Advisory Committee on Nuclear and Radiation Safety
Minutes of Meeting

18 – 21 November 2024, Oslo
Visit to KLDRA Himdalen on 19 November and to DSA in Østerås on 20 November

1 Welcome & introductory remarks

The Committee Chair welcomed the members to the fourth (third in-person) meeting of the Advisory Committee on Nuclear and Radiation Safety since its reconstitution under new Terms of Reference in 2023.

Following on from the site visits during the two preceding meetings, this meeting included a visit to the third nuclear site in Norway, the Combined Disposal and Storage Facility for Low- and Intermediate-level Waste (KLDRA) in Himdalen. It also included a visit to DSA's headquarters in Østerås where Committee members made presentations on their views of good regulatory practice, as part of an internal seminar that was open to all DSA staff and included informal discussions with staff.

The Chair informed members about the development of a committee domain on DSA's English website and thanked members for providing the requested information[1].

Committee members discussed communication between members and DSA staff on specific technical matters. It was noted that the Terms of Reference states that issues to be discussed by the Committee can be identified by any member; discussions and any advice resulting from those discussions will be recorded in the minutes. There might also be circumstances where intersessional technical advice is sought by DSA staff, or by third parties attending Committee meetings. In all such interactions it must be clarified whether the advice is provided on behalf of the Committee or in an individual capacity. The Chair will propose amendments to the ToR to reflect this point and circulate to members for comments and seek approval for the amendments from the Director General of DSA.

2 Application by Norwegian Nuclear Decommissioning (NND) for a licence under the Nuclear Energy Act to own and operate the nuclear facilities at Halden

2.1 Status of DSA's review and assessment, recommendations and next steps

DSA presented the project for review and assessment of NND's licence application under the Nuclear Energy Act for transfer of IFE's (Institute for Energy Technology) nuclear facilities at Halden to NND. The review and assessment was in its final stage. The

[1] Information about the Committee is now publicly available at The Advisory Committee on Nuclear and Radiation Safety - DSA

Committee had previously (at the meetings in October 2023 and June 2024) been appraised of the structure and progress of DSA's review and assessment project, including

- checklists for twelve different review and assessment areas
- procurement of external consultants
- project structure.

The review and assessment aimed at reaching conclusions on whether:

- **information has been submitted by the applicant in sufficient detail and depth to enable DSA to conclude its assessment and provide well-founded advice to Government** – DSA noted that there had been frequent updates and supplements to application documentation, over the course of the review, and frequent meetings had been held to seek further clarification. Overall, the information had been sufficient for reaching a conclusion
- **the arrangements and agreements (including for transfer of responsibilities, assets and staff) allow for a seamless transition where potential safety risks have been identified and properly managed** - DSA noted the application of the 'continuity principle' in transferring, to NND, the management system, staff, software, etc., as implemented by IFE today.
- **the applicant has the capability and capacity to comply with the Nuclear Energy Act and any other relevant legislation** - DSA noted that transfer of staff is key, with competence and 'intelligent customer' capability to be verified ahead of approval of operations.
- **the applicant can manage hazards and risks to health and safety of people, the environment, and assets, including during incidents and accidents** – DSA noted that updates were required, and were already ongoing, of the safety analysis report (SAR) and of the safety assessment process.
- **there are implications of the hearing process for the assessment of safety, and for DSA's advice in connection with a transfer of the licence from IFE to NND** - DSA noted that general satisfaction with the licence transfer had been expressed at public meetings and in correspondence from interested parties to DSA.

Several elements of NNDs application point to ongoing actions to improve and develop the processes to ensure full compliance with the regulatory framework, notably the development and implementation of a new process for the safety case and SAR. Other areas under development are related to the management system, overview and analysis of competence and human resources status and needs after licence transfer.

DSA was working towards submitting a recommendation[2] to the Ministry of Health and Care Services to prepare a licence, in consultation with other relevant Ministries, authorising NND to own and operate the nuclear facilities at Halden, to be formally granted

[2] The recommendation was submitted 4 December 2024. Oversendelse av innstilling til søknad om konsesjon fra Norsk nukleær dekommisjonering for å eie og drive atomanlegg i Halden (in Norwegian)

by Royal Decree before the King in Council. The recommended transfer date is 1st March 2025.

DSA will make the 25 General Licence Conditions (GLC) applicable to NND's licence, with additional conditions. Some of the conditions must be met before DSA can authorise operations pursuant to § 11 of the Nuclear Energy Act. Ahead of being issued an operating licence, NND must also submit evidence of having been granted all requisite approvals under other relevant legislation, which, *inter alia*, will necessitate the transfer of IFE's existing permits under the Pollution Control Act to NND.

DSA will continue the review and assessment of NND's licence application to own and operate the radioactive waste storage and disposal facility KLDRA Himdalen, currently operated (but not owned) by IFE. It is anticipated that DSA's recommendation would be submitted to Government by mid-2025.

2.2 Discussion and advice

During and following DSA's presentation, the Committee made several comments and observations that were presented on the final day of the meeting as summarised below:

- the Committee congratulated DSA and expressed its satisfaction that the first of a planned three-step relicensing process was nearing completion
- the Committee discussed and commented in general terms on the nature of licence conditions, including
    - the importance of consistency and predictability
    - level of detail and prescriptive content
    - the need for information and consultation so that conditions are properly understood by the applicant
    - clarity in establishing what is required to satisfy or 'close' a condition (reasonable assurance in lieu of 'compliance by the letter') and avoidance of 'moving targets'
    - the use of a graded and risk-based approach as good regulatory practice
    - providing opportunity and incentive to the licensee to increase its maturity on their own initiative
- NND had applied for the licence to be valid for 10 years, which is currently the established practice in Norway. The matter of a potentially unlimited duration of the licence was under consideration by DSA. In this context, the Director General of DSA requested formal advice from the Committee on the suitable duration of the licence. The Committee discussed the matter *in camera* and agreed on the advice at Attachment B to these minutes, stating: "*While mindful that the Government may wish to consider broader issues outside the remit of DSA, the Committee advises DSA that granting a licence to own and operate the nuclear installations at Halden* ***with indefinite duration*** *would be appropriate. This*

positioning is aligned with international good practice[3] *and will help facilitate ongoing high standards of nuclear safety and nuclear security for installations at Halden during the care & maintenance and decommissioning phases*". [4]

3 KLDRA Himdalen

3.1 Orientation about the KLDRA Himdalen facility

DSA provided information about the early history of the KLDRA Himdalen facility. More recently, in May 2023, DSA issued an instruction to IFE to develop a plan for the development and implementation of a periodic safety report (PSR) for the facility. In addition, DSA issued an instruction to IFE to stop the disposal of radioactive waste at the facilities until a new safety report for the facility had been issued and approved by DSA, demonstrating that it is safe to resume disposal of waste. The safety report must cover safety of the facility during operations, as well as post-closure.

In preparation for the site visit, DSA presented the main findings of an inspection, undertaken in November 2023 regarding ageing management and maintenance, and follow-up actions by IFE. DSA also provided information about NND's plans for the facility, and on challenges associated with the facility's safety concept.

3.2 Site visit

The visit to the KLDRA Himdalen facilities was attended by all members of the Committee, and by the Secretariat, DSA staff and NND staff, in addition to the IFE hosts. IFE provided an orientation about the facility, ongoing work, and future plans, followed by a walkdown of the facility and discussions based on information and observations.

3.3 Discussion and advice

During discussions and walk-down of the facility, the Committee took note of the fact that DSA's inspection a year prior to the Committee's visit had provided evidence of poor maintenance that had gone unnoticed, or had not been actioned upon, for considerable time. However, the walk-down of the facility demonstrated significant improvement in housekeeping and general care and maintenance since the inspection. The Committee considered it important that the experience gained over the last 12 months is used by DSA to:

- inform ('lessons learned') improvements in DSA's oversight of licensed facilities, including a strengthened inspection program with focus on the safety functions of the facility and which may need to address long term competence development

[3] Specific Safety Guide No. SSG-12 *Licensing Process for Nuclear Installations*, issued by the International Atomic Energy Agency (IAEA) in 2010.

[4] DSA subsequently recommended the licence to be issued without time limit.

- assess whether lessons were learned by the operator and adequately reflected in the periodic safety review (PSR), which is currently in its planning stage
- further develop a risk-informed approach to the assessment and management of risks, taking into account the uncertainties surrounding safety functions and inventory.

The Committee reflected on the safety concept and long-term operational and post-closure safety of the facility. Passive safety of the facility is governed by emplacement of the waste in sarcophagi placed in several rock vaults, with the sarcophagi having been concreted over. Water transport through the facility is not well understood and there are remaining uncertainties regarding the waste inventory. The Committee supported DSA's position that the planned PSR and safety analysis should consider long-term (post-closure) safety.

Among issues identified for further consideration were:

- the importance of documenting experiences and history of the design, construction and operation of the facility, to enable better understanding of the facilities safety functions and where lack of, or loss of, some documentation was acknowledged to present a challenge
- the need to clarify the hydrogeology/ water transport in the facility
- the need to update the inventory including credible best estimates with proper understanding of uncertainties as the basis for a bounding safety case
- the benefit and safety of interim storage at the facility
- the need for an analysis and documentation of a broad range of options for the long-term management and maintenance of the facility.

Furthermore, the Committee advised DSA to consider expanding its competence in evaluating safety cases for long-term safety, potentially in international collaboration, where members noted that both Sweden and Finland have relevant experience from the construction and operation of comparable facilities in comparable geological formations.

4 Seminar for DSA staff on "Good Regulatory Practice" and subsequent discussion (DSA headquarters, Østerås)

The seminar was held in a hybrid format with staff attending in-person or on-line, including during the discussions. Under the umbrella of 'good regulatory practice', the presenters focused on regulatory approaches, challenges and experience in Australia, Finland, Sweden and the USA. Presentations were held in the morning and allowed for Q&A and comments related to the subject of the presentations. In the afternoon, Committee members were available for discussions with any DSA staff who chose to attend. Attendees ranged from newly graduated and employed members of staff, to senior staff with managerial responsibilities.

Discussions included but were not limited to:

- key attributes of a 'good' regulator, such as independence and trustworthiness

- competence development, mentoring and opportunities to establish networks, and learning from other organisations
- identifying and as necessary breaking down internal barriers to utilising resources (including competence) optimally
- recognition that the development and implementation of a coherent and stable regulatory frameworks assists all aspects of regulatory work, but is time-consuming and requiring significant resources
- the necessity of licensees assuming responsibility for their own activities while being monitored by the regulator using a graded and risk-informed approach.

5 Orientation about the committee established by the Norwegian Government to evaluate the potential role of nuclear power in the Norwegian energy mix

The Committee Chair provided a short overview of the remit of the committee[5]. The committee is due to deliver its final report in April 2026.

6 Committee feedback on the meeting and preliminary dates for next meeting

Members agreed that it had been a productive and fruitful meeting and expressed their appreciation of the opportunity to discuss 'good regulatory practice' with DSA staff at Østerås. Having visited all three nuclear facilities in Norway, members had a good understanding of challenges and opportunities offered by the situation in Norway, and were ready for further detailed interaction with DSA staff at all levels.

Two weeks in May were identified as candidates for hosting the next Committee meeting, tentatively in Oslo[6].

7 Adjournment

The Chair thanked the Committee members for their efforts and engagement in the discussions and thanked participating DSA staff for their contributions. Members expressed their thanks to IFE and NND staff for arranging the visit to KLDRA Himdalen and for willingness to engage in open and constructive discussions. The Secretariat was thanked for their tireless efforts before and during the meeting – and in anticipation for the work remaining to be done after the meeting. The meeting was adjourned.

Attachments:

A. List of participants
B. Advice, "Duration of licence to own and operate the nuclear installations at Halden"

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[5] More information about the Committee is available at Kjernekraftutvalget (in Norwegian)
[6] It has subsequently been decided to hold the next meeting 12-14 May 2025, in Oslo.

ATTACHMENT A

Meeting participants

Committee Members:

Name	Organisation
Carl-Magnus Larsson	Consultant, Sweden (Chairperson)
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
Allison Macfarlane	University of British Columbia, Canada
Anna Clark	IAEA

DSA Staff (excluding staff participating in the seminar and ensuing discussions):

Name	Office/Department
Per Strand (day 4)	Director General
Kristin Elise Frogg (day 4)	Director of the Department of Radiation and Environmental Safety
Tone Bergan (day 4)	Director of the Department of Nuclear Safety and Control of Sources
Ingeborg Mork-Knutsen (day 1, 2)	Head of Section for Nuclear Waste and Decommissioning
Heidar Hüttmann (day 1, 4)	Section of Nuclear Waste and Decommissioning
Trine Celius (day 2)	Section of Nuclear Waste and Decommissioning

Secretariat:

Name	Office/Department
Carol Robinson (day 1, 4)	Office of the Director General

	Hege Sofie Haugan	Department of Radiation and Environmental Safety
	Yngvild Sauge	Department of Radiation and Environmental Safety

Hosts and participants in site visit to KLDRA Himdalen (Committee members, Secretariat and DSA staff excluded)

	Name	**Organisation**
	Nils Morten Huseby	CEO IFE
	Geir Mjønes	Sector Director for Nuclear Division, IFE Halden
	Elisabeth Strålberg	Sector Director for Nuclear Division, IFE Kjeller
	Sindre Øvergaard	IFE
	Knut Bjørnar Larsen	IFE
	Paula Nunez	IFE
	Jan Wethe	IFE
	Bjørn Bergan	NND
	Ildiko Nordensvan	NND
	André Øraas	NND

ATTACHMENT B

Date: 28 November 2024

Advisory Committee on Nuclear and Radiation Safety
Interim Advice to Director (DSA)

"Duration of licence to own and operate the nuclear installations at Halden"

Introduction

The Norwegian Radiation and Nuclear Safety Authority (DSA) has established the Advisory Committee on Nuclear and Radiation Safety (the Committee) to "…as requested by the Chair or the Director of DSA, or on its own initiative, provide DSA with strategic and technical advice[7] on the safety of nuclear and radiation facilities and activities…".

The Committee has over recent successive meetings been apprised by DSA and the Norwegian Nuclear Decommissioning (NND) about NND's application under the Nuclear Energy Act to own and operate the nuclear installations at Halden, currently owned and operated under a licence issued to the Institute for Energy Technology (IFE). DSA is nearing completion of its regulatory review and assessment, and will shortly provide recommendations to Government about relicensing of the nuclear installations at Halden under the Nuclear Energy Act, with the licence potentially granted to a new owner and operator (NND).

In this regard, the Director DSA has requested the Committee to **provide advice on the appropriate duration, with justification, of a licence,** should the King in Council grant a licence. This document provides the committee's advice with underpinning justification and reference to relevant international experience. The advice should be considered interim as the final review and assessment as well as the recommendation to Government is not yet available to the Committee. It reflects the Committee's current understanding and is unanimously supported by its members.

Advice

While mindful that the Government may wish to consider broader issues outside the remit of DSA, the Committee advises DSA that granting a licence to own and operate the nuclear installations at Halden **with indefinite duration** would be appropriate. This positioning is aligned with international good practice[8] and will help facilitate ongoing high standards of

[7] The Committee is independent of DSA and is not liable to any decisions based on its advice to DSA. DSA is under no obligation to follow the Committee's advice and is entirely responsible for its own decisions. This is in line with General Safety Requirements No. GSR Part 1 (Rev. 1) *Governmental, Legal and Regulatory Framework for Safety*, issued by the International Atomic Energy Agency (IAEA) in 2016.

[8] Specific Safety Guide No. SSG-12 *Licensing Process for Nuclear Installations*, issued by the International Atomic Energy Agency (IAEA) in 2010.

nuclear safety and nuclear security for installations at Halden during the care & maintenance and decommissioning phases.

Considerations

- At its meeting on 18 – 21 November 2024, the Committee deliberated on DSA's preliminary review and assessment of NND's licence application as well as on DSA's preliminary recommendation to Government to prepare a decision under the Nuclear Energy Act for the King in Council to grant NND a licence to own and operate the nuclear installations at Halden.
- The Committee has, as requested, considered the issue of licence duration should a licence be granted.
- A periodic relicensing would enable the establishment of a new licencing basis at regular intervals, thus providing an updated point of reference for the facility. The Committee noted that a limit on the duration of the licence (for example, 10 years) may be appropriate for operational nuclear installations such as reactors, but also noted that reactors may be licensed for their entire design lifetime (40 years or longer).
- Limiting the duration of the licence may be less relevant for nuclear installations under care and maintenance, awaiting decommissioning activities to commence in the short term, or undergoing decommissioning. The Committee noted that granting a licence without time limitation would be in accordance with international good practice as outlined in the safety standards of the International Atomic Energy Agency (IAEA).
- The Committee noted that relicensing is a resource-intensive activity on the part of the applicant as well as the regulatory body. In line with a graded (risk-informed) approach, an indefinite duration licence would enable both NND and DSA to commit resources on a longer-term basis to the progressive build-up of competence and procedures, and to the establishment of interim and permanent measures to manage radioactive waste and spent fuel in accordance with the newly published waste strategy[9]. Thus, ultimately reducing and/or eliminating risks associated with the back-end management of nuclear installations taken out of operation.
- Finally, the Committee noted that DSA is in possession of a 'regulatory toolbox' that enables prevention of, or, as necessary, halting activities considered unsafe, and to enforce rectification of unsafe practices. Regular evaluation of progress and safety can be requested in the form of tailored periodic safety reviews (PSR), updated decommissioning plans, or by other means. A revocation of the licence as a result of the relicensing process would have limited practical meaning, and would leave the facility unregulated unless extraordinary measures are put in place by Government.

On behalf of the Advisory Committee on Nuclear and Radiation Safety

[9] *Strategi for trygg, sikker og forsvarlig håndtering av radioaktivt avfall i Norge*, Klima- og miljødepartementet, 2024

Carl-Magnus Larsson (Chair)