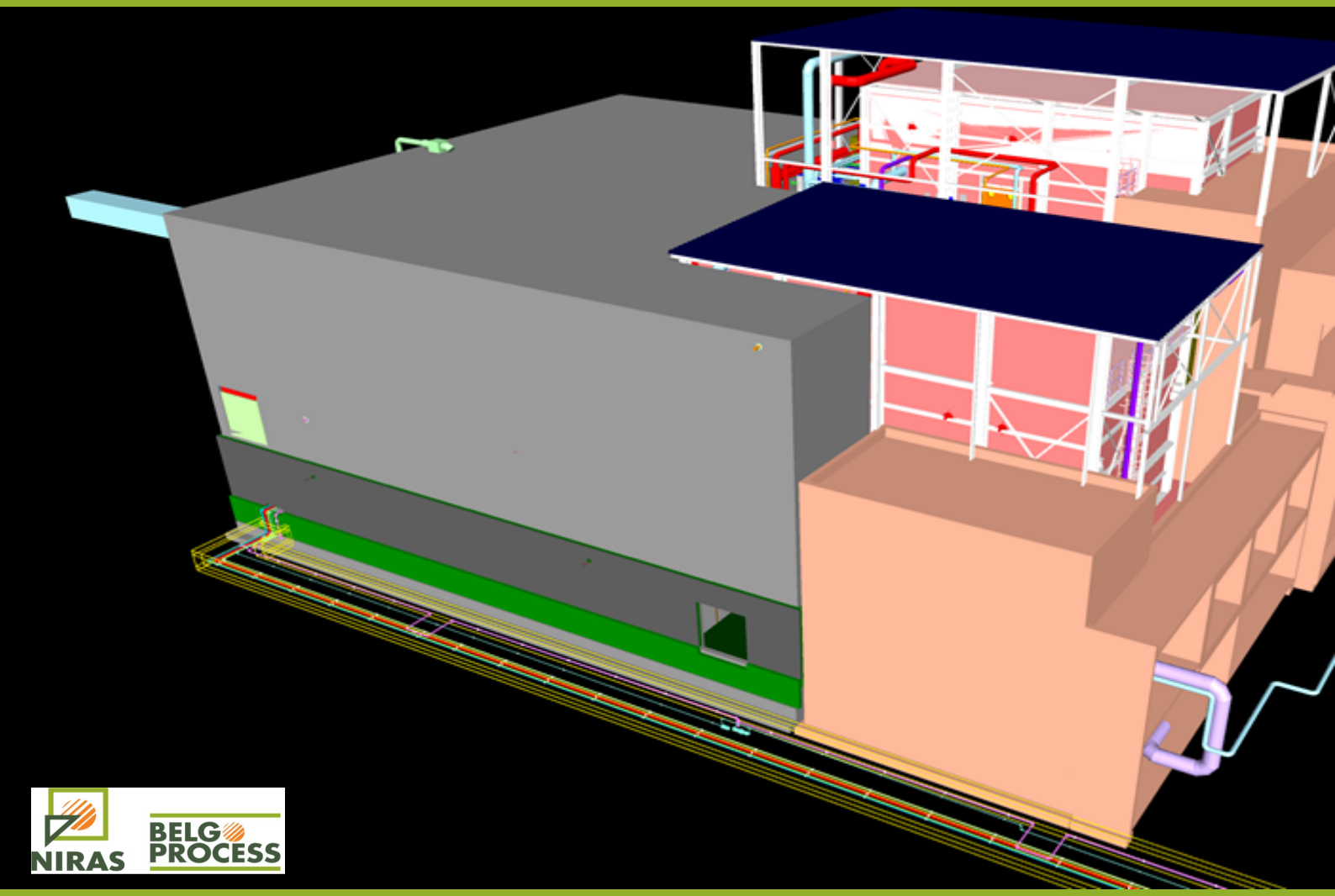
FACILITY FOR THE SAFE DECONTAMINATION AND DISMANTLING OF STORAGE TANKS IN BUILDINGS 105X/122X ON THE ONDRAF/NIRAS SITE 1 (DESSEL, BELGIUM)

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



NIRAS BELG PROCESS

BY THE NATIONAL AGENCY FOR RADIOACTIVE WASTE AND ENRICHED FISSILE MATERIALS

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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 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

Building 170X will be constructed on ONDRAF/NIRAS site 1, operated by Belgoprocess, where Belgian radioactive waste is processed and stored. Belgoprocess is located within the territory of Dessel, a municipality in the east of the province of Antwerp.

From 1958 to 1975, managed by a joint undertaking of 13 European states under the umbrella of OECD-NEA, the experimental reprocessing plant Eurochemic[1] was an innovative pilot reprocessing installation that made nuclear spent fuel reprocessing possible at an industrial scale. The Eurochemic installations were progressively taken over by the host country, Belgium, in the 1980s.

After its closure, Eurochemic became the first civil nuclear reprocessing plant to be decommissioned. Belgoprocess that is carrying this dismantling since 1980 became a subsidiary of ONDRAF/NIRAS in 1986.

During the operation of the reprocessing plant, high-level liquid effluents were temporarily stored in tanks, pending vitrification. After rinsing, significant amounts of radioactive residual material remained on the bases of these tanks. These tanks are located in buildings 105X en 122X, adjacent to the building 131X (PAMELA).

The new building 170X, which will integrate the existing buildings 105X and 122X, has been designed to allow the safe decontamination and dismantling of the storage tanks with high-level liquid effluents, as well as the subsequent dismantling of buildings 105X and 122X. This new building 170X will not be reused afterwards and will also have to be decontaminated and dismantled.

[1] EUROCHEMIC stands for European company for the Chemical processing of irradiated fuels

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.

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

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

1.2 / NAME OF THE INVESTMENT PROJECT.

Facility for the safe decontamination and dismantling of storage tanks in buildings 105X/122X on the ONDRAF/NIRAS site 1 (Dessel, Belgium).

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

Sector 8 - Treatment of irradiated nuclear fuel for the separation of all or part of the elements contained therein.

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

It is a new installation (building) 170X designed to allow the decontamination and dismantling of the storage tanks in the buildings 105X and 122X, followed by the decontamination and dismantling of both buildings. The new building 170X will also be decontaminated and completely dismantled afterwards.

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

Not applicable

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

Consultancy	
Tractebel Engineering	Follow-up of study/implementation
ONET	Study/provision of decontamination
Contractors	
Franki Construct	Newbuild
Interboring	Concrete sawing works
Saint-Gobain	Lead windows
Cofely Fabricom	E&I – automation
THV CEM/COM	Handling equipment
SIT	Manipulators
BNG	Docking & Lining
Cofely Fabricom	Process & Piping
Belgoprocess	Radiomonitoring
Cofely Axima	Ventilation

1.7 / METHODS OF FINANCING.

All ONDRAF/NIRAS costs for the construction of building 170X are borne by the Belgian State as financially responsible for the nuclear liabilities BP1/BP2.

The Belgian law of 29 April 1999 on the organisation of the electricity market structures the financing for all obligations resulting from the decommissioning of the BP1 (former pilot reprocessing plant of Eurochemic or BP1 liability) and BP2 (former Waste department of SCK•CEN or BP2 liability) sites, including the radioactive waste generated by these activities.

To this end, a specific fund for liabilities BP1/BP2 was set up. ONDRAF/NIRAS is responsible for the management of this fund for liabilities BP1/BP2 and for the realisation of the remediation and dismantling activities of these liabilities.

1.8 / GEOGRAPHICAL LOCATION.

Building 170X will be constructed on ONDRAF/NIRAS site 1, operated by Belgoprocess, where Belgian radioactive waste is being 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

1.9 / BRIEF DESCRIPTION AND GENERAL PLANS.

Dismantling building 170X

The purpose of the new installation 170X is to enable the safe decontamination and dismantling of the existing storage tanks in buildings 105X and 122X.

Building 170X has a ground surface of 514 m² and a roof surface of 869 m², of which 355 m² is located above the buildings 105X/122X. The highest point of building 170X is 20 metres above ground level. Combined, buildings 105X, 122X and 170X have a practically rectangular floor plan, 49 m long and 26 m wide. The total floor surface area of these buildings is approximately 1.207 m².

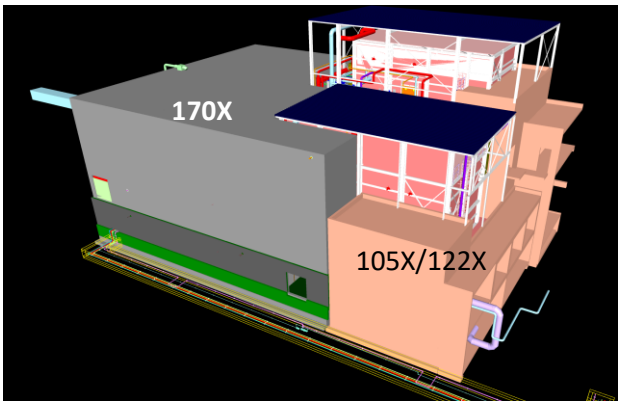


Figure 2: 3D representation of the exterior of building 170X

Control room, access to the controlled area, operator rooms, extraction filters, utilities, transport containers, intervention cells, measurement devices, air locks, etc. are spread across several levels in building 170X.

Figure 3: Establishment of building 170X and building site

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

Dismantling building	Costs (€m)
Building 170X	**67.9**
Construction	6
Technical facilities	39.4
Follow-up	22.5

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 project started in 2010 with preliminary engineering studies. The preparatory works for the construction of building 170X started in 2017. By the end of 2019, approximately two-thirds of the investment had already been made (~ €35m). Commissioning of building 170X is planned for 2022. The effective implementation of the decontamination works is scheduled from 2023 onwards.

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

In the first phase (decontamination), the focus is on removing the source term from the four storage tanks via remote control. In the second phase, the tanks and other installations of buildings 105X, 122X and eventually 170X will be dismantled.

After the complete release of all rooms in a building, the non-nuclear or controlled demolition can be carried out. Here, the materials are collected during decomposition and released, or not, in accordance with the applicable procedures and the Belgian law under the supervision of the nuclear regulator.

The decontamination and dismantling of buildings 105X, 122X and 170X is estimated to last 10 years.

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

The licence for the construction and operation of building 170X is part of a dismantling licence provided by Royal Decree. This occurs after assessment of the licence application by an independent authority, the Federal Agency for Nuclear Control (FANC).

The dismantling of nuclear installations belonging to class I installations is subject to a prior licence granted by the King, after approval by the 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 the dismantling operations are finalised.

The procedure for obtaining a dismantling licence is the same as for obtaining a setting-up and operating licence.

The design and construction of building 170X and its equipment will be implemented in accordance with the European and Belgian regulations, codes and standards applicable at the time.

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

Not applicable.

PART 02

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

The production relates to the total amount of primary and secondary radioactive waste that will be produced during the decontamination and dismantling of buildings 105X, 122X and 170X.

Conservative estimate of primary waste according to type (tonnes)

Building	Concrete/ barite	Metal	Residual material (tanks)	Various
5/22	49.0	91.8	1.148	11.09
170X	42.1	83.7	-	-

Estimate of primary waste 5/22 according to waste category

5/22	HLSW (tonnes)	MLSW (tonnes)	LLSW-α bearing (tonnes)	LLSW (tonnes)	MLLW (m^3)
Other	1.148				
Liquid					500
Metal		2.3	76.3	13.2	
Concrete			33.7	13.8	
Barite				1.6	
Various				1.1	
Total	**1.148**	**2.3**	**110**	**29.7**	**500**

HLSW: High Level Solid Waste – MLSW: Medium Level Solid Waste – LLSW- α: Low Level Solid Waste (α -bearing) – LLSW: Low Level Solid Waste – B08: Medium Level Liquid Waste

Estimate of primary waste 170X according to waste category (tonnes)

170X	MLSW	LLSW-α bearing	LLSW
Metal	19.5	19.5	44.8
Concrete			42.1
Total	**19.5**	**19.5**	**86.9**

MLSW: Medium Level Solid Waste – LLSW- α: Low Level Solid Waste (α -bearing) – LLSW: Low Level Solid Waste

In addition to the expected quantities of primary waste indicated above, an additional quantity of secondary radioactive waste will be produced, primarily low-level combustible and compressible intervention clothing, ventilation filters, blasting medium and suspicious liquids:

- 13 tonnes of secondary solid waste
- 2,530 m^3 of secondary liquid waste

2.2 / MAIN FEATURES OF THE INSTALLATION.

Building 170X will be built against and on top of the cells containing the tanks in existing buildings 105X and 122X.

The part of the new building on top of these cells will be constructed in a light steel structure, which connects both the buildings 105X and 122X as well as the new building 170X.

The building is designed in such a way that the areas with the radioactive source term, the process rooms and the storage buffers are close to each other. These areas will be built in such a way that workers are sufficiently protected during the decontamination and dismantling operations.

A new ventilation system in building 170X coupled to buildings 105X and 122X will create an underpressure cascade system in the controlled area, thereby avoiding the spread of any possible contamination outside the building.

The design of building 170X took into account a operational life span of 20 years.

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?

Not applicable.

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.

PART 06

Not applicable.

PART 07

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

Ontmanteling gebouwen 10X-122X-170X op site 1 van Belgoprocess. Algemene beschrijving en veiligheidsaspecten. December 2014. Belgoprocess.

ANNEXES

Annex 1: Location

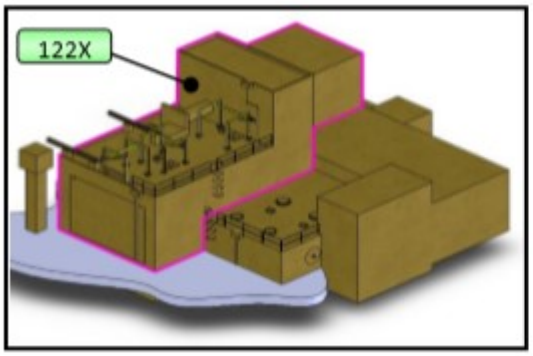
Annex 2: Spatial presentation of buildings 105X/122X

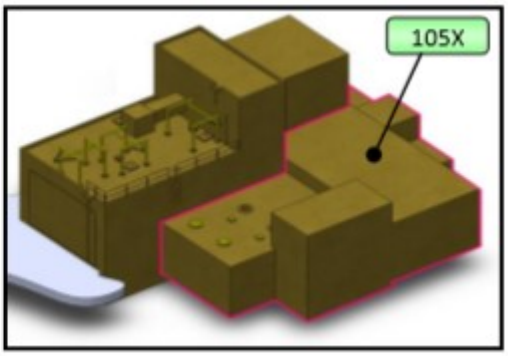
Annex 3: Buildings 105X/122X with the storage tanks

ANNEX 1

Location of buildings 105X and 122X on the general layout of site BP1.

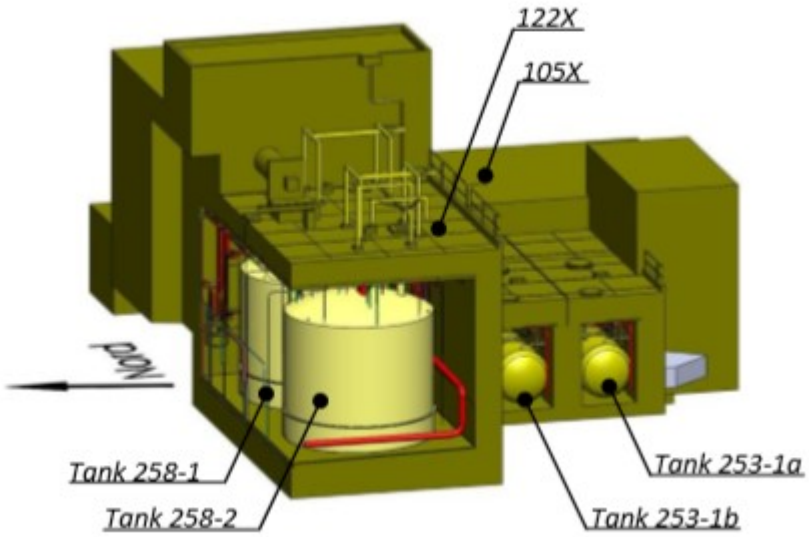
ANNEX 2





Spatial presentation of buildings 105X/122X

ANNEX 3



Buildings 105X/122X with the storage tanks to be decontaminated.