AUTORITÉ DE SÛRETÉ NUCLÉAIRE

ASN GUIDES

Guide 23

ALL FIELDS

Drafting and modification of the waste zoning plan for BNIs

Version of 30/08/2016

Preamble

The ASN collection of guides is intended for professionals concerned by the nuclear safety and radiation protection regulations (licensees, users or transporters of ionising radiation sources, general public, etc.).

The guides set out recommendations with the aim of:

- explaining the regulations and the rights and obligations of the persons concerned by the regulations;
- explaining the regulatory objectives and, as applicable, describing the practices considered by ASN to be satisfactory;
- giving practical tips and information concerning nuclear safety and radiation protection.

Application of these guides does not in any way reduce the responsibility of a Basic Nuclear Installation licensee with regard to the safety of its installation.

ASN Guide no. 23 was edited on 30 August 2016.

Contents

1. INTRODUCTION

1.1. Reference texts

- [1] Environment Code, particularly title II of book I and titles IV and IX of book V
- [2] Labour Code, particularly title V of book IV of its fourth part
- [3] Public Health Code, particularly its articles R. 1333-3 and R.1333-4.
- [4] Decree 2007-1557 of 2nd November 2007 amended, relative to basic nuclear installations and to the regulation of the transport of radioactive substances in terms of nuclear safety.
- [5] Order of 7th February 2012, amended, setting out the general rules relative to basic nuclear installations, more specifically its articles 6.1 to 6.6
- [6] ASN resolution 2008-DC-0106 of 11th July 2008 concerning the implementation of internal authorisation systems in basic nuclear installations
- [7] ASN resolution 2015-DC-0508 of 21st April 2015 concerning the study of waste management and the inventory of waste produced in the BNIs
- [8] ASN Guide No 14 concerning the remediation of structures in BNIs – version of 30th August 2016
- [9] Draft ASN resolution on the packaging of radioactive waste – draft version of 9th July 2015
- [10] ASN Guide No 24 on the management of soils polluted by BNI activities – version of 30th August 2016

1.2. Scope

This guide concerns all BNIs, from commissioning to delicensing.

1.3. Purpose of the guide

The purpose of this guide is to explain the conditions for drafting and modification of the waste zoning plan mentioned in article 6.3 of the order of 7th February 2012 [5]. It implements the requirements of Title III of ASN resolution 2015-DC-0508 of 21st April 2015 concerning the waste management study and the inventory of waste produced in the BNIs [7] and presents how they are to be implemented.
It is supplemented by the provisions of guides [8] and [10] with respect to the management of the remediation of structures and of soils polluted by the activities of a BNI.

1.4. Document status

This is the final version of the guide. It incorporates the comments made at the public inquiry held on the ASN website from 14th December 2015 to 14th January 2016.

1.5. Definitions

The definitions used in this guide are those which appear in articles L. 541-1-1 and L. 542-1-1 of the Environment Code [1], articles R. 4451-18 and R. 4451-28 of the Labour Code [2], article 1.3 of the order of 7th February 2012 [5], and article 1-1 of the appendix to the resolution of 21st April 2015 [7] and in guide [10].

In this guide, the "modifications to the waste zoning map" correspond to temporary or definitive declassification or reclassification of waste zoning.

1.6. Glossary

The acronyms used in this guide are as follows:

- BNI: Basic Nuclear Installation
- RGE: general operating rules, as mentioned in article 20 of the Decree of 2nd November 2007 [4]
- ZDC: conventional waste zone
- ZppDN: zone in which nuclear waste production is possible

2. REMINDER OF GENERAL WASTE MANAGEMENT DOCTRINE IN BASIC NUCLEAR INSTALLATIONS (BNI)

Waste management in the BNIs is part of the general framework set by the Environment Code and its implementing decrees. It is based on the responsibility of the waste producers and the traceability of the waste from production up to its final destination. It is in conformity with the provisions set out in the decree of 2nd November 2007 [4], the order of 7th February 2012 [5] and the resolution of 21st April 2015 [7].

Waste management is more specifically based on the waste zoning plan, mentioned in article 6.3 of the order of 7th February 2012 [5] **and included in Title III of the appendix to the resolution of 21st April 2015** [7]**. This waste zoning plan is produced in order to demarcate areas with the possible production of nuclear waste** (**ZppDN**) **in which the waste produced is or is liable to be contaminated or activated.** The zones of a BNI which are not defined as ZppDN are conventional waste zones (ZDC).

To guarantee a high level of confidence in the non-radioactive classification of the waste produced in BNIs, several independent and successive lines of defence are put into place:

- the drafting of the waste zoning plan, which is based on an in-depth examination of the status of the BNI,
- the confirmation of the pertinence of the waste zoning plan, more specifically through radiological checks,
- more specifically by means of radiological checks, confirmation that the waste from conventional waste zones (ZDC) is non-radioactive.

After checking that there is no contamination or activation, the waste from the ZDC is sent to the authorised disposal routes, pursuant to article 3.1.4 of the appendix to the resolution of 21st April 2015 [7].

Waste from a ZppDN must be managed as radioactive waste unless it can be demonstrated that it could not have been contaminated or activated in any way or at any time, pursuant to article 3.1.3 of the appendix to the resolution of 21st April 2015 [7]. These management methods are clarified in §4 of this guide.

3. THE WASTE ZONING PLAN

3.1. Drafting and justification of the zoning plan and the reference waste zoning map

The main rules for drafting of the waste zoning plan and the reference waste zoning map are presented in the facility's general operating rules (RGE).

3.1.1. The waste zoning plan

For the entire perimeter of the nuclear facility, including outdoor areas, channels, underground areas and roadways, the waste zoning plan, mentioned in article 6.3 of the order of 7th February 2012 [5] and implemented by Title III of the appendix to the resolution of 21st April 2015 [7] presents and justifies the methodological principles concerning:

- **the demarcation of the ZppDN and the ZDC, enabling the reference waste zoning map to be drawn up,**
- **the procedures used for temporary or definitive declassification or reclassification of waste zoning,**
- **the traceability and conservation of the history of the zones in which the structures and soils are liable to have been contaminated or activated.**

The drafting of the waste zoning plan is based on detailed knowledge and analysis of the BNI and the processes used in it. The following should be taken into account:

- the design (use of radioactive substances or particle beams which could lead to activation of materials, static containment, dynamic containment, physical barriers, etc.) and the status of completion of the facility (partial commissioning, etc.),
- the operating modes of the facility, including those that are transitional (works, worksites, periodic checks and tests requiring a containment breach, transfers of radioactive substances, modification of ventilation, of containment, etc.). Waste zoning must be such that the waste produced in a ZDC cannot be contaminated or activated, including during their transfer within the BNI,
- the history and experience feedback from operation of the facility and, as applicable, from other comparable facilities[1] (incidents, remediation performed, modifications made, periodic
- radiological checks, historical presence of radioactive substances, etc.),
- the radiological status of the facility, more specifically with regard to the risks of dissemination of radioactive substances and the risks of activation of materials. The zones considered as presenting such risks in normal operation[2], are classified ZppDN,
- the radiological zoning stipulated in articles R. 4451-18 to R. 4451-28 of the Labour Code [2] and the implementing texts. The monitored or controlled zones may in particular be classified ZDC if they comprise no risks of contamination or activation of materials. Specially regulated areas (regulated stay, limited stay and prohibited areas) generally require ZppDN classification.

The zoning plan must be as simple as possible. It is nonetheless possible to define sub-categories within one or two types of zones (ZppDN or ZDC), provided that these new categories meet the definitions of the order of 7th February 2012 [5] and the resolution of 21st April 2015 [7].

[1] Case of pressurised water reactors for example. Some BNIs can also entail similar problems in terms of waste management (irradiators and accelerators, fuel processing facilities, etc.).

[2] Normal operation includes scheduled maintenance or outage situations.

Sub-dividing the areas is a way of ensuring that the checks and requirements are proportionate to the various waste categories produced in these areas.

It may more particularly be appropriate to differentiate between several ZDC sub-categories, such as:

- "reinforced memory" ZDC,
- "vigilance" ZDC,
- "no added radioactivity" ZDC.

In the "reinforced memory" ZDC, the waste produced is neither contaminated, nor activated, nor liable to be so in usual operating conditions, but reclassification as ZppDN must be envisaged when a worksite is carried out in the area and must be implemented during the facility decommissioning phase. This concerns areas which are contaminated or activated but where measures have been taken which, in normal operating conditions, preclude the contamination or activation of the waste produced in these areas and the equipment passing through them. This is more specifically areas with fixed contamination spots, areas which were contaminated and for which partial remediation of the structures has been carried out, or areas in which contamination could have migrated to the walls and the soils.

In the "vigilance" ZDC, the waste produced is neither contaminated, nor activated, nor liable to be so in usual operating conditions, but radioactive substances could be or could have been used, handled, transported, etc. This is more specifically areas which could be the subject of modifications to the waste zoning map (temporary reclassifications in particular), areas which are the subject of complete remediation as defined in guide [8], areas in which the history of the facility could not be clearly established or areas which are geographically close to nuclear waste areas with a high level of contamination (for example, the ZDC within the "nuclear island" of pressurised water reactors or within "forward" or "hot" areas of laboratories and plants).

In the ZDC "with no added radioactivity", the waste produced is neither contaminated, nor activated, nor liable to be so, because radioactive substances or particle emitters capable of leading to activation have never been used, handled, transported, etc. This is for example the case with administrative buildings.

Determining these types of sub-categories aims to improve the definition of the issues involved in a conventional waste area in the operating phase, but also with a view to decommissioning of the facility. Particular attention must be paid to the ZDC at final shutdown, during the operations in preparation for decommissioning and during decommissioning.

Therefore, identifying a "vigilance" ZDC, enables attention to be focused on areas liable to produce radioactive waste during modifications. Their (temporary or definitive) reclassification as a ZppDN must be reassessed when modifying the facility and in particular if the envisaged modification is such as to place radioactive substances in suspension or produce activated waste.

Similarly, "reinforced memory" ZDCs must undergo a specific assessment with a view to the performance of works. During decommissioning operations, they must systematically be reclassified as ZppDN. However, depending on the schedule of these operations, this reclassification may be deferred, to allow prior disassembly of equipment not affected by the contaminated or activated area. For example, the disassembly of a single element in an area classified as a "reinforced memory" ZDC owing to fixed contamination which is remote from this equipment, would not entail reclassification of the area.

For example, if a room classified as ZDC is contaminated by a radioactive fluid and the concrete of the walls or soil is therefore liable to be contaminated in depth, the area should first of all be reclassified as a ZppDN. Secondly, the reference strategy should be complete remediation of the area as defined in guide [8]. A distinction should then be made between the following three cases:

- complete remediation out has been performed and, following decontamination, the area is then declassified as a "vigilance" ZDC. The history of contamination and the remediation operations must be kept (in particular the radiological spectrum and the adopted decision threshold levels),
- if only partial remediation is possible or if remediation cannot be envisaged, but it is possible to install a physical barrier to contain the contamination (e.g.: paint) and thus guarantee the absence of contamination of the waste produced in the area, it can then be declassified to a ZDC. It will then be considered to be a “reinforced memory” ZDC. A situation such as this implies the use of particular operating measures, more specifically with:
  - periodic checks to verify the condition of the physical barrier deployed to guarantee containment of the contamination,
  - adequate signalling of the barrier (e.g.: paint) so that the personnel do not puncture or remove it without precautions, or any equivalent system designed to guarantee that such an objective is met,
  - reclassification (temporary or definitive) of the area as a ZppDN if the barrier is degraded, for performance or works or during decommissioning of the facility. If contamination is situated on a slab, it is necessary to verify that the contamination has not migrated to it or into the ground below, when the facility is decommissioned,
- if the contamination cannot be removed or contained, the area must remain classified as a ZppDN.

NB: When an area needs to be reclassified as a ZppDN, this generally concerns the entire area. However, reclassification only concerning a part of the area is acceptable provided that the absence of the risk of transfer of contamination or activation can be demonstrated and that there is clear demarcation of the new areas thus defined.

3.1.2. The reference waste zoning map

The reference waste zoning map as defined in article 1.1 of the appendix to the resolution of 21st April 2015 [7] is the detailed map of a BNI identifying the ZppDN and the ZDC, as defined by the waste zoning plan.

If waste zoning comprises sub-categories, ASN recommends showing them on the reference waste zoning map.

The reference waste zoning map is updated for those parts of the facility concerned when there is definitive declassification or reclassification of waste zoning. It is not updated in the case of temporary modifications. In addition to the reference waste zoning map, an “operational” waste zoning map (computerised for example) may be created in order to provide a real-time identification of the classification of the areas, notably in the case of temporary reclassification of a ZDC as a ZppDN. It may be appropriate to post extracts from this “operational” map in the facility (for a building, set of rooms on a given level in a building, etc.). Organisational measures enable updates to be managed and ensure that they are traceable.

Posting this "operational" map does not preclude the need for waste zoning signage pursuant to Chapter 3.3 of the appendix to the resolution of 21st April 2015 [7] which enables the actual ZppDN or ZDC classification to be identified at the entrance to each area, along with any sub-categories determined.

3.2. Confirmation of the pertinence of the waste zoning plan and conformity of the waste zoning map with it

The radiological checks mentioned in Chapter 3.5 of the appendix to the resolution of 21st April 2015 [7], must be carried out for subsequent validation of the pertinence of the waste zoning plan and the conformity of the reference waste zoning map with it. These checks are also able to verify that these documents are up to date.

These checks and their frequency are appropriate to the radionuclides present in the facility and to the operations liable to contaminate the objects, equipment, products, etc., present in it or to the stream of particles liable to activate them. For the ZDC, they should notably be able to verify:

- that there is no stream of particles liable to activate the materials,
- that there is no labile contamination liable to induce contamination of the waste produced in these zones or of the equipment passing through them. The absence of labile contamination must be demonstrated on the basis of the best available techniques. The detection limits associated with the measuring instruments are determined according to the decision thresholds, the spectra to be measured, the background noise and the characteristics of the zones to be inspected,
- that there is no impact by contaminating systems (tightness checks, etc.),
- that the compensatory measures implemented in the event of a breach in the physical barriers separating the ZppDN from the ZDC are effective.

If the above-mentioned ZDC categories are put into place, the frequency of the checks should be tailored and proportionate to the zone sub-category: greater in the "reinforced memory" and "vigilance" ZDCs than in the ZDCs "with no added radioactivity".

The main rules designed to confirm the pertinence of the waste zoning plan and the conformity of the reference waste zoning map with it (or the operational map if utilised) are defined in the general operating rules. They lead to the definition of an inspection programme.

The pertinence of the waste zoning plan and the conformity of the reference waste zoning map with it will be periodically assessed, for instance during the facility's periodic safety reviews, on the basis of the elements to be considered, mentioned in § 3.1 of this guide.

The annual review of the modifications to the waste zoning map mentioned in article 4.2.3 of the appendix to the resolution of 21st April 2015 [7] and the contents of which are specified in §5 of this guide, contribute to confirming the pertinence of the waste zoning plan and the conformity of the reference waste zoning map with it.

3.3. Prevention of the transfer of contamination and activation of materials

3.3.1. Arrangements for the prevention of transfer of contamination and activation of materials

A zone generally consists of a set of rooms, a room or a part of a room (e.g.: effluents tank, glovebox, etc.), for which there are boundaries or physical barriers to prevent all transfer of contamination or activation between this zone and the other types of zones thus defined. **The checks on the physical barriers mentioned in article 3.4.2 of the appendix to the resolution of 21st April 2015 [7] and their frequency, are to be tailored to the possible modes of degradation of their ability to limit transfers of contamination or their capacity to limit activation of materials.**

In the event of a breach in the physical barriers between a ZppDN and a ZDC, notably in those areas constituting passageways for personnel and equipment, compensatory measures to prevent the dissemination of radioactive substances or activation, as mentioned in article 3.4.1 of the appendix to the resolution of 21st April 2015 [7], are more specifically based on:

- design measures (ventilation, dynamic containment),
- operating conditions (wearing of oversuits, overshoes, systems to fix the contamination, etc.),
- checks to ensure that there is no contamination of personnel, objects, tools, packagings, transiting from a ZppDN to a ZDC.

The checks performed on the physical barriers or the compensatory measures implemented also make it possible to verify the **compliance of the reference waste zoning map with the facility's operating conditions. The main rules for preventing contamination transfer or activation are defined in the facility's general operating rules** (**RGE**).

3.3.2. Transit of objects, equipment and tools to a zone with the possible production of nuclear waste

Whenever possible, the licensee has equipment dedicated to the ZppDN and which is not used in or does not transit through a ZDC.

The transit to the ZppDN of equipment, objects, tools, etc. intended for reuse in a ZDC or outside the BNI, as mentioned in articles 3.4.3 and 3.4.4 of the appendix to the resolution of 21st April 2015 [7], must be the subject of special rules designed to prevent their contamination or their activation. **The main management rules are defined in the facility's general operating rules** (**RGE**).

Using a principle similar to that for waste management, independent and successive lines of defence must ensure the absence of contamination or activation of equipment, objects, tools, etc. which are to be reused outside a ZppDN, for example, by means of:

- a preliminary risk assessment. This assessment aims to identify the potential contamination or activation risks. As necessary, protective measures may be taken, notably to prevent the contamination of the equipment in parts that are difficult to access or parts where the non-contamination check would be hard to perform,
- appropriate checks, systematically including radiological checks (spectrometry, smear tests, etc.). The absence of labile contamination may be demonstrated in the conditions set out in §3.4.1 of this guide.

The licensee assesses all contamination or activation of equipment, tools or objects which transited through a ZppDN. Contamination or activation deviations are detected, examined and dealt with in accordance with the provisions of Chapter VI "Deviations management" of Title II of the order of 7th February 2012 [5].

3.4. Radiological checks on waste

3.4.1. Checks to confirm the absence of contamination and activation

The radiological checks stipulated in article 3.1.4 of the appendix to the resolution of 21st April 2015 [7], should be carried out to confirm the absence of contamination or activation of the waste from a ZDC. They should be able to guarantee that the waste from the ZDC is neither contaminated nor activated as a result of its production location or its transit or transport within the facility.

These checks, which should be systematic rather than spot checks, are performed using the best available techniques and with appropriate means.

The main radiological inspection rules are defined in the facility's general operating rules (RGE). They may lead to the definition of an inspection programme and notably comprise:

- the choice of the inspection locations, appropriate to the origin of the waste. If the ZDC sub-categories presented in §3.1.1 of this guide are used:
  - for waste produced in a "reinforced memory" ZDC, it is preferable for the checks to be performed on the one hand on exiting this type of zone and, on the other, on exiting the BNI or the facility. The checks on exiting a "reinforced memory" zone aim to prevent the risks of dissemination and to redirect the waste as close as possible to the source. The checks performed on exiting the BNI or facility enable measurements to be taken at a place where the facility's background noise is the lowest. The equipment and tools which transited through or were used in a ZppDN should also undergo these two checks,
  - for waste in a "vigilance" ZDC, an assessment must be carried out to define any checks required in addition to the site exit check, which should be performed at the very least,
  - for the waste produced in a ZDC "with no added radioactivity", a site exit check is necessary and may be sufficient,
- measurement methods and techniques (choice of instruments, surface measurements, mass measurements, etc.) taking account of the radionuclides involved and the typical spectra and potential activation phenomena. Particular attention must be given to the measurement methods adopted in the presence of α radiation or low-energy β radiation, which are harder to measure,
- the detection limits of the measuring instruments, the decision-making criteria and the measurement uncertainties. The measurements taken must be based on the best available techniques. The limits associated with the measuring instruments are determined according to the decision thresholds, the spectra to be measured, the background noise and the characteristics of the zones to be inspected.

All contamination or activation of waste from conventional waste zones constitutes a deviation to be examined and dealt with in accordance with the provisions of Chapter VI "Deviations management" of title II of the order of 7th February 2012 [5]. The analysis of the deviation aims more specifically to verify the pertinence of the waste zoning plan and the conformity of the waste zoning map with it. As necessary, this plan is modified in the conditions set out in §4 of this guide.

3.4.2. 3Checks on waste from the ZppDN

Pursuant to article 6.2-II of the order of 7th February 2012 [5], **waste from a ZppDN undergoes radiological, physico-chemical and, if necessary, biological characterisation**, notably with a view to its packaging as set out in article 6.7 of the order of 7th February 2012 [5] and by the draft resolution [9].

The main characterisation rules are defined in the facility's general operating rules (**RGE**). The measurement systems (measurement by dose rate, spectrometry, neutron measurement, counting time, uncertainties) are appropriate to the radionuclides (α, β, γ emitters) present in the waste.

4. WASTE ZONING AND MANAGEMENT ROUTES

4.1. Waste from conventional waste zones

Pursuant to article 3.1.4 of the appendix to the resolution of 21st April 2015 [7], the waste from ZDCs and for which the absence of radioactivity has been confirmed in the conditions set out in §3.4.1 of this guide, is dealt with and managed in accordance with its characteristics in routes specifically designed for hazardous, non-hazardous or inert waste. The identification of management routes is more specifically based on the waste codification set out in appendix II of article R. 541-8 of the Environment Code [1]. These wastes can also be utilised outside the nuclear sector for the manufacture of consumer goods or building materials.

The management of these wastes must comply with the provisions of title IV of book V of the Environment Code [1]. It places emphasis on the preparation of the waste for reutilisation, recycling or any other reuse, in acceptable technico-economic conditions. Disposal in repositories is reserved for ultimate waste alone.

4.2. Waste from zones where nuclear waste production is possible

Waste from a ZppDN must be managed as radioactive waste (general case) unless it can be demonstrated that it could not have been contaminated or activated in any way or at any time, pursuant to article 3.1.3 of the appendix to the resolution of 21st April 2015 [7] (special case).

General case – I of article 3.1.3 of the appendix to the resolution of 21st April 2015 [7]:
Waste from a ZppDN is managed in accordance with the provisions of the Environment Code and more particularly in accordance with the national radioactive materials and waste management plan and the decree determining the prescriptions, pursuant to article L. 542-1-2 of the Environment Code [1].

Waste from a ZppDN must thus be managed in routes where the fact that it is contaminated, activated, by radioactive substances, or liable to be so, is taken into account with respect to the objectives mentioned in article L. 542-1 of the Environment Code [1]. These routes consist of facilities covered by the BNI system or installations classified on environmental protection grounds or, as applicable, facilities subject to the Public Health Code.

Special case – II of article 3.1.3 of the appendix to the resolution of 21st April 2015 [7]:
Pursuant to the provisions of II of article 3.1.3 of the appendix to the resolution of 21st April 2015 [7], the licensee must submit a file to ASN for approval, demonstrating that the waste produced in a ZppDN could not have been contaminated or activated, in any way or at any time.
The licensee's file should notably guarantee the absence of contamination or activation on the basis of:

- the history, the design of the facilities, their operation, etc.,
- the radiological cleanness measures applicable in the premises or parts of the premises in which the waste is produced,
- radiological measurements.

This demonstration cannot be limited to measurements on the waste produced.

Application examples are given in §6.2 of this guide.

The ASN resolution is opened up for public consultation on the website. If this resolution authorised management of waste from a ZppDN as waste not liable to be contaminated or activated, it is managed as waste from a ZDC in accordance with the provisions of article 3.1.4 of the appendix to the resolution of 21st April 2015 [7] and §4.1 of this guide.

5. DECLASSIFICATION AND RECLASSIFICATION OF WASTE ZONING

The classification of a zone as ZppDN or ZDC can change, either temporarily or definitively, to take account of changes made to the facility or to its operating conditions. These modifications are generally linked to a change in one of the criteria set out in article 3.2.1 of the appendix to the resolution of 21st April 2015 [7] and in §3.1 of this guide.
The modifications of the waste zoning map can thus be linked to:

- scheduled and controlled events, notably changes to the design of the facility, to its operating mode, to decommissioning or remediation work, occurring in the zone or an adjacent zone, to the installation of radioactivity containment,
- to unscheduled events, more specifically as a result of incidents, the impossibility of returning to the initial conditions, non-conforming results of radiological checks,
- a reassessment of the adequacy of the zoning plan (radiological checks, contribution of new elements in the history of the facility, etc.).

Pursuant to article 3.6.5 of the appendix to the resolution of 21st April 2015 [7], all the temporary or definitive declassifications and reclassifications of waste zoning are logged and archived. The traceability conditions must thus be defined and justified. For example if, following a modification to the waste zoning map, the decision is taken to leave in situ contamination that has migrated within the structure, or to fix contamination, the memory of this contamination must be conserved (place, type, origin, corresponding radiological spectrum, etc.), notably by identifying it on a diagram (e.g.: reference waste zoning map) and if possible displayed in the area concerned. This archived information concerning contamination or activation of structures and soils is used to draw up the decommissioning plan and the post-operational clean-out methodology during the decommissioning operations.

The modifications to the waste zoning map, even temporary, lead to an update of the signage set out in Chapter 3.3 of the appendix to the resolution of 21st April 2015 [7] so that the ZppDN or ZDC classification can be identified by the personnel liable to be working in the zone.

An annual summary of the modifications to the waste zoning map is enclosed in the report mentioned in article 4.2.3 of the resolution of 21st April 2015 [7]**.** It can be used to verify the pertinence of the waste zoning plan and the conformity of the reference waste zoning map with the operating conditions. With this in mind, the licensee presents the events (whether or not scheduled) leading to the modification to the waste zoning map and any difficulties encountered (difficulty with return to initial conditions, etc.).

When one of the waste zoning sub-categories is implemented in the conditions set out in § 3.1.1 of this guide, the modifications of this sub-category not compromising the ZppDN or ZDC classification are also logged, archived and displayed in the facilities. These modifications do not fall under the provisions of Chapter VII of title III of the decree of 2nd November 2007 [4] but it is useful for the licensee to integrate the analysis of these modifications into the annual summary of the modifications to the above-mentioned waste zoning map.

Similarly, if the "operational" map mentioned in §3.1 of this guide is implemented, the temporary or definitive changes to the waste zoning also lead to an updating of this map and its display in the facility.

5.1. Temporary modifications to waste zoning

The temporary modifications to the waste zoning are generally as a result of changes to the operating conditions, to works, to maintenance operations, periodic tests or incidents (contamination or activation) in the zone in question. The maximum duration authorised for these modifications is defined by the licensees. **These modifications should not exceed a period of 6 months, except in special cases.**

The temporary modifications to the waste zoning are logged and archived but do not lead to an update of the reference waste zoning map.

5.1.1. Temporary reclassification of waste zoning

Temporary reclassification of the waste zoning corresponds to a modification of the waste zoning map so that a ZDC becomes a ZppDN, before being returned to ZDC status. Temporary reclassification of the waste zoning does not represent a notable modification as defined by article L. 593-15 of the Environment Code, when performed in accordance with the conditions defined by the RGE and the documents to which they make reference.
The facility's RGE must specify the main rules for temporary reclassification of the waste zoning on the basis of several independent, successive lines of defence, in order to guarantee the return of the zone to ZDC status.

The facility's RGE specify:

- the maximum frequency of reclassification, that is the frequency beyond which it is preferable to reclassify the zone as a ZppDN definitively. Excessively frequent reclassifications in principle indicate that the reference waste zoning map is unsuitable,
- the maximum duration of temporary reclassifications, which should not exceed six months, except in special cases,

- the conditions for their implementation: prior justifications, as applicable, of the absence of activation or migration of contamination to the structures of the zone, special steps taken to prevent the dispersal of radioactive substances taking account of the possibility of transfer, migration, etc.), monitoring provisions to guarantee that the zone could effectively be reclassified as a ZDC,
- the information, signage or demarcation procedures regarding a change in waste zoning, in order to enable the personnel to ensure appropriate management of the waste produced,
- the procedures for the traceability and processing of deviations or incidents in the case of temporary reclassifications, linked to unscheduled events. If a zone is reclassified owing to excessively frequent unscheduled events, it must be reclassified as a ZppDN.
- a radiological inspection programme must be implemented in order to confirm the safe restoration of the initial conditions. This programme must describe and justify the type of measurements taken (methods and techniques used for measurement and, as applicable, for sampling, detection thresholds, etc.). It is based on the provisions covered in §3.2 of this guide. The detection limit of the measuring instruments shall, as far as possible, be less than 0.2 Bq/cm^2 for β/γ emitters and 0.02 Bq/cm^2 for α emitters.

5.1.2. Temporary declassifications of waste zoning

Temporary declassification of the waste zoning corresponds to a modification of the waste zoning map so that a ZppDN becomes a ZDC, before being returned to ZppDN status.
Temporary declassifications, which must be kept to the strict minimum, should only be envisaged in exceptional circumstances and if specifically justified for particular technico-economic reasons for example. **These temporary declassifications of the waste zoning must, barring the particular case mentioned below, be authorised in accordance with article 26 of the decree of 2nd November 2007** [4]**.** The file submitted in support of this authorisation application must comprise all the assessment data needed to substantiate the conventional nature of the waste produced, demonstrating the effectiveness of at least two independent, successive lines of defence. It must specify the reasons for which the zone cannot continue to be maintained as a ZDC.
Pursuant to the provisions of article 3.6.1 of the appendix to the resolution of 21st April 2015 [7], **temporary declassifications of the waste zoning may only be notified under article 27 of the decree of 2nd November 2007** [4] **if the ASN resolution setting out the list of operations subject to notification explicitly mentions it.**

5.2. Definitive modifications to waste zoning

In accordance with section 3.6.2 of the appendix to the resolution of 21st April 2015 [7]**, the definitive modifications of the waste zoning lead to an updating of the reference waste zoning map.**

5.2.1. Definitive reclassifications of waste zoning

Definitive reclassification of the waste zoning does not represent a notable modification as defined by article L. 593-15 of the Environment Code. It is performed in the conditions defined by the RGE and the documents to which they make reference.

5.2.2. Definitive declassifications of waste zoning

The definitive declassification of waste zoning, mentioned in Chapter 3.6 of the appendix to the resolution of 21st April 2015 [7], corresponds to a notable modification as defined in article L. 593-15 of the Environment Code. When subject to ASN authorisation in accordance with article 26 of the decree of 2nd November 2007 [4], the file submitted in support of the authorisation application must be able to guarantee return of the zone to ZDC status, on the basis of several independent, successive lines of defence. Definitive declassifications of waste zoning may also be notified in accordance with the provisions of article 27 of the decree of 2nd November 2007 [4], in the conditions specified below.
A distinction must be made between a declassification of waste zoning that requires remediation operations and that which does not.

a. Declassification of waste zoning not requiring remediation

The authorisation application for declassification of a ZppDN not requiring remediation work must comprise all data for assessing the conventional nature of the waste produced. The file submitted must more specifically demonstrate:

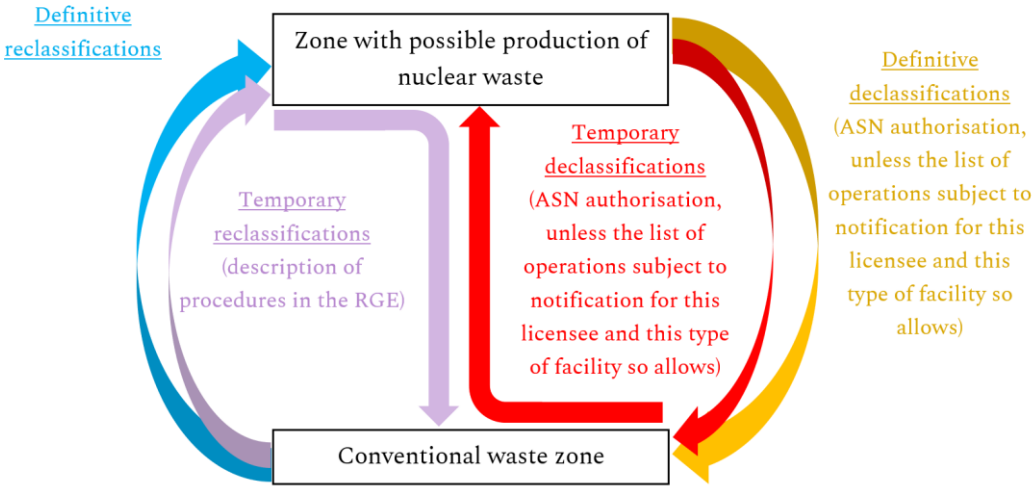
- the absence of contamination of the zone to be declassified and the absence of activation or migration of contamination to the structures of the room, on the basis of the criteria mentioned in article 3.2.1 of the resolution of 21st April 2015 [7] and §3.1 of this guide (design, operating mode, history),
- the absence of future contamination of the zone. The file must present the status of the physical barriers separating the zone to be declassified from the other ZppDN. It must present any steps taken, such as modification of the operating conditions, a change in equipment or any other measure designed to prevent contamination of the zone.

A radiological inspection programme must be put into place in order to confirm the soundness of the zone declassification application, notably by demonstrating the absence of contamination over a period representative of the zone operating conditions. This programme must describe and justify the type of measurements taken (methods and techniques used for measurement and, as applicable, for sampling, detection limits, etc.). It is based on the provisions covered in §3.2 of this guide. The detection limit of the measuring instruments shall, as far as possible, be less than 0.2 Bq/cm^2 for β/γ emitters and 0.02 Bq/cm^2 for α emitters.
The definitive declassifications of zones for which there has been no activation or migration of contamination to the structures are liable to be the subject of notification as per article 27 of the decree of 2nd November 2007 [4], provided that the criteria set by ASN to establish the list of operations subject to notification cover such operations.

b. Declassification of waste zoning requiring remediation

When definitive declassification concerns a zone in which there has been migration of contamination to the structures or soils, or an activation phenomenon, the licensee shall send ASN the remediation methodology envisaged, as well as any corresponding provisions. These provisions are specified for structures in guide [8] and for soils in guide [10]. It should be recalled that the licensee must more specifically quantify the physical phenomenon enabling it to connect the activity liable to be present inside the structure concerned by remediation to its depth and define the total thickness of remediation, taking account of precautionary margins.

If the licensee has a remediation methodology approved by ASN applicable to the zone concerned, its declassification is liable to be the subject of notification as per article 27 of the decree of 2nd November 2007 [4], provided that the criteria set by ASN to establish the list of operations subject to notification cover such operations.
If the licensee does not have a remediation methodology approved by ASN applicable to the zone concerned, the licensee must transmit the envisaged methodology beforehand. In the absence of an ASN agreement on the envisaged remediation methodology, this type of operation may not be subject to notification.



Waste zoning modifications diagram

6. PARTICULAR CASES

6.1. Demarcation of waste zoning on the equipment

The waste zoning generally concerns premises, but can also concern parts of premises or particular equipment. This "detailed" zoning enables waste management to be optimised and allows management in the appropriate management routes. It must be shown on the reference waste zoning map.

For example, a room containing a glovebox can be classified ZDC (provided that the criteria mentioned in section III of the appendix to the resolution of 21st April 2015 [7] and to § 3.1 of this guide are adhered to) and only the glovebox itself is classified ZppDN. The reference waste zoning map must thus identify the room as ZDC and the glovebox as ZppDN.
Similarly, a room containing radioactive effluent tanks may be classified ZDC. The reference waste zoning map must identify the room as ZDC and the effluent tanks (and even their retention pans) as ZppDN.

6.2. Processing of certain waste in the conventional route

Temporary declassification of a zone in which nuclear waste production is possible
Certain zones in a BNI entail no risk of either contamination or activation but, because they are located in the middle of zones with the possible production of nuclear waste, are sometimes classified ZppDN (rather than

ZDC). The operating conditions do not always make it possible to transfer the waste produced without the risk of it being contaminated or activated.
In the case of works producing large quantities of waste or special waste[3], more restrictive operating conditions could be put into place to guarantee the absence of contamination (or activation) of the waste when it is transferred[4]. In cases such as this, the licensee must file a modification authorisation application in accordance with article 26 of the decree of 2nd November 2007 [4] concerning temporary declassification of waste zoning.

Processing of certain equipment in the conventional route
Certain equipment inside a ZppDN is isolated in this zone and not liable to be contaminated or activated. Its handling in a conventional route can thus be envisaged. Pursuant to II of article 3.1.3 of the appendix to the resolution of 21st April 2015 [7] the licensee must submit a file demonstrating the absence of contamination or activation of this equipment on the basis of the elements mentioned in §4.2 of this guide.

For example, handling in a conventional route of neon tubes or cells and batteries placed in sealed boxes could be envisaged. The waiver application files contain:

- a reliable and robust demonstration that this equipment could not have been contaminated or activated in any way and at any time, with presentation of justifications concerning:
  - the integrity of the physical barriers,
  - the procedures implemented for preventing contamination (or activation) of this equipment during inspections or maintenance work that could breach the containment provided by the boxes, as well as on their removal from these boxes,
  - the operating history (results of radiological cleanness checks),
- demonstration of the absence of contamination or activation of these wastes by measurements taken as close as possible as well as in areas with a low background noise. The detection limit of the measuring instruments shall, as far as possible, be less than 0.2 Bq/cm^2 for β/γ emitters and 0.02 Bq/cm^2 for α emitters.

Unlike the particular case mentioned in §6.1 of this guide, this equipment is not necessarily identified on the reference waste zoning map. Its handling in a conventional route must however be presented in the waste zoning plan.

6.3. Radioactive waste storage

The zoning of a radioactive waste storage facility is determined according to the packages used and the type of operations carried out in it. It is possible that radioactive waste could be stored in or transit through conventional waste zones, more particularly on condition that:

- it is contained in packages ensuring that there is no diffusion of contamination between the interior of the package and the exterior,
- the absence of labile contamination on the package has been checked with an appropriate inspection protocol.

[3] Wastes with technico-economic issues which vary according to how they are managed.
[4] For example, when replacing the chillers installed in a ZppDN in an NPP, the licensee had requested temporary declassification of the waste zoning and provided substantiation in terms of operating history, measurements, etc., in order to demonstrate the acceptability of the temporary declassification. This request was accepted.

6.4. Outdoor zones in which nuclear waste production is possible

The waste produced in outdoor areas and roadways is in principle conventional waste. However, certain areas (contaminated effluent transfer areas) are liable to lead to the production of contaminated waste. Certain outdoor zones are therefore classified as ZppDN. The limits of these zones must be physically represented. The steps taken to avoid the dispersion of contamination, more specifically in terms of entrainment of contamination by water (waterproofing of the soil surface, installation of a specific, controlled drainage network, etc.) must be identified in the waste zoning plan and implemented.

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