

Advisory Committee on Nuclear and Radiation Safety Minutes of Meeting

17 – 19 October 2023

Oslo

Visit to Kjeller on Wednesday 18 October 2023

1. Welcome & Introductions

Per Strand, DSA Director General, and the Committee Chairperson, Carl-Magnus Larsson, welcomed the members of the Committee to the first in-person meeting of the newly constituted committee. Among other things, the meeting was structured to include a site visit to Institute for Energy Technology's (IFE) facilities at Kjeller, and to provide an opportunity for the current and future operators and licensees of the nuclear sites to provide their perspectives.

2. Introduction to NND

NND introduced its activities. NND was established in February 2018 as an agency under the Ministry of Trade, Industry and Fisheries. NND will be a nuclear site licensee with responsibilities including the decommissioning of the nuclear activities at Kjeller and Halden, currently under licence to IFE, and for the safe handling, storage, and disposal of radioactive waste (excluding NORM).

NND identified challenges with recruitment and building competence, uncertainties regarding the transfer of facilities, and maintaining optimal communications with IFE. It was noted that, under the NND structure, safety cases will be developed by a technical department, separate from the operating division. A stepwise transfer from IFE to NND has been proposed, starting with the Halden site in 2026, followed by the Combined storage and disposal facility for low- and intermediate-level waste (KLDRA) at Himdalen in 2028¹. A later transfer of the Kjeller site is currently envisaged, where challenges associated with the likely co-location of IFE and future NND facilities, and definition of site boundaries, need to be addressed.

A programme for the development of future waste management facilities is in preparation, including treatment, storage and deep geological disposal and other facilities. There have been communications with Studsvik, Sweden about the possibility of treating a fraction of

¹ The sequence is currently under review with simultaneous transfer of Halden and KLDRA Himdalen being considered.

the inventory of spent fuel and subsequent interim storage, pending the construction of appropriate facilities for storage and disposal in Norway.

During discussion, it was noted that, as an organization, IFE's business model is on scientific investigation rather than on the management and decommissioning of existing facilities. NND on the other hand, has been established to focus on decommissioning, waste management and the associated safety considerations. The challenge of maintaining staff motivation over the timescales necessary for transfer of licences (including regulatory review and assessment), assets and personnel was noted.

It was suggested that it would be useful to establish a map of current risks, and the level of urgency associated with them, to aid prioritization. NND deliver an annual risk assessment to the responsible Ministry. The risks related to the stepwise transfer of facilities, as well as the ageing of facilities and personnel were noted as particular challenges. The value of regulators and operators working together to, where possible, develop a joint understanding of priorities, capacities for safety-related improvements and outcomes was recognized. It was noted that high risk focus areas had been identified – these include criticality assessment and spent fuel storage – and progress is awaited.

3. NND Licence Application

NND gave a presentation on the NND licence application, delivered to DSA in December 2022, comprising applications for the ownership and operation of Kjeller and Halden nuclear facilities, and operation of the KLDRA repository for low and intermediate level waste in Himdalen. NND has undertaken a gap-analysis of the IFE safety assessments and has established a programme of work to address shortcomings, in collaboration with IFE.

NND's integrated management system was presented and demonstrated. Its structure is based on the national general licensing conditions (GLC) and IAEA requirements. The system is process-driven and has been developed using an iterative approach involving many people. A QA and feedback loop is included to facilitate continuing improvement.

It was noted that, from an NND perspective, DSA had provided useful guidance material to support interpretation of the licence conditions, and that the quality of explanations on, for example, safety case expectations had improved. NND noted that information from other regulatory bodies with mature regulatory processes (e.g. Office of Nuclear Regulation in UK) had also been helpful input to developing the licence applications and interpreting international good practice.

The Committee noted the complexities of transferring nuclear site licences and identified the need for clarity in defining the responsibilities of NND and IFE and their interactions. It will also be necessary for the scope of the review, safety assessment process and the conditions of licence transfer to be clear. The main objective will be to determine whether NND is capable of taking over responsibility for the existing facilities, including an understanding of the current and future situation and expectations.

The duration of the licence was discussed, and the Committee noted that NND has applied for licences with a duration of 10 years. This is the standard licence period for nuclear

facilities in Norway, partly related to the current practice of periodic safety review (PSR) assessments for operational facilities. However, it was suggested that a longer licence period and a different approach to periodic safety review may be more appropriate for decommissioning situations, where a more dynamic outcome-focused approach to safety assessment may be required, without the distraction of relicensing. In addition, a longer period might be more appropriate to take account of the extended timescales of some decommissioning processes (e.g. decay storage). Furthermore, the Committee commented that adapting to the changing situation during decommissioning is likely to be a learning process for both the regulator and the operator. It is therefore important to interact closely while remaining mindful of the respective roles and responsibilities.

4. DSA Approach to review and assessment of the NND Licence Application

DSA presented its project to undertake the review and assessment of the NND licence application. A staged process is proposed, initially focusing on national legislation, the GLCs and IAEA Requirements, and subsequently increasing the depth of the assessment in certain areas, for example by including Specific Safety Guides as necessary. Consideration of transfer of the licences to NND will need to take into account the organization, safety culture, management system and a graded approach to the review of the safety assessment.

NND has proposed a stepwise transfer of facilities, beginning with the Halden site. DSA has provided preliminary feedback to NND, requesting further information and confirming that DSA will initially focus its assessment and review on the application for the Halden site.²

There were queries about the extent to which the applications are based on IFE's safety assessments, which are due to be updated. It was noted that IFE is currently working on the criticality assessment and ageing management aspects. There have been delays in delivery and there is pressure to complete this work, despite facing capacity issues.

Practical proposals for implementing a graded approach for reviewing the application were discussed. It was suggested that further clarification of DSA's interpretation of graded approach in this context could be beneficial. This could include developing a list of potential issues that could block progress and criteria for acceptance. The way in which IAEA Safety Standards would be used as the basis for review was queried; review against Requirements may be appropriate but use of lower-level documents, e.g., Safety Guides, could imply an inappropriately detailed level of review. It was also noted that some existing facilities may not be able to comply with some modern standards. In such cases, a test of reasonable practicability could be applied in the review and assessment process. It was noted that some existing features of the JEEP II reactor and the current status of some fuel storage facilities may not be compliant with relevant current IAEA safety standard guidance. It was, however, recognized that these standards were not in existence when the original facilities were constructed.

² See, however, footnote 1

The review and assessment process will include inspections and the Committee noted the value of developing guidance for inspectors that acknowledges that there may be different ways of demonstrating compliance, while recognizing that licensees have a duty to comply with licence conditions. It was noted that DSA guidance, interpreting international standards and expectations, would take less time to prepare than legislation or regulations.

The extent of stakeholder interest in the licensing process, and transfer to NND, was discussed. The licensing process will include public hearings. Documents that support the hearing process will need to be prepared, such as a summary of the safety case. These processes are open debates involving members of the public and non-governmental organizations. A strategy for cross-border communication with the population in Sweden adjacent to Halden will also be developed. It appears that many actors in Norway are keen for the licence transfer to take place quickly.

5. Radioactive Waste Strategy and Implementation

DSA explained that a draft national strategy for the safe, secure and environmentally sound management of radioactive waste was currently under consideration by the Ministries and is expected to be published in late 2023. The strategy will contain a compilation of relevant laws, regulations and policies related to radioactive waste in Norway, as well as identifying responsible entities and challenges in the coming years. Following the publication of the national strategy, it is expected that DSA will publish guidance on its regulatory expectations and that NND will publish its implementation strategy and plans.

It was noted that there is an urgent need for storage and disposal facilities for radioactive waste and that the development of such facilities is a long process that requires political support and a common understanding by all stakeholders. Storage facilities for spent fuel will need to be upgraded and/or developed to allow flexibility to apply to a range of disposal options. Some measures have been put in place to improve the situation in the short term, but further action is urgently needed.

It will be necessary to establish appropriate storage and disposal options for all types of radioactive waste, incl. spent fuel. The quantities of spent fuel in Norway are small but there is a wide variation in type. As a consequence, it is unlikely to be possible to develop facilities that provide an ideal solution for all types. It will be necessary to identify options that are appropriate for as much as possible in an acceptable way. It was suggested that it may be advisable to look at a specific solution for the 'worst case' spent fuel category while adopting a different solution for other categories of fuel or wastes of higher activities. The use of dual-purpose casks (for storage and transport) or multi-purpose (including disposal) was identified as one of a range of options.

DSA has prepared a draft implementation guidance document setting out DSA's expectations on the processes for the regulatory review of new nuclear installations and for decommissioning. Completion and publication are pending the release of the national strategy. It was noted that the Norwegian concept evaluation process was not ideally

suited to the assessment of new nuclear facilities and that this issue would need to be addressed.

KLDRRA Himdalen is currently not accepting radioactive waste following the identification of issues related to safety assessment and documentation. An inspection was due to take place in November 2023. Current arisings of waste are being stored at the Radwaste facility at Kjeller. The facilities are old and not well suited for long-term storage for radioactive waste.

The Committee noted that the tritiated heavy water that is currently in drums for interim storage, requires special attention.

6. Site visit to Kjeller

The day started with a presentation from IFE about their nuclear history and status today, and some current challenges including the transitioning from operation to shut-down, building and re-organizing their organization, maintaining constructive relations with DSA, and preparing for business transfer while expanding their other areas of research.

The Committee visited the following facilities (outside):

- Lagerbygg II (storage facility), where the waste is stored after it is treated and packaged for transport to Himdalen,
- Brønnhus storage facility (mainly storage for JEEP II),
- Radavfallsanlegget (the national radioactive waste treatment facility) and
- JEEP I Stavbrønn (storage for fuel from JEEP I reactor).

The Committee also visited the Met.Lab II building and received a presentation about the laboratories and equipment, including the hotcells. The last part of the site visit was to the JEEP II reactor building, and the interim storage area for the tritiated heavy water.

After the visit, there was a summary of the day and some concluding remarks from IFE and the members of the Committee.

7. Introduction to the Norwegian Nuclear Research Centre and CERAD

NMBU gave a presentation on the newly established Norwegian Nuclear Research Centre (NNRC), which is led by the University of Oslo (UiO), in collaboration with the Norwegian University of Life Sciences (NMBU). UiO leads on fundamental radiation physics while NMBU is building on 10 years' work as the Centre of Excellence for Environmental Radioactivity (CERAD) and focuses on radioecology, emergencies, decommissioning and waste management aspects. Plans for bachelor, master, and PhD programmes have been or are being prepared.

It was noted that a masters' programme in the UK had been an effective route to enhance competence. Unlike the situation in some other countries, there did not appear to be a problem with attracting students in Norway to nuclear and radiation safety related courses and research.

8. Options for Strengthening the Technical Support (TS) Function in Norway

DSA explained that DSA had a broad strategic objective in engaging in this area to sustain and enhance competence in radiation and nuclear safety. There is a need to enhance collaboration and to develop a strategy in this field.

DSA also highlighted the need for further developing expertise in decommissioning and waste management. DSA had been given the task of considering the need for and the possible future structure of a TS function in Norway. An evaluation had been initiated focusing on DSA technical support capacity and its interactions with other organizations. The IAEA Technical Support Organization Self-Capability Assessment (TOSCA) process had been one input to this process. Proposals on a way forward were due to be developed by the end of 2023.

At present, it is proposed that a focal point within DSA is assigned to coordinate and to enhance DSA's role as an intelligent customer to procure and maintain the most appropriate technical support.

The Committee noted that regulatory bodies in different countries procured technical support in many ways and queried whether it was necessary to establish a stand-alone TSO in Norway, given the limited size of the programme. The importance of DSA maintaining its role as an intelligent customer to procure technical support was stressed.

Most countries find it difficult to find organizations that are willing to provide independent and extensive long-term support to regulators alone. It is therefore important to establish exclusive contracts with compartmentalized organizations to protect against conflicts of interest and to maintain independence of advice.

The current approach, of building on known expertise and interacting with several national and international organizations, was considered to be a sound approach. The value of Nordic cooperation in this area was noted, particularly in view of limitations on resources.

9. High-level reflections on DSA's interaction with licensees

Based on the meeting and the site visit, the Committee offered some general reflections to DSA on enhancing its regulatory processes, in the interests of fostering continuous improvement, acknowledged to be a basic principle for excellence in nuclear and radiation safety. These reflections may also contribute to strengthened relationships with licence holders.

In general terms these may be summarized as follows:

- further refine and implement a graded (risk-informed) approach to regulatory oversight, recognizing the risk of unnecessary replication of the licensee's work
- prioritize actions that would enable a timely and safe provision of new / refurbished waste management facilities, thus supporting initiatives under the (draft) waste management plan
- enhance communications with licensees to, where possible, build and common understanding of priorities to ensure that response times are appropriate for the situation, considering the urgency and the level of formality of communication.

- support national efforts to build interest in decommissioning as a career path to attract the next generation of good quality industry and regulatory staff.
- promote an efficient and effective relicensing process to enable a seamless transfer of licences and operations from IFE to NND, including working with NND management to build a healthy organisation.

10. Committee feedback on Committee meetings

The Committee also provided feedback on the meeting structure. The first two meetings had provided a good summary of the Norwegian situation and challenges. It was beneficial to hear from all parties, i.e., the regulator (DSA), licensee (IFE) and prospective licensee (NND). The Committee confirmed its expectation that high-level strategy advice was expected rather than detailed technical inputs; this was confirmed by the Chairperson. Members expressed their appreciation of the meeting arrangements, management of discussions, and openness of all non-Committee participants (DSA, IFE, NND and NMBU).

11. Next meeting and adjournment

It was proposed that the next in-person meeting be held in May/June 2024 and that it should include a site visit to Halden. Additional virtual meetings may be held before then. The Secretariat will be in touch as soon as possible to check for members' availability.

The Committee Chairperson and the Director DSA thanked the Committee members, and other participants, for their engagement in the discussions and for their advice and thanked the Secretariat for smooth and efficient meeting management.

Present:

Committee Members:

Name	Organization
Carl-Magnus Larsson	Chairperson, DSA
Jussi Heinonen	STUK, Finland
Karin Liljequist	SSM, Sweden
Øystein Nordgulen	Norwegian Geological Survey, Norway
David Senior	Consultant, UK
David Winfield	Consultant, Canada
Simon Wisbey	Consultant, UK

DSA Staff

Name	Office/Department
Per Strand (day 1, 3)	Director General
Kristin Elise Frogg (day 1)	Director of the Department of Radiation and Environmental Safety
Tone Bergan (day 1, 2)	Director of the Department of Nuclear Safety and Control of Sources
Sara Skodbo (day 3)	Director of the Department of Research and Development and International Nuclear Safety
Anne Liv Rudjord (day 3)	Section Head of Research and Development Section
Ian Barraclough (day 1)	Section for Pollution Control and Decommissioning
Heidar Hüttmann (day 1)	Section for Nuclear Safety
Giedrius Paskevicius (day 1)	Section for Nuclear Safety

Secretariat

Carol Robinson	Office of the Director General
Hege Sofie Haugan	Department of Nuclear Safety and Control of Sources

Ole Stian Bockelie	Department of Radiation and Environmental Safety
Yngvild Sauge	Department of Radiation and Environmental Safety

Invited representatives of other organizations

Name	Organization
Pål Mikkelsen	Director, NND
Nina Ramberg	Director for Safety, Quality Assurance and Environment, NND
Deborah Oughton	Professor, CERAD and NMBU

Hosts and participants in site visit to IFE Kjeller

Name	Organization
Nils Morten Huseby	CEO
Atle Valseth	Head of Nuclear Division / Deputy President
Grete Rindahl	Sector Director Safety, Quality and Environment, Safety Manager IFE
Geir Mjønes	Sector Director for Nuclear Division, Halden
Elisabeth Strålberg	Sector Director for Nuclear Division, Kjeller
Jonas Blavik Bjørnes	Senior Adviser Communications

On site tour:

Ketil Tørtberg	Operations Manager, Nuclear Division Kjeller
Hans-Jörg Kleemann	Deputy Operations Manager, Nuclear Division Kjeller
Knut Bjørnar Larsen	Operations Manager for Radioactive Waste and KLDRRA Himdalen