

Country Profile: Norway

1. Section 1: Summary

1.1. Relevant national authorities and responsibilities

Norwegian Radiation and Nuclear Safety Authority (DSA) is the national authority, regulatory body and expert body in matters concerning nuclear safety and security, radiation protection, radiation use, natural radiation, radiation contamination in the environment and radioactive waste management. DSA is responsible for regulating the use of radioactive sources in medicine, manufacturing and research.

DSA is also responsible for regulating the two research reactors and the accompanying fuel cycle facilities at Halden and Kjeller, and the waste repository in Himdalen. The three facilities are run by the Institute of Energy Technology (IFE). IFE is a stated owned independent research foundation.

The Government has made the decision to take the economic responsibility for decommissioning of the nuclear facilities, and to develop a strategy that involved the development of sufficient disposal capacity to address the increased volumes of waste that will arise from decommissioning. The Government has established the organization Norwegian Nuclear Decommissioning (NND). NND will be responsible for the management of decommissioning and radioactive waste management from the nuclear sector in the future.

DSA is organized as a directorate under the Ministry of Health and Care Services, from which DSA primarily receives funding. DSA is also a directorate under the Ministry of Climate and Environment with respect to releases to the environment and waste from nuclear and non-nuclear industries, and under the Ministry of Foreign Affairs with respect to implementing safety measures under the Norwegian Government's Action Plan, which sets up long-term goals for cooperation on nuclear safety and security with Russia, Ukraine and other countries in Eurasia (see dsa.no for more information), DSA is also an authority under the Ministry of Defence concerning the regulation of nuclear powered military vessels entering Norwegian waters and ports. DSA also assists and advises other ministries on matters related to DSA's fields of expertise.

1.2. National legislation and basis for regulation

DSA regulates according to three Acts and associated regulations:

- The Nuclear Energy Activities Act
 - The Regulation on Nuclear Materials and Facilities
 - The Regulation on Nuclear Materials etc.
- The Pollution Control Act
 - The Regulation on Pollution Control
 - The Regulation on Waste
 - The Regulation on Radioactive Pollution and Waste
- The Radiation Protection Act
 - The Regulation on Radiation Protection

The Pollution Control Act has applied to radioactive pollution (including discharges and releases)¹ and radioactive waste since 01.01.2011. Under this Act, pollution is forbidden unless specifically permitted by law, regulations or individual permits. The objective of this Act is to secure a satisfactory environmental quality based on a balance of interests, which includes cost associated with any measures and other economic considerations.

Facilities and activities are also regulated in accordance with the Radiation Protection Act with associated regulations, and in addition nuclear facilities and activities are also regulated by the Nuclear Energy Activities Act and associated regulations.

1.3. Application of BAT/BEP in domestic legislation

The Norwegian practice when issuing authorizations for facilities and activities, is to focus on BAT, the ALARA principle and the precautionary principle. The use of BAT regarding discharge of radioactive substances is implemented under the Pollution Control Act, section 2 3.:

Section 2 Guidelines

The Act shall be implemented in accordance with the following guidelines ...

3. Efforts to avoid and limit pollution and waste problems shall be based on the technology that will give the best result in the light of an overall evaluation of current and future use of the environment and economic considerations.

1.4. Dose limit, constraints and discharge limit setting rationale

The effective dose limit for members of the public and non-occupationally exposed workers from ionizing radiation, specified in the Regulation on Radiation Protection, is 1 mSv/year. The Regulation on Radiation Protection also specifies a dose constraint of 0.25 mSv/year.

DSA defines radionuclide-specific discharge limits for each facility and activity. The limits are based on the ALARA principle, historical discharge data and planned changes of facility and activity, while ensuring compliance with the dose limits. The discharge limits are the annual activity level in discharge to water and air.

The operators of facilities and activities must also ensure that the dose constraint, and the dose limits, are not exceeded for the sum of all discharges at a given site.

¹ The definition of pollution according to the Pollution Control Act § 6. What is meant by pollution.

For the purpose of this Act, pollution means:

1. The introduction of solids, liquids or gases to air, water or ground,
2. Noise and vibrations,
3. Light and other radiation to the extent decided by the pollution control authority
4. Effects on temperature

Which causes or may cause damage or nuisance to the environment,

The term pollution also means anything that may aggravate the damage or nuisance caused by earlier pollution, or that together with environmental impacts such as are mentioned in items 1 to 4 causes or may cause damage or nuisance to the environment.

The release permits issued by DSA are issued to the Kjeller site and Halden site do not differentiate between the different types of facilities i.e. fuel fabrication facility, radioactive waste treatment facility and research reactors.

1.5. Regulation, surveillance and monitoring

Facilities and activities are inspected by DSA on a regular basis with regard to nuclear safety and security, radiation protection and environmental protection. A part of the inspection is the assessment of the annual reports from facilities and activities on environmental monitoring and routine measurements of discharges.

1.6. Environmental monitoring programmes

Discharge authorizations issued by DSA for nuclear facilities require that the operators of facilities and activities carry out measurements of the discharges to water and air. The measurements are conducted according to a monitoring program approved by DSA and the results of the monitoring program are annually reported to DSA.

In addition to the environmental monitoring programs carried out by the operators of facilities and activities, DSA coordinates a national monitoring program of radioactivity present in the marine and terrestrial environments.

The marine monitoring program was established in 1999. The principal objective of the monitoring program is to document levels, distributions and trends of anthropogenic and naturally occurring radionuclides along the Norwegian coast, in the North Sea, the Norwegian Sea and in the Barents Sea, and to make information regarding radioactive contamination available to authorities, the fishing industry, media and the public in general.

1.7. Radiation dose assessment methods

The total annual effective doses to the public are evaluated from discharges to rivers and from emissions are based on model calculations. The total doses are estimated to the representative person (or hypothetical critical group) from liquid discharges and emissions to the atmosphere for comparison with dose constraints.

Dose rates to non-human biota are also routinely assessed, notably using the ERICA Tool for comparison with associated screening levels and international recommendations.

1.8. Environmental norms and standards

The degree of protection of the environment is primary based on the protection of human health through the application of dose constraints and limits but assessments for non-human biota are also undertaken.

Reference levels for the activity concentrations of Cs-134 and Cs-137 in foods have also been specified for activity present in the environment as a consequence of the Chernobyl accident.

1.9. Quality assurance

IFE's internal Health and Safety Department has a quality control and assurance system related to all work tasks and described in associated working instructions and procedures. The department is also a member of the International Atomic Energy Agency (IAEA)'s ALMERA network of radioanalytical laboratories for analysis of environmental samples.

In 2011, IFE was certified to the ISO 9001 and ISO 14001 standards, and re-certified in 2018. Whereas the ISO 9001 involves standard for quality management systems, the ISO 14001 is a standard for environmental management.

Section 2: Nuclear Power Plants

N/A

Section 3: Reprocessing facility

N/A

Section 4: Fuel fabrication facilities

There are two fuel fabrication facilities under the management of the Institute for Energy Technology (IFE), located in Kjeller, a village located about 20 km north-east of Oslo. There is also a facility in Halden, separate from IFE's site at Halden, about 120 km south of Oslo. All of these facilities are currently licensed until 31 December 2028.

Facilities at Kjeller:

- Metallurgisk laboratorium I
was commissioned in 1961, with additions commissioned in 1979 and 1987
- Metallurgisk laboratorium II
was commissioned in 1965.

All liquid effluents from the Kjeller site are pumped to the Radioactive Waste Treatment Plant. After treatment these effluents are discharged to the river Nitelva, which is about 100 km from the sea. The river has an annual mean flow of 5 m³/s. It leads into the lake Øyeren where the water is mixed with the water from the river Glomma, which has an annual mean flow of 400 m³/s. Glomma river flows into the Oslo Fjord, which has an open connection with Skagerrak (OSPAR region II).

The facility at Halden:

- Brenselsinstrumentverkstedet
was commissioned in 2007.

Liquid discharges from the Halden site are released to the river Tista which flows into Iddefjorde, leading to Skagerrak (OSPAR region II). The average flow of the river Tista is 21 m³/s. The volume of Iddefjord is 4 10⁸ m³, the average outflow to Skagerrak is 180 m³/s and average inflow from Skagerrak is 150 m³/s.

Section 5: Radioactive waste treatment facilities

- Radioactive Waste Treatment Plant for low level- and intermediate level waste
located at the IFE site in Kjeller. It was commissioned in 1958, with additions commissioned in 1959 and 1966, and is currently licensed until 31 December 2028.

Section 6: Research reactors

- JEEP I
is located at the IFE site in Kjeller. It was commissioned in 1951 and was shut down in 1966.
- Halden Boiling Water Reactor
is located at the IFE site in Halden. It was commissioned in 1959 and is currently licensed until 31 December 2020. An application for a renewed licence has been submitted to DSA and is under consideration. In June 2018, IFE decided that Halden Boiling Water Reactor would be permanently shut down.
- NORA
is located at the IFE site in Kjeller. It was commissioned in 1961 and shut down in 1968.
- JEEP II
is located at the IFE site in Kjeller. It was commissioned in 1967 and is currently licensed until 31 December 2028. In April 2019, IFE decided that JEEP II would be permanently shut down.

Section 7: Decommissioning activities

N/A