

Minutes from
3rd NIRAB Meeting
NIRAB-17-1



Minutes

NIRAB third meeting

July 1st 2014, 10.30-16:00

The Council Chambers, Sackville Street Building, University of Manchester

Attendees:

MEMBERS

Dame Sue Ion	Chair	Malcolm Joyce	Lancaster University
Tim Abram	University of Manchester	Bill Lee	Imperial College
Andrew Carlick	DBD Ltd	John Lillington	AMEC
Richard Clegg	Lloyd's Register	Martin O'Brien	CCFE
Graham Fairhall	NNL	Andrew Sherry	University of Manchester
Mick Gornall	Springfields Ltd	Paul Stein	Rolls-Royce
Paul Harding	Urenco	Neil Thomson	EDF Energy
Neil Hyatt	University of Sheffield	Peter Wylie	Sellafield Ltd

OBSERVERS

Derek Allen	TSB	David Senior	ONR
Melanie Brownridge	NDA	John Perkins	BIS
Jason Green	EPSRC		
Robin Grimes	FCO		

OFFICIALS

Si Dilks	DECC	Jenny Moore	GO-Science
Craig Lucas	DECC	Dominic Scullard	BIS
Chris Darby	GO-Science	Juan Matthews	UKTI

SECRETARIAT

Gordon Bryan	NIRO	Andy Howarth	NIRO
Andrew Brown	NIRO	Simon White	NIRO

OTHERS

Gordon Waddington Independent

Apologies:

MEMBERS

Steve Cowley	CCFE
Mike Tynan	NAMRC
Laurence Williams	CORWM

OBSERVERS

Sir Mark Walport	GO-Science
David Mackay	DECC
John Jenkins	ONR

Agenda item 1 - Welcome and introductions

The meeting was opened by the Chair, welcoming members and outlining the agenda for the day. Minutes from the last NIRAB meeting were accepted.

Agenda item 2 – Output of Small Modular Reactor (SMR) Feasibility Study

The SMR feasibility study independent Project Director, Gordon Waddington, presented the emerging findings and recommendations of the study. NIRAB members were given an overview of a global market analysis, a financial analysis and technical assessments of several reactors for which commercial deployment is realistic within a decade. Draft conclusions from the study are

- If there is a large future global market for nuclear electricity there is likely to be a substantial market for SMRs as they fulfil a market need that cannot always be met by large plants.
- SMRs could be cost-comparable with larger reactors and have the potential for cost reduction with sufficient volume of orders.
- None of the designs reviewed are yet ready for market and there are opportunities for the UK to secure significant IP.
- It is likely that the remaining development bill for any of the leading SMR designs would be in the broad region of £0.5-1.0bn over a 7-10 year period, depending on the technology and the challenges.
- Industry in the UK will not participate on their own in the development of these reactors without a partnership with Government involving a significant aspect of public support.

NIRAB members made the following comments on the study:

- The market analysis undertaken by the study is not applicable to micro reactors, such as the U-battery concept, and a specific market analysis is needed to inform progression of such designs.
- It was recommended that the UK market assessment should consider both low and high deployment scenarios.
- The option of a UK SMR design should be added to the possible options for HMG consideration.

Based on the discussion, the Board supported the study's recommendation that a technical due diligence exercise is undertaken over the next year on a small number of reactor designs to provide the evidence to inform a decision on whether and which route to commercialisation the UK should follow. The Board emphasized that this SMR technical due diligence work should be funded alongside the wider programme of research it is recommending and should not displace funding for the proposed research programme.

Agenda item 3 – Recommendations for Research and Development

A paper (NIRO-E-10-2) presenting draft recommendations for research and development and early funding estimates was presented by NIRO. The recommendations were developed through sub-groups and discussions at meetings to consider themed topics. The paper included an illustration of the link between the proposed research areas and the aspirations set out in the Nuclear Industrial Strategy. The proposed research programme areas are: advanced nuclear fuels, advanced reactors, recycling, waste management, strategic assessments, modelling and simulation, public engagement, validation and verification, instrumentation and control, robotics and remote handling, knowledge

management and emerging nuclear technologies. However it is anticipated that the number of programme areas will be consolidated to 5 or 6 prior to the NIRAB annual report in January.

All members and observers were invited to comment on the recommended research priorities, as set out in report NIRO-E-10-2. Detailed editorial comments were received in advance of the meeting from several members. These will be included in the revised version of the document. In addition the following comments were noted:

- The text should be enhanced to frame the issue for Ministers, identify opportunities for international collaboration and highlight links to other industries on topics such as robotics and big data.
- The description of the strategic assessment programme should be strengthened, highlighting its use to identify research priorities, integrate the main components of the programme and develop an understanding of the economic and environmental impact of alternative technologies or strategies.
- More clarity is needed in the description of the purpose of the emerging technology programme area. Alternatively tasks could be incorporated into other parts of the programme.
- The indicative value of the programme during the CSR period may be underestimated in this draft and is likely to be of the order of £30M/year if the Nuclear Industrial Strategy objectives are to be met.
- There is a need for research into control and instrumentation on an earlier timescale than indicated in the draft paper.
- The report needs to more specifically identify the synergies between fission and fusion research needs.

The emphasis on the need for programme funding and the general recommendations in report NIRO-E-10-2 were endorsed, subject to taking into account these comments.

There was a discussion on the need for an archive of materials. Melanie Brownridge advised that NDA is in the process of considering the issues associated with establishing such an archive across the NDA estate and agreed to provide an update at the next meeting.

- **Action 1: Melanie Brownridge to report back on NDA deliberations on the issues associated with establishing a materials archive within the NDA estate.**

In the course of the discussions on R&D recommendations the following actions were captured relating to the future working of NIRAB/NIRO ahead of the end of year recommendations.

- **Action 2: NIRO and the sub-group chairs to identify and implement opportunities to engage the wider community.**
- **Action 3: Andrew Carlick and Mike Tynan to identify and, if appropriate, implement processes to engage SMEs in the recommended innovation and research areas.**
- **Action 4: Andrew Carlick to liaise with NDA to identify potential options for harvesting IP from historic UK projects.**
- **Action 5: Neil Hyatt, Melanie Brownridge, Peter Wylie and Andrew Carlick to identify opportunities to exploit waste management and decommissioning R&D expertise in the international market.**

- **Action 6: Bill Lee and Andrew Sherry to identify a means of realising the potential for innovation in the academic field.**

Agenda item 4 – Medical Isotopes

Gordon Bryan presented a brief summary of the issues impacting on the security of supply of Molybdenum 99 and Technetium 99 for use in medical diagnostic procedures in the UK. The UK has no complete indigenous supply chain for these isotopes. The production of medical isotopes involves the irradiation of highly enriched uranium targets in a reactor. These targets are then processed to extract Molybdenum 99 which is used to produce medical isotope generators. Most of the reactors used for this process are elderly and approaching the end of their lives. None of the reactors are in the UK. The bottleneck for global production is the availability of reactor time to irradiate targets.

Members agreed that NIRAB should contribute to discussions within the nuclear medicine community to identify the optimum approach to ensuring a secure supply for the UK. Expertise available within NIRAB will complement the expertise currently deployed. The Board agreed that a NIRAB led study on this issue should be carried out and reported back to the Board at the next meeting.

- **Action 7: Bill Lee to lead on a study to look into the options for the UK in securing a supply of medical isotopes and/or targets and advise on the most appropriate approach for the UK.**

Agenda item 5 – Response to BIS Consultation on Proposals for Long-Term Capital Investment in Science & Research

It was highlighted that, at the time of the meeting, a public consultation was underway into long term capital investment in science & research. Gordon Bryan proposed that NIRO should submit a response, based on the priorities set out in draft paper NIRO-E-10-2, and agreed to circulate a draft consultation response to members.

- **Action 8: NIRO to distribute a draft response to all members, observers and officials prior to the closure date of 4th July.**

Agenda item 6 – NIRAB/NIRO Additional Notable Activities

The Chair and NIRO outlined stakeholder meetings that have taken place since the last NIRAB meeting.

Agenda item 7 – Next Steps

The Chair requested that all NIRAB members come to the next meeting prepared to inform the Board of any relevant research and development that is ongoing in the member's organisations.

- **Action 9: Members to prepare to brief the Board at the next NIRAB meeting on their own organisations ongoing R&D, especially in the areas highlighted as priorities.**

Agenda item 8 – AOB

Robin Grimes highlighted the need for the UK academic community to agree a coherent approach to collaborating with Chinese institutions, outlining an initiative that he planned to implement in conjunction with the Research Councils.

Future Meetings

The next NIRAB meeting will be on 21st October 2014 in London. Meeting dates for the next two years will be determined soon.