S.N. Nuclearelectrica S.A.
CNE Cernavoda

ACTION PLAN

SYSTEM: N/A	BSI: N/A	UNIT: 1	U1-PA-17-0017	REV.#1	PAGE: 1 OF 5
TITLE/ PURPOSE: Ensuring the operation of Unit 1 for the projected duration of 30 years at a capacity factor of approximately 90% and preparing the retrofitting project in view of a second life cycle					

GENERAL DESCRIPTION OF THE PLAN:

1. **INTRODUCTION**

In compliance with the standards of the 1960s/ 1970s, the CANDU600 nuclear power plants were designed for a lifespan of 30 years, at a capacity factor 0f 80%. For this purpose, tests were performed to prove that the most sensitive components, i.e. the fuel channels, can operate for this entire time, namely 210,000 EFPH (Effective Full Power Hours), but without establishing their lifetime limit.

Normally, at the end of the first life cycle, a complex project can be executed, which implies the retrofitting of the unit (replacing the fuel channels, as well as other replacements, changes or improvements) so that, at the end of this project, the retrofitted unit enters a second life cycle of 30 years. Thus, a relatively new reactor is obtained, with approximately 40% of the costs of a new reactor.

Due to the latest improvements, the capacity factor continued to increase, reaching over 90% in Unit 1. In these conditions, in the summer of 2023, after approximately 26.5 years since commissioning, the fuel channels of Unit 1 shall reach their life limit of 210k EFPH taken into account in the initial project, but the other structures and systems of the power plant could ensure its operation until December 2026, when the first life cycle of 30 years of Unit 1 would end.

It must be mentioned that further research on the lifespan of fuel channels and the re-run of the initial analyses highlighted the possibility that this lifespan could be significantly larger. Such research has already been put into practice in Canada and Argentina, where it was proven that the lifespan of the fuel channels may reach approximately 245,000 EFPH.

The capitalization of this international experience in CNE Cernavoda would allow the operation of Unit 1 for the entire projected period of 30 years, but correlated with a capacity factor 10% higher than the one taken into account in the project. Exploiting this course of action is all the more opportune and necessary as, should Unit 1 be retrofitted in 2023, CNE Cernavoda would not have the time necessary to prepare this project as, based on the international experience in the field, it must start approximately 10 years before the actual implementation (the manufacturing period of the tubes alone is of 4-5 years).

2. **Strategy**

Taking into account all the considerations presented in the introduction, CNE Cernavoda developed a strategy based on two major courses of action, complementary to each other, that we deem ensure, in the current conditions and based on the current knowledge, the optimal solutions for SNN, from the technical, financial and human resources points of view.

The first course of action, which will be discussed in section 1 of this document, is represented by the start of the activities necessary to ensure the operation of U1 for a period of 30 years in the conditions of a capacity factor of approximately 90%. For this purpose, complex analyses are necessary to confirm that exceeding the 210k EFPH can be achieved in conditions of nuclear safety.

This project will take place in two stages. In stage I, the nuclear safety documentation necessary for the approval of the lifespan extension shall be established, followed by the detailing of the authorization strategy, while in step II the supporting analyses are to be performed.

The second course of action, which shall be the subject of sections II and III of the plan, is represented by the preparation and execution of the retrofitting project of Unit 1, which mainly consists of the replacement of the fuel channels and of the feeders. On this occasion, other replacements, changes and improvements of other systems may be performed as well, so that the operation of the power plant for the following period will take place in the most efficient conditions possible. All these aspects were documented in several Information Reports on the Retrofitting of Unit 1, endorsed by SNN CTES and/or approved by the SNN Board of Directors, by means of which the resources necessary for the performance of the analyses concerning the status assessment of the equipment important for the operation of the power plant and for the setting out the actions needed to improve their operation were allocated.

It must be mentioned that, given the scope of the project, for its good organization, it is necessary to request an assessment performed by specialists with management experience in such projects, who, after analyzing the current organization of CNE Cernavoda, must forward an organization proposal deemed optimal for the execution of the project. These activities are treated in section II.

Section III of the action plan specifies the three main stages of the retrofitting project, i.e. defining its purposes, developing solutions and the engineering documentation and the actual implementation.

Taking into account all of the above, this action plan was structured according to the following three sections:

- Ensuring the operation of U1 for the projected duration of 30 years until retrofitting (extending the lifespan over the 210,000 hours of operation at rated power initially considered for the fuel channels);
- Preparing the retrofitting project from the point of view of the optimal organization method;
- Finalizing the necessary documentations, approving the project and implementing it.

Note: Section III may suffer changes after finalizing the actions in section II, and after getting the results of the studies to be performed in 2017. Depending on their impact, this action plan will be adequately revised so as to faithfully reflect reality.

Special constraints: The completion of the Cernavoda Tritium Removal Facility, whose commissioning at the end of 2024 would allow, within approximately 2 years of operation (2025-2026), the reduction of the tritium concentration to values that would lower the special requirements imposed by the handling and storage of tritium-treated heavy water during the retrofitting.

ACTION PLAN

SYSTEM: N/A	BSI: N/A	UNIT: 1	U1-PA-17-0017	REV.#1	PAGE: 3 OF 5
TITLE/ PURPOSE: Ensuring the operation of Unit 1 for the projected duration of 30 years at a capacity factor of approximately 90% and preparing the retrofitting project in view of a second life cycle					

No.	***ACTION***	***Intercon-ditions***	***NR/AR***	***PERSON IN CHARGE***	***DEADLINE***
Section I – Ensuring the operation of U1 for the projected duration of 30 years at a capacity factor of 90% (extension of the 210,000 hours of operation at rated power for the fuel channels and feeders until reaching an operation duration of 30 years)					
1.1.	Drawing up of the procurement documentation for stage I concerning the drawing up of the safety report for the operation of U1 until the end of the 30 years since commissioning (extension of the lifespan of fuel channels over the 210k EFPH up to 245k EFPH – stage I)			A. Cojanu	Performed
1.2.	Contracting the drawing up of the safety report mentioned under item 1.1.			A. Cojanu	Performed
1.3.	Kick-off meeting concerning the safety report			A. Cojanu	Performed
1.4.	Contract execution – analyses and verifications; meetings with CNCAN and establishing the common goals			A. Cojanu	September 30, 2017
1.5.	Acceptance of the safety report of stage I concerning the extension of the lifespan over the 210,000 EFPH			A. Cojanu	October 2017
1.6.	Obtaining the letter of comfort from CNCAN			A. Cojanu	December 2017
1.7.	Drawing up and approval of the cost benefit analysis (business case) and approval of the budget for stage II			A. Cojanu	March 2017
1.8.	Contracting of supporting studies necessary for the extension of the CNE Cernavoda Unit 1 lifespan over the 210,000 EFPH, stage II			A. Cojanu	October 2018
1.9.	Performance of studies concerning the operation of U1 for the projected period of 30 years (extension of the tubes' lifespan to over 210,000 EFPH), stage II			A. Cojanu	December 2020
1.10	Planning and performing, if necessary, activities/ works necessary for lifespan extension up to 245k EFPH, stage II			A. Cojanu	December 2022

1.11	Sending authorization documentations to CNCAN			A. Cojanu	October 2022

ACTION PLAN

SYSTEM: N/A	BSI: N/A	UNIT: 1	U1-PA-17-0017	REV.#1	PAGE: 4 OF 5
TITLE/ PURPOSE: Ensuring the operation of Unit 1 for the projected duration of 30 years at a capacity factor of approximately 90% and preparing the retrofitting project in view of a second life cycle					

1.12	Obtaining the extended authorization until the end of 2026			A. Cojanu	March 2023
Section II – Preparing of the retrofitting project (completion of the organization study)					
2.1.	Drawing up of the procurement documentation for the study on the optimal organization of the retrofitting project			A. Cojanu	Performed
2.2.	Carrying out the procurement procedure and contracting the study concerning the organization of the project			A. Cojanu	May 201
2.3.	Approving the study concerning the organization of the project			A. Cojanu	December 2017
2.4.	Implementing the resulted logistical and organizational changes				January 2018
Section III – Finalization of the necessary documentations and approval of the project. Implementation					
3.1.	**Scoping and approval of the project**				
3.1.1	Scoping: Condition assessment, life assessment, setting out the list of changes and improvements needed to be performed once with the retubing				January 2019
3.1.2	Drawing up of the feasibility study (including defining the scope of work)				January 2021
3.1.3	Approval of the project in BoD and GMS				March 2021
3.2.	**Finalizing the documentations**				
3.2.1	Starting the procedure for obtaining an environmental permit				April 2021
3.2.2	Drawing up of PSR				April 2021
3.2.3	Drawing up of documentations for the logistic support of the project and contracting related works				April 2023
3.2.4	Drawing up of engineering packages necessary for the detailed documentation of the changes				May 2024
3.2.5	Review of the feasibility study				July 2024
3.3.	**Contracting**				
3.3.1	Signing of long-lead contracts (retubing, feeders)				March 2022
3.3.2	Contracting of execution works				July 2025
3.4.	**Implementation**				

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3.4.1	Arrangements and logistics prior to the start of the works				December 2025
3.4.2	Authorization to start the implementation of the retrofitting project				December 2026
3.4.3	Unloading the fuel from the reactor				December 2026
3.4.4	Implementation of the project				December 2028
3.4.5	Commissioning of the retrofitted U1 for a new 30 year life cycle (100 day operation without refueling)				December 2028
3.4.6	Beginning the commercial exploitation of the retrofitted U1				December 2028

NECESSARY RELATED DOCUMENTS:

REFERENCES:

PERSON IN CHARGE OF MONITORING THE COURSES OF ACTION:

DRAWN UP BY/ DATE:	***CHECKED BY/ DATE:***	***ENDORSED BY:***	***PROCESSED BY/ DATE:***
A. Cojanu *Illegible signature*	**S. Ghelbereu** *Illegible signature* *May 22, 2017*	**M. N. Serban** *Illegible signature* *May 22, 2017* ***APPROVED BY/ DATE:*** **D. Lulache** *Illegible signature*	

Resolution No. 27/23 December 2013
of the Extraordinary General Meeting of the Shareholders
Societatea Nationala Nuclearelectrica S.A.

Head Office: 65, Polona Street , sector 1, Bucharest, registered with the Trade Register Office under number J40/7403/1998, Sole Registration Code RO 10874881

Today, 23 December 2013, hours 12:00, the shareholders of Societatea Nationala Nuclearelectrica (hereinafter called ”the Company” or “SNN”) have met within the Extraordinary General Meeting of the Shareholders (“EGMS”) of SNN, at the National Institute for Statistics – Blue Ballroom, 16 Libertatii Boulevard, Sector 5, Bucharest, the meeting being opened by the Meeting Chairman, Mr. Alexandru Sandulescu, in his capacity as the President of the Board of Directors.

Whereas:

- The Convening Notice for the EGMS published in the Romanian Official Gazette, Part IV, issue number 6444 of 22 November 2013, in the daily paper “Adevarul”, number 124 of 22-24 November 2013 and on the web address of the company;
- The amended convening notice al the GMS of SNN SA published in the Romanian Official Gazette, Part IV, issue number 6970 of 12 December 2013, in the daily paper “Adevarul”, number 7044 of 12 December 2013 and on the web address of the company;
- The provisions of the company’s Constitutive Act in force (“the Constitutive Act”);
- The applicable legislation;

The meeting chairman ascertains that at the opening of the meeting, the EGMS is legal and statutory, 27 shareholders are present or represented, holding a number of 259.949.647 shares, representing 92,25179 % of the subscribed and paid up share capital, representing 92,25179 % of the total voting rights. The quorum requirement is fulfilled in compliance with the provisions under Art. 15 of the Constitutive Act and with the provisions under Art. 115 paragraphs 1 and 2 of the Law of companies No. 31/1990 (“Law No. 31/1990”). The meeting Chairman ascertains that the EGMS is statutory and legally constituted and organized, and may adopt valid resolutions with respect to the issues on the agenda.

Following the debates, the company’s shareholders decide as follows:

1. The election of the Secretary of the Extraordinary General Meeting of the Shareholder.

In compliance with the provisions under Art. 129 of Law No. 31/1990, the shareholders of SNN elect Mr. Dan Valentin Gheorghe as the secretary of the EGMS, while the company appoints Mrs. Letitiea Hrebenciuc as the technical secretary of the EGMS.

In the presence of the shareholders representing 92,25179 % of the share capital and 92,25179 % of the voting rights, this item is adopted with 259.949.647 votes representing 100% of the total votes held by the present or represented shareholders, in compliance with the provisions under Art. 15 of the Constitutive Act corroborated with the provisions under Art. 115 paragraph 2 of the Law No. 31/1990.

The votes were recorded as follows:

- 259.949.647 votes "for"
- 0 votes "against"
- 0 votes "abstain
- 0 votes were not casted.

A number of 0 votes was annulled.

2. The approval of the decision regarding the extension of the Investment Agreement concluded by SNN with ArcelorMittal and Enel for the Cernavoda NPP's Units 3 & 4 Project, only on the basis of the report regarding the conclusions of the renegotiation of the Investors Agreement for the Project "Cernavoda NPP – Units 3 and 4", approved by the management of the Department for Energy, in accordance with the mandate of the renegotiation commission approved by the decision of the Minister Delegate for Energy. The empowerment of the executive management of SNN SA to purchase the shares owned by Enel and ArcelorMittal taking into account their notifications through which they exercise their put option, respectively the empowerment of SNN to purchase their shares at a price of 80% of the nominal value of the share, in accordance with the Addendum number 6 to the Investors Agreement, following that the Investors Agreement for Cernavoda NPP Units 3 and 4 to cease. The project company SC EnergoNuclear SA SA will continue to operate as a subsidiary fully owned by SNN, until the end of 2014.

In the presence of the shareholders representing 92,25179 % of the share capital and 92,25179 % of the voting rights, this item is adopted with 231.331.314 votes representing 88,99082 % of the total votes held by the present or represented shareholders, in compliance with the provisions under Art. 15 of the Constitutive Act corroborated with the provisions under Art. 115 paragraph 2 of the Law No. 31/1990.

The votes were recorded as follows:

- 231.331.314 votes "for"
- 27.846.836 votes "against"
- 771.497 votes "abstain"
- 0 votes were not casted.

A number of 0 was annulled.

3. The approval of the Refurbishment Strategy and Plan for the Cernavoda NPP's Unit 1 with a view to extending its lifetime.

In the presence of the shareholders representing 92,25179 % of the share capital and 92,25179 % of the voting rights, this item is adopted with 259.949.647 votes representing 100% of the total votes held by the present or represented shareholders, in compliance with the provisions under Art. 15 of the Constitutive Act corroborated with the provisions under Art. 115 paragraph 2 of the Law No. 31/1990.

The votes were recorded as follows:

- 259.949.647 votes “for”
- 0 votes “against”
- 0 votes “abstain”, and
- 0 votes were not casted.

A number of 0 was annulled.

4. The approval of the purchase of legal assistance/consultancy services or representation related to the development of Cernavoda NPP Units 3 and 4 Project.

In the presence of the shareholders representing 92,25179 % of the share capital and 92,25179 % of the voting rights, this item is adopted with 231.331.349 votes representing 88,99083 % of the total votes held by the present or represented shareholders, in compliance with the provisions under Art. 15 of the Constitutive Act corroborated with the provisions under Art. 115 paragraph 2 of the Law No. 31/1990.

The votes were recorded as follows:

- 231.331.349 votes “for”
- 27.469.181 votes “against”
- 771.462 votes “abstain”, and
- 0 votes were not casted.

A number of 0was annulled.

5. The approval of the date of **15.01.2014** as the registration date in compliance with the provisions under art. 238 of the Capital Market Law No. 297/2004, namely, the date which helps identifying the shareholders who will be affected by the decisions made by the EGMS.

In the presence of the shareholders representing 92,25179 % of the share capital and 92,25179 % of the voting rights, this item is adopted with 259.949.647 votes representing 100% of the total votes held by the present or represented shareholders, in compliance with the provisions under Art. 15 of the Constitutive Act corroborated with the provisions under Art. 115 paragraph 2 of the Law No. 31/1990.

The votes were recorded as follows:

- 259.949.647 votes “for”
- 0 votes “against”
- 0 votes “abstain”, and
- 0 votes were not casted.

A number of 0 was annulled.

5. The empowerment of Mr. Alexandru Sandulescu, in his capacity as President of the Board of Directors, in order to sign the decisions made by the EGMS on behalf of the shareholders and any other documents related thereto and in order to perform any act or comply with any formality required by law for the registration and implementation of the EGMS decisions, including the publishing and registration procedures thereof with the Trade Register Office or with any other public institution. Mr. Alexandru Sandulescu may delegate the powers mentioned above to any appropriate, competent person in order to fulfill this mandate.

In the presence of the shareholders representing 92,25179 % of the share capital and 92,25179% of the voting rights, this item is adopted with 259.949.647 votes representing 100% of the total

votes held by the present or represented shareholders, in compliance with the provisions under Art. 15 of the Constitutive Act corroborated with the provisions under Art. 115 paragraph 2 of the Law No. 31/1990.

The votes were recorded as follows:

- 259.949647 votes “for”
- 0 votes “against”
- 0 votes “abstain”, and
- 0 votes were not casted.

A number of 0 was annulled.

PRESIDENT OF THE BOARD OF DIRECTORS

Alexandru SANDULESCU

ANNEX 3

LIST OF STUDIES AND THEIR STAGE, INCLUDING EXPENSES INCURRED BY DECEMBER 31, 2016

No.	Name	Scheduled implemen-tation period	PR	Value executed at Dec 31, 2016 (RON)	Stage	Remarks
1	Extending the life of Cernavoda CNE Unit 1 by 25 years compared to the projected lifetime (Feasibility Study)	2015-2017	-	-	Delayed for 2019-2020	The data required for the feasibility study (CA, PSR, purpose assessment of the retrofitting) will be available in 2019.
2	Execution of "lifetime evaluation" studies for each type of power transformer at CNE Cernavoda, from U0 and U1 without exhaust transformers	2014-2015	26871	314,560	In progress	Activities in progress; The contract was signed on 15.08.2015 and ends in 2017.
3	Life Assessment study for Fuel Channels U1	2013-2018	25388	2,686,364	Made in 2018, the study will be reviewed	Further studies are needed to extend the lifetime to more than 210,000 EFPH
4	Life Assessment study for Reactor Building U1	2014-2018	26854	521,571	Performed in 2016	N/A
5	Life Assessment study for feeders U1	2013-2018	25388	707,312	Performed in 2016	Further studies are needed to extend the lifetime of more than 210000 EFPHs
6	Life assessment evaluation & life extension detailed planning document for CNE Cernavoda U1, turbine, generator and auxiliary systems	2012-2013	25096	1,804,425	Performed	N/A
7	Lifetime evaluation services for heat exchangers at CNE Cernavoda U1	2012-2013	25434	1,001,234	Performed	The study for capacitors has been carried out and the study for nuclear heat exchangers is to be contracted
8	Nuclear Safety Analysis Services for updating EPSN Level 1 and achieving EPSN Level 3	2014	26864	3,643,873	Performed	Services performed in the position of the approved budget for the investment objectives after Fukushima
9	Services for updating the Nuclear Safety Final Report of CNE Cernavoda Unit 1	2012-2013	26115	3,155,110	Performed	Services made from the approved budget position for studies necessary for investment objectives
10	Environmental studies required to obtain approvals, agreements and environmental permits for U1 retrofitting	2014-2018	27596		Procurement canceled	Procurement procedure canceled (non-compliant bids).
11	**Other supporting/ approval documentation required by the regulatory authorities, unforeseen or requested during the procedure**	**2014-2018**		**11,842,235**		
11.1	Engineering services for U1 retrofitting		26603	174,336	Performed	N/A

No.	Name	Scheduled implemen-tation period	PR	Value executed at Dec 31, 2016 (RON)	Stage	Remarks
11.2	Training services for refurbishment U1		25619	1,394,447	Performed	N/A
11.3	Development study Probabilistic Safety Assessment Level 2 UI		22174	9,948,732	Performed	Services performed in the position of the approved budget for the investment objectives after Fukushima
11.4	Study on impact of acute tritium emissions on the population		27933	129,000	Performed	N/A
11.5	Engineering assistance services for upgrading and extending the life of Unit 1 from CNE Cernavoda		27789	195,721	Performed	N/A
	Total			**25,676,684**		

ANNEX 4 – Activities and projected budgets for the period 2017-2021

No.	Cost element	Budget article	Done until Dec 31, 2016	Budget 2017	Budget 2018	Budget 2019	Budget 2020	Budget 2021	Total budget
			(RON)	(RON)	(RON)	(RON)	(RON)	(RON)	(RON)
Studies LA / CA			7,036,466	920,126	4,844,988	6,278,582	4,679,133		23,558,275
1	Evaluation studies of the lifetime of power transformers from U0, U1 and U2 CNE Cernavoda, Contract 26871	121							
2	Life assessment study for Reactor Building U1. PR # 26854	121							
3	Lifetime evaluation study of medium voltage, low voltage and instrumentation cables, PR 26680	121							
4.	Condition Assessment Study of Expansion Compensators U1, PR 27694	121							
5	Condition Assessment Study of Buried Pipes U1 PR26681	121							
6	Condition Assessment Study of pipes (Vibration) U1 PR25316	124							
7	Condition Assessment Study of snubbers U1 P R26939	302							
8	Development of "Condition Assessment Evaluation" Study for Diesel groups EPS U1	121							
9	Lifetime evaluation services of heat exchanger, PR 25434	121							
10	Lifetime Assessment Evaluation & Life Extension detailed planning document for CNE Cernavoda Unit 1 - Turbine, Generator and Auxiliary Systems, PR 25096	121							
11	CA study update for SDG	121							
12	LA Fuel Channel, PR 26388- S1	121							
13	LA Feeders, PR 25388 - S2	121							
Engineering services contracts			**1,764,503**	**800,000**	**9,542,376**	**13,993,246**	**3,225,600**	**0**	**29,326,724**
14	Studies necessary for the retrofitting process of U1, including preparatory services using foreign personnel, Contract 25619	121							
15	Engineering services for the retrofitting of Unit1 PR26603	121							
16	Engineering Assistance Services for retrofitting and extending the lifetime of Unit 1 at CNE Cernavoda - PR 27789	121							
17	Status evaluation of the structure and component system of CNE Cernavoda Unit 1 in view of long term operation (Condition Assessment)	121							
18	Engineering services for verification of the purpose of retrofitting (including cost assessments) by a company that participated in the retrofitting of a CANDU plant	121							
19	Organization of the retrofitting project of CNE Cernavoda Unit 1, PR 28812	121							
Studies for lifetime extension over 210,000 EFPH			**0**	**1,860,000**	**7,108,318**	**16,428,318**	**15,428,318**	**0**	**39,814,954**
20	"Buy in" for JPs developed by OPG and Bruce to extend the first life cycle of 210,000 EFPH with 15000 - 25000 EFPH	121							
21	Studies necessary to extend the life cycle of the plant the first 210 kEFPH 15-25 kEFPH, PR 28813	121							
22	Drawing up of Safety Report (Safety Case) and supporting studies necessary to extend the lifetime of CNE Cernavoda Unit 1 over 210,000 EFPH	121							

No.	Cost element	Budget article	Done until Dec 31, 2016	Budget 2017	Budget 2018	Budget 2019	Budget 2020	Budget 2021	Total budget
			(RON)	(RON)	(RON)	(RON)	(RON)	(RON)	(RON)
Feasibility study			0	0	0	450,000	2,000,000	2,960,000	6,400,000
23	Technical and economic assessments (Feasibility study)	121							
24	Cooling water provision study (required for feasibility)	121							
26	Risk Analysis	121							
Nuclear Safety Analysis			**16,747,716**	**430,000**	**0**	**1,260,000**	**11,840,000**	**11,840,000**	**42,137,716**
26	Development of Probabilistic Safety Assessment Study, Level 2 U1 and U2, PR 22174	124							
27	Nuclear Safety Analysis services for the upgrade of EPSN Level 1 and execution of EPSN Level 3	124							
28	Update services of the final Nuclear Safety Report of CNE Cernavoda Unit 1	302							
29	PSR	121							
30	Studies and analyses on fire protection	121							
31	FSSA	121							
Environmental Studies			**129,000**	**0**	**1,216,000**	**1,060,000**	**760,000**	**600,000**	**3,644,000**
32	Environmental Assessment and Development Services to obtain the Environmental Permit for investment projects in CNE Cernavoda	121							
33	Study on the radioactive waste disposal solution PR79-96002-89606	121							
34	Study on the storage solution of D20	121							
35	Study on the impact of acute tritium emissions on the population PR27933	121							
Infrastructure			**0**	**0**	**292,600**	**316,000**	**450,000**	**450,000**	**1,507,500**
36	Computer network (Pavilion 5 rewiring, network upgrading, computers)	121							
37	Rehabilitation of work spaces + furniture	121							
Unexpected			**0**	**0**	**0**	**0**	**0**	**4,611,832**	**4,611,832**
38	Studies/ additional engineering services	121							
TOTAL			**26,676,684**	**4,006,126**	**22,803,181**	**38,795,126**	**38,373,051**	**20,351,832**	**150,000,000**

Annex 5

Ensuring the operation of Unit 1 during the projected period of 30 years at a capacity factor of approximately 90% and preparing the retrofitting project for a second life cycle

Activity ID	Activity name	Start	Finish
1.	Ensuring Unit 1 operation at a capacity factor of approx. 90% (ext. from 210 to 245 kEFPH)	29-Apr-16A	23-Mar-23
0003	Safety report to extend the lifespan to more than 210,000 EFPH Stage 1 - Procurement	29-Apr-16A	28-Feb-17A
0005	Safety report to extend the lifespan to more than 210,000 EFPH Stage 1 - SNC Canada contract	01-Mar-17	06-Oct-17
0005	Acceptance of the Security report to extend the lifespan to over 210,000 EFPH	09-Oct-17	27-Oct-17
0015	Development of Business Case	09-Oct-17	07-Dec-17
0010	Obtaining a letter of comfort from CNCAN	30-Oct-17	13-Dec-17
0020	Preparing the procurement documentation for the safety report to extend the lifespan to over 210,000 EFPH Stage 2	09-Oct-17	07-Feb-18
0016	Obtain budget approval	14-Dec-17	15-Mar-18
0025	Obtaining safety report to extend the lifespan to over 210,000 EFPH Stage 2	16-Mar-18	17-Oct-18
0035	Submitting documentation to obtain CNCAN authorization until the end of 2026		20-Oct-22*
0040	Obtaining a CNCAN operating authorization until the end of 2026	21-Oct-22	23-Mar-23
2.	Preparing the refurbishment project (completion of the organizational study)	29-Apr-16A	16-Ian-18
3.	Defining the necessary documentation and approval of the project. Implementation	01-Mar-17	29-Dec-28
3.1	**Scoping and project approval**	01-Mar-17	18-Mar-21
3.1.1	Condition Assessment	01-Mar-17	07-Jan-19
3.1.2	List of changes and improvements needed with retubing	16-N0V-17	07-Jan-19
3.1.3	Feasibility study	17-Jan-18	15-Jan-21
3.1.4	Approval of the project in the BoD & GMS	18-Jan-21	18-Mar-21
3.2.	**Finalizing Documents**	17-Jan-18	15-Jul-24
3.2.1	Starting the procedure for obtaining the environmental permit	15-Apr-21	15-Apr-21
3.2J2	Development of PSR (periodic review of nuclear safety)	17-Jan-18	30-Apr-21
3.2.3	Development of documentation for logistic support	24-Mar-22	27-Apr-23
3.2.4	Development of engineering packages for detailed documentation of changes	24-Mar-22	31-May-24
3.2.5	Review of the Feasibility Study	12-Jan-24	15-Jul-24
3.1	**Contracting**	16-Mar-20	07-Jul-25
3.3.1	Long-Lead Contract	16-Mar-20	24-Mar-22
3.3.2	Financial arrangements	24-Mar-22	26-Dec-22
3.3.3	EPC Contract	24-Mar-22	07-Jul-25
3.4	**Implementation**	27-Dec-22	29-Dec-23
3.4.1	Arrangements and logistics prior to the start of the works	27-Dec-22	08-Dec-25
3.4.2	Authorization to start the retrofitting	11-Jun-26	11-Dec-26
3.4.3	Start of fuel discharge from the reactor	14-Dec-26	23-Feb-27
3.4.4	Starting the project implementation	24-Feb-27	28-Dec-28
3.4.5	Commissioning	27-Dec-27	29-Dec-28
3.4.6	Commercial exploitation	29-Dec-28	29-Dec-28

The activities and times in the chart are estimates; it is possible that, with the development project, they will change. If these changes do not impact the overall project duration, the amended chart will not need to be reconsidered for approval.