STORAGE FACILITIES FOR (NON) CONDITIONED LOW AND MEDIUM-LEVEL WASTE ON THE TERRITORY OF DESSEL (BELGIUM)

Communication on ONDRAF/NIRAS investment projects in application of Council regulation No 2587/1999 of 2 December 1999 defining the investment projects to be communicated to the Commission in accordance with Article 41 of the Treaty establishing the European Atomic Energy Community

BY THE NATIONAL AGENCY FOR RADIOACTIVE WASTE AND ENRICHED FISSILE MATERIALS

INTRODUCTION **3**

PART 01 ..... **4**

1.1 / NAME AND ADDRESS OF THE PERSON OR UNDERTAKING NOTIFYING OF THE INVESTMENT PROJECT AND, WHERE APPROPRIATE, NAME OF A RESPONSIBLE PERSON TO WHOM SUPPLEMENTARY QUESTIONS MAY BE ADRESSED IF NECESSARY. 5

1.2 / NAME OF THE INVESTMENT PROJECT. 5

1.3 / INDUSTRIAL ACTIVITIES UNDER WHICH THE INVESTMENT PROJECT COMES PURSUANT TO ANNEX II OF THE TREATY. 5

1.4 / IS IT TO BE A NEW INSTALLATION, A REPLACEMENT OR A CONVERSION? 5

1.5 / REFERENCE TO DOCUMENTS PREVIOUSLY COMMUNICATED TO EURATOM IN RESPECT OF THE INVESTMENT PROJECT (DATE OF CORRESPONDANCE). 5

1.6 / NAME AND ADDRESS OF THE PERSON(S) OR UNDERTAKING(S). 5

1.7 / METHODS OF FINANCING. 6

LEGAL BASE 6

1.8 / GEOGRAPHICAL LOCATION. 7

1.9 / BRIEF DESCRIPTION AND GENERAL PLANS. 8

STORAGE BUILDING 151E 8
STORAGE BUILDING 165X 8
STORAGE BUILDING 167X 9
LOCATION OF THE STORAGE BUILDINGS 9

1.10 / COSTS OF INITIAL INSTALLATION (IN EURO) AND BREAKDOWN FOR THE MAIN COMPONENTS OF THE COSTS. 10

1.11 / PROPOSED TIME-SCALE FOR THE PLACING OF MAIN ORDERS, INSTALLATIONS AND START-UP, PARTICULARLY THE CONCLUSION OF INITIAL CONTRACTS WITH SUPPLIERS OF THE COMMENCEMENT OF CONSTRUCTION WORK, AND THE PLANNED COMMISSIONING DATE. 10

1.12 / DESCRIPTION OF PLANS IF ANY, FOR THE DECOMMISSIONING OF THE INSTALLATION. 11

1.13 / OFFICIAL STATE AUTHORITY SUPPLYING THE LICENCES FOR CONSTRUCTION AND OPERATION: DURATION OF LICENCE FOR OPERATION. 11

1.14 / SHORT DESCRIPTION OF RESEARCH AND DEVELOPMENT PROGRAMMES, IF ANY. 11

PART 02 ..... **13**

2.1 / COMPOSITION AND NATURE OF THE PRODUCTION; ANNUAL CAPACITY. 14

2.2 / MAIN FEATURES OF THE INSTALLATION. 14

2.3 / IF AN EXTENSION TO THE INSTALLATION IS PROPOSED, STATE BY WHAT PROCESS, OVER WHAT PERIOD AND IN WHAT PROPORTION IT IS PLANNED TO CHANGE ANNUAL PRODUCTION? 15

2.4 / WHERE NO EXTENSION IS PLANNED, STATE WHETHER, TAKING INTO ACCOUNT LOCAL CONDITIONS AND OTHER CIRCUMSTANCES, AN INCREASE IN ANNUAL PRODUCTION CAPACITY IS POSSIBLE AND IF SO TO WHAT EXTENT. 15

PART 03 ..... **16**

PART 04 ..... **18**

4.1 / PROPOSED COMPOSITION AND ANNUAL QUANTITY OF PRINCIPAL SUPPLIES NEEDED FOR THE OPERATION OF THE PLANT, INCLUDING POWER REQUIREMENTS, STATING PROPOSED SUPPLIERS. 19

PART 05 ..... **20**

5.1 / IF RELEVANT, SUPPLEMENTARY DATA ON SITING OF THE INSTALLATION. 21

RELEVANT DOCUMENTS **22**

ANNEXES **24**

ANNEX 1 25

ANNEX 2 25

ANNEX 3 26

ANNEX 4 27

INTRODUCTION

GENERAL DESCRIPTION OF ONDRAF/NIRAS

The Belgian agency for radioactive waste and enriched fissile materials (ONDRAF/NIRAS), is responsible for radioactive waste management in Belgium. ONDRAF/NIRAS develops solutions for the safe management of all radioactive waste in Belgium, now and in the future, with respect for society and the environment.

ONDRAF/NIRAS is a public body with legal personality. Its missions and operating rules are laid down in Article 179, §2, of the Law of 8 August 1980 and the Royal Decree of 30 March 1981 [Belgian Official Gazette, 1980; Belgian Official Gazette, 1981]. It is supervised by the ministers responsible for energy and the economy. A report of its activities is presented every year to Parliament.

ONDRAF/NIRAS is the only actor appointed to ensure the long-term management of radioactive waste. It may conduct its radioactive waste management mission and its other missions using its own resources or allow these missions to be carried out by third parties under its responsibility. In practice, ONDRAF/NIRAS entrusts:

- the transport of radioactive waste outside the production areas to specialised transport companies;
- its industrial activities to third parties, in particular Belgoprocess nv, its industrial subsidiary in Dessel. Belgoprocess carries out processing and conditioning activities for the non-conditioned radioactive waste taken over by ONDRAF/NIRAS, the storage activities for conditioned and non-conditioned waste, and the dismantling, remediation and disassembly of decommissioned installations and buildings;
- studies and RD&D activities to third parties, in particular to SCK•CEN in Mol.

ONDRAF/NIRAS handles the general coordination of all the above-mentioned industrial and RD&D activities, and ensures the sustainability and integration of knowledge. Its role as a radioactive waste manager is separate from its role as a nuclear operator.

When it acts as a nuclear operator, ONDRAF/NIRAS is controlled by the FANC, like any other nuclear operator.

In accordance with the provisions of the Law of 8 August 1980, ONDRAF/NIRAS must allocate its costs, estimated at cost price and in proportion to its services, between the beneficiaries of those services, namely the radioactive waste producers and financially liable institutional entities (Federal State, Walloon Region and European Commission).

GENERAL DESCRIPTION OF THE PROJECT

The short-term and medium-term management activities of ONDRAF/NIRAS are part of a national policy of centralised, safe management on the site of Belgoprocess in Dessel, a municipality in the east of the province of Antwerp.

In order to continue guaranteeing the safe intermediate storage of radioactive waste, an expansion of the storage capacity is planned.

ONDRAF/NIRAS will construct two storage buildings (building 151E and building 167X) mainly for standard low-level packages and low-level packages potentially presenting an ASR (alkali-silica reaction) phenomenon.

ONDRAF/NIRAS will also construct a storage building (building 165X) for the reception and storage of primarily non-conditioned low-level and medium-level waste.

The buildings will be operated by Belgoprocess.

PART 01

1.1 / NAME AND ADDRESS OF THE PERSON OR UNDERTAKING NOTIFYING OF THE INVESTMENT PROJECT AND, WHERE APPROPRIATE, NAME OF A RESPONSIBLE PERSON TO WHOM SUPPLEMENTARY QUESTIONS MAY BE ADRESSED IF NECESSARY.

ONDRAF/NIRAS
Company registration number : BE 0222.116.241
14, Avenue des Arts
B-1210 Brussels

Further questions may be addressed to:
ONDRAF/NIRAS
Mr. Marc Demarche
Director-General
14, Avenue des Arts
B-1210 Brussels

1.2 / NAME OF THE INVESTMENT PROJECT.

It concerns the following three investment projects on ONDRAF/NIRAS site 1 :

1) Construction of a storage building 151E for low-level conditioned waste
2) Construction of a storage building 165X for non-conditioned waste
3) Construction of a storage building 167X for ASR-affected packages

1.3 / INDUSTRIAL ACTIVITIES UNDER WHICH THE INVESTMENT PROJECT COMES PURSUANT TO ANNEX II OF THE TREATY.

Sector 12 -Installations for the industrial processing of radioactive waste prepared in conjunction with one or more of the facilities indicated in the list.

1.4 / IS IT TO BE A NEW INSTALLATION, A REPLACEMENT OR A CONVERSION?

It concerns two new storage buildings (165X and 167X) and one extension (151E) to the existing storage building 151X.

1.5 / REFERENCE TO DOCUMENTS PREVIOUSLY COMMUNICATED TO EURATOM IN RESPECT OF THE INVESTMENT PROJECT (DATE OF CORRESPONDANCE).

These projects have not been the subject of any previous communication to the Commission by ONDRAF/NIRAS.

1.6 / NAME AND ADDRESS OF THE PERSON(S) OR UNDERTAKING(S).

(a) Name and address of the company that will operate the facility

BELGOPROCESS NV
Gravenstraat 73
2480 Dessel

(b) Name and address of the company preparing the project for the installation

ONDRAF/NIRAS
14, Avenue des Arts
B-1210 Brussels

(c) Name and address of the company that will monitor and inspect the implementation of the project

ONDRAF/NIRAS
14, Avenue des Arts
B-1210 Brussels

(d) Names and addresses of companies that will be primarily responsible for supplying the equipment

Only the engineering consultancy Sweco has been appointed at the present time. The contractors for the contracts for the construction of the new storage buildings 165X and 167X are not yet known.

The contractors for the building 151E are the following:

Consultancy & Architect	
Sweco	Follow-up of study/implementation
Arteum Architects	Architect
Contractors	
IBS	Newbuild
Engie Fabricom	Electricity and instrumentation
Comete	Rolling bridge
Imtech Belgium	Ventilation

1.7 / METHODS OF FINANCING.

Legal base

The Article 179, § 2, of the Law of 8 August 1980 (ONDRAF/NIRAS Law) [Belgian Official Gazette, 1980] foresees the following:

- stipulates that the costs related to ONDRAF/NIRAS' activities, including RD&D costs, are charged to the beneficiaries of its services;
- allows ONDRAF/NIRAS to create a "long- term fund" to finance its long-term missions;
- allows ONDRAF/NIRAS to create a "medium-term fund" to cover the costs of integrating disposal projects into the local communities concerned;
- allows ONDRAF/NIRAS to create an "insolvency fund" to compensate for the potential bankruptcy or insolvency of some producers;
- gives ONDRAF/NIRAS the mission of evaluating the existence and sufficiency of the provisions established by nuclear facilities operators and the holders of radioactive substances to finance their decommissioning costs, including the costs of managing spent fuel and radioactive waste, and their remediation costs.

The Royal Decree of 30 March 1981 (ONDRAF/NIRAS Royal Decree) [Belgian Official Gazette, 1981] implements the ONDRAF/NIRAS Law and, in particular, stipulates the obligation for radioactive waste producers to sign an agreement with ONDRAF/NIRAS focusing on, among other things, the financial terms for taking charge of their radioactive waste.

The key principles

The Royal Decree of 25 April 2014, published in the Belgian Official Gazette on 18 June 2014, brings significant changes to the Royal Decree of 30 March 1981 by establishing some principles – called 'leidende beginselen' or key principles – for calculating the fees and supplying the Long Term Fund (LTF).

The key principles established by this change provide, among other things, that the producers owe fees as long as all the costs necessary for the long-term management of their radioactive waste are not covered.

Another aspect since the Royal Decree was changed, is that even though the fees are still due, ONDRAF/NIRAS, when taking charge of the radioactive waste, may ask for early payments in order to be sure that sufficient resources are available at any time.

Since it is impossible to continuously pass on the possible under-financing in the costs for taking charge of future radioactive waste, the key principles provide that the fees must be calculated not only based on the planned radioactive waste, but also on the radioactive waste that has already been taken charge of. Should there be, at the time of calculation, any shortfall in the raised resources in order to cover the long-term management activities, the difference would have to be compensated according to the rules agreed on by ONDRAF/NIRAS and the producers.

The LTF finances all project components that constitute a direct service for the radioactive waste producers, i.e. the effective storage of radioactive waste.

The LTF is funded by the radioactive waste producers, including, among others, the operators of the Belgian nuclear power plants and the Federal State, as financial responsible for historical nuclear liabilities.

Funding of LTF occurs via fees paid by the radioactive waste producers as a compensation for ONDRAF/NIRAS' services, and in proportion with the radioactive waste accepted by ONDRAF/NIRAS. The feeding mechanism of the LTF starts to work any time a radioactive waste producer delivers radioactive waste to ONDRAF/NIRAS and the latter accepts responsibility for it. Prior to this transfer of responsibility, the radioactive waste is checked for compliance with the applicable waste acceptance criteria.

A mechanism guarantees that the fixed costs for ONDRAF/NIRAS are covered under all circumstances, and that its variable costs are covered as they occur.

The mechanism is based on the following principles:

- the contractual radioactive waste quantities. Each large producer notifies ONDRAF/ NIRAS of his planned radioactive waste production in the form of contractual quantities. These allow ONDRAF/NIRAS to plan the dimension of its facilities and to evenly and fairly distribute the fixed costs of the investments and the operation activities over the producers.

- tariff payment. Each producer makes a contribution to the LTF proportional to the total cost price of the long-term management of the radioactive waste that he transfers to ONDRAF/NIRAS and for which the latter accepts responsibility. These contributions cover both the fixed and the variable costs.

- the contractual guarantee. The books of the large radioactive waste producers and the accounts of the nuclear liabilities will include a provision for the difference between the fixed costs that can be attributed to the radioactive waste quantity announced by the producer or that are related to the liability on the one hand, and the fixed costs that already have been paid via the applied fees on the other. This contractual guarantee warrants coverage of all costs of the storage, even if the storage quantity turns out to be smaller than the contractual quantity.

- collection contracts. The work method for the LTF has been established in agreements between ONDRAF/NIRAS and the radioactive waste producers. These agreements are referred to as “collection contracts”. In principle, the contractual quantities announced by the producers are adjustable every five or ten years, or earlier in the case of force majeure. This allows for regular adaptation of the financial conditions to the evolution of the project and the economic context.

The storage projects for conditioned radioactive waste are financed by the Long Term Fund (LTF) and more specifically its compartment dedicated to storage.

Financial mechanisms

1. Storage buildings 151E and 167X

The storage buildings 151E and 167X shall be funded via the Long-term Fund for storage.

2. Storage building 165X

Specific funding mechanism will be organised for the storage building 165X.

1.8 / GEOGRAPHICAL LOCATION.

The storage buildings will be constructed on ONDRAF/NIRAS site 1 and operated by Belgoprocess, where Belgian radioactive waste is currently processed and stored. Belgoprocess is located in Dessel, a municipality in the east of the province of Antwerp and adjacent to the Bocholt-Herentals Canal.

Figure 1: Location of the municipality of Dessel on the map of Belgium

Figure 2: 3D-plan with the three storage buildings on site 1 (1: 165X, 2: 151E, 3: 167X)

1.9 / BRIEF DESCRIPTION AND GENERAL PLANS.

Storage Building 151E

In order to have sufficient storage capacity for the storage of the low-level conditioned waste, an additional storage capacity of 5,000 packages is foreseen.

Building 151E is an extension of building 151X, a storage building for the storage of low-level conditioned waste. The extension is limited to a storage area for 5,000 packages of conditioned waste, an area for the supply and removal of the packages and a limited technical area.

Building 151E has a maximum length of 54.4 m and a maximum width of 22.1 m. The maximum height, including roof edge, is approximately 13 m. The floor surface area of the building is approximately 1200 m².

Building 151E consists of one floor.

Figure 3 shows a 3D representation of the exterior of building 151E.

Figure 3: 3D representation of the exterior of building 151E

In the storage area, the 400-litre packages of conditioned waste are stacked in a classic pyramid form (one package on top of three others), five layers high.

Storage Building 165X

There is a need for a central reception and storage location for non-conditioned waste and a central location for performing non-destructive characterisation measurements to determine the radioactivity of non-conditioned waste. The non-conditioned waste will be held temporally in storage pending further processing and conditioning.

The building will be further extended to house additional destructive analysis techniques (DT) and other non-destructive analysis techniques (NDT). These facilities, which include a LINAC, are used to evaluate a number of criteria on conditioned waste that must be respected in order to qualify for surface disposal at Dessel. [1]

If there is a need for this, building 165X can eventually be expanded with separate (adjacent) modules for the possible interim storage of conditioned low-level and medium-level short-lived waste.

Building 165X, with a rectangular ground plan, has a maximum length of 66 m and a maximum width of 56 m. The maximum height is approximately 15 m. The total floor surface area of the building is approximately 3,696 m².

These dimensions do not yet take into account the extension for housing the (N)DT facilities and the possible extension for the storage of low-level and medium-level short-lived waste.

Building 165X consists of two floors, where the waste is stored and the non-destructive radioactive characterisation measurements are performed on the ground floor, and the technical facilities (including HVAC) are primarily on the first floor.

Figure 4 shows a 3D representation of the exterior of building 165X.

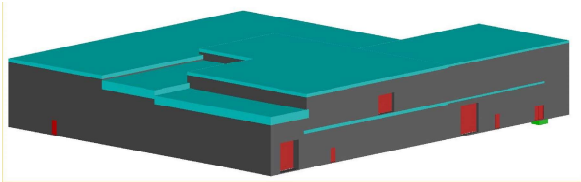

Figure 4: 3D representation of the exterior of building 165X

The reception and storage centre consists of two loading and unloading areas with access to the associated storage rooms for the storage of radioactive waste, and a room equipped with the measuring installations to perform the non-destructive radioactive analysis techniques.

[2] Excluding the extension of the building to house additional destructive (DT) and other non-destructive analysis techniques (NDT) and excluding the possible extension with separate (adjacent) modules for possible interim storage of conditioned low-level and medium-level short-lived waste.

Building 165X is divided into three access zones: the non-controlled area, the controlled area (B zone) and the controlled area with high-risk (C zone).

The technical elaboration of the building, to accommodate additional destructive (DT) and other non-destructive analysis techniques (NDT) is in progress and is too early to be described in this document. The possible extension with separate (adjacent) modules for the possible interim storage of conditioned low-level and medium-level short-lived waste will only be developed if there is a need in this regard.

Storage Building 167X

In storage building 151X, a number of packages of low-level conditioned waste were found to have a gel-like outflow as a result of an alkali silica reaction (ASR) in the concrete that encapsulates the radioactive waste.

Building 167X is being constructed to house the packages with gel outflow, or those with an increased risk of outflow. These packages will be individually inspected and monitored in an efficient manner.

Unlike the current storage buildings, where the packages are stacked in a pyramid form, it will be possible to remove each package from the storage areas if a gel-like outflow is detected. It will be possible to carry out interventions on these packages. The packages will remain in storage pending a decision on their final destination.

Ultimately, and if it is necessary, building 167X can be extended with a separate (adjacent) module for possible future storage of potentially ASR-affected resin and concentrate packages with a concrete stopper.

The building, without the extension option, has a maximum length of 137 m (at the point with the greatest length) and a maximum width of 41 m. The maximum height is approximately 15 m in relation to ground level. The floor surface area of the building is approximately 4100 m².

Building 167X consists of two floors, where the waste is stored on the ground floor and the technical facilities (including HVAC) are primarily on the first floor.

Figure 5 shows a 3D representation of the exterior of building 167X.

Figure 5: 3D representation of the exterior of building 167X

The storage area consists of two storage halls for the 400-litre packages of low-level conditioned waste, and an intervention room for handling non-compliant packages with a possible gel outflow.

Location of the storage buildings

Building 151E

Storage building 151E will be built on site 1, on the undeveloped land located within the internal perimeter, to the east of building 151X and north of building 137X.

Figure 6: Establishment of building 151E

Building 165X

Storage building 165X will be built on site 1, on the un-developed land located within the internal perimeter, to the west of building 155X and north of building 127X.

Figure 7: Establishment of building 165X

Building 167X

Building 167X will be built on site 1, on the undeveloped land located within the internal perimeter, to the west of building 151X and north of building 137X.

Figure 8: Establishment of building 167X

1.10 / COSTS OF INITIAL INSTALLATION (IN EURO) AND BREAKDOWN FOR THE MAIN COMPONENTS OF THE COSTS.

Storage buildings	Costs (€m)
Building 151E	**7**
Construction	3.2
Technical facilities	2.2
Follow-up	1.6
Building 165X [2]	**43.5**
Construction	18.7
Technical facilities	14.8
Follow-up	10
Building 167X	**46.5**
Construction	16.5
Technical facilities	17.5
Follow-up	12.5

Follow-up includes the costs of the consultancy firms, technical inspection, safety coordination, site supervision and quality control.

1.11 / PROPOSED TIME-SCALE FOR THE PLACING OF MAIN ORDERS, INSTALLATIONS AND START-UP, PARTICULARLY THE CONCLUSION OF INITIAL CONTRACTS WITH SUPPLIERS OF THE COMMENCEMENT OF CONSTRUCTION WORK, AND THE PLANNED COMMISSIONING DATE.

The table below gives an overview of the most important phases for the construction of the storage buildings 167X, 165X and 151E.

Storage buildings	Period
Building 151E	
Study phase	2018 – 03/2019
Licence phase	02/2019 – 08/2019
Construction and test phase	09/2019 – 10/2020
Commissioning	11/2020 – 12/2020

[2] Excluding the extension of the building to house additional destructive (DT) and other non-destructive analysis techniques (NDT) and excluding the possible extension with separate (adjacent) modules for possible interim storage of conditioned low-level and medium-level short-lived waste.

Building 165X [3]	
Study phase	2014 – 11/2019
Licence phase	12/2019 – 12/2020
Construction and test phase	01/2021 – 12/2022
Commissioning	01/2023 – 03/2023
Building 167X	
Study phase	2014 – 05/2020
Licence phase	06/2020 – 06/2021
Construction and test phase	07/2021 – 08/2023
Commissioning	09/2023 – 12/2023

1.12 / DESCRIPTION OF PLANS IF ANY, FOR THE DECOMMISSIONING OF THE INSTALLATION.

The dismantling of nuclear installations is subject to a licence issued by the Federal Agency for Nuclear Control (FANC).

The dismantling operations for storage buildings 167X, 165X and 151E will be performed in accordance with the recommendations of ONDRAF/NIRAS for the preparation of dismantling plans for nuclear installations.

The methodology for dismantling nuclear installations at Belgoprocess is as follows:

1) drawing up, amending, approving and distributing initial and final dismantling plans for the installation;

2) drawing up, amending, approving and distributing the definitive dismantling plan for the actual dismantling of the installation;

3) recording the actual dismantling activities in the installation that has been definitively shut down.

1.13 / OFFICIAL STATE AUTHORITY SUPPLYING THE LICENCES FOR CONSTRUCTION AND OPERATION: DURATION OF LICENCE FOR OPERATION.

The storage buildings are nuclear installations.

The licence for the construction and operation of a storage building, the nuclear licence, is provided by Royal Decree. This occurs after assessment of the licence application by an independent authority, the Federal Agency for Nuclear Control (FANC). The nuclear licence specifies the conditions to be met in order to be able to build and subsequently operate the installation. The licence is valid for an indefinite period, until it is suspended.

Each of the storage buildings requires an environmental licence granted by the Flemish Region. The environmental licence covers the urban development section and the environmental section. For the extension of building 151X (building 151E) only the urban development section needs to be drawn up. The buildings 165X and 167X are subject to the EIA obligation (Flemish Government Decree 10/12/2004).

Buildings 167X and 165X are new Class I – installations. For both installations, a separate nuclear licence application will be submitted, together with a safety report.

For buildings 167X and 165X, a separate certification file for physical safety will also be drawn up, in accordance with the legislation on the physical safety of radioactive material (Royal Decree 17/10/2011).

Building 151E is regarded as an extension of the existing storage building 151X. Modifications to the existing safety report for building 151X are sufficient, in addition to the inclusion of specific conditions for building 151E.

1.14 / SHORT DESCRIPTION OF RESEARCH AND DEVELOPMENT PROGRAMMES, IF ANY.

Building 167X

In early 2013, during inspections of storage building 151X intended for the storage of conditioned low-level radioactive waste, packages were found that were not in compliance with the visual inspection criteria. The non-conformity consisted in the fact that the outflow of a very limited quantity of a gel-like substance was visible at the cover and on the outside of the package.

ONDRAF/NIRAS launched a research programme in collaboration with various partners, including a panel of experts, the FANC and Bel-V.

The research programme focused on the one hand on analysing the alkali-silica reaction in the concrete matrix in which the waste is immobilised, and which is believed to be the reason behind the phenomenon.

[3] Excluding the extension of the building to house additional destructive (DT) and other non-destructive analysis techniques (NDT) and excluding the possible extension with separate (adjacent) modules for possible interim storage of conditioned low-level and medium-level short-lived waste.

On the other hand, the research focused on long-term management and safety, in particular the compatibility of the packages in question with the planned surface disposal. The long-term evolution of the composition of the substance, which determines its swelling properties, remains a fundamental question to which an answer must be found. This research programme must ultimately provide the necessary information as to whether a reconditioning and/or suitable post-conditioning is necessary.

Building 151E

Not applicable

Building 165X

Not applicable

PART 02

2.1 / COMPOSITION AND NATURE OF THE PRODUCTION; ANNUAL CAPACITY.

Building 151E

Building 151E will be able to store approximately 5,000 packages of low-level conditioned waste.

This capacity corresponds to approximately 5 times the annual production of low-level conditioned waste produced by CILVA on site 1, the central installation for processing and conditioning low-level waste.

Building 165X

The waste to be stored (excluding the extension) includes both low-level and medium-level short-lived solid non-conditioned waste, low-level and medium-level long-lived solid non-conditioned waste, high-level sources and low-level liquids.

The quantities to be stored depend on the supply of radioactive waste from Belgian waste producers, and primarily on the decommissioning waste produced at Belgoprocess sites 1 and 2.

Building 167X

The waste to be stored in building 167X is concentrates, which were homogeneously conditioned in a concrete matrix in the processing/ conditioning installation of Electrabel (Doel site). The waste was packed in a 400-litre final packaging with a cover. It is a maximum of 5,643 packages of low-level conditioned waste.

Of the total number of packages in question, 5,293 are stored in the storage buildings of Belgoprocess and 350 are stored on the Doel nuclear power plant site. The latter packages will eventually be transported to building 167X.

2.2 / MAIN FEATURES OF THE INSTALLATION.

Building 151E

Building 151E has been designed according to the specific design criteria and requirements for nuclear and conventional safety for building 151E.

In building 151E, in the storage area, the same environmental conditions as in building 151X must be met, to prevent corrosion of the packages.

Various functionalities of building 151X are used (ventilation connection with building 152X, remote handling via control room).

The structures and non-replaceable equipment of building 151E are designed for a minimum life span of 50 years. The replaceable equipment (including the non-structural elements of the bridge crane) has a minimum life span of 20 years.

Only 400-litre packages, heterogeneously conditioned according to a specific conditioning process, are eligible for storage in building 151E.

From building 151X or building 137X (CILVA) packages are transported to building 151E via transport wagons. Via a bridge crane, the packages are taken out of the transport wagon and arranged in a pyramid form at a specific location.

The reverse procedure is applied to remove the packages from storage.

Building 165X

Building 165X is designed in accordance with the Royal Decrees on safety regulations for nuclear installations and storage installations and in accordance with the design criteria and requirements for nuclear and conventional safety of building 165X.

Based on the FANC guidelines and the source term, the central part of building 165X, which contains the largest fraction of the total source term, is structurally executed as Graded Approach Category 3 (GAC 3). The surrounding area, with significantly lower source term, is structurally executed as a GAC 2 building component.

The structures of building 165X are designed for a minimum life span of 75 years. The non-replaceable equipment should also have a minimum life span of 75 years.

Based on the specific properties of the storage areas, the different types of packages can be stored in one or more rooms, according to adapted logistic flows.

Since various types of packages are transported to and from building 165X, the transporter (both external and internal) is adapted to this.

From the storage areas, the packages to be measured can be picked up with appropriate devices and transported to the room where non-destructive analysis can be performed.

Building 167X

Building 167X is designed in accordance with the Royal Decrees on safety regulations for nuclear installations and storage installations and in accordance with the design criteria and requirements for nuclear and conventional safety of building 167X. Based on the FANC guidelines and the source term, building 167X is classed as Graded Approach Category 1 (GAC 1).

The structures and non-replaceable equipment of building 167X are designed for a minimum life span of 50 years. The replaceable equipment has a minimum operational life span of 20 years.

The transfer of the low-level packages from building 151X (where the relevant packages are currently located) to building 167X is done via remote control. A temporary connection between the two buildings is envisaged to this end.

For the storage of the 400-litre packages, the concept has been chosen whereby the packages are stored vertically in groups of four, in a skid, or horizontally in groups of two, in a skid with a gel collection facility. The skids are stackable.

In the event of gel outflow, it is decided to remove the cover of the package, remove the gel, clean the package and then place a plexiglass cover to close the package, in a separate intervention room, semi-manually. Samples of the gel may be taken during the intervention, for RD&D purposes. During storage, periodic and automatic visual checks are performed on all packages, via cameras. If gel outflow is detected, the skid can be taken out of the storage, after which the gel will be removed by an operator in a separate intervention room.

2.3 / IF AN EXTENSION TO THE INSTALLATION IS PROPOSED, STATE BY WHAT PROCESS, OVER WHAT PERIOD AND IN WHAT PROPORTION IT IS PLANNED TO CHANGE ANNUAL PRODUCTION?

The concept of building 165X provides for the possibility to extend the building in the short term to house additional destructive (DT) and other non-destructive analysis techniques (NDT). The concept also takes into account the possibility of extending the building in the medium term for the storage of conditioned low-level and medium-level short-lived waste.

For building 167X there is the possibility to envisage an extension for possible future storage of potential ASR-affected resin and concentrate packages with concrete stopper.

2.4 / WHERE NO EXTENSION IS PLANNED, STATE WHETHER, TAKING INTO ACCOUNT LOCAL CONDITIONS AND OTHER CIRCUMSTANCES, AN INCREASE IN ANNUAL PRODUCTION CAPACITY IS POSSIBLE AND IF SO TO WHAT EXTENT.

Not applicable

PART 03

Not applicable.

PART 04

4.1 / PROPOSED COMPOSITION AND ANNUAL QUANTITY OF PRINCIPAL SUPPLIES NEEDED FOR THE OPERATION OF THE PLANT, INCLUDING POWER REQUIREMENTS, STATING PROPOSED SUPPLIERS.

The suppliers and the corresponding energy requirements have not yet been selected.

PART 05

5.1 / IF RELEVANT, SUPPLEMENTARY DATA ON SITING OF THE INSTALLATION.

Not applicable.

RELEVANT DOCUMENTS

LEGAL REFERENCES AND POLICY

Loi du 8 août 1980 relative aux propositions budgétaires 1979-1980, article 179,§§ 2 à 11

Arrêté royal du 30 mars 1981 déterminant les missions et fixant les modalités de fonctionnement de l'organisme public de gestion des déchets radioactifs et des matières fissiles

Arrêté royal du 18 novembre 2002 réglant l'agrément d'équipements destinés à l'entreposage, au traitement et au conditionnement de déchets radioactifs

Loi du 11 avril 2003 sur les provisions constituées pour le démantèlement des centrales nucléaires et pour la gestion des matières fissiles irradiées dans ces centrales

Loi du 15 avril 1994 relative à la protection de la population et de l'environnement contre les dangers résultant des rayonnements ionisants et relative à l'Agence fédérale de Contrôle nucléaire

Arrêté royal du 20 juillet 2001 portant règlement général de la protection de la population, des travailleurs et de l'environnement contre le danger des rayonnements ionisants

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, done at Vienna on 5 September 1997

Council of Ministers, Meeting January 16, 1998. Gestion à long terme des déchets radioactifs de faible activité. 98A40450.039

Council of Ministers, Meeting June 23, 2006. Disposal of radioactive waste (category A). 2006A42450.020

KB van 17/10/2011 over de fysieke beveiliging van kernmateriaal

KB van 30/11/2011 houdende veiligheidsvoorschriften voor de kerninstallaties.

KB van 29/05/2018 houdende veiligheidsvoorschriften voor opslaginstallaties van kernbrandstof en colli met radioactief afval

Vooroverlegnota's:

151E: IPA 151X/05 als aan vulling van het veiligheidsrapport Opslaggebouw voor geconditioneerd laag radioactief afval – gebouw 151X op de site 1 van Belgoprocess (Belgoprocess)

165X: Algemene omschrijving nieuw receptie- en opslagcentrum (ROC) voor de receptie en opslag van niet geconditioneerd afval op site BP1 (gebouw 165X): Voorinformatie in het kader van het vooroverleg met FANC/BelV (Belgoprocess)

167X: Algemene omschrijving nieuw opslaggebouw voor de opslag van potentieel ASR geaffecteerd geconditioneerd radioactief afval (laagactieve concentraten) op site BP1 (gebouw 167X): Voorinformatie in het kader van het vooroverleg met FANC/Bel V (Belgoprocess)