CROSS INDUSTRY LEARNING STANDARDS WORKSHOP

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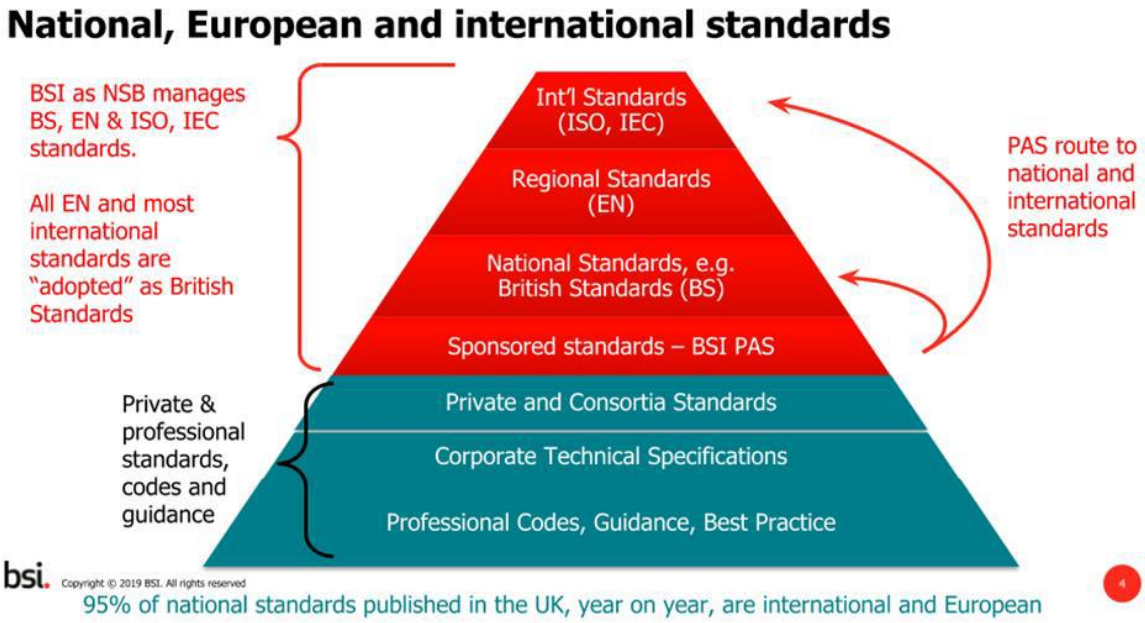
THE CHALLENGE

The Nuclear Decommissioning Authority and regulators have been working together to understand the status of standards (guidance) available for the nuclear industry. The general conclusion, supported by work from the British Standards Institution (BSI), is that there is a lack of coordination and consistency across the sector in the production and use of standards and that nuclear industry coordination on standards is not sufficient to meet the Government's Department for Business Energy & Industrial Strategy (BEIS) expectations.

The NDA has set up a cross sector initiative to ensure engagement, sharing and transfer of decommissioning learnings across the renewables, oil & gas, defence, space, process and waste UK sectors. Standards was identified as one of 16 themes of common interest between sectors from which relevant industries could benefit from sharing their learnings.

Standards in this sense are market-based tools that make it easier for industry, regulators and Government to deliver better and outcome focused regulation. The standards pyramid depicted in the graphic below requires active coordination, co-creation and participation at all levels.



WORKSHOP APPROACH AND FORMAT

This workshop was organised by the regulators and the NDA to bring together a relatively small hand-picked group of subject matter experts from across industry to focus on cross sector collaboration and learning. This was an informal one-day workshop convened under the Chatham House rule. The workshop encouraged open-ness and thorough discussion with senior representatives across government, regulators and industry. Each industry represented at the workshop gave a 15-20-minute presentation overview on the subject, outlining in particular some examples of what works and what needs more attention. The Format of the day was split into:

1. Introduction and Opening Remarks
2. Standards Approaches – Pros' and Cons'
3. Examples of Good Practice
4. Breakout session 1 & 2 and feedback
5. Next steps

The objectives of the workshop included;

- Share learnings and insights on the subject of decommissioning standards, between industries focused on but not limited to nuclear, water and rail transport;
- Capture key learning and recommendations to support the development of a nuclear industry co-ordinated approach to managing standards.

The benefits of a co-ordinated nuclear industry approach to the delivery of standards are:

- Allows operators to capture and consistently apply good practice supporting reduced costs (e.g. through economies of scale and interoperability), anticipate changes and avoid duplication of effort.
- Enables Government policy makers and regulators to deliver better and outcome focused regulation;
- Enhances public confidence, underpinning the social licence to operate

The outcome of the workshop was alignment to initiate a nuclear industry approach to the co-ordination, production, resourcing and delivery of standards within the nuclear industry. It was recognised that this needs to include cross sector industries working together but also that there needs to be a coordinated approach within the nuclear industry to produce sector guidance.

WORKSHOP INTRODUCTION

The NDA Cross Industry Learning programme originated as a joint effort between the NDA, BEIS and Oil & Gas Authority, in Aberdeen, February 2018, when the two authorities established an agreement to collaborate (Principles of Engagement) together with an agreed series of thematic areas of common interest. Engagements to date have been primarily between the UK Nuclear and Oil & Gas sectors, though it is recognised that other sectors also share similar challenges including; Defence, Renewables, Space, Rail and Water. Previous cross-industry learning workshop themes have included; Project Management; Commercial Models; Supply Chain; Late Life Asset Management; Regulation & Policy; Technical Innovation; Cost & Schedule.

This workshop comprised an invited audience of decision makers and influencers drawn from across nuclear, rail and water industries, representing a vertical cross-section from government and technical subject matter experts.

Participants agreed that discussion notes would be taken and published in a subsequent report, to be generally available. As such, the Chatham House Rule would apply in that "*participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.*" The workshop occurred during a pre-election period and as a result some government representatives were constrained in terms of an ability to make certain statements. Key points from introductory remarks, delivered by BEIS, included:

- There is a UK role for nuclear, recognising that the Net zero target will be challenging for UK industry;
- The social licence to operate depends on demonstration that it can drive down costs and speed up delivery;
- Good Standards are an essential element of delivering this, and there is support for sharing best practice across industry and demonstrating measurable benefits from the sharing;
- In common with other industries where the UK were pioneers, the nuclear sector has left a legacy that needs management;
- The International Atomic Energy Agency (IAEA) Integrated Regulatory Review Service (IRRS) provided an international peer review of legislation and regulators – the draw through of standards was identified as an area for improvement;
- Nuclear has enabling regulators; operators should have the confidence to approach regulators to discuss standards.

OPENING REMARKS

Office for Nuclear Regulation (ONR)

ONR introduced their presentation with a reminder of the definition of 'as low as reasonably practicable' (ALARP) that it was equivalent to 'so far as reasonably practical' (SFARP) and on the meaning of what 'reasonably practicable' means. The concept of 'Relevant Good Practice' (RGP) was a key focus; the advantages of using RGP highlighted as:

- RGP is a standard recognised by ONR as satisfying the law and ALARP compliance;
- This reduces the burden of developing new standards.

ONR highlighted the guidance they have already published and is currently available which identify their standards; the effort required to maintain the standards was highlighted, and an example provided:

- New External Hazard Technical Assessment Guide
  - 2 ½ years to produce;
  - Consultation resulted in 700 comments on the draft document to be accommodated.

The standards (Technical Inspection Guides – TIGs) and (Technical Assessment Guide – TAGs) also deliver an essential function of ensuring continuity for the next generation of ONR Inspectors.

The difference between Standards and standards was emphasised, where standards were industry generated standards and guidance - CIRIA and BRE were identified as good examples of these.

Regarding the use of international codes and codes generated from outside the nuclear industry - not all of these codes are applicable to the nuclear industry but where they are identified for use, care must be taken to assess their suitability – they must be relevant to the activity (**RGP**). The tolerability of risk must be considered to ensure the risk is acceptable for use within the nuclear industry – examples of where this had been done successfully were provided in the presentation.

Key messages included:

- RGP is underpinned by Standards and standards;
- Duty holder must have conversations with regulator around what constitutes RGP;
- Regulators are not looking for best practice but RGP;
- Ensure relevant standards are identified and applied;
- The use of standards needs to permeate through the supply chain.

Importance of Standards - Environment Agency (EA)

Key messages from the EA's presentation:

- Standards allow for self-regulation within a framework;
- The priority is to achieve good environmental outcomes – how to get there is open to discussion with the regulator;
- Sustainable development – this is a key part of standards going forwards; it has been developing in decommissioning and the water regime but needs considering in new activities as well;
- As always, the application of Best Available techniques (BAT) shall be applied in standards;
- Modern standards are produced with industry and are voluntary, not enforced by regulators;
- Need to take an overview to understand if a standard has achieved its purpose – does it deliver what it was supposed to? Measurement of success?
- Dissemination of standards – in an open and collaborative way.

There was some discussion on co-regulation which identified examples where ONR and EA work together to produce standards, (e.g.: within the COMAH regime).

Standards in the UK - Nuclear Energy Directors Forum (NEDF) Standards sub-group

The NEDF outlined the work and progress made to date on standards. The NEDF Standards sub-group is tasked with looking at standards; the group was formed in response to a 4 page 'standard problem statement' generated by EA and ONR. The problem statement identified a fragmented approach to standards management and no understanding / directory of all the standards groups operating.

The NEDF noted several common themes: work on standards lacked funding; operated on people's goodwill/ spare time and that there was no overarching co-ordination of standards. It was also noted that there may be duplication of work taking place with groups operating as part of the nuclear sector deal.

NEDF provided a brief summary of the Standard sub-group's activities:

- Sub-group consists of 4- 5 people (Magnox, NDA, LLWR) and 1 contractor for assistance;
- The group identified 100+ standard groups across the nuclear industry;
- All groups were contacted, and a standard question set sent to them;
- Analysis of the groups identified them as either producing standards or Learning From Experience (LFE) type;
- Key challenges identified by each group were:
  - Funding;
  - Gaps where standards have not been produced;
  - Communications – few links outside immediate area
- A road map of the different groups was produced.

Based on the input form this work, the NEDF Standards Sub-group determined a forward work programme:

- Good Practice Guide for working groups developing standards;
- Knowledge sharing – proposing to upload information to the NDA knowledge hub and develop a page summary for each group;
- Discussions with relevant groups how to address gaps in standards;
- Hold further discussions with regulator on standards;
- Look at new groups produced under the nuclear sector deal;
- Check for overlap/efficiency across groups.

There was discussion on how the gaps are to be filled, it was noted that gaps are often identified when an operator identifies an issue. A proactive approach to identifying the gaps is the preferred approach and prevents uncontrolled standards being produced locally to manage the issue.

Codes and Standards - National Nuclear Laboratories (NNL)

NNL provided an overview the use of standards in the Advance Nuclear Reactors development programmes; the key areas where standards are currently required are in manufacturing and materials development.

NNL have developed a road strategy to ensure it has the appropriate standards in place:

- For SMRs (Small Modular Reactors) codes and standards have been mapped and development areas have been identified;
- For GEN4/AMRs (advance module reactors) a 2-phase approach has been utilised:
  - Phase 1: carryout a broad range review of available standards to support all material requirements linked to the AMR; and engagement and links to code bodies where development is needed;
  - Phase 2: manufacture of material standards development.

Once again, caution when using off the shelf international standards was advised.

There was discussion around international standards, noting that harmonisation across countries is possible, however individual country's legislative requirements always need to be met. Additional complications stem from cultural differences. It was noted that to some extend IAEA already have this role, although their requirements are much higher level.

Once again, the issue of the lack of funding was highlighted especially where it was felt that the need for continued interaction with international bodies could be more important post Brexit.

There was also some debate following a question of whether there are perhaps too many bodies looking to regulate nuclear sector activity which tends to create its own industry.

STANDARDS APPROACHES: PROS' & CONS'

British Standards Institution (BSI)

An overview of BSI's capability and current activities supporting standards in the UK was provided. Key activities of the BSI are summarised below (more detail was provided in the presentations):

- Support the development of standards over a wide range of topics- compliance specifications, governance, material sourcing, etc.;
- Works closely with government, but not part of government;
- Developing standards, build consensus, involve stakeholders, government, industry, NGOs;
- Identify the need for and develop national standards and provide UK voice into the international domain (ISO, IEC, etc);
- BSI/PAS maps standards against policy requirements;
- Sponsors fast track standards to support innovation;
- Operates mirror groups in UK which mirror the ISO standard committees, for example for the ISO TC 85, ISO TC 45A and ISO TC 45B groups, all of which have equivalent BSI committees.
- Identifies the right experts to talk about standards which determines the BSI document that is produced and what 'good' looks like;
- Open consensus based, consultation and review are key;
- Standards are voluntary – but help manage compliance;
- Provide a route to input to international standards and support strategic policy objectives.

Sellafield

This presentation opened by considering the quantity of standards available to an engineer working at Sellafield, from international engineering and design standards, industry standards, CoP, TAGs, TIGs, WANO, INPO and asked – is it possible for an engineer to understand all of these?

A new approach was outlined where standards are linked to values through an approach termed 'value stream mapping' which uses a holistic approach recognising more than regulatory requirements and aligning standards with information management systems.

Another important consideration was the whether we should recognise competency rather than rely on written instruction.

There was some discussion around the thought of too many standards, or if they were aligned with what was actually needed. Further comments were on the complexity of standards which should be clear and straight forward, but also that there could be an engineering biased tendency for choosing the recognised 'gold plated' route, rather than the most relevant.

Case studies were also provided with the key messages:

- Utilise suitable specifications and ensure the standards identified are appropriate;
- Determine if standards are suitable - reviews and new standards are subject to an applicability assessment;
- Ensure standards are owned by subject matter experts;
- Work in this area has resulted with a set of suitable standards that are now controlled.

It was commented that the National Nuclear Ventilation Forum (NNVF) standards include project specific procurement specification supported by guidelines.

Water UK

Water UK is funded by the Water Companies to provide a single voice and strategic direction across companies. It utilises sub-committees including a 'Standards Board'.

There are a number of sources of standards utilised in the water industry:

- Water UK – produces own standards;
- WIS – Water Industry Spec – used if there is no BS or EU standard available
- ING – information and guidance notes;
- Water Industry Mechanical and Electrical standards (WIMES)
- Trade bodies produce standards and guidance

Key learnings:

- Engage with your sector;
- Establish priorities;
- Appoint a co-ordination Body.

The co-ordination group was resourced and funded by the industry; all companies contribute to support this; a negative of this arrangement is that it can sometimes be seen as a burden and the advantages overlooked.

It is recognised within the water industry that the commonality of standards when applied can reduce costs; which was highlighted with the example of standardising the valves utilised across the water industry resulting in a significant cost reduction.

EXAMPLES OF GOOD PRACTICE

National Nuclear Ventilation Forum (NNVF)

The presentation from the NNVF identified key considerations in the development of the NNVF Standards:

- Ensure there is good input from Site Licence holders who will then adopt the standard;
- BSI link – gain LFE in these areas which should reduce time and cost producing the standards.
- Engage plant manufactures to gain their agreement to work to the same standard.
- The standards are kept updated to accommodate changes in BS/EN/ISO, events (e.g. recent failed fan alignment incident) and developments in other industries.
- The NNVF group is open and transparent; work shared between SLC's and manufacturers and all information is published on the NDA Hub.

Key points:

1. Standards are a work in progress;
2. 3 manufacturers are a good number to support the group;
3. Encourage feedback from users and manufacturers and respond to their feedback.

Network Rail

Rail has a mature standard regime covering 2500 stations, 30 000km of track and 29000 bridges and tunnels. There are 5 semi-autonomous regions that need to co-ordinate their standards.

Standards are essential to the business – for example, all EU trains have to be able to use UK lines and access to the EU market is needed for equipment and supply export.

Utilise a RAG approach to standards:

Red – must comply

Amber – carryout a risk assessment to see if needed

Green - guidance

The Industry has recently attempted to rationalise its standards, updating the 'critical' standards and continue to carryout benchmarking of standards and specs with other transport and industry areas – an example was recent agreement with British Steel regarding the quality of steel needed.

Gaps have been identified from new developments for example Climate Change and Cyber.

Key points for consideration:

- Stakeholder involvement;
- Standards justification – consider commercial impact;
- Whole system (avoid silos);
- Evolution rather than revolution;
- Consider cultural factors – are standard owners' risk adverse?
- Have board for standards – Railtrack are part of this arrangement.

Water UK

3 examples were discussed:

1. Blockages in systems due to wet wipes marked as 'flushable';
    - Fine plastic webs in most wipes block pipes and cause plastic pollution;
    - Water Industry joined BSI/ISO development of standard with regard to wipes to ensure adequate testing standards were implemented. This resulted in a comprehensive testing mechanism;
    - Manufactures that cannot meet the testing criteria are removing 'flushable' form packages.
2. Developers building sewers
    - Drive developers to produce sewers to the correct standard prior to hand over to the water company;

- Guidance note developed by water industry to identify correct standards to construct sewers;

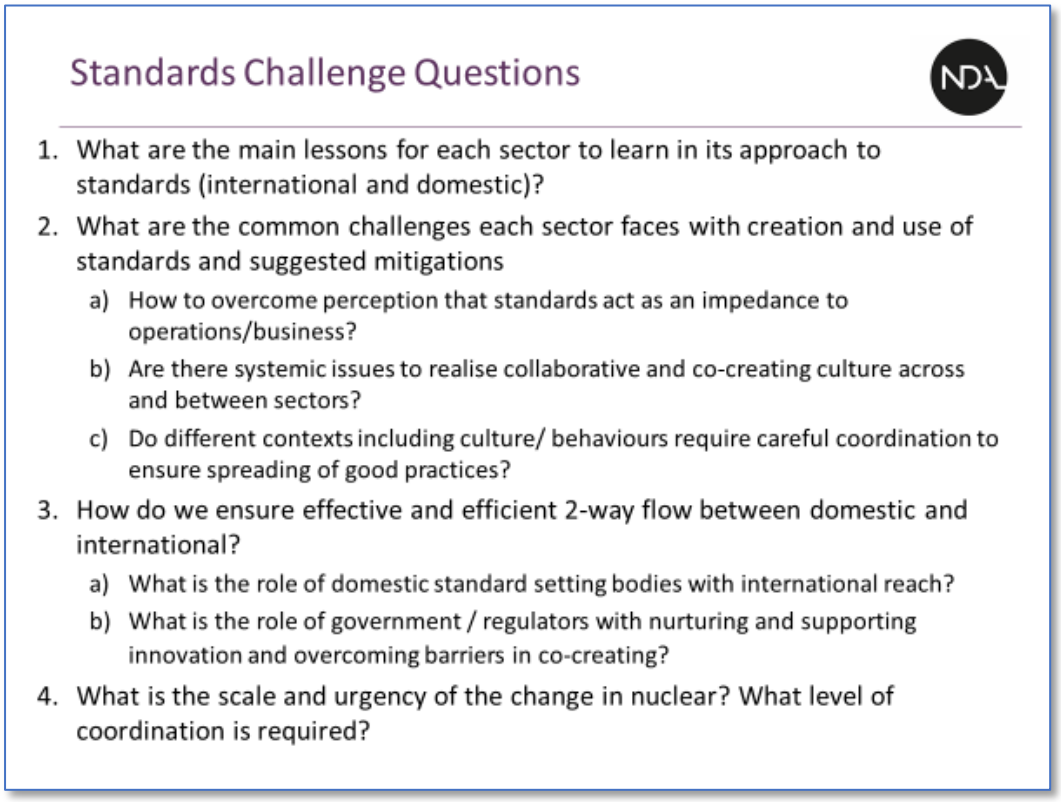
3. Mechanical and electrical standard

    - Adoption of standard valves has reduced costs by 40-60% as all valves are now the same

There was discussion round the business case impact of standards, and it was highlighted it was important to consider the capital costs against the long-term performance savings (e.g. it lasts longer).

BREAKOUT SESSION 1

The delegates divided into four groups, each with a scribe and presenter to consider the following questions;



Each group could choose to either take one question to discuss or as many as the time afforded. Many of the highlights were practical actions which should be followed up.

The following generalised points were captured in feedback from each group;

Table 1	**Table 2**
• Commonality of successful standard artefacts – what they have in common • It needs a clear mandate/forum • Example of Water cost benefit and efficiencies helps articulate the business case • Standards could be seen to add cost • Need a common language • Avoid duplication • Avoid a 'standards industry' and over engineering! • Can we harmonise?	• Do we go and sell the benefits effectively? • Good example here today • Staring point could be always to see what is in place already then tweak? • Lack of confidence due to incidents and accidents • Do we have enough international influence? • Do we need standards board funded by SLC's • Not all risks are equal! Need for different application of standards e.g. AWE

• Business case doesn't have to show immediate benefit – need long term view	• Too many distractions from Govt and operational priorities
Table 3 • Nuclear Sector deal driver – Opportunity and driver • Significant player in Net zero • Don't standardise for its own sake • Credit card example of win-win standard • The NDA Knowledge Hub useful tool for collaboration • Reasons for old standards have been lost in time – it is right to question • Need better NIA/ international cooperation	**Table 4** • Resourcing and funding issues need sorting • A need for prioritisation • Why not move SL standard to BSI/PAS? – too costly and lengthy • Policy change and regulation can focus mind • Commonality between sectors • Cultural dynamics • Need appropriate body representation • Can BEIS set a policy/purpose for standards e.g. Sector Deal

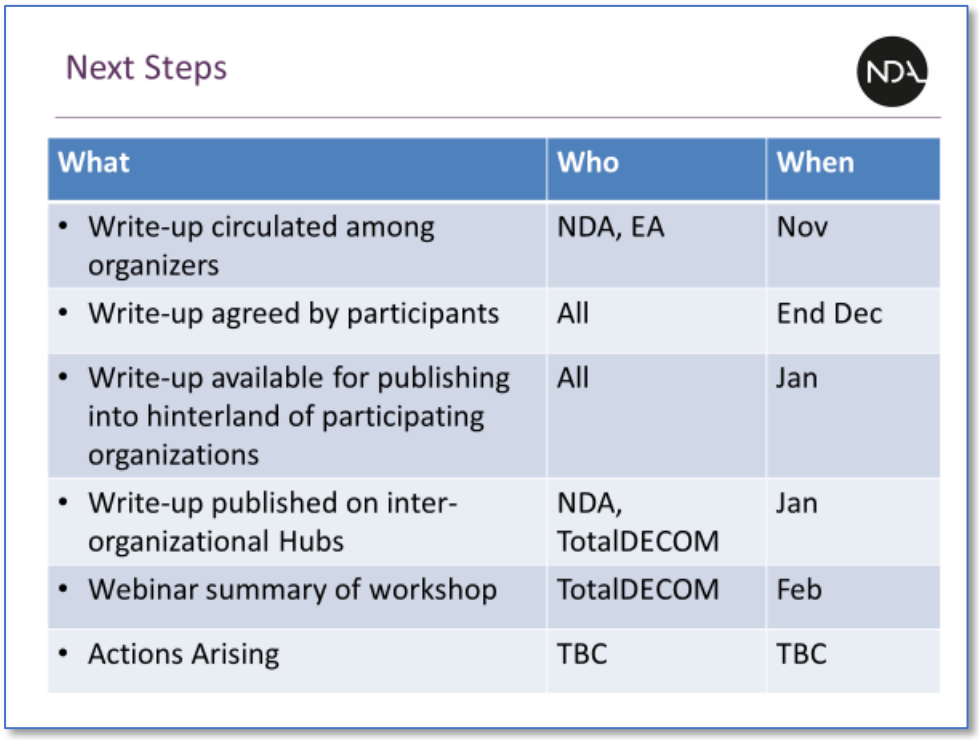
BREAKOUT SESSION 2

The groups were then and asked to consider priorities from among the feedback of break-out sessions 1 and assign SMART actions. Feedback as follows from each group (note the same participants were on each Table as breakout session 1):

Table 1 • Structure to be developed, led and owned but needs to be funded • Get in front-foot and ready for SMR/AMR • Understand and map the big picture	**Table 2** • Hold a co-ordinating meeting to exchange information (and progressing work started by NEDF) • Meet in the next couple of months • Follow up meetings longer term • Needs a funding mechanism to continue sub groups. BEIS? • Establish feasibility if Nuclear Industry Standards body similar to Water/NHS
Table 3 • Through NEDF, share standards route map • Communication of NEDF outputs on NDA Knowledge Hub • Equivalent bodies across sector to NEDF – means of future collaboration, possibly through TotalDECOM	**Table 4** • Extend NNVF Model to other areas • Create better links with industry/users and improved IT access • Target budget holders 'what's in it for me' • Standardisation methodology for review and issue and simplified

NEXT STEPS

The meetings adjourned following confirmation of the next steps and highlighted below;



Next Steps

What	Who	When
• Write-up circulated among organizers	NDA, EA	Nov
• Write-up agreed by participants	All	End Dec
• Write-up available for publishing into hinterland of participating organizations	All	Jan
• Write-up published on inter-organizational Hubs	NDA, TotalDECOM	Jan
• Webinar summary of workshop	TotalDECOM	Feb
• Actions Arising	TBC	TBC

ORGANISATIONS REPRESENTED

Nuclear Decommissioning Authority (NDA)
Office for Nuclear Regulation (ONR)
Department for Business, Energy & Industrial Strategy (BEIS)
National Nuclear Laboratory (NNL)
British Standards Institution (BSI)
Nuclear Engineers Directors' Forum (NEDF) and its Standards sub-group
Low Level Waste Repository (LLWR)
Chair of TC85/NCE009
Network Rail
National Nuclear Ventilation Forum (NNVF)
TotalDECOM
WYG
IHS Markit
Water UK
Atomic Weapons Establishment (AWE)
Magnox Ltd
Environment Agency EEA)
Safety Directors Forum (SDF)