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CERNAVODA NPP UNIT 1 REFURBISHMENT PROJECT

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1. Introduction

- The refurbishment activities started within U1 Refurbishment Group, as part of the Investment & Development Department of Cernavoda NPP organization;

- In September 2017, by the Decision no. 9 the SNN Extraordinary Shareholders Meeting approved only Phase 1 of this project, with an estimated value of 250 millions lei (approx. 50 millions Euro);

- In October 2017 U1 Refurbishment Group has been reorganized, going under the functional coordination of the Technical and Refurbishment Division in SNN;

- In November 2020 the Unit 1 Refurbishment Department and Tritium Removal Facility Group become part of a new division, called Strategic Project Division, incorporated into Cernavoda NPP organization.

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1. Introduction

Two major stages have been identified, respectively:

I. Extending the Cernavoda U1 life of existing reactor components from 210.000 Effective Full Power Hours (EFPH) to at least 245.000 EFPH.

II. Identifying the scope of “Cernavoda NPP UNIT 1 REFURBISHMENT PROJECT” and preparation of the refurbishment works, providing the financial resources, obtaining all preliminary permits and approvals, Unit 1 shutdown and effectively carrying out the refurbishment works in order to operate Unit 1 for a further 30 years’ life cycle.

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2. CERNAVODA UNIT 1 LIFE EXTENSION

I.1. Obtaining CNCAN generic agreement on the approach.

A letter of comfort from CNCAN has been obtained.

I.2. Elaboration of the Unit 1 Periodic Safety Review documentation (PSR).
The execution of the contract signed with Kinectrics Inc. is in progress.

I.3. Preparation of a Safety Case report to demonstrate the possibility of existing reactor components to operate beyond 210.000 EFPH. The execution of the contract signed with SNC Lavalin/Candu Energy Inc. is in progress.

I.4. Preparation of Safety Analyzes to demonstrate the functionality of Unit 1.
The execution of the technical assistance contract with SNC Lavalin/Candu Energy Inc. is in progress.

I.5. Updating the Final Nuclear Safety Report.
Will be carried out by the NPP Safety Department based on the information obtained from the contracts mentioned above.

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3. Cernavoda Unit 1 Refurbishment

Based on the international experience, the Cernavoda NPP U1 Refurbishment Project was structured in 3 phases.

Phase 1 of the project has started in December 2017 and it includes the activities for defining the scope of the project work. Phase 1 will be finalized with the approval of the Refurbishment Project Feasibility Study.

Phase 2 of the project, which starts after the feasibility study approval, includes the preparation activities of the previously identified works, the provision of financial resources, as well as obtaining all the necessary permits and approvals.

Phase 3 of the project starts with the unit shutdown and consists in effectively carrying out the Refurbishment Project works in the unit's facilities, recommissioning and commercial operation start-up of the unit.

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3. Cernavoda Unit 1 Refurbishment

According to the level 2 schedule, Phase 1 is to be completed by the end of first quarter of 2022 year, with the approval of the feasibility study of the project, after which Phase 2 will be carried out by the end of 2026, when Unit will be shut down and Phase 3 will start at the beginning of 2027 with a duration of approximately 2½ years.

2017 2027 2029

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3. Cernavoda Unit 1 Refurbishment

Identification and development of the activities for defining the scope and preparing the feasibility study of the Refurbishment Project.

1. Evaluation of the “Condition Assessment” of Unit 1 systems, structures and components (SSC), which is the basis for establishing the volume of works to be carried out during Unit 1 refurbishment shutdown, the economic impact, as well as other actions to be performed in the next cycle of operation.

The execution of the contract signed with the original designers SNC Lavalin/Candu Energy Inc. and ANSALDO is in progress. For U1 Turbo generator and auxiliaries, these activities are being carried out by General Electric, the original manufacturer, as a subcontractor of Candu Energy Inc. and ANSALDO.

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3. Cernavoda Unit 1 Refurbishment

Identification and development of the activities for defining the scope and preparing the feasibility study of the Refurbishment Project.

2. Identifying the design modifications that will be implemented during Cernavoda NPP Unit 1 refurbishment, elaboration of their conceptual solutions and cost estimation.
The execution of the contract signed with the original designers SNC Lavalin/Candu Energy Inc. and ANSALDO is in progress.

2.1. Identifying the solution to repair the Unit1 Spent Fuel Bay epoxy liner and contracting the necessary work.
The recommendation on the solution to repair will be done by the original designer Candu Energy Inc. in the scope of work of the design modification contract.

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3. Cernavoda Unit 1 Refurbishment

Identification and development of the activities for defining the scope and preparing the feasibility study of the Refurbishment Project.

2.2. Identification of the solutions to repair the Unit 1 Used Ionic Resin Storage Tank, 1-7914-TK1 and contracting the necessary work, for heavy water storage during refurbishment.
The recommendation on the solution to repair will be done by the original designer Candu Energy Inc. in the scope of work of the design modification contract.

3. Preparation of the Preservation Plan for systems and components during the refurbishment outage and carrying out the preservation works provided in that plan.
Following a competitive procurement procedure, the contract was awarded to Canadian Nuclear Partners in association with Framatome.

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3. Cernavoda Unit 1 Refurbishment

Identification and development of the activities for defining the scope and preparing the feasibility study of the Refurbishment Project.

4. Identification of the technical solution for the replacement of nuclear fuel channels, calandria tubes and feeders (Retubing).

Following a competitive procedure, SNC Lavalin/ Candu Energy Inc. has been awarded a contract to prepare and deliver "Technical Solution to Replace Nuclear Fuel Channels, Calandria Tubes and Feeders of the Cernavoda NPP Unit 1 Reactor". The documentation has been delivered by Candu Energy in October 2020.

5. Preparation of the Feasibility Study regarding the solution for storage of the radioactive waste resulting from Unit 1 refurbishment process as well as storage solutions for radioactive waste from Unit 1 long-term operation.

The execution of the contract with KHNP Co. is in progress.

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3. Cernavoda Unit 1 Refurbishment

Identification and development of the activities for defining the scope and preparing the feasibility study of the Refurbishment Project.

6. Preparation of the Infrastructure Plan necessary to Unit 1 Refurbishment Project (layouts, mock-up buildings, offices, platforms, roads).

A report on "Status of SNN assets at Cernavoda NPP site available to be used for Unit 1 Refurbishment Project" has been issued. This information together with updated General Layout Plan of Cernavoda NPP Site has been provided to Candu Energy Inc. to be used in preparation of technical-economical evaluation of the Retubing work.

7. Elaboration of the Feasibility Study for Unit 1 Refurbishment Project, following its submission to SNN Shareholders Assembly for approval.

Following the public tendering procurement procedure, the contract has been awarded to Ernst & Young Inc.

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3. Cernavoda Unit 1 Refurbishment

Identification and development of the activities for defining the scope and preparing the feasibility study of the Refurbishment Project.

8. Procurement of consulting services for engineering and management of Phase 1 of Unit 1 Refurbishment Project.

A public tender to contract independent verification and consultation services is in progress.

9. Preparation of the necessary technical documentation, in order to obtain the Environmental License for Unit 1 Refurbishment Project.

The Procedure for obtaining the Environmental Permit for Unit 1 Refurbishment Project has been started. First necessary preliminary approval from local authority has been obtained and Environment Minister has been already notified.

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3. Cernavoda Unit 1 Refurbishment

Identification and development of the activities for defining the scope and preparing the feasibility study of the Refurbishment Project.

10. Obtaining the construction authorization from CNCAN for radioactive waste storage, according to CNCAN order 407/2005.

After approval of both Storage of the radioactive waste and Unit 1 Refurbishment Project feasibility studies.

11. Preparation of the necessary documentation for Notification of the European Commission about Unit 1 Refurbishment Project in accordance with Article 41 of the Euratom Treaty.

The documentation will be prepared when more information will be available after the Feasibility Study for Unit 1 Refurbishment Project will be issued .

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Thank you!
Questions?

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