

**HEALTH AND SAFETY COMMISSION
NUCLEAR SAFETY ADVISORY COMMITTEE
SUB-COMMITTEE ON RESEARCH**

**Minutes of the 37th Meeting of the
Nuclear Safety Advisory Committee Sub-Committee on Research
27 September 2005 at HSE, Rose Court, London**

Present:

SCR Members

HSE

Prof N Moray (Chair)

Dr P Storey

Dr P Haigh

Dr H Starkie

Prof D Owens

Dr R Dolby

Prof R Grimes

Dr. R Taylor

Licensees

Structural Integrity Presentation

Dr R Ainsworth, BE

Mr P Smith, HSE

Dr J Hobson, BNGSL

Dr R Nicholson, HSE

Mr S Daniell, Magnox Electric Ltd.

Dr R Ainsworth, British Energy

Ms M Wise UKAEA

Dr C Brown, BNGSL

Dr D Keighley, BNGSL

Dr A Wooldridge, Magnox Electric Ltd.

Others

Mr S Walgrove (DTI)

Dr N Smart (NDA)

1. Welcome to New Members and Apologies for Absence

1.1 Prof. N Moray, the new chairman, opened the meeting. He welcomed new members, Richard Taylor who had recently retired as head of R&D at Sellafield and Prof. Robin Grimes from the Department of Materials at Imperial College, London. Retiring members Profs. B Littlewood and John Knott were thanked for their work on the committee. Apologies were received from Robert Owen, Ian Hudson, Colin Dimbylow, Alex Miller and Paul Davies. The committee sent its good wishes to SCR member Sue Parry who is in hospital.

2. Approval of Minutes: 36th Meeting and Matters Arising.

2.1 The minutes of the 36th meeting held in April 2005 (NuSAC/SCR/05/M1) were approved.

2.2 It was noted that all but one of the actions had been completed or were on the agenda. The issue of British Energy's proposed University Technical Alliances was raised (Action 05/2). Bob Ainsworth pointed out that the company had been in discussions with Rolls Royce, BNFL and EPSRC with a view to linking the proposed University Research Alliances (URAs) to British Energy's long-term needs. Following these consultations, British Energy had decided that a 'mixed' list of URAs would best suit the company's needs. Some URAs will involve long-term commitment on the BNFL model, whilst others would be for shorter terms and be part supported by the EPSRC. It was noted that Prof. Barry Marsden's graphite group at Manchester had secured extra funding for another two post-doctoral researchers.

2.3 The SCR asked British Energy to prepare a paper on their proposed University Research Alliances in time for the next meeting (Action 05/8). Speaking for the NDA, Neil Smart offered to collate a paper on the NDA Licensees' URAs, with contributions from BNGSL, Magnox Electric Ltd. and UKAEA. The SCR accepted this offer (Action 05/9). The SCR then agreed to present a paper discussing URAs from the Universities' perspective for the next meeting (Action 05/10).

3. Membership of the SCR

3.1 The Chair of the SCR reported to the meeting that he intended to review the existing Terms of Reference of the SCR with a view to rationalising them. He also reported that he wanted the means by which new members are appointed to the SCR to be made more transparent and accountable.

4. Update on Developments with NDA Research Arrangements and Development of the 06-07 NDA Generic Programme Paper NuSAC/SCR/05/10

(This was discussed in a closed session involving only the SCR, HSE, DTi and NDA)

4.1 For the NDA, Neil Smart reported that the NDA research programme would be driven by an identification of R&D needs, risks and opportunities incorporated into the LCBL. Safety research was primarily the responsibility of the SLCs. Where the research was generic in nature, NDA may fund the work directly but would still prefer SLCs to take the lead. The research portfolio of Nexia Solutions had been reviewed. This review had resulted in continued support for the URAs an increase in the scope of the Pu immobilisation programme, the stopping of the sludge project and new tasks in spent fuel inventory assessment and development of actinide skills at Manchester. In addition to work with SLCs and Nexia Solutions, the NDA was directly funding a programme with Westlakes to develop

an epidemiology and biology research programme, to benefit all SLCs. Other generic research proposals supported include metals recycling assessment and a uranic materials strategy. Ideas for further generic research were being sought from the open market.

4.2 In response to this presentation, the SCR asked if the SLCs would have their own budgets for innovative research. Neil Smart replied that innovative research would not be funded that way but SLCs were expected to include innovative proposals in their NTWPs. The SCR then asked whose responsibility it was to keep abreast of developments internationally. Neil Smart replied that this was a fundamental requirement of the SLCs' contracts. The SCR wanted to know if the NDA had preferred suppliers for research. Neil Smart replied that an umbrella research contract existed with Nexia Solutions to maintain the URAs. Members of the URAs were already considered to have obtained their contracts through competitive tender. In response to questions from the SCR Neil Smart reported that where work requirements were specific to a URA, further competitive tendering would not be used but otherwise research contracts could be let to other universities who choose to bid for work. In response to a further question from the SCR, Neil Smart replied that responsibility would lie with the SLCs to undertake research that was necessary to support compliance with Site Licence Conditions although the NDA would not specify what research needed to be undertaken. The SCR raised the question of the independent audit of the research programmes to make sure that NDA policy is being followed. Neil Smart replied that the NDA would develop internal audit arrangements.

4.3 Peter Storey added that the NDA had inherited 153 key posts in Nexia Solutions plus the URAs but expected arrangements for other research programmes to evolve just as the GNSR arrangements had evolved over the past 10 years. For the DTi, Steve Walgrove added that the Secretary of State at the DTi has responsibility for nuclear safety and the department's policy with respect to nuclear safety research had not changed. The department also has responsibility for keeping the nuclear option open (KNOO) where the department's interests are focussed upon research and skills maintenance.

4.4 Peter Storey raised the question of whether the NDA's epidemiology study would raise conflicts with the Ionising Radiation Regulations. Neil Smart replied that all Licensees would be represented on the committee that drives the research. Peter then raised the point that it would be necessary to match the timing for the NDA and NSD research programmes. NSD needs to have agreed programmes at the end of March for execution at the beginning of the following financial year. He then raised the question of whether NDA would have a co-ordinating role for research when the present two major Licensees become six, seven or eight small ones and what arrangements would there be to share best practice between licensees. Neil Smart replied that all results of NDA funded research must be shared between SLCs and all IPR derived from that work would be owned by the NDA. Peter reminded the meeting that the NDA could not own IPR that has been brought to the decommissioning programme by new contractors. The question of how a research project is taken forward to improve safety was raised by the SCR. It was suggested by a member of SCR that a statement of how the results of the research could improve safety should be included in the project report.

4.5 The SCR next raised the question of what would happen if NII needed a SLC to undertake research at short notice, for example in response to an incident. Neil Smart replied that the NDA would reimburse the SLC's costs for any research necessarily undertaken, up to a limit. If further expenditure were necessary to meet NII's requirements, the SLC could use the change control procedure. The SCR asked how many SLCs had to have a research issue in common for the research to be considered to be generic. Neil Smart replied that the criteria for declaring research as generic had not yet been established.

Peter Storey added that resource limitations meant that both NII and the SLCs would always need to balance research and operational needs. Most competing demands could be resolved by holding pragmatic discussions between the NII and SLCs.

4.6 The SCR asked if the SCR could comment upon the NDA research programme. Neil Smart replied that the NDA Research Board was being established to take an overview of its programme. He added that the Board was considering the election of independent members that could include members of the SCR. The SCR replied that the SCR would at least like to be an observer on the NDA Research Board.

5 HSC Co-ordinated Programme of Nuclear Safety Research: Policy and Strategy Paper NuSAC/SCR/05/11

(This paper was discussed in a closed session involving only the SCR, HSE, DTi and NDA)

5.1 In this paper, Peter Storey argued that in spite of the Magnox closure programme and the accelerated decommissioning programme, there was still a need for nuclear safety and the research to support it. There was therefore no need for changes in the research policy and strategy. He then expressed the opinion that because operating Magnox stations were at a stage of their history where their safe operation would not benefit from long-term research, their research arrangements should be brought into line with those for the decommissioning stations. For the operating AGRs and Sizewell B, the existing arrangements were working well and did not need to change, although it was recognised that in mature technical areas, there was only a need to maintain expertise or up to date knowledge. These mature areas could be managed less formally in future. For Sellafield, the decommissioning Magnox sites and the UKAEA, the established Sellafield arrangements should be applied in a way that was proportionate to the hazards on each of those sites. This proportionality would allow the arrangements to be continued if the decommissioning licensees were broken up into more, smaller, licensees. In future, this principle of proportionality could also be extended to bring the defence licensees, GE Healthcare and the Research Reactors into the research arrangements.

5.2 The SCR commented that changes to the DTi guidelines for the nuclear safety research programme might be necessary to accommodate these changes in arrangements. Such changes could not be made unilaterally by NII. The SCR queried whether requiring research schedules to be prepared in response to NII's strategies was adequate for the operating Magnox stations. Peter Storey replied that the remaining safety issues on operating Magnox stations were so few that the NRI was no longer appropriate. The SCR gave its support for the paper but asked if the research policy statement could be circulated for the benefit of new members of the SCR. HSE agreed to do this (Action 05/11).

6 Presentation on Structural Integrity Research Programme

6.1 Paul Smith from HSE gave an overview of the structural integrity research programme. This was followed by a presentation by Bob Ainsworth of British Energy on the R6, R5 and R3 programmes. The SCR asked if it was difficult to attract new people into this technical area. Bob Ainsworth replied that these programmes helped to attract new people because the procedures could be applied outside of the nuclear industry. The SCR remarked that this programme was an exemplar of knowledge capture before asking how British Energy decide the balance of investment in this programme. Bob Ainsworth replied that investment was decided on the basis of risks, opportunities and queries from users inside of the company. The SCR asked how external advisors for the programme were chosen. In response, there then followed a discussion on the Technical Advisory Group on Structural Integrity (TAGSI).

The TAGSI sponsors (Magnox Electric, British Energy, MoD and HSE) nominate independent members of TAGSI. Independents are appointed to the group for three years. Working Groups of TAGSI have an Independent from the main TAGSI committee as chairman, a number of other Independents plus members from the TAGSI sponsors.

6.2 Christine Brown opened the presentation for BNGSL. This was followed by a detailed technical description of the Sellafield Programme from Deborah Keighley. Deborah pointed out that corrosion processes rather than fatigue, fretting and erosion were the principal mechanisms of structural steel degradation on radiochemical plant, so the majority of effort in the Sellafield programme was dedicated to corrosion research. At the end of Deborah's presentation, Christine Brown added that Sellafield was having difficulties recruiting materials graduates into the company, to enable it to retain its intelligent customer role. Michelle Wise remarked that the UKAEA had already taken steps to address this problem. The SCR asked if the knowledge gained from this research was recorded in a code or document. Deborah Keighley responded that it was not but it should be considered. The SCR next enquired if the structural integrity programme covered concrete structures. Deborah Keighley replied that Sellafield are more reliant upon the supply chain for advice on concrete structures, although some research is undertaken by the SLC. This research is listed in the Civil Engineering Research Schedule.

6.3 Tony Wooldridge made a presentation on NDE for Magnox Electric Ltd. that focussed upon the UK Research centre in NDE. This Research Centre is a research club led by Imperial College and the University of Strathclyde and includes a number of other universities and companies in the nuclear, defence, petrochemical and aerospace industries. In response to the presentation, Peter Storey commented that the UK Research Centre in NDE is part of a repository of excellence that could become incorporated into the proposed National Nuclear Laboratory. However Peter wanted to know what the future of this Centre would be as Magnox Electric Ltd.'s own requirements decline. Tony Wooldridge replied that the success of the Centre was that it provided somewhere where the NDE expertise of several industries could be brought together. Steve Daniell for Magnox Electric Ltd. pointed out that although the company's need for the centre would decline, the needs of the UK as a whole for NDE would grow. He was looking for a lead to capture this growth for the benefit of the centre.

7 HSE Co-ordinated Programme of Nuclear Safety Research Update for 2005-06 Paper NuSAC/SCR/05/12

7.1 Peter Storey presented this paper. The paper presented information to show that expected spends on the HSE Levy, British Energy NRI, Magnox Electric Ltd. NRI and BNGSL research programmes was forecast to be close to the planned expenditure at the beginning of the financial year. The SCR asked how the Licensees could be so sure about their year-end expenditure forecasts. Peter replied that the commissioning of research projects was running to schedule. The SCR then queried a statement on the Sellafield programme that some of the programme timescales had slipped (although the lost time was expected to be made up by the year end) due to the need to divert effort to support THORP. Peter explained that the people responsible for commissioning safety research in the NII and in the Licensees also had front-line safety responsibilities. These responsibilities took a higher priority with their time.

8 Input to 06-07 Programme

Reactor Research Index 2005 – Paper NuSAC/SCR/05/13

8.1 Haydn Starkie presented a summary of the 2005 update of the NRI. The SCR asked how the year-to-year growth or decline in the numbers of issues in each technical area compared with the forward looks. Haydn Starkie replied that the changes were consistent with expectations from forward looks and in response to requests from SCR members, agreed to circulate the most recent forward look review (NuSAC/SCR/05/05) to members of the SCR (Action 05/12).

Sellafield Research Strategies 2005 – Paper NuSAC/SCR/05/14

8.2 Haydn Starkie presented an overview of the 2005 update of Research Strategies for each technical area, following review by the NSD technical specialists. The SCR asked if there was any way issues were prioritised before recommending that a more objective way of ranking issues should be developed. The SCR then asked how UK-wide issues, such as hydrogen, would be addressed. Neil Smart replied that the Sellafield programme could be tailored to meet wider needs.

9 Arrangements for Record Management and Archiving Plant Material Samples Paper NuSAC/SCR/05/15

9.1 Following some opening remarks by Haydn Starkie, Bob Ainsworth gave a short presentation on how knowledge related to the R6, R5 and R3 procedures is captured, reviewed, documented and disseminated. Steve Daniell then gave a short presentation on Magnox Electric Ltd.'s reactor materials sample archiving programme, aimed at supporting the decommissioning programme. Neil Smart added that NDA had received a proposal from Nexia to set up a UK database on concrete samples. Michelle Wise commented that the UKAEA had contributed material samples of its own to the Magnox Electric Ltd. programme. The SCR commented that the NDA needed to look at the issues of knowledge management and sample archiving in the big picture. Neil Smart offered to arrange for a paper on the NDA arrangements for knowledge management and sample archiving to be presented to the next meeting of NuSAC/SCR (Action 05/13).

9.2 The SCR then raised a question about 'old knowledge' that pre-dates the modern QA arrangements for knowledge management. Bob Ainsworth replied that there is significant information in documents such as R5 and R6, from reports that predate modern QA systems. The application of verification and validation to the procedures confirms the value of this 'old knowledge', that is, it is captured but care is exercised in its use. This care particularly applies to materials data not collected according to modern testing standards, where changes in standards are assessed to quantify any impact on data derived from their application. A further question was raised about whether British Energy had examples of good practice with knowledge management arrangements other than the R6, R5 and R3 procedures. Bob Ainsworth replied that there are many examples such as Magnox, AGR and PWR Materials Data Manuals, CO₂ Oxidation Ground Rules, Dosimetry Manuals, Computational Fluid Dynamics Codes and Reactor Physics Codes.

10 Evaluation of the 04-05 Programme:

**HSE Levy
British Energy
Magnox Electric Ltd.
BNGSL**

**Paper NuSAC/SCR/05/16
Paper NuSAC/SCR/05/17
Paper NuSAC/SCR/05/18
Paper NuSAC/SCR/05/19**

10.1 Peter Storey gave a summary of the HSE Levy Evaluation paper. Bob Ainsworth commented that in future, the licensees would be able to comment upon the value of the HSE Levy programme. He added that retrospective audits, typically five years after completion of a project, would be a useful way of determining if the work had found a safety application.

10.2 Bob Ainsworth summarised the evaluation of the British Energy 2004-05 programme. The SCR replied that although they were unhappy with the way British Energy had delayed execution of some parts of its programme in the autumn of 2004, they now wished to compliment the company on the way it was making every effort to catch up with the programme during 2005-06.

10.3 A summary of the Magnox Electric Ltd. programme by Steve Daniell raised no comments.

10.4 John Hobson's summary of the Sellafield programme evaluation led Peter Storey to comment that there was a need to highlight achievements in these evaluation reports. He asked the Research co-ordinators to provide him with examples of where the research programme had made a contribution to safety for him to include in his paper to HSC. The SCR commented that the description of the plant materials part of the report was vague. He was unsure if work had been completed and closed out.

11 Report from the Human Factors Workshop Paper NuSAC/SCR/05/20

11.1 This below-the-line paper was noted by the SCR.

12 Reconciliation of proposed costs, outturns and Forward Looks Paper NuSAC/SCR/05/21

12.1 This below-the-line paper was noted by the SCR.

13 Consequences of Freedom of Information Act Paper NuSAC/SCR/05/22

13.1 This below-the-line paper was noted by the SCR.

14 Any Other Business

14.1 The specialist topic for the April 2006 meeting will be Reactor Chemistry.

14.2 Peter Storey will pass on the good wishes of all who attended the meeting to Sue Parry.

14.3 Members of the SCR asked that the Structural Integrity programme presenters be thanked formally.

14.4 The next meeting will be on Tuesday 4th April 2006. Tuesday October 3rd 2006 has been proposed as the date for the autumn meeting.

Actions

- 05/8 British Energy- Prepare a paper on the company's university research alliances for the April 2006 meeting.
- 05/9 NDA and NDA Licensees- prepare a paper on the NDA's university research alliance arrangements for the April 2006 meeting.
- 05/10 SCR- Prepare a paper on university research alliances from the universities' perspective.
- 05/11 HSE- Circulate the Research Policy statement to members of the SCR.
- 05/12 HSE- Circulate most recent Forward Look Paper to the SCR.
- 05/13 NDA- Prepare a paper on the NDA's arrangements on Knowledge Management and Sample Archiving for the April 2006 meeting.