



Authority for Nuclear Safety and
Radiation Protection

Guidelines on the conventional technical preconditions for nuclear facilities

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1 Introduction

Nuclear facilities such as nuclear power plants, reactors, uranium enrichment companies and companies which store radioactive waste must apply for a licence under Section 15(b) of the Nuclear Energy Act (KEW) prior to setting up such a facility. Important aspects in the licensing of nuclear facilities in the context of the Nuclear Energy Act (KEW) are nuclear safety and the management of radiation exposure in the environment (the nuclear aspects). Technical preconditions for various conventional aspects may also be included in the licence. In this sense, the Nuclear Energy Act (KEW) licence is an integrated environmental licence.

This document provides guidelines for the licence applicant. It provides a summary of the most relevant conventional environmental aspects and related technical preconditions which are important for nuclear facilities and, although it is not exhaustive, is therefore a useful aid in applying for a licence. It also forms a basis for preliminary consultations between the licensing authority (ANVS) and the licence applicant; it provides insight into the scope of the conventional aspects making up the Nuclear Energy Act (KEW) licence and can be used to ensure the completeness of the licence application. Licences in the context of the Environmental Permitting (General Provisions) Act (Wabo), the Flora and Fauna Act (FFW), the Nature Conservation Act (Nb-wet) and the Water Act (Wtw), which fall outside the scope of the Nuclear Energy Act (KEW), must be applied for from the relevant competent authority, if applicable.

Chapter III, part 2 of the Nuclear Energy Act (KEW) deals with the topic of licences. It states that requirements can be attached to a licence to protect the interests (including the protection of people, animals, plants and property) referred to in Section 15b. In general, the requirements for the conventional aspects will correspond with the requirements laid down in the context of the Environmental Management Act (Wm) and the Environmental Permitting (General Provisions) Act (Wabo) and related legislation; different requirements are, however, possible. Most of the legislation and regulations referred to in Chapter 3 are not pursuant to the Nuclear Energy Act (KEW), but it is logical to apply them, as far as possible, in accordance with the abovementioned laws in the context of licensing under the Nuclear Energy Act (KEW).

The nuclear aspects, including safety aspects, fall within the scope of the International Atomic Energy Agency (IAEA). This organization has published a large number of Safety Standards (such as 'NS-R-3 Site Evaluation of Nuclear Installations' and 'GS-G-4.1 Format and Content of the Safety Analysis Report for Nuclear Power Plants') which deal with the nuclear safety of nuclear power plants and other nuclear facilities. These nuclear aspects fall outside the objectives of these guidelines. The conventional aspects are listed briefly below in so far as they are discussed in these publications.

NS-R-3 Site Evaluation of Nuclear Installations

The preface of this IAEA standard reads as follows:

'Non-radiological aspects of industrial safety and environmental protection are also not explicitly considered: it is recognized that States should fulfil their international undertakings and obligations in relation to these.'

This implies that international and national legislation applies in full to the non-nuclear aspects. In the case of the Netherlands, it is logical to fall back on the Environmental Management Act (Wm) and Environmental Permitting (General Provisions) Act (Wabo), which implement the international (that is, European) environmental law.

The Scope of the IAEA standard contains the following statement:

'The evaluation of the non-radiological impacts of a nuclear installation is not considered.'

Later in the standard we come across the following:

'The possible non-radiological impact of the installation, due to chemical or thermal releases, and the potential for explosion and the dispersion of chemical products shall be taken into account in the site evaluation process.'

And again later:

'The potential for interactions between nuclear and non-nuclear effluents, such as the combination of heat or chemicals with radioactive material in liquid effluents, should be considered.'

This suggests that the IAEA does not lay down any conditions for the purely conventional aspects of the facility but that the connection between the nuclear and non-nuclear aspects must explicitly be looked at.

GS-G-4.1 Format and Content of the Safety Analysis Report for Nuclear Power Plants (SAR)

This Safety Guide devotes a short section to the non-nuclear aspects which has been reproduced below in its entirety.

Non-radiological impacts

3.207. This section should cover all aspects of site activity that have the potential to affect the non-radiological impacts of the site throughout the lifetime of the plant, including construction, operation and decommissioning. In particular, this section should provide a description of the measures that will be taken to control discharges to the environment of any dangerous solid, liquid and gaseous non-radioactive effluents. This section also:

- (a) Should identify the chemical and physical nature of the releases or discharges;
- (b) Should identify any authorized limits and operational targets for discharges;
- (c) Should describe the off-site monitoring regime for pollution;
- (d) Should describe the alarm systems required to respond to unplanned releases;
- (e) Should identify the measures that will be taken to make appropriate data available to the public.

As stated in the SAR, the non-nuclear aspects will also have to be examined in detail in the licence application. Given the aforementioned points, it would seem logical to link up with the system from the Environmental Management Act (Wm) and Environmental Permitting (General Provisions) Act (Wabo), as described in Chapter 3 of this report.

In all other respects, when implementing the requirements relating to the nuclear aspects of the application arising directly from international legislation, the applicant must pay heed to the non-nuclear aspects in so far as they are explicitly mentioned. If the requirements laid down are different to those in the national legislation, this will have to be discussed with the competent authority.

These guidelines are based on the statutory regulations and provisions as applicable on 1 January 2016. No rights can be derived from these guidelines in the context of the licensing procedure.

1.1 Reader's guide

Where possible, this document sketches the system of standards for each environmental aspect. It will be clear however that this will not be possible for every topic, particularly if a topic is only a precondition, such as the requirements laid down for the storage of dangerous substances in accordance with PGS15 (a series of publications on dangerous substances). It will suffice for us to sum up the legislation and its most important aspects here.

Chapter 3 contains a summary of the aspects which are relevant in licences for conventional environmental facilities falling under the Environmental Permitting (General Provisions) Act (Wabo) and environmental facilities falling under the Activities (Environmental Management) Decree (Barim). These topics are filtered for their applicability to nuclear facilities and their relevance to the Nuclear Energy Act (KEW) licence is indicated.

Chapter 4 provides insight into the relevant assessment framework. A simple, clear-cut classification comprising two parts was consciously opted for in this chapter: one on legislation and regulations, in which the applicable (statutory) rules are named, and one outlining the applicable system of standards.

Where possible, the section on the system of standards provides measurable standards with limits and target values, in so far as this is applicable. The system of legislation and regulations is, however, often unable to provide this clarity, because the applicable standard usually depends on a large number of factors, including environmental factors, which are not known in advance.

Furthermore, rather than measurable numerical standards, obligations to use best endeavours or measures which have to be taken in advance apply to many topics. In these cases, the system of standards indicates the guidelines to be followed. The way in which this can be addressed in the application and the conditions which may be attached to the licence are also indicated.

Where necessary, comments are added about the relationship between the conventional and the nuclear parts of the facility (for example in relation to fire safety).

2 Method

The preconditions relating to each topic or environmental aspect are discussed, the following order of information being observed for each one:

- Applicable law (acts of parliament);
- Substantive law (decisions and regulations);
- Guidelines and ministerial circulars.

The following information will also be provided for each topic, in so far as it is available:

- The most important aspects of the legislation;
- The applicable rules and conditions;
- Measurable standards and requirements, if available.

Statutory regulations for each environmental aspect are thus examined in the following order:

- Legislation which has a direct effect under the Nuclear Energy Act (KEW);
- Legislation (including environmental legislation) and statutory regulations which do not have a direct effect under the Nuclear Energy Act (KEW), but can be declared applicable via Section 15b of this law.

Pursuant to Section 15c of the Nuclear Energy Act (KEW), requirements which are necessary to protect designated interests under or pursuant to Section 15b can be attached to licences. These interests include the protection of people, animals, plants and property. This means that, where necessary, requirements must also be included regarding conventional environmental aspects. Because of the rules

already laid down for this in this legislation, much of what is regulated in the environmental legislation (Environmental Management Act (Wm) and the Environmental Permitting (General Provisions) Act (Wabo)) can be declared applicable by analogy.

Normative boundaries relating to many matters are regulated in Administrative orders (AMvBs) such as the Activities (Environmental Management) Decree (Barim) or ministerial regulations, such as the Public Safety (Establishments) Decree and Regulation (Bevi and Revi). These will be mentioned where applicable. Measurable requirements and systems of standards are also derived from ministerial circulars and guidelines, such as the series of publications on dangerous substances (PGS) and the Guide to Industrial Noise and Licensing (*Handreiking industrielawaai en vergunningverlening*).

Each conventional environmental aspect is looked at to see whether there are any special points which must be addressed in relation to the type of nuclear facility in question and the specific processes and activities which will take place.

Finally, international legislation was consulted, the regulations drawn up by the IAEA in the field of nuclear safety being the most important source for this.

3 Relevant aspects and licences

3.1 Relevant aspects

The table below contains a summary of the topics which are of importance for the licensing of comparable conventional environmental facilities in so far as they are relevant for a particular nuclear facility. Whether the topic is important for the nuclear facilities already known to be operating in the Netherlands and which points for attention (conversion) are applicable are also indicated. In addition, the table indicates under which statutory regulation this topic is dealt with in the licence and how it can be applied for a Nuclear Energy Act (KEW) licence.

1st column: Here the relevant environmental aspects are summed up which are important in comparable conventional facilities such as power stations, storage companies and companies in the chemical/process industry.

2nd column: The relevance for nuclear facilities is indicated in this column:

Red means not relevant for nuclear facilities or falling under the nuclear part of the application (and will not be handled in these guidelines).

Green means possibly relevant for nuclear facilities.

Guidelines/Directive/Standard/ Environmental aspect	Relevant or not relevant for a Nuclear Energy Act (KEW) licence	Chapter
Industrial Emissions Directive (RIE)	The Industrial Emissions Directive (RIE) contains environmental requirements for large environmentally contaminating companies such as big combustion plants for the generation of energy, for example, integrated chemical plants, and solvent and waste incineration plants. The Directive and the BREFs (best available techniques reference documents) give the framework for the best available techniques (BBT) for these installations. Nuclear facilities are not Integrated Pollution Prevention and Control (IPPC) installations, but relevant parts from the Industrial Emissions Directive (RIE) and BREFs may be included in the Nuclear Energy Act (KEW) licence.	
BREF Waste treatment	Important if waste is incinerated or co-incinerated at combustion plants. Generally speaking, this does not apply to nuclear facilities.	
BREF Industrial cooling systems	Relevant for cooling systems that are also used at nuclear facilities.	4.1.2
BREF Large combustion plants	Relevant for large combustion plants for the generation of energy, for example. Generally speaking, this is not relevant for nuclear facilities.	
BREF Storage and transshipment of bulk goods	Possibly relevant for the storage of liquids at nuclear facilities.	4.1.2
Electrical installations	Standard requirements in connection with the soundness and safety of the installation.	4.1.3
Special operating situations	Unusual operating situations which lead to abnormal/greater environmental loads/safety risks must be provided for in the licence.	4.1.4
Process monitoring	A reliable monitoring system and process control must be organized. For nuclear facilities, this falls under the international nuclear safety requirements.	
Light pollution	Site lighting and lighting on the site boundaries for surveillance cameras, for example, may be a nuisance for local residents.	4.1.5
Workshops	This is a collective term for anything that has to do with 'skilled trades' such as welding, woodworking, metalworking, maintenance work, etc.	4.1.6
Pipelines	Relevant for oil and gas-fired facilities. Possibly relevant for nuclear facilities.	4.1.7
Gas pressure regulating and metering stations	If present on the site of the facility for which the licence is being applied.	4.1.8
Traffic and transport	Emissions, safety and air quality relating to transport to and from the facility.	4.1.9
Noise	Relevant for most nuclear facilities.	4.2
Waste	Relevant above a certain annual load, which will also apply for nuclear facilities.	4.3
AP-AO/IC	Acceptance and processing policies, Administrative Organization and Internal Control, as stipulated for the processing of biomass. Not relevant for nuclear facilities.	

Guidelines/Directive/Standard/ Environmental aspect	Relevant or not relevant for a Nuclear Energy Act (KEW) licence	Chapter
Waste water	Direct and indirect discharges occur at a number of nuclear facilities.	4.3.3
Odours	Relevant for coal and biomass-fired incineration facilities (and storage), not relevant for nuclear facilities.	
Air quality	Emission of NOx and particulate matter by incineration facilities and traffic, in particular. Relevant for nuclear facilities in connection with auxiliary facilities and traffic.	4.4.1
Air emissions	Important for the emission of substances at incineration facilities in particular. Relevant for a nuclear facility's emergency power system, for example.	4.4.2
Dust emission	Relevant for loading and unloading, processing and storage of coal and biomass (pellets) or other dust-emitting products. Not relevant for nuclear facilities.	
Dangerous substances	Storage of dangerous substances (including waste) in packaging or tanks.	4.5
Energy	Restricting the consumption of energy in for example buildings by using energy-efficient equipment and procedures.	4.6
Environmental management system	The company's own contribution to the continual monitoring and improvement of the environmental management at the company.	4.7
External safety	This is of particular importance if larger quantities of dangerous substances are stored and processed.	4.8
Public Safety (Establishments) Decree (Bevi)	This is applicable to the storage and processing of dangerous substances. In the case of nuclear facilities, this is applicable to larger quantities of refrigerated ammonia, for example.	4.8
Major Accidents (Risks) Decree (BRZO) 2015 ¹	Regulation for companies which store and process large quantities of dangerous substances.	4.8
Fire safety	This is mainly regulated in the integrated environmental permit (construction), which is also compulsory for nuclear facilities, and requirements for continual attention to fire safety.	4.9
Explosion hazard	The obligations for companies regarding gas and explosion hazards are enshrined in the Working Conditions Act (<i>Arbowet</i>) and the Working Conditions Decree (<i>Arbobesluit</i>).	
Soil	Activities which may pollute soil must be carried out in such a way as to minimize this risk. For a nuclear power plant, this topic is relevant for working with transformer oils, for example.	4.10

3.2 Licences

The Nuclear Energy Act (KEW) licence application must, in certain cases, be accompanied by an environmental impact assessment (MER). The environmental impact assessment (MER) procedure guarantees that the environmental interest has a proper place in the decision making about the intended activities.

Chapter 7 of the Environmental Management Act (Wm) distinguishes between two environmental impact assessment (MER) procedures: the detailed and the limited versions. The limited environmental impact assessment (MER)

procedure is legally required for Nuclear Energy Act (KEW) licences. Because of the impact of Nuclear Energy Act (KEW) licences and also because the Nuclear Safety and Radiation Protection Authority (ANVS) in principle attaches a great deal of value to public participation, the ANVS always follows the detailed environmental impact assessment (MER) procedure of its own accord. The environmental impact assessment (MER) study includes most of the topics discussed below. Often the partial reports (for example on noise, soil, air, etc.) which are drawn up for the environmental impact assessment (MER) can also be used for the Nuclear Energy Act (KEW) licence application. A point for attention here is that the environmental impact assessment (MER) describes a variant study and that the partial investigations take this into account. The licence application concerns a clear operating situation (the preferred alternative). If the partial reports from the environmental impact assessment (MER) study are also used for the application, the situation for which the licence is applied for must be clearly described in it.

¹ The Major Accidents (Risks) Decree (BRZO) 2015 has a direct effect via the Nuclear Installations, Fissionable Materials and Ores Decree (Bkse), a decree under the Nuclear Energy Act (KEW). Dangerous substances would not, however, be expected in a nuclear power plant in such large amounts that the Major Accidents (Risks) Decree (BRZO) 2015 would have to be applied.

environmental impact assessment (MER) procedure

An environmental impact assessment (MER) procedure and a licence application follow fixed steps. Public participation is a part of both.

The detailed environmental impact assessment (MER) procedure comprises the following steps:

1. Notification of the project

The initiator who wishes to submit an application for a licence which is subject to an environmental impact assessment (MER) notifies the competent authority, in writing, accordingly.

2. Announcement

The competent authority announces that there is an intention to submit a licence application. This announcement states:

- that the documents about the intention will be deposited for inspection and where and when this will take place;
- that everyone will be offered the opportunity to put forward objections about the intention, how to do so and the deadline for doing so;
- whether the environmental impact assessment (MER) commission or another independent authority will be asked to give advice on the intended activity;
- whether the activity will take place in the National Ecological Network (EHS) or in a Natura 2000 area.

3. Consultation

The competent authority consults the government agencies which have to be involved in the decision on the scope and the level of detail of the environmental impact assessment (MER). The environmental impact assessment (MER) Commission is also consulted on a voluntary basis. In this context, the Commission puts together a working group and issues recommendations, in writing, which are open to the public.

4. Recommendations regarding the scope and level of detail

The competent authority compiles its advice on the scope and level of detail of the environmental impact assessment (MER) to be drawn up. The time limit for doing so is six weeks from the receipt of the notification. This time limit can be extended once by a period of no more than six weeks.

5. Environmental impact assessment (environmental impact assessment (MER))

The initiator draws up an environmental impact assessment (MER). There is no statutory time limit within which this must take place.

6. Announcement and deposition for inspection of the environmental impact assessment (MER) and application

After the licence application and the environmental impact assessment (MER) have been received, the competent authority announces this and deposits both for inspection.

7. Announcement, deposition for inspection and public participation

On the basis of the application and the environmental impact assessment (MER), the competent authority draws up a draft decision. The draft decision is announced and deposited for inspection with the application and the environmental impact assessment (MER).

The announcement states that anyone may submit objections regarding the environmental impact assessment (MER), the application and the draft decision. The deadline for objections is six weeks.

8. Recommendations by the environmental impact assessment (MER) Commission

The environmental impact assessment (MER) Commission makes recommendations on the environmental impact assessment (MER) within the time limit of six weeks; this time limit also applies to the submission of objections.

9. Definitive decision

The competent authority takes a definitive decision regarding the licence. This indicates how the environmental impact described in the environmental impact assessment (MER) has been taken into account, the considerations regarding the alternatives described in the environmental impact assessment (MER), the objections and the recommendations of the environmental impact assessment (MER) Commission. If applicable, the competent authority also indicates what has been taken into consideration in the environmental impact assessment (MER) regarding any significant detrimental cross-border environmental impact. Methods and dates for evaluations are also laid down.

10. Announcement of the decision

The applicant is notified of the decision. The decision is also announced in the Government Gazette, national and regional daily newspapers and in a free local paper. The advisers, the government agencies involved in the decision and those who have submitted objections are also notified of the decision.

11. Evaluation

The competent authority evaluates the actual environmental impact described in the evaluation section of the decision. If necessary, the competent authority takes additional measures to reduce the environmental impact.

The environmental impact assessment (MER) study focuses on describing the environmental impact arising from the initiative and the way in which this can be controlled, reduced or completely avoided. The point of departure comprises a number of alternatives and variants with which the initiative can be realized. In the licence application, the emphasis is on describing the activity in question, as it will actually be realized, and the environmental impact it will entail. It is important to keep in mind this difference in the level of detail at which the information has to be processed in the environmental impact assessment (MER) and the application.

Besides the Nuclear Energy Act (KEW) licence, an integrated environmental permit often also has to be applied for,

for example for the construction or renovation of an entire, or part of a, facility, groundwater extraction and the construction of roads.

Moreover, it is not out of the question that a licence under the Nature Conservation Act (Nb-wet) and an exemption for the Flora and Fauna Act (FFW) will also have to be applied for. These permissions may follow on from the integrated environmental permit. There is no link with the Nuclear Energy Act (KEW).

A water permit (under the Water Act (Wtw)) will be needed for, among other things, the extraction of surface water and direct discharge to it (cooling water intake and discharge).

4 Relevance assessment framework

In general, the requirements for the conventional aspects will correspond with the requirements laid down in the context of the Environmental Management Act (Wm) and the Environmental Permitting (General Provisions) Act (Wabo) and the related legislation; different requirements are, however, possible.

In this section, the assessment framework (for each environmental aspect) which applies to licensing in the context of the Nuclear Energy Act (KEW) is compared with that of the licensing method for the integrated environmental permit.

4.1 General aspects

This chapter discusses the general environmental aspects to be addressed in the application and licence. They include matters not falling under the more general 'larger' environmental aspects such as noise, air, safety, etc. A brief outline of the legislation and, if applicable, a system of standards for each topic is given below.

4.1.1 General details

It goes without saying that the general details of the facility and its holder must be stated in the application. Land registry data must also be provided so that it is clear where the facility is located and how ownership is divided. A list of licences granted earlier and still in force must be provided too.

4.1.2 Best available techniques

In the context of the licence application, it is customary to investigate whether there are any applicable BREF documents and the degree to which the facility can meet the requirements in question. The best available techniques (BBT) conclusions laid down at a European level play an important role here (for more information on this, see the summary of the best available techniques (BBT) conclusions on the InfoMil site). BREFs can be both vertical (per branch) in nature and horizontal (per activity). The application must indicate which BREFs are important for the activities which take place or and how the provisions in these documents can be met. A few examples of the best available techniques (BBT) conclusions are:

- BREF for waste treatment;
- BREF for large combustion plants;
- BREF for cooling systems;
- BREF for the storage and transshipment of bulk goods.

In addition to the the best available techniques (BBT) conclusions laid down by the European Union, the annex to the Ministerial Environmental Regulation (Mor) also

designates a number of documents drawn up specifically for particular environmental aspects, such as the Netherlands Soil Protection Guideline (NRB), as the best available techniques (BBT). These are discussed along with the environmental aspect in question.

4.1.3 Electrical installations

The licence includes requirements which must be met by electrical installations and electrical equipment (for example, NEN 1010 for electrical installations, NEN-EN-IEC 60079-0:2012 for electrical equipment and NEN-EN-IEC 62305 series for protection against lightning).

4.1.4 Special operating conditions

Special operating conditions may be unexpected and unforeseen events, but they may also be special conditions in connection with maintenance or tests. In so far as these special operating conditions may be foreseen, they must be described in the application and an indication must be given of when they will take place, how long they will last, their frequency and their abnormal environmental impact. A provision will be incorporated in the licence which includes the obligation to report these events in advance or to ask permission for them.

If they lead to environmental effects which deviate from the licensed activities, unforeseen operating conditions must be reported to the competent authority immediately after they occur or are over.

4.1.5 Light pollution

One of the aspects which must be considered is the chance of light pollution. The General guidelines on light pollution (*Algemene richtlijnen betreffende lichthinder*) drawn up by the Dutch Foundation for Illumination (NSVV) are often used for investigating light pollution. In the case of nuclear facilities, site lighting is a point for attention which falls under this aspect. The effect of this type of lighting may be perceptible as an increase in sky brightness and the direct incidence of light. If houses are located close to the facility in question, the direct incidence of light must be addressed. In the context of an environmental impact assessment (MER), the direct incidence of light may have to be investigated. Part 2, the supplement to the aforementioned NSVV's general guidelines concerning site lighting, can be used to this end. Requirements will be incorporated in the licence to address this topic.

4.1.6 Workshops

Whether special requirements are included in the licence in connection with the activities in the workshops will depend on the extent and the nature of the activities which are to

take place. The assumption is that only small-scale activities will be involved. If the activities are to be carried out on a larger scale and, for example, welding or spray-painting is concerned, the requirements indicated in Chapter 4 of the Activities (Environmental Management) Decree (Barim) (General Rules for Establishments (Environmental Management) Decree) will apply. Because the Activities (Environmental Management) Decree (Barim) does not directly affect a facility falling under the Nuclear Energy Act (KEW), relevant requirements from the former will be reproduced in the licence.

4.1.7 Pipelines

Requirements which must be met by pipelines (non-nuclear pipelines) constructed on the facility site (for example, NEN 3650) will be included in the licence.

4.1.8 Gas pressure regulating and metering stations

If a gas pressure regulating and metering station is present on the facility site, it must meet the requirements of NEN 1059. Additional requirements may also be laid down in the licence, such as:

- a leak detection system;
- a ban on smoking and naked flames;
- activities may only be carried out on the station by authorized people;
- records must be kept of incidents and technical data.

4.1.9 Traffic and transport

A licence application must show the measures the applicant will take to reduce the environmental impact of transport movements. This aspect will be assessed according to the number of personnel, in line with the system stipulated in the Environmental Management Act (Wm). The Transport policy management/Mobility memorandum management to and from a facility (*Vervoermanagement / Mobiliteitsmanagement van en naar een inrichting*) describes how transport management can be implemented.

Points to be addressed for the application are:

- What environmentally friendly alternatives will be provided for traffic to and from work?
- What measures will be taken at the facility site and in the immediate vicinity of the facility to ensure traffic safety?
- A summary of the number of private vehicles and trucks which will visit the facility every day and every year should be included.
- What alternatives have been investigated, considered and applied to reduce the number of traffic movements to and from the facility (both of personnel and goods transport)?
- Will there be adequate numbers of parking spaces on the facility site?
- Will the routing of goods transport on the facility site and the loading and unloading places be laid out logically?

4.2 Noise

Legislation and regulations

The topic of noise is regulated in the Noise Abatement Act (Wgh) and the Environmental Management Act (Wm), including the related decrees (administrative orders) and regulations. Local legislation and policy (primarily provincial) are also important here.

A distinction is made between facilities which are isolated and those which are located on a zoned industrial estate pursuant to the Noise Abatement Act (Wgh). The Noise Abatement Act (Wgh) is not applicable to the former category. For nuclear facilities located on a zoned industrial estate, the following are of importance:

- The Noise Abatement Act (Wgh);
- The Environmental Management Act (Wm);
- The Noise Abatement Decree (Bgh);
- Policy regulations, development plans and modelling schemes of the industrial estate in question;
- General Provincial By-laws;
- The Guide to Industrial Noise and Licensing;
- Industrial Noise Measurement and Calculation Manual (HMRI 1999).

System of standards

Noise caused by a facility (company/industry) is assessed on two parameters, determined at the outer walls of houses or buildings or at other noise-sensitive designations in the vicinity². These parameters are the long-term average assessment level ($L_{Ar,LT}$) and the maximum noise level (L_{Amax}). The former is a measure of the average noise level and the latter of noise peaks.

In the case of a zoned industrial estate, the total noise level caused by all the companies is also measured at the zone boundary.

The total noise level at the zone boundary may not exceed 50 dB(A) 24-hour value. For the purposes of this document, 24-hour value is taken to mean the highest value of:

- 50 dB(A) in the hours between 07.00 and 19.00 (day period);
- 45 dB(A) + 5 in the hours between 19.00 and 23.00 (evening period);
- 40 dB(A) + 10 in the hours between 23.00 and 07.00 (night period).

Furthermore, the total noise level at the outer walls of houses or other noise-sensitive designations in the zone may not exceed the limit values laid down.

The standard which will apply for a nuclear facility will therefore depend on the total noise load calculated at the

² These measurements might be taken at schools, health care institutions and traveller sites. See also the Noise Abatement Act (Wgh) and Noise Abatement Decree (Bgh).

zone boundary and at houses or other noise-sensitive designations within the zone at the time of licensing. There must therefore be noise allowance available for this new facility in the zone in question. It is not possible to determine the noise allowance in advance.

Most municipalities and provinces have drawn up a policy for the management of noise allowance in such zones. This policy or development plan lays down a specific noise allowance for every plot, whether developed or undeveloped. It may be in the form of an emission in dB(A)/m² or an immission value at the zone boundary and/or houses or other noise-sensitive designations within the zone. The noise requirements can be derived from this value, depending on the plot. It should be noted in this regard that the zone management system does provide possibilities for changing noise allowance allocations. Noise allowance allocations are increasingly laid down directly in zoning plans, which means that individual noise allowances for the plots in question have greater legal force.

To summarize, for the zoning test the following must be known:

- The plot on which the nuclear facility is to be built or is in operation;
- Whether there are possibilities for shifting noise allowance between plots in the development plan if more noise allowance is needed for the facility.

Besides the long-term average assessment level (or equivalent noise level), the maximum noise level (L_{Amax}) at the outer walls of houses in the vicinity of the zoned industrial estate is also assessed. Generally speaking, the following standard is observed for this:

- 70 dB(A) in the hours between 7.00 and 19.00;
- 65 dB(A) in the hours between 19.00 and 23.00;
- 60 dB(A) in the hours between 23.00 and 7.00;

Maximum noise levels are assessed on the basis of the Guide to Industrial Noise and Licensing, which was written for the issuing of integrated environmental permits in the context of the Environmental Permitting (General Provisions) Act (Wabo).

Testing of indirect noise (traffic-attracting effect) can be omitted in the licensing of facilities located on zoned industrial estates, but is important for facilities which are located in isolated areas. This concerns traffic to and from the facility in so far as this can be distinguished from the other traffic on public roads. The establishment of standards and the method of determination are laid down in the circular dated 29 February 1996 from the Minister of Housing, Spatial Planning and the Environment (VROM), entitled Noise pollution caused by road traffic to and from the facility; assessment in the context of licensing on the basis of the Environmental Management Act (*Geluidhinder veroorzaakt door het wegverkeer van and naar de inrichting*;

beoordeling in het kader van de vergunningverlening op basis van de Wet milieubeheer).

The traffic-attracting effect for nuclear facilities located on zoned industrial estates is assessed in environmental impact assessment (MER) studies.

Noise arising from special activities which occur occasionally and can cause a higher noise level than the regular operating situation can be excluded from the assessment if they take place fewer than 12 times per year.

Facilities which are located in isolated areas are not subject to zoning tests; the Guide to Industrial Noise and Licensing is the most important assessment framework for such facilities. For the long-term average assessment level, the permissible value will depend on where the facility is located and the reference level of the ambient sound (the noise already present in the area excluding the facility itself). The evaluation of the maximum noise levels for facilities which are located in isolated areas is the same as for those located on zoned industrial estates.

An acoustic report which meets the provisions of the Industrial Noise Measurement and Calculation Manual (HMRI 1999) must also be submitted as part of the application.

4.3 Waste

For more information on the topic of waste, see the special status of radioactive and potentially radioactive waste. The processing of this waste falls outside the scope of the conventional aspects.

Legislation and regulations

This topic is dealt with in the Environmental Management Act (Wm); the provisions of the second National waste management plan (LAP2) are applicable.

The second National waste management plan (LAP2) indicates the general waste management policy, with details of how to handle specific categories of waste in the annex. The following are, to a greater or lesser degree, important for this topic:

- Chapter 10 of the Environmental Management Act (Wm);
- The National waste management plan 2 (LAP2);
- The General Rules for Establishments (Environmental Management) Decree (Barim); Activities (Environmental Management) Decree (Barim).
- In this context, the following can also be consulted:
- InfoMil's guide Roads to prevention (of waste) at businesses (*Wegen naar preventie bij bedrijven*) (April 2006);
- The Waste Substances (Landfills and Dumping Bans) Decree (Bssa).

System of standards

Requirements for waste prevention have not been included in the Activities (Environmental Management) Decree (Barim), because these fall under the general duty of care in Section 2(1)(2).

The LAP2 indicates the policy framework for waste separation. Waste separation is regulated in Part 2.5 of the Activities (Environmental Management) Decree (Barim). It is, furthermore, advisable to consult the sector plans in the LAP2 when applying for a licence and to indicate the extent to which the national policy for waste processing will be satisfied. The application must clearly indicate the quantity and type of waste to be released annually and how this will be stored, recycled and/or disposed of.

The starting point is that the companies which operate nuclear facilities are not waste collectors or processors within the meaning of Category 28.4 of Annex 1 of the Environmental Permitting Decree 2010 (Bor) (the collection or processing of waste from third parties). This is not, of course, taken to mean the collection of nuclear waste; the special conditions which are laid down for this are not discussed here.

4.3.1 Records

Under the Environmental Management Act (Wm, Section 10.38), a company must keep records of non-radioactive waste and hazardous waste given to third parties. It may only be given to licence holders. These records must be kept, updated and available for inspection by the competent authority for five years. Provisions of this kind may be included in Nuclear Energy Act (KEW) licences.

4.3.2 Storage

The licence application must state the types and quantities of waste which will be released annually. The methods of storage of non-radioactive residual products and waste must also be indicated. The following requirements can be laid down for this:

- Waste must be stored such that no soil contamination can take place.
- Waste must be separated according to type, with a view to recycling.
- It is not permitted to incinerate waste.
- It is not permitted to place waste in or on the ground permanently.
- It is not permitted to store waste for longer than three years prior to its useful application.
- It is not permitted to store waste for longer than one year prior to removal.
- The waste present at a facility must be removed within eight weeks of the termination of the facility in question.
- It is not permitted to compress waste unless:
 - a. it is not hazardous waste, and
 - b. the compression does not constitute an obstacle to its later separation or recycling.

- The storage of hazardous waste in packaging may fall under the PGS15 guidelines and may have to be stored in accordance with these guidelines. This must be indicated in the application.
- Substances used in the processing of oils must be stored in liquid-proof packaging.
- Paper residues and household waste must be stored in closed containers, such as press containers.
- Particular attention must be paid to emptying and removing spent oils without spillage.
- The conditions laid down by the Activities (Environmental Management) Decree (Barim) can be declared applicable if foods are prepared on the site (canteen).

4.3.3 Waste water

If waste water is to be discharged directly, an application under the Water Act (Wtw) will be needed. If a nuclear facility's waste water is discharged indirectly via its sewers, this must be dealt with in the Nuclear Energy Act (KEW) licence.

For more information on the topic of waste water, see the special status of radioactive and potentially radioactive waste water. The processing of this waste falls outside the scope of the conventional aspects.

Legislation and regulations

- The Environmental Permitting (General Provisions) Act (Wabo);
- The Environmental Management Act (Wm);
- The Soil Protection Act (Wbb);
- The Activities (Environmental Management) Decree (Barim);
- The Water Act (Wtw);
- Recommendations drawn up by the Centre for Civil Engineering Research and Codes (CUR)/Plan for soil protection provisions (PBV) Environmental design criteria for company sewers (*Milieutechnische ontwerpcriteria voor bedrijfsrioleringen*).

System of standards

The requirements laid down for the discharge of waste water will depend on the way in which this takes place. The various methods are given below:

- the discharge of waste water via the sewers (indirect discharge);
- the purification of waste water and subsequent discharge into the sewers (indirect discharge);
- the purification of waste water and discharge into the surface water (direct discharge);
- the discharge of waste water into the surface water (direct discharge).

In any case, the application must state how waste water will be transported out of the facility, the quantities involved and the type of waste water (household use, sanitary use, etc.).

Waste water must be treated in line with the system stipulated in the Activities (Environmental Management) Decree (Barim). In brief, this reads as follows:

- Discharge into the waste water sewer is permissible, provided the requirements of Part 3.1 of the Activities (Environmental Management) Decree (Barim) and the duty of care referred to in Section 2.1 are met.
- Other discharges, direct discharges and discharges into a clean water sewer are forbidden, unless explicitly permitted under the conditions of Part 3.1 van het Activities (Environmental Management) Decree (Barim).

Clean rainwater can be discharged via the soil (for this, see Section 3.3 of the Activities (Environmental Management) Decree (Barim)). Special provisions do, however, apply here with regard to any radioactive contamination.

Direct discharges, the intake and discharge of cooling water (see also Section 3.1.5 of the Activities (Environmental Management) Decree) will be regulated in the licence in the context of the Water Act (Wtw).

Any radioactive contamination and checks on it fall under the nuclear part of the Nuclear Energy Act (KEW) licence.

The company sewers must meet the recommendations drawn up by the Centre for Civil Engineering Research and Codes (CUR)/Plan for soil protection provisions (PBV) Environmental design criteria for company sewers (*Milieutechnische ontwerpcriteria voor bedrijfsrioleringen*). The licence application must include a drawing of the sewer system on the facility site.

4.4 Air

4.4.1 Air quality

Legislation and regulations

- The Environmental Management Act (Wm) Chapter 5 + Annex 2;
- Not Make a Significant Contribution (air quality requirements) Decree (NIBM);
- The Ministerial regulation on the evaluation of air quality (RBL2007);
- The Decree on Sensitive Land Uses (air quality requirements) (*Besluit gevoelige bestemmingen*);
- Guidelines for calculating air quality (*Handreiking rekenen aan luchtkwaliteit*).

System of standards

Air quality aspects must be assessed in line with the system stipulated in the Environmental Management Act (Wm). Chapter 5 of the Environmental Management Act (Wm) and the related decrees and regulations are important here, a distinction being made between air quality standards for people and those for ecosystems.

Air quality standards for people

Because the emissions from a nuclear facility are assumed to be low, it is likely that the requirements laid down in the Not Make a Significant Contribution (air quality requirements) Decree (NIBM);

Decree can be met. This means that no further investigation will be necessary if a reasonable case can be made to the effect that the annual average concentration of PM₁₀ and NO₂ will not increase by more than 3%. This means a maximum increase of 1.2 µg/m³ for both PM₁₀ and NO₂.

The Regulation on air quality assessment (*Regeling beoordeling luchtkwaliteit*) (2007) and the Guidelines for calculating air quality (*Handreiking rekenen aan luchtkwaliteit*) (2011) must be used for further investigation. Annex 2 of the Environmental Management Act (Wm) provides a system of standards for air quality. The most important limit values are given below:

Limit values for air-pollutants

Pollutant		Level µg/m ³
NO ₂	Annual average concentration	40
	Hourly average concentration which may be exceeded no more than 18 times annually	200
Particulate matter PM ₁₀	Annual average concentration	40
	24-hour average concentration which may be exceeded no more than 35 times per calendar year	50
Particulate matter PM _{2.5}	Annual average concentration	25
SO ₂	24-hour average concentration which may be exceeded no more than 3 times per calendar year	125
	Average hourly concentration which may be exceeded no more than 24 times annually	350
CO	8-hour average	10,000
Benzene	Annual average concentration	5
Lead (Pb)	Annual average concentration	0.5

The traffic and emergency power systems or auxiliary boilers are the most significant sources of emissions of the aforementioned substances for nuclear facilities.

Emissions by traffic sources are calculated using the Standard Calculation Method (SRM) 1 or 2. Emissions by point sources are calculated using SRM3, based on the New National Model (NNM).

Emissions are calculated from the boundary of the facility; the Decree on Sensitive Land Uses (air quality requirements) (*Besluit gevoelige bestemmingen (toetsingscriterium)*) can be consulted for more details.

Summary of immission limit values for ecosystems, vegetation and the environment

Component	Section in Annex 2 of the Environmental Management Act (Wm)	Applicable to	Immission limit value (ug/m ³)
SO ₂	1.2	Ecosystems	Annual average 20 µg/m ³ (also as winter half-year average concentration)
SO ₂	1.3	Ecosystems	Hourly average of 500 µg/m ³ which applies for three successive hours in areas of at least 100 km ² . This is the alert threshold
Nitrogen oxides	3.1	Vegetation	Annual average of 30 µg/m ³
Ozone	8.2 a	Vegetation	18,000 µg/m ³ as the AOT40 value (the accumulated amount of ozone over the threshold value of 40 ppb) for the period from 1 May up to and including 31 July averaged over five years as target value.
Ozone	8.2 b	Vegetation	6,000 µg/m ³ as the AOT40 value for the period from 1 May up to and including 31 July of a calendar year as target value for the long term.
Ozone	8.3	The environment	Information threshold at the hourly average concentration of 180 µg/m ³
Ozone	8.4	The environment	Alert threshold at the hourly average concentration of 180 µg/m ³
Nickel	11.1	The environment	Target value of 20 ng/m ³ as the annual average concentration on the basis of the total nickel content in (PM ₁₀) the fraction.
Benzo(a)pyrene	12	The environment	Annual average 1 ng/m ³

Air quality standards for ecosystems

The air quality requirements are applicable to ecosystems in areas with a surface area of at least 1,000 km² which are located at a distance of at least 20 km from conurbations or at least 5 km from other areas with buildings, facilities or motorways. In the Netherlands, however, there are no areas with a surface area of 1,000 km² so the immission limit values are not applicable. Looking at these immission limit values of ecosystems can, however, be considered because there is no other assessment framework available.

4.4.2 Air emissions

Legislation and regulations

- Activities (Environmental Management) Decree (Barim)

System of standards

The standards stipulated in the legislation pursuant to the

Activities (Environmental Management) Decree (Barim) apply to the environmental aspect 'air emissions'.

For a nuclear facility, it is likely that combustion plants or auxiliary combustion plants (with a thermal capacity of less than 50 MW) will be present which will be comparable with combustion plants or auxiliary combustion plants falling under Part 3.2 of the Activities (Environmental Management) Decree (Barim) in the case of conventional facilities. The standards laid down in the Activities (Environmental Management) Decree (Barim) can be reproduced in the requirements for Nuclear Energy Act (Kew) licensing. The most important emission values which apply pursuant to the Activities (Environmental Management) Decree (Barim) are given below; it must, however, be noted that different standards apply for boilers with smaller capacities (between 400 kW and 1 MW).

Emission limit values from Section 3.2.1 of the Activities (Environmental Management) Decree (Barim) (non-exhaustive)

BOILERS nominal capacity >1 MW _{th}	NO _x (mg/Nm ³)	SO ₂ (mg/Nm ³)	Total material (mg/Nm ³)	C _x H _y (mg/Nm ³)
Solid and liquid fuels with the exception of biomass	100 (solid) 120 (liquid)	200	5	–
Biomass <5 MW _{th}	200	200	20	–
Biomass ≥5 MW _{th}	145	200	5	–
Gaseous fuel	70 ¹	200	–	–
GAS TURBINE INSTALLATIONS	NO _x (mg/Nm ³)	SO ₂ (mg/Nm ³)	Total material (mg/Nm ³)	C _x H _y (mg/Nm ³)
Gaseous fuels	140	200	–	–
Liquid fuels	140	200	15	–

LIQUID ENGINE SYSTEMS	NO _x (mg ^x /Nm ³)	SO ₂ (mg ₂ /Nm ³)	Total material (mg/Nm ³)	CxHy (mg/Nm ³)
Liquid fuels	450	200	50	–
GAS ENGINE SYSTEMS	NO _x (mg ^x /Nm ³)	SO ₂ (mg ₂ /Nm ³)	Total material (mg/Nm ³)	CxHy (mg/Nm ³)
Gaseous fuels with the exception of biogas				
Installations ≥ 2.5 MW _{th}	450	200	50	–
Installations < 2.5 MW _{th}	450	200	50	–
Biogas	450	200	50	–

¹ If a gaseous fuel other than natural gas is used at a facility, the emission limit value is multiplied by a factor. Besides the emission requirements, the monitoring of requirements is important. These have been included in the Activities (Environmental Management) Regulation (Activiteitenregeling). The maintenance of combustion plants is also regulated in the Activities (Environmental Management) Decree (Barim).

4.5 Storage and use of dangerous substances

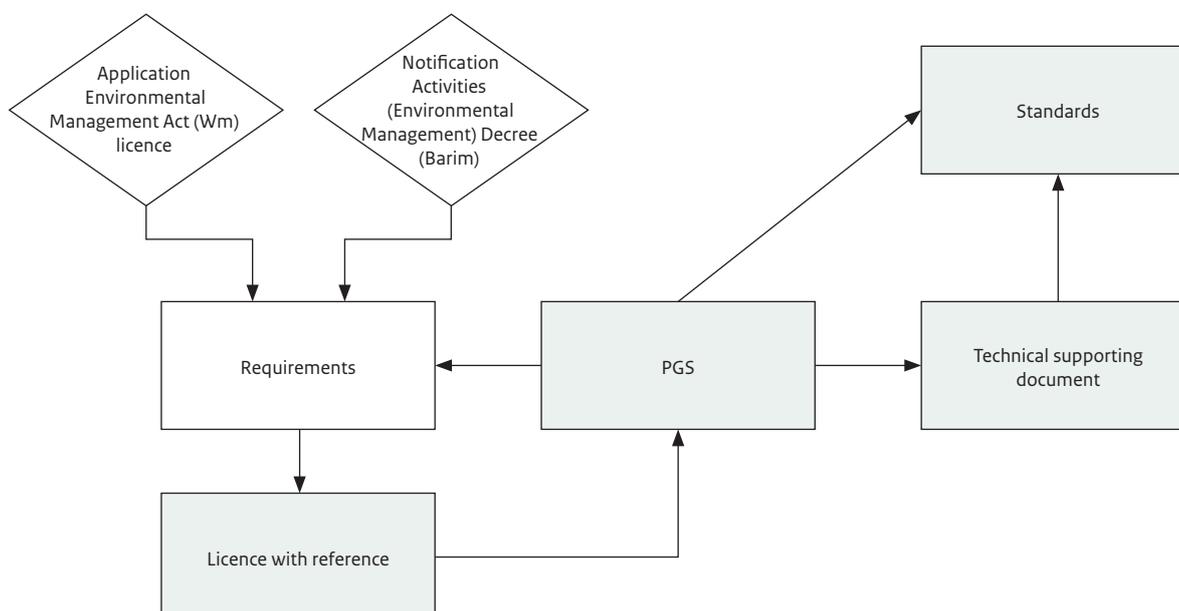
The storage and processing of radioactive substances emphatically do not fall under the scope of the laws and regulations listed below.

Legislation and regulations

- The Environmental Management Act (Wm);
- The series of publications on dangerous substances (PGS);
- The Environmental Permitting (General Provisions) Act (Wabo) - Ministerial Environmental Regulation (Mor) - Annex 1: Designated BREFs;
- *Accord européen relatif au transport international de marchandises dangereuses par route* (ADR).

The series of publications on dangerous substances (PGS) have been included in the Ministerial Environmental Regulation (Mor), Annex 1 and are thus designated BREFs. The application of the best available techniques (BBT) is enshrined in the Environmental Permitting (General Provisions) Act (Wabo) and in the Nuclear Energy Act (KEW), and thus forms the basis for the application of the series of publications on dangerous substances (PGS)³. The diagram below shows the relationship between the series of publications on dangerous substances (PGS) and the Environmental Management Act (Wm) licence; they apply in the same way to both integrated environmental permits and Nuclear Energy Act (KEW) licences.

³ The Ministerial Environmental Regulation (Mor) has no direct effect under the Nuclear Energy Act (KEW).



System of standards

When applying for a licence, the applicant must investigate which of the standards and provisions in all the PGS publications are applicable.

The application must indicate, in advance, how the provisions of the publications in question are to be met, or must include a declaration to the effect that the activity will meet these requirements.

The licensing authority may, by means of regulations attached to the licence, demand that the holder of the facility shows that adequate steps are being taken to meet the requirements of the publication in question. This may take place prior to the commissioning of the facility or after a specific period of operation. The PGS is also an important instrument for enforcement afterwards.

For application of the PGS, see the website www.publicatiereeksgevaarlijkstoffennl

The PGS publications which may be applicable are as follows:

- PGS9 Cryogenic gases;
- PGS12 Ammonia: storage and loading and unloading;
- PGS13 Ammonia: application as coolant for cooling units and pumps;
- PGS14 Guide to fire-fighting systems;
- PGS15 Storage of packaged dangerous substances;
- PGS28 Liquid fuels: underground storage installations and delivery systems;
- PGS29 Liquid petroleum products: aboveground storage in cylindrical installations;
- PGS30 Liquid fuels - aboveground storage installations and delivery systems;
- PGS31 Non-packaged liquid chemicals in tanks (2015).

PGS12 and 13 are listed here because there may be cooling systems which use ammonia at nuclear facilities.

Fire fighting may be incorporated in the safety provisions required for the nuclear part of the facility.

The point of departure here is that dangerous substances (for example cleaning and maintenance agents) will definitely be stored in some way at the facility.

Liquid fuels or petroleum products (for emergency diesel generators) and lubricants may, for example, be stored.

The principle of equivalence applies for the measures listed in the PGS. If the applicant opts for another, but equivalent measure, this will have to be substantiated in the application.

Finally, the ADR contains a classification of substances used to determine the area of application of the various PGS publications (particularly PGS15) and, thus, those required for the licence application.

4.6 Energy

Legislation and regulations

- The Activities (Environmental Management) Decree (Barim);
- The Environmental Management Act (Wm).

Europe has asked its member states to reduce their energy consumption and related emissions substantially. For companies, this has been laid down in the Energy Efficiency Directive (EED). Transport management is also a part of the energy audit. The energy audit must be carried out every four years. Companies with more than 250 employees or an annual turnover greater than €50 million and an annual balance sheet total greater than €43 million are obliged to carry out an energy audit. For more information, see <http://www.rvo.nl/eed>.

System of standards

The standards laid down in the legislation pursuant to Part 2.6 of the Activities (Environmental Management) Decree (Barim) apply to the environmental aspect 'energy'.

Existing companies can join the long-term agreement on energy efficiency 2001-2020 (*MJA3 covenant*). An element of this agreement is the drawing up of an energy saving investigation and annual reports on progress.

If a facility has not concluded the aforementioned agreement and is energy relevant, regulations will be included in the licence specifying a period after the licence has gone into force within which an energy saving investigation will be required (unless this investigation is already a part of the licence application).

If a facility is less energy relevant, details of how energy and water consumption will be managed may be requested in the licence application. The licence may also contain an obligation to keep an energy monitoring system.

4.7 Environmental management system

Legislation and regulations

A general duty of care and internalization as is customary in the current environmental policy and based on, among other things, the system of legislation and regulations pursuant to the Environmental Management Act (Wm).

System of standards

The company must have an internal company environmental management system (BIM), preferably integrated in the entire management system of the facility.

In its application, the company must declare that this environmental management system will be drawn up and that environmental management will be a systematic part of business operations.

The licence may stipulate that an environmental management system has to be operational within a year of commissioning. It may also contain an obligation to draw up an annual report and an annual management review.

Because environmental management is dynamic, an obligation is often imposed to set up a long-term environmental programme and to update this annually and indicate in it what environmental measures are being taken.

Besides the environmental management system, or as part of it, a system of records must be set up for environmentally-related aspects, such as an energy monitoring system, annual environmental management report and records of the consumption of raw and auxiliary substances, measurements, study reports, etc.

4.8 External Safety

Legislation and regulations

- The Environmental Management Act (Wm);
- The Major Accidents (Risks) Decree (BRZO) 2015;
- The Public Safety (Establishments) Decree (Bevi);
- The Public Safety (Establishments) Regulation (Revi);
- Local policy on external safety.

System of standards

Nuclear safety is the most important element in the national and international licensing of nuclear facilities. The licensing authority may request that conventional safety aspects be integrated in the safety studies carried out for the nuclear aspects. The conventional safety aspects which may play a role in licensing are considered below.

Public Safety (Establishments) Decree (Bevi)

The Public Safety (Establishments) Decree (Bevi) contains safety standards for companies which form a risk for people outside the company site. This concerns companies which fall under the Major Accidents (Risks) Decree (BRZO) 2015, including LPG service stations, storage sites and ammonia cooling units. This decree does not apply directly to nuclear facilities. The requirements primarily concern the localized risk and the group risk.

The presence of vulnerable objects (houses, for example) or partly vulnerable objects is important for the localized risk. A limit value of 10^{-6} per year⁴ must be observed for vulnerable objects. A target value must be observed for partly vulnerable objects (a company with a limited number of people present is, for example, partly vulnerable).

The Public Safety (Establishments) Decree (Bevi) monitors dangers which arise as a result of dangerous substances. An investigation into the localized risk and the group risk is also known as a quantitative risk analysis or QRA. The outcome of this analysis is mainly formed by the presentation of risk contours.

⁴ This means the chance per year of dying outside the facility as a direct result of an accident occurring at the facility.

The competent authority determines a risk contour around an area where one or more risky facilities is/are located or could be located. A new development is then tested against this contour. The contour also has consequences for the possible construction of vulnerable or partly vulnerable objects (in so far as there is no functional connection) within the contour. These points are described in the local (provincial) safety policy.

At a nuclear installation, the following activities may be applicable in relation to the Public Safety (Establishments) Decree (Bevi):

- ammonia cooling units with a volume of more than 1,500 kg (this also applies to containment systems);
- the storage of dangerous substances in quantities exceeding 10,000 kg per storage place;
- a facility which falls under the Major Accidents (Risks) Decree (BRZO) 2015.

Ammonia cooling units with a volume of less than 1,500 kg fall under PGS13, as do the larger installations.

Major Accidents (Risks) Decree (BRZO) 2015

The Major Accidents (Risks) Decree (BRZO) 2015 is the Dutch implementation of the European Seveso III Directive and regulates the prevention and management of severe accidents involving dangerous substances and imposes requirements on companies which work with dangerous substances on a large scale.

The threshold values given in Annex 1 of the Seveso III Directive for the dangerous substances and mixtures present determine whether a company falls under the Major Accidents (Risks) Decree (BRZO) 2015. In the case of nuclear facilities, the quantities of diesel (for emergency diesel generators) or ammonia (for cooling), among other things, would be relevant here.

The annex also indicates whether the facility in question is a low or high threshold facility (formerly subject to the Major Accident Prevention Policy (PBZO) or the safety report (VR)). Companies deemed high threshold facilities must draw up a safety report (VR).

The Major Accidents (Risks) Decree (BRZO) 2015 has a direct effect on the Nuclear Energy Act (KEW) for dangerous substances which are not also radioactive via Section 23 of the Nuclear Installations, Fissionable Materials and Ores Decree (Bkse).

A point to be addressed based on the Major Accidents (Risks) Decree (BRZO) 2015 is whether a severe accident can spread to neighbouring companies (domino effects).

Various safety studies will, furthermore, be carried out in connection with nuclear safety, including on the design and use of the installation. Requirements relating to the conventional aspects may also be involved. An integrated approach is most effective for these studies.

Finally, it should be noted that the deliberations and the external safety study will take place in the context of the environmental impact assessment (MER) study, so that these data and the assessments made will be available for submission with the licence application.

4.9 Fire safety

Legislation and regulations

- The Buildings Decree (*Bouwbesluit*) 2012;
- NEN 3011 (Safety colours and safety signs in workplaces and public areas);
- NEN 2535 (Fire safety of buildings - Fire detection installations - System and quality requirements and guidelines for detector siting);
- NEN 2575 (Evacuation alarm installations and evacuation schemes);
- NEN 2654-2 (Management and control of evacuation alarm systems);
- The Security Regions Act (Wvr)
- The Building Occupants (Fire Safety) Decree (*Besluit brandveilig gebruik bouwwerken*); Buildings Decree (*Bouwbesluit*) Section 1.18 if more than 50 people are present.

System of standards

The system of standards is discussed below.

Fire safety aspects are regulated in the Buildings Decree (*Bouwbesluit*) and comprise some of the conditions under which integrated environmental permits (for construction) are issued.

Fire is also one of the aspects which can lead to detrimental effects for people, animals, plants and property, which is why it falls within the scope of the Nuclear Energy Act (KEW). The criterion for the laying down of fire safety requirements in the Nuclear Energy Act (KEW) licence is whether the detrimental consequences for people, animals, plants and property can extend outside the facility as a result of fire.

In licensing pursuant to the Nuclear Energy Act (KEW), an integrated approach is pursued in which the actors involved, such as the security region, coordinate their activities to realize the required fire safety level.

The board of the security region can designate a Nuclear Energy Act (KEW) facility as being subject to a company fire brigade obligation. If this is the case, it may affect the requirements laid down in the Nuclear Energy Act (KEW) licence.

It is common for a facility to have a fire safety plan (and that this is also prescribed in the requirements) before it goes into operation. This fire safety plan lists the:

- Structural fire safety provisions (fire compartments, fire-resistant constructions, escape routes, etc.);
- Technical fire safety provisions (fire detection and fire-extinguishing systems, including control systems, maintenance and emergency power systems, etc.);
- Organizational fire safety provisions (emergency plan, emergency procedures, training, registration, etc.

The plan must be approved in advance by the local fire service and there must always be at least one contact person present during operation of the facility who, in the event of a fire, can provide the fire service with the necessary information. In the case of a nuclear facility, the plan must also be approved by the ANVS and may be combined with the fire safety aspects for the nuclear part.

Particular attention must be paid to the accessibility of the facility and infrastructure of the site as regards access for emergency service vehicles in its design. Fire-extinguishing equipment (extinguishing water pipes, pumps, water supplies) which the fire service will need to extinguish any fires and their accessibility and maintenance are also of prime importance. The requirements in this respect have been included in the Buildings Decree (*Bouwbesluit*) 2012.

The licence will stipulate that an up-to-date emergency plan is present. It is also common for requirements to be included regarding the presence of extinguishing equipment, accessibility of the facility etc. Because planning permission has a finite character, the Nuclear Energy Act (KEW) licence is an enforceable way of guaranteeing fire safety in the long term.

Conventional fire safety cannot be seen separately from the fire safety measures relating to the nuclear part of the facility.

4.10 Soil

The following phases can be distinguished with regard to the environmental aspect 'soil' during the lifetime of nuclear facilities:

- the design and construction phase;
- the operational phase;
- the occurrence of soil incidents due to leaks, mistakes, technical failures, accidents, etc., which have caused, or can cause, soil pollution;
- the closure and dismantling of the installation.
- Different laws and regulations play a role in the various 'stages of life' of nuclear facilities.

Furthermore, asbestos may have been used in the construction of nuclear facilities and/or, given the period in which many were built, may be present in the soil on the site. In this case, the asbestos legislation will also be important in the construction of new facilities or the decommissioning of old ones (see also Section 4.3 on waste).

Legislation and regulations

- The Soil Protection Act (Wbb) (duty of care for soil pollution, remediation of historical soil pollution);
- The Uniform Remediation Standards Decree and regulations (remediation of immobile soil pollution and/or small oil spots);
- The Soil Quality Decree (Bbk) and regulations (apply to the soil if buildings and/or facilities are constructed and/or decommissioned);
- The Ministerial circular on soil remediation 2013;
- The Environmental Impact Assessment Act, in so far as it concerns the aspect of soil;
- The Environmental Permitting (General Provisions) Act (Wabo)/Environmental Management Act (Wm), and/or the sections on soil included in them (dealing with unusual events, baseline and final situation surveys);
- The Activities (Environmental Management) Decree (Barim) (conventional facilities with standard soil-protecting provisions);
- The Housing Act (Wtw) and building legislation, and/or the sections on soil included in them (obligation to investigate plots on which buildings to be lived in by people will be realized);
- NEN 5717 and NEN 5725, protocols for preliminary studies prior to exploratory and main survey (for sediment and soil respectively);
- NEN 5707 and NEN 5740, protocols for exploratory and/or baseline surveys of soil (for asbestos and other substances respectively);
- NEN 5720, protocol for exploratory surveys of sediment;
- NTA 5755, protocol for further investigation of soil;
- The Netherlands Soil Protection Guideline 2012 (NRB).

System of standards

The Netherlands Soil Protection Guideline (NRB), which is linked to the Environmental Permitting (General Provisions) Act (Wabo)/Environmental Management Act (Wm) and which can be declared applicable, describes measures and provisions for realizing a negligible risk during the operation of the facility.

To this end, a soil risk document may be requested as part of the application or prior to the start of construction; this document must show that a final emission score of 1 for soil risk category A can be met.

The soil protection provisions prescribed in the PGS publications (see Section 3.5) must also be met.

A baseline survey must be submitted as part of the planning application. This is mandatory under the aforementioned NEN standards; an assessment can then be made of whether the soil is suitable for the intended building plan or will have to be remediated first.

The NEN standards for exploratory soil surveys stipulate that the soil must at least be tested for the standard list of substances for soil and groundwater, based on prior information about the substances used/stored.

The baseline and final situation surveys focus only on the materials which will be consumed by, used in and/or stored for the activities which are subject to an environmental licence in so far as these materials could cause soil pollution between the implementation of the baseline and final situation surveys.

In addition to the NEN standards, the Netherlands Soil Protection Guideline (NRB) contains a great deal of information about the way in which the baseline survey has to be carried out.

The baseline soil survey report must, in any case, contain the following information:

- information about activities at the company which could pollute the soil, existing provisions, the soil structure and the legal situation;
- a company site plan showing activities which could pollute the soil, the direction of flow of groundwater and the drilling plan;
- a summary of the analysis results, composite samples and sampling depths.

5 Documents consulted

5.1 Laws and regulations

The following laws, statutory regulations, standards and guidelines have been consulted (this is not an exhaustive list):

- The Nuclear Energy Act (KEW) including the ensuing decisions (administrative orders) and regulations (ministerial regulations);
- The Environmental Management Act (Wm) including decisions and regulations such as:
 - The Activities (Environmental Management) Decree (Barim and Rarim);
 - The 'Not Make a Significant Contribution' (air quality requirements) Decree (NIBM Decree);
 - The Ministerial regulation on air quality assessment 2007;
 - The Decree on Sensitive Land Uses (air quality requirements);
 - The Emission Limits (Combustion Plants) Decree (Environmental Management A);
 - The Emission Limits (Mid-sized Combustion Plants) Decree (Environmental Management);
 - The Major Accidents (Risks) Decree 2015 (BRZO) 2015;
 - The Public Safety (Establishments) Decree (Bevi and Revi);
- The Environmental Permitting (General Provisions) Act (Wabo) including decisions and regulations such as:
 - The Environmental Permitting Decree 2010 (Bor);
 - The Ministerial Environmental Regulation (Mor);
 - The annex to the Ministerial Environmental Regulation (Mor): Dutch reference documents on the best available techniques (BBT)⁵
- The Housing Act (Wtw) including decisions and regulations such as:
 - The Building Occupants (Fire Safety) Decree (*Besluit brandveilig gebruik bouwwerken*), (the Occupancy Decree);
 - The Buildings Decree (*Bouwbesluit*) 2012.
- The Noise Abatement Act (Wgh) including decisions and regulations such as:
 - The Noise Abatement Decree (Bgh);
 - The Industrial noise measurement and calculation manual (HMRI 1999) (guidelines);
 - The Guide to industrial noise and licensing (guidelines).
- The Soil Protection Act (Wbb) including decisions and regulations such as:
 - The Uniform Remediation Standards (*Besluit uniforme saneringen*) Decree and regulations;
 - The Soil Quality Decree (Bbk) and regulations;
 - The Ministerial circular on soil remediation 2013;
- The Water Act (Wtw)
- The Security Regions Act (Wvr)
- The Standard sheets
 - NEN 1010 Safety provisions for low-voltage installations;
 - NEN 1014 Standards for protection against lightning;
 - NEN 1059 Requirements for gas pressure regulating and metering stations;
 - NEN 2535 (Fire safety of buildings - Fire detection installations - System and quality requirements and guidelines for detector siting);
 - NEN 2575 (Evacuation alarm installations and evacuation schemes);
 - NEN 2654-2 (Management and control of evacuation alarm systems);
 - NEN 3011 Safety colours and safety signs in workplaces and public areas;
 - NEN 3650 Requirements for pipeline systems;
 - NEN 5717 Soil - Sediment - Strategy for the preliminary study for exploratory and main survey;
 - NEN 5707 Soil - Investigation, sampling and analysis of asbestos in the soil;
 - NEN 5720, protocol for exploratory surveys of sediment;
 - NEN 5725 Soil quality - Strategy for preliminary investigation prior to exploratory and main survey;
 - NEN 5740 Soil - Investigation strategy for exploratory survey;
 - NEN-EN-IEC 60079-0:2012 Explosive atmospheres: Electrical equipment;
 - NEN-EN-IEC 62305 Protection against lightning;
 - NTA 5755, protocol for further investigation of soil;
 - NPR 7910-1, Classification of hazardous areas with respect to explosion hazard;
 - ATEX 95, Requirements for equipment and protective systems;
 - ATEX 137, Explosion prevention;
 - ADR *Accord européen relatif au transport international de marchandises dangereuses par route*.

⁵ Other the best available techniques (BBT) documents mentioned elsewhere in this summary.

- Guidelines/plans
 - The general guidelines regarding light pollution;
 - The Dutch Emission Guidelines for Air;
 - The Netherlands Soil Protection Guideline (NRB);
 - The National Waste Management Plan 2;
 - Guidelines for calculating air quality
 - Series of publications on dangerous substances (PGS);
 - Recommendations drawn up by the Centre for Civil Engineering Research and Codes (CUR)/Plan for soil protection provisions (PBV) Environmental design criteria for company sewers (*Milieutechnische ontwerpcriteria voor bedrijfsrioleringen*).

- Provincial legislation/regulations/policy
 - The Policy Rule on the Zone Management System in Vlissingen-Oost Industrial Estate;
 - General provincial by-laws;
 - Policy vision on External Safety Risks (*Beleidsvisie Externe Veiligheid Risico's In Zicht*) (province of Zeeland, 7 October 2005).

- International documents (IAEA safety standards)
 - NS-R-3 Site Evaluation of Nuclear Installations;
 - GS-G-4.1 Format and Content of the Safety Analysis Report for Nuclear Power Plants.



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