures

27. For the first audit at an establishment a preliminary step is a discussion with appropriate senior members of the site management in order to clarify any points concerning the objectives of the audit. It is useful at this stage to identify and meet where possible those members of senior and middle management who are concerned with site-wide safety aspects of relevance to the first audit and also those responsible for the operation of the nominated facility. It is also appropriate to identify and arrange for provision to the audit team of documentation, eg safety regulations, guidance papers etc, that will assist the team in gaining an understanding of site safety arrangements and policies and those of the nominated facility.

29. An important stage of the audit is an initial visit by the audit team to the facility nominated for audit. This visit takes place early in the audit process and it is essential that the intended objectives of the audit are fully appreciated by both the team and the facility management. Thus detailed planning by the audit team and adequate advanced notification of requirements to the local management are considered necessary in order that effective use is made of this visit.

29. The audit process is then mainly concerned with assessment of the various aspects of site and building safety arrangements based on information from documentation and these visits. Throughout this stage there will be further contacts between individual team members and individual members of site safety services and building managements, some involving informal visits to the site. Writing up, in draft form, the findings of each topic examined is an important feature of audit during this period. As far as possible, it is desirable to discuss the draft sections with an appropriate member of site or facility management to ensure factual correctness and enable local management to draw attention to any relevant points which have been overlooked.

30. A further team visit to the nominated facility will in most audits be necessary towards the final stages of investigation. The purpose of this final visit is to compare working practices with the team's understanding of arrangements and procedures. Thus this visit is primarily concerned with discussions with supervisory and operating personnel.

Reporting of the Audit

31. The final report by the audit team is addressed to the Head of Laboratories who will formally accept totally or in part the conclusions and recommendations of the report. Non acceptance of any part of the report must be discussed with SRD and would be the subject of a further report if necessary.

CONCLUSION

32. The management of safety at WNL is built around the formal line management structure which is subjected to a system of checks by safety committees, inspections by internal and external bodies and by a system, recently introduced within the UKAEA, of internal (but managerially independent) safety audits by the Safety and Reliability Directorate, UKAEA.

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