

NUCLEAR SAFETY DIRECTORATE - BUSINESS MANAGEMENT SYSTEM	
RESEARCH NUCLEAR SAFETY RESEARCH	RES/001
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1. Purpose & Scope

1.1 This procedure states the process for management of the HSC Co-ordinated programme of nuclear safety research. This programme covers all licensed nuclear installations in principle, but has focused on reactors, chemical plant and sites being decommissioned. There are arrangements in place with:

- BEGL, BEG(UK)Ltd, British Nuclear Group Reactor Sites (BNGRS) for reactors
- British Nuclear Group Sellafield Limited (BNGSL) for operating and decommissioning chemical plant
- UKAEA (Decommissioning plant)

1.2 General information and references to the detailed guidance are given for the reactor and chemical plant programmes. The programme is cyclical. This procedure identifies the order and relative timing of each stage in the process for the reactor programme.

1.3 The reactor research programme comprises three parts:

- Levy programme, commissioned by HSE
- Licensee commissioned projects in response to issues on NSD's Nuclear Research Index, and promulgated to HSE by the Nuclear Research Schedules
- Licensee commissioned projects included in the Nuclear Research Schedule, not corresponding to NRI issues, but declared to assist in the judgement for balance and adequacy of the programme.

1.4 There is currently no levy programme for BNGSL or UKAEA.

2. Policy

2.1 The HSC has directed the programme since 1989 when it was given the responsibility by DTI. The HSC has delegated this responsibility to HSE's NSD. When responsibility for the programme passed from the DTI to HSC the DTI set objectives for the HSC, and consequently HSE. These are laid out in the DTI Guidelines, given in Appendix 1. The guidelines were revised in 1994 and are expected to be replaced by the HSC Guidelines at a date to be determined.

2.2 Although the DTI Guidelines were written generally for nuclear installations, they were only put into application for power reactors. However, HSC confirmed in October 2002 that HSE's oversight of nuclear safety research extended in principle to all licensees, on a basis of proportionality. New arrangements were correspondingly put into place with BNGSL, and a set of Guidance Notes developed to detail the arrangements.

2.3 A Research Sub-Committee of the Nuclear Safety Advisory Committee (NuSAC) advises the HSC on behalf of NuSAC on the adequacy and balance of the programme. A Nuclear Safety Research Steering Group (NSRSG), chaired by the HSE Chief Scientist, oversees the programme, but only meets if there are disputes between the licensees and NSD, or if there were a major change of policy. G/RES/006 provides guidance on the consultation process.

3. Roles and Responsibilities (General and for reactor research)

3.1 Head of Directorate is answerable to the Executive and the HSC for a balanced and adequate programme which meets all the objectives.

3.2 Head of Unit 4A is responsible for liaison with the licensees and for developing an overall strategy. For the reactor programme he is responsible for directing the programme, (in co-ordination with the reactor licensees), to an agreed scope and budget.

3.3 Reactor Licensees' responsibilities are given in the reactor licensees' NSR Guidance Note 1.

3.4 HSE NSD 4A's general responsibilities are to:

- Ensure the adequacy of nuclear safety research activities, including the HSE levy programme, to meet the requirements

of the DTI guidelines (or replacement) and NSRSG (if required), taking into account licensees' nuclear safety research activities.

- Provide the Secretariat for the NUSAC sub-committee on Research and the NSRSG.
- Report to NuSAC SCR, NSRSG (if required), HSE and obtain approval from HSC for the HSE Levy programme, and the balance and adequacy of UK nuclear safety research.
- Develop with the licensees the processes under which the research activities operate to meet the requirements of the DTI guidelines (or replacement), NuSAC, NSRSG and the HSC.
- Communicate the framework, arrangements and guidance for the implementation of the nuclear safety research activities to the NSD Technical Representatives.
- Liaison with the licensee Research Coordinators.
- Resolve issues referred from technical level with licensee Research Coordinator.
- External dissemination.

3.5 HSE NSD 4A's extra responsibilities for the reactor programme are:

- Overall production of the Nuclear Safety Research Index (NRI) and nuclear safety research strategy.
- Manage the development of the HSE Levy programme and placing contracts to complete this programme.
- Discuss with the licensees the charging for levy projects.
- Advise licensees of relevant levy programme and overview of progress on projects.

3.6 NSD Reactor Research Technical Representatives are listed in Appendix 2. Their responsibilities are (within their Technical area) to:

- With the advice of the NTG, assist NSD 4A with the development of the NRI and technical area strategy
- Monitor licensee safety research activities

- Assess licensee Nuclear Research Schedules
- Assess inter-licensee collaboration
- Provide or expedite formal close out of NRI issues
- Manage the production of the HSE Levy project proposals, specifications
- Bring project proposals for all levy projects to the licensee Technical Rep for industry input and seek their agreement as far as possible *(but not their approval – see paragraph 3.6)
- Identify levy project technical monitors
- Provide progress reports to the licensee Technical Rep for HSE levy projects*
- Provide close out statements to the licensee Technical Rep for HSE levy deliverables on completion of the work*
- Make the licensee Technical Representative aware of issues and potential solutions from the wider HSE horizons including feedback from international knowledge
- Promote internal dissemination of results.

3.7 The right of the HSE NSD to carry out independent research work, through the levy programme, is not in question. The involvement of the licensee in the levy issues is to help ensure that the maximum benefit is obtained from the overall activities. Progress on all levy work should be reported to the licensee Technical Rep as the default. It is accepted that there are circumstances where either party may not wish this to be done.

3.8 Levy Project Technical Monitors' responsibilities are primarily to the appropriate NSD Technical Representative (and also to HSE NSD 4A) for:

- Development of project proposals as requested by the NSD Technical Rep
- Production of the Technical specifications
- Primary lead in Tender assessment
- Technical monitoring of the project
- Production of progress reports to meet the NSD Technical Rep's requirements

- Ensure that the deliverable is in the optimum form to meet the industry/NSD requirements
- Production of the close out statement in an agreed format on completion of the work. This statement should include a statement on how this work is likely to be used.

3.9 HSE Research Purchasing Unit are responsible, on behalf of NSD under the terms of a Service Level Agreement, for:

- placing and signing of contracts;
- processing amendments to contracts;
- receiving and distributing deliverables within HSE;
- processing and payment of invoices.

3.10 The relevant Nuclear Topic Groups are listed in Appendix 1. These have as their main purpose the facilitation of a consistent approach for scientific and engineering topics across NSD. They have no executive powers, but have a facilitating and advising responsibility for the following aspects of nuclear safety research in their topic area as follows.

- Developing and maintaining NSD's strategy for nuclear safety research.
- Monitoring the development and maintenance of HSE's Nuclear Research Index.
- Advising on maintenance of UK's nuclear infrastructure, licensees access to expertise and NSD's access to independent technical capability.
- Monitoring the content of the industry managed and HSE managed programmes of nuclear safety research.
- Monitoring cross licensee collaboration on nuclear safety research activities.
- Monitoring the licensees' dissemination of safety critical research outcomes to all relevant parties.
- Facilitating the appropriate dissemination of research outcomes both internal to HSE/NSD and externally.

3.11 In addition the NTG Leads have a role of identifying / nominating the lead technical contact staff.

3.12 Division 1 (operating reactors) has currently no specific research organisation, and relies on the reactor research technical rep structure (see Appendix 2) and the NTG role. It is preferable that the NSD technical reps are Division 1 staff, or if not, that they are also BNFL Sellafield research technical reps.

4. Procedure for the reactor research programme

4.1 The administration of the programme follows a cycle of activities which are undertaken by HSE and the reactor licensees but co-ordinated by HSE. A full cycle spans about three years and is best described by a series of stages in a timeline. There are two series of Guidance Notes produced by the licensees and NSD respectively giving details of the procedures. The arrangements may be modified with respect to BNGRS with the setting up of the NDA and the closure of the Magnox stations.

May Year 1

- NSD Technical Representatives consult colleagues and the relevant NTG to review technical strategy and identify new safety issues that they expect to benefit from research.
- Representatives update technical strategy and enter new safety issues into the NRI database.

August Year 1

- NSD 4a collates technical strategies, updates programme strategy (in conjunction with the reactor licensees) and compiles new NRI document.
- NSD presents the NRI to the reactor licensees.

September Year 1

- HSE present NRI to NuSAC SCR.

October Year 1

- In response to the NRI, reactor licensees develop NRS Issue 1

outlining proposed research programme of NRI and non-NRI related activities and submit to NSD for assessment.

- NSD4a develop issue 1 of proposed Levy funded programme of research and submit to licensees for consideration.
- NSD/Licensee Technical Representatives initiate dialogue on proposed programmes.

February Year 2

- NSD/licensee dialogue concludes. Where a consensus on the levy programme and the NRS is not achieved the parties will apply the dispute procedures set out in the licensees' guidance NSR GN 5.
- NSD Technical Representatives submit NRS assessment reports.
- NSD4a collate assessments and produce summary NRS assessment reports.
- Licensees submit NRS Issue 2 to NSD.
- NSD develop final issue of proposed Levy programme.

March Year 2

- NSD 4a combine NRS and Levy programme to form HSC Coordinated Programme.
- NSD Management Board asked to endorse programme.

April Year 2

- HSE and Licensees present Levy and licensee elements of HSC Coordinated Programme to NuSAC SCR for consideration and to inform their advice to HSC.
- NSRSG are asked to adjudicate if there are any disputes between licensees and NSD on the proposed HSC Coordinated Programme.

April/May Year 2

- HSE seeks HSC approval of proposed programme by below the line programme paper (ie not discussed at the meeting).

HSE provides justification for the programme and HSC is advised by NuSAC. HSC's agreement is recorded in the minutes.

May Year 2

- NSD 4A writes a letter for the HSE Chief Scientist to send to each of the 4 reactor licensees to notify them how much HSE proposes to recover from them by means of the Levy.
- NSD 4A would advise RPU and PEFD of the agreed levy programme budget.

April Year 2 to March Year 3

- HSE commission and project manage Levy research projects.
- NSD Technical Representatives monitor licensees' progress with commissioning of the programme via technical exchange arrangements.
- HSE and Licensees exchange quarterly updates of committed spend and predict the outturn for their respective programmes.

September Year 2

- HSE reports to NuSAC SCR on any problems with the current year's programme.

April Year 3

- HSE reports to NuSAC SCR on any problems with the programme

May Year 3

- Licensees confirm final outturn for programme.
- HSE calculates actual outturn charges for the Levy Programme to licensees and produces the Memorandum Trading Account (MTA).

August Year 3

- NSD's project officers evaluate outcome of completed

research projects and undertake 3 yearly review of projects in progress.

September Year 3

- HSE report to NuSAC SCR final outturn for previous year's programme.
- HSE and Licensees report to NuSAC SCR on evaluation of previous year's programme

March Year 4

- HSE produces HSC Evaluation Report.

April/May Year 4

- HSE present Evaluation Report to HSC (below the line).

4.2 Each annual programme runs concurrently and therefore particular activities for different years are dealt with at the meetings outlined. Other strategic issues, including dissemination are considered throughout the year on an ad hoc basis but there is an emphasis to be proactive rather than reactive.

4.3 Figure 1 shows the principal milestones in the development, commissioning and evaluation of the HSC Coordinated Programme.

5. Procedure for BNGSL research

5.1 The procedure for BNGSL research (including the timetable) is given in the guidance notes listed below. NSD provide BNGSL with an overall strategy and technical area strategies outlining NSD's concerns, and in response BNGSL makes transparent that part of their research programme which addresses the strategies. The arrangements will be modified in the future with the setting up of the NDA.

5.2 There is a Division 2 unit head who is BNGSL 'Research Champion' (see Appendix 3), with a role of overseeing the arrangements. The technical representatives are listed in Appendix 3.

6. Procedure for UKAEA

6.1 There have been annual presentations of UKAEA R&D to NSD. The process for making transparent UKAEA research and development is being modified, partly in response to the setting up of the NDA. NSD will contribute to the NDA Technical Issues list. UKAEA will submit to NSD the Corporate Technology Plan developed for NDA.

6.2 Division 2 has a research rep, who liaises with NSD 4A, the relevant inspectors and Div 3 unit heads (see Appendix 4).

7. Associated Documents

HSE annual paper to HSC entitled 'HSC Co-ordinated Programme of Nuclear Safety Research'

(HSC - Agendas, Papers and Minutes)

NuSAC SCR – Agendas, Papers and Minutes

NSD Nuclear Safety Research Guidance Notes.

- G/RES/001 Policy relevant research and support
- G/RES/002 Nuclear Research Index
- G/RES/003 NRI issue closure
- G/RES/004 Technical Exchanges
- G/RES/006 Consultation, auditing and reporting arrangements
- G/RES/007 Levy programme
- G/RES/008 Procuring research and support
- G/RES/009 Monitoring research and support
- G/RES/010 Dissemination of research and support
- G/RES/011 Evaluation of research and support
- G/RES/012 External relations

Licensee Nuclear Safety Research Guidance Notes (on NSD server in h:/research/Guidance Notes)

- GN-1 Licensee's Nuclear Safety-Related Research Responsibilities
- GN-2 Preparation of the Nuclear Research Schedule

- GN-3 Technical Exchanges
- GN-4 Project Completion Report
- GN-5 Resolution of Disputes with the NII
- GN-6 Standard Information for Final Reports on Nuclear Reactor Safety Research
- BNGSL/HSE Chemical Plant Research Guidance Notes (available on BNGSL NCPSRA Room)
- GN-1 Overview of Arrangements
- GN-2 Technical area research strategies
- GN-3 Meetings
- GN-4 Roles and Responsibilities
- GN-5 Preparation of Research Schedules
- GN-6 Assessment of Research Schedules
- GN-7 Timetable
- GN-8 Technical Exchanges
- GN-9 Resolution of Disputes
- GN-10 Strategy Update and Issue Closure
- GN-11 Evaluation

8. Abbreviations

DTI	Department of Trade and Industry
HSC	Health and Safety Commission
NRI	HSE Nuclear Research Index (of safety issues)
NRS	Licensees' Nuclear Research Schedule
NSR	Nuclear Safety Research
NSRSG	Nuclear Safety Research Steering Group
NTG	Nuclear Topic Group
NuSAC	Nuclear Safety Advisory Committee
OSP	Operational Support Programme
RPU	Research Procurement Unit
SCR	Sub-Committee on Research
SI	Superintending Inspector

GUIDELINES FROM THE PRESIDENT OF THE BOARD OF TRADE

These guidelines amend and update those issued with effect from 1 April 1990 regarding nuclear safety research responsibilities which are, or will be, managed on the Commission's behalf by the Health and Safety Executive (HSE). They take effect from 1 April 1994 except where otherwise indicated.

The guidelines take into account the fact that the safety of nuclear installations is the responsibility of the licensees of such installations, and that research covering their safety is largely undertaken or commissioned by commercial licensees, if necessary at the request of the HSE's Nuclear Installations Inspectorate (NII). They also take account of the public interest in maintaining the availability of the research capability needed for regulatory purposes.

1. Primary Objectives

- i) To ensure that adequate and balanced programmes of nuclear safety research continue to be carried out, based on a view of the issues likely to emerge both in the short and long term.
- ii) To ensure that, as far as reasonably practicable, the potential contribution which such research can make to securing higher standards of nuclear safety is maximised.
- iii) To ensure that the results of any such research having implications for nuclear safety are disseminated as appropriate.

2. Supporting Objectives

- i) To take account of the desirability of maintaining a sufficient range of independent capability to ensure the attainment of the primary objectives.
- ii) To ensure that proper account is taken of the advantages of international collaboration in furthering the primary objectives.

3. Research and related work covered by HSC Co-ordinated Programme

These arrangements cover research and related work which has as a primary purpose the improvement of nuclear safety, offers a potential return in terms of greater safety standards at reasonable cost, and which is relevant to any activity or process associated with operation or decommissioning of nuclear power systems on a UK licensed site.

The HSC Co-ordinated Programme may also include work which:

- i) would not be undertaken by commercial licensees on their own account;
- ii) though of potential interest to commercial licensees is more appropriate for HSC to retain the proprietary rights;
- iii) though required by licensees, may for legal or contractual purposes require HSC to retain the proprietary rights (e.g. where government participation is required for collaboration with other countries).

4. Research not covered by HSC Co-ordinated Programme

- i) Research which is undertaken individually or in collaboration by, or on behalf of, commercial licensees primarily for purposes other than safety; or to meet licensing conditions or their own safety design rules;
- ii) Research which is commissioned by the NII to enable it to take specific licensing decisions, or by the licensees as a particular condition of their licences.

5. Determination of HSC Co-ordinated Programmes and Budgets

The HSC should determine the programmes in the light of consultations by HSE with:

- i) the nuclear industry bodies concerned;
- ii) the Advisory Committee on the Safety of Nuclear Installations (ACSNI);
- iii) such other sources as they consider appropriate;

and upon recommendation by the HSE.

6. Basis for Cost Recovery

- i) The costs of research, and its management by HSE, should be recovered from licensees of, or licence applicants for, nuclear installations to the safety of which the research appears to the HSC/HSE to relate.
- ii) They should be recovered in proportions which
 - reasonably reflect the costs of research (and its management by HSE);
 - and which take account inter alia:

- in the case of existing licensees, of the scale on which each of them undertakes the activities to which the research relates.
- in the case of licence applicants, of the scale on which each of them plans to undertake the activities to which the research relates.

The scaling factors will be specified in a Memorandum of Arrangements between HSE and the licensees.

7. Proprietary Information

In exercising their co-ordinating role, the HSC/HSE should use their best endeavours to protect any proprietary information which comes to their attention, so far as this is consistent with the requirements of nuclear safety.

8. The Department of Trade and Industry's residual Programme of Safety Research

The Department of Trade and Industry may retain responsibility for funding certain safety research which is more relevant to its own responsibilities than to those of the HSC/HSE. The results of this work will nevertheless be made available to HSC/HSE, and their views may be sought on its content and direction.

Department of Trade and Industry
April 1994

Appendix 2

NSD and reactor licensee Technical Areas & NSD Representatives

Technical Area	Ref	NSD rep	BE area	MGBG area	NTG

Plant Life Management - Steel Components	PC	P Smith 1d	Plant Life Management - Structural Integrity	OSP C - Reactor and Boiler Internals. OSP D - Remote Inspection & Repair OSP G Structural Engineering and Steel Pressure Circuit	Structural Integrity
Plant Life Management - Civil Engineering	CE ex PC	D Twidale 1e	Civil Engineering	OSP A - Plant Engineering	Civil Engineering & Internal Hazards
Hazards - External & Internal	EE	T Allmark 1d A Wylie (Fire) 1e	Civil Engineering	OSP G - Structural Engineering and Steel Pressure Circuit	Civil Engineering & External Events
Chemical Processes	CC	S Nicholson 1e	Chemical Processes	OSP E - Radwaste, Radiological & Chemistry.	Chemical Engineering & Internal Hazards
Nuclear Science	NS ex RP	R Moscrop 1f	Nuclear Physics	OSP B - Reactor Physics, Fuel and Fault Studies.	Accident Analysis
Plant Modelling	PM ex HTH, SAM	R Moscrop (GCR) 1f I Wilson (PWR) 1f	Plant Modelling	OSP B - Reactor Physics, Fuel and Fault Studies.	Accident Analysis
Fuel	FC ex FP	I Wilson 1f	Fuel	OSP B - Reactor Physics, Fuel and Fault Studies.	Accident Analysis
Graphite	GRA	G Heys 1e	PSR and Graphite	OSP C - Reactor and Boiler Internals	Structural Integrity

Human Factors	HF	J Bowie 1c (J Williams HSL)	Risk Management	OSP A - Plant Engineering OSP F - Safety Case Management OSP H - Human Factors	Human Factors
PSA	PSA	A Gomez- Cobo 1f	Risk Management	OSP F - Safety Case Management	Accident Analysis
Control and Instrumentation	C&I	R Yates 1f	Control and Instrumentation	OSP A Plant Engineering	Electrical Engineering, C&I
Radiological Safety	RS ex RPS	I Wilson 1f	Radiological Safety	OSP F - Radwaste, Radiological & Chemistry	Radiological Protection & Accident Analysis
Radio Nuclides	RS	I Wilson	Radiological Safety	OSP F - Radwaste, Radiological & Chemistry	Accident Analysis
Waste and Decommissioning	W&D	G Davies 2f (+P Hudson)	Waste and Decommissioning	OSP E - Radwaste, Radiological & Chemistry D&D Decommissioning	Radioactive Waste & Decommissioning
Nuclear Systems and Equipment.	NSE	M Robinson 2e	Fuel Handling	OSP A - Plant Engineering OSP D - Remote Inspection & Repair	Mechanical Engineering

Appendix 3

Nuclear Chemical Plant Technical Areas & Representatives

Taken from Nuclear Chemical Plant Research GN 4 Roles and responsibilities

Div 2 Research Champion	Geoff Vaughan	
Technical area	NII rep	NTG

Civil structures	Les Railton	Civil Engineering & External Hazards
Plant materials (steel etc)	Ian Bramwell	Structural Integrity
Human Performance & Organisation	Margaret Berg (J Williams HSL)	Human Factors
External events	Les Railton	Civil Engineering & External Events
Internal events & Fire	Jonathan Heyes	Chemical Engineering & Internal Hazards
Fault Modelling	Phil Brighton	Accident Analysis
Process Technology	Neil Blundell	Chemical Engineering & Internal Hazards
Decommissioning	Glyn Davies	Radioactive Waste & Decommissioning
Waste Management	Glyn Davies	Radioactive Waste & Decommissioning
Nuclear Physics	Dave Simister	Accident Analysis
Radiological Protection	Dave Simister	Radiological Protection
Control, Instrumentation & Electrical	Mark Robinson Bob Yates	Electrical Engineering, C&I
Mechanical Systems	Bill Seddon	Mechanical Engineering

Notes

- Process technology includes run away reactions, red oil, hydrogen, hydrazine, fuel (MOX), source terms and radionuclide chemistry.
- Waste management is wider than legacy wastes, and includes smelting, incineration, minimisation, abatement.
- Nuclear physics includes criticality, shielding, burn-up.
- Radiological Protection includes IRRs etc.
- Mechanical systems includes vents, ventilation, cranes, shielding doors.

Appendix 4

UKAEA Research representative

Rowland Cooke

FIGURE 1 Nuclear Safety Research Programme

