



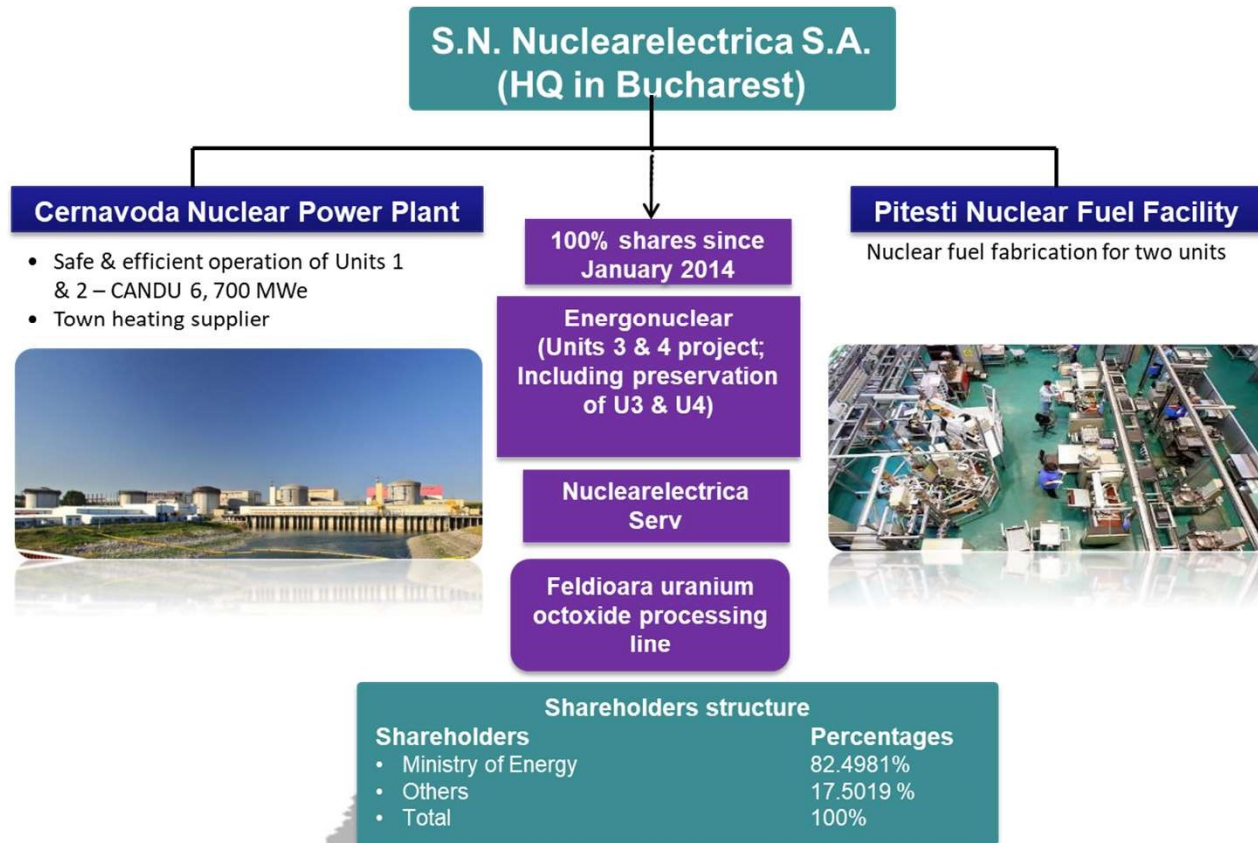
# Implementation of Supply Chain process in Nuclear Power Plants

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*Nuclearelectrica Cernavoda Nuclear Power Plant*

# About Nuclearelectrica



# Cernavoda nuclear power plant



- Construction started in 1979

## UNIT 1

- First criticality – April 1996
- In service since – December 1996
- In service GCF – 90,77%

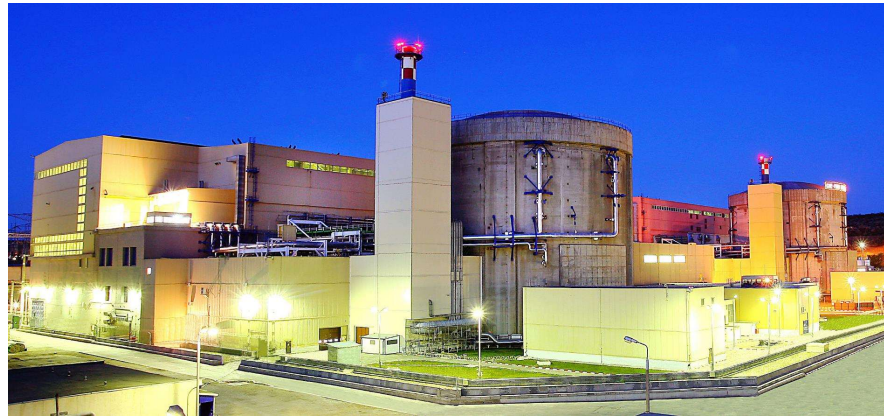
## UNIT 2

- First criticality – May 2007
- In service since – Septembre 2007
- In-service GCF – 93,92%



# Cernavoda nuclear power plant

- Candu technology - Canadian deuterium uranium;
- Both reactors CANDU 6
- 706,5 MW each
- Natural uranium
- Heavy water as a moderator and coolant agent



# SNN's Current Project Development



**Refurbishment /  
Life Extension of Unit 1**



**Two new CANDU Units  
around 2031**



**SMR Development**



**CTRF**



**Integrated Nuclear  
Fuel Cycle**



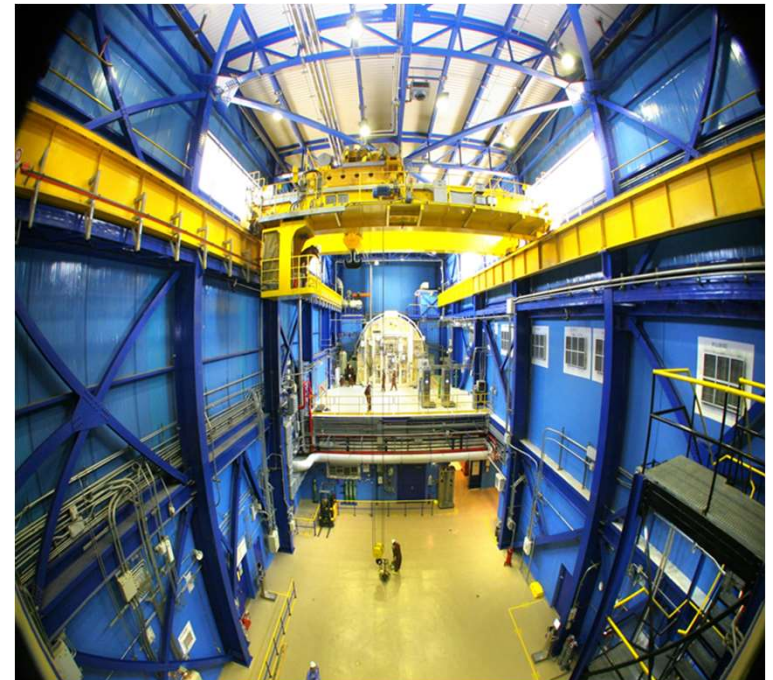
# Cernavoda Tritium Removal Facility (CTRF)



Using LPCE – CD (Liquid Phase Catalytic Exchange – Cryogenic Distillation) technology is aimed **at extracting the tritium from the heavy water in the moderator** and thus ensuring a significant reduction of the radioactive emissions in the environment and of the professionally exposed personnel's internal dose.

CTRF is beneficial during the Refurbishment as well as Decommissioning of CANDU Units, creating a safe environment for the involved workforce

**It represents an opportunity for contribution to global tritium supply for fusion, mainly with respect to ITER (the International Thermonuclear Experimental Reactor) as well as to recovery and uses He3 resulting from tritium disintegration.**



# Refurbishment / Life Extension of Unit 1



**Phase 1** — finalized  
*Final Investment Decision approved  
on February 23<sup>rd</sup>, 2022*

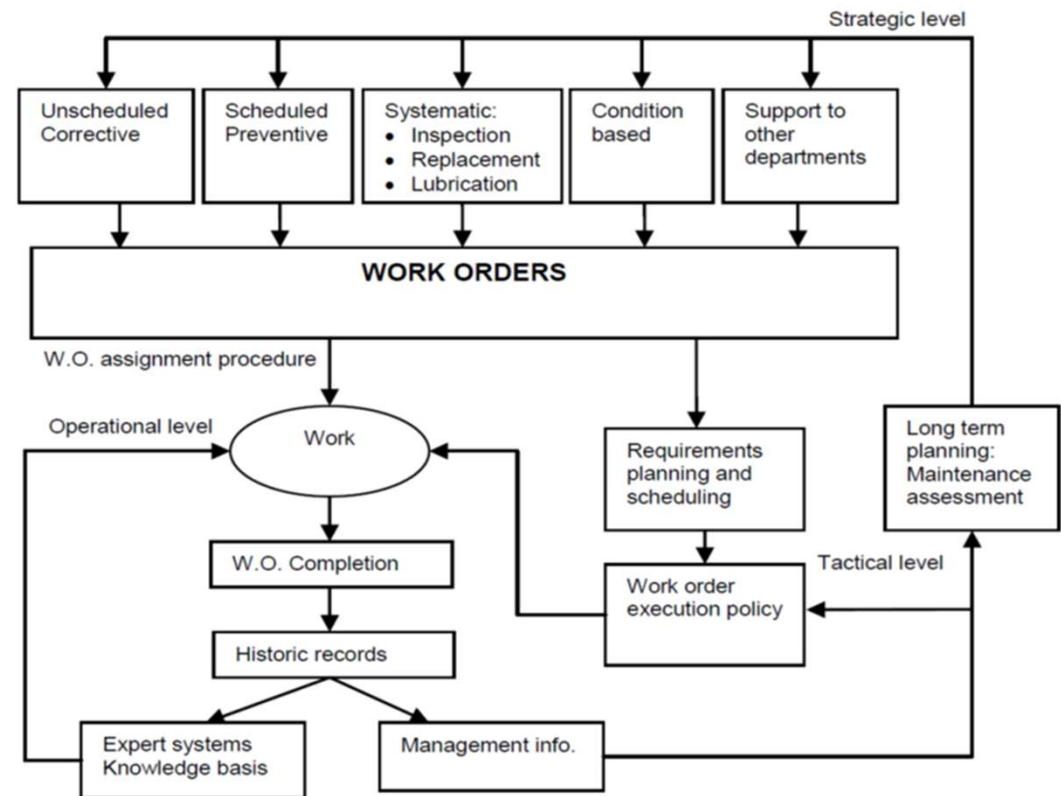
**Phase 2** — Project implementation  
(engineering, procurement, EPC  
contract, licensing, COM Opinion,  
FID).

**Phase 3** — Effective development  
of the refurbishment project – mid-  
2027 –2030.

# Strategic planning – Work Management – Inventory Management



- In 2017, CNE Cernavoda implemented an integrated digitalized process in order for maintenance strategies to be successful. A clear picture of what are the maintenance focus areas and an obvious connection between the maintenance activities and the fulfilment of the companies strategic goals, was developed.
- Business priorities are transformed into maintenance priorities at the strategic level. At a tactical level, determine the sufficient amount of maintenance resources (skills, equipment, etc.) necessary to fulfil the maintenance plan.



# Strategic planning – Work Management – Inventory Management



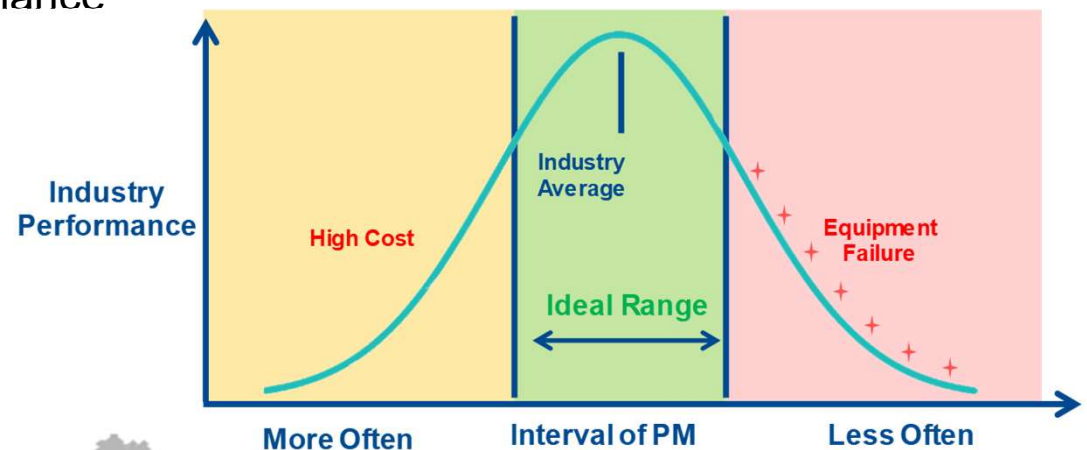
- There are two fundamental elements to determine what an inventory control strategy would be: **How much** to order? and **When** to order?
- Today's supply chains are the result of what we've done in the past; tomorrow's supply chain will be the result of what we do today. So, a utility that is constantly examining the efficiency of their supply chain should consistently remain more efficient.
- A comprehensive inventory management must address all classes of spare parts. However, focus on high safety class, high price, high value or long lead-time items, which can be considered as high criticality items.

# Strategic planning – Work Management – Inventory Management



Work Verification Review leverages the following key data focus areas:

- Historical Cernavoda NPP work performance
- Current Cernavoda NPP equipment performance
- Global Historical work performance
- Global component failure history

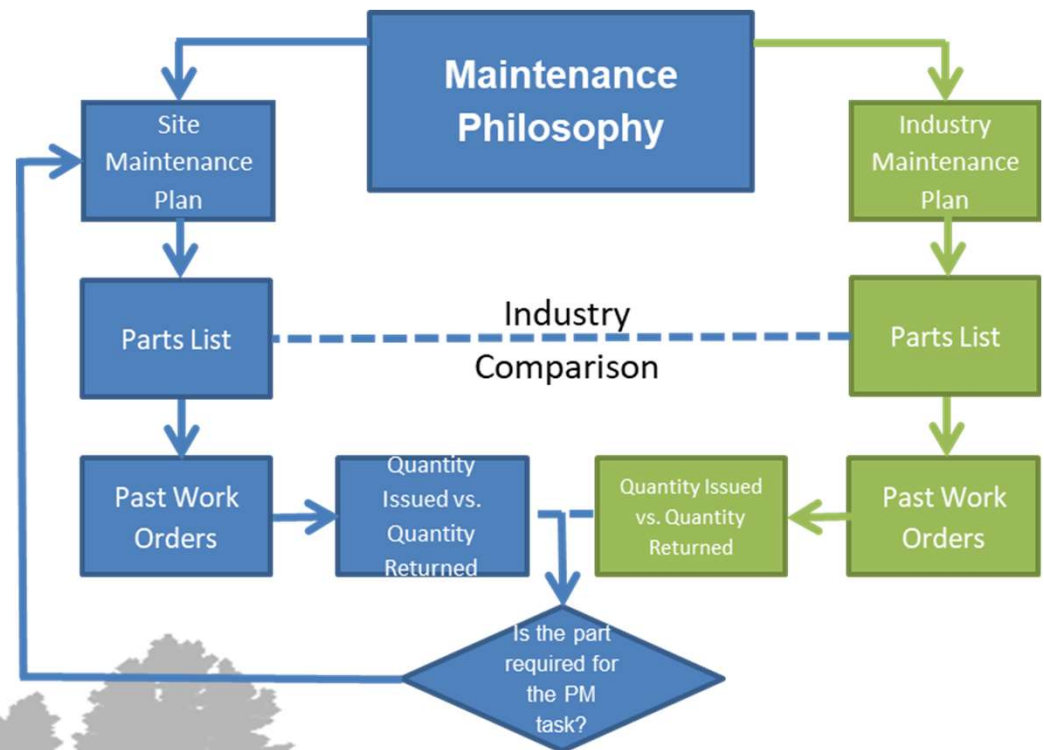


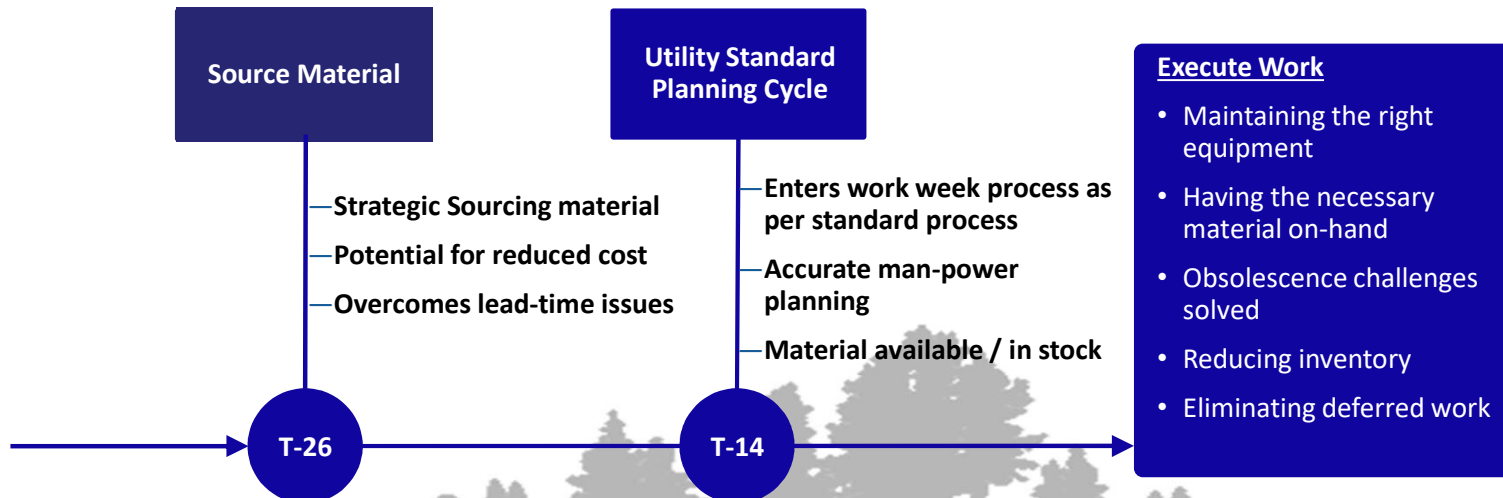
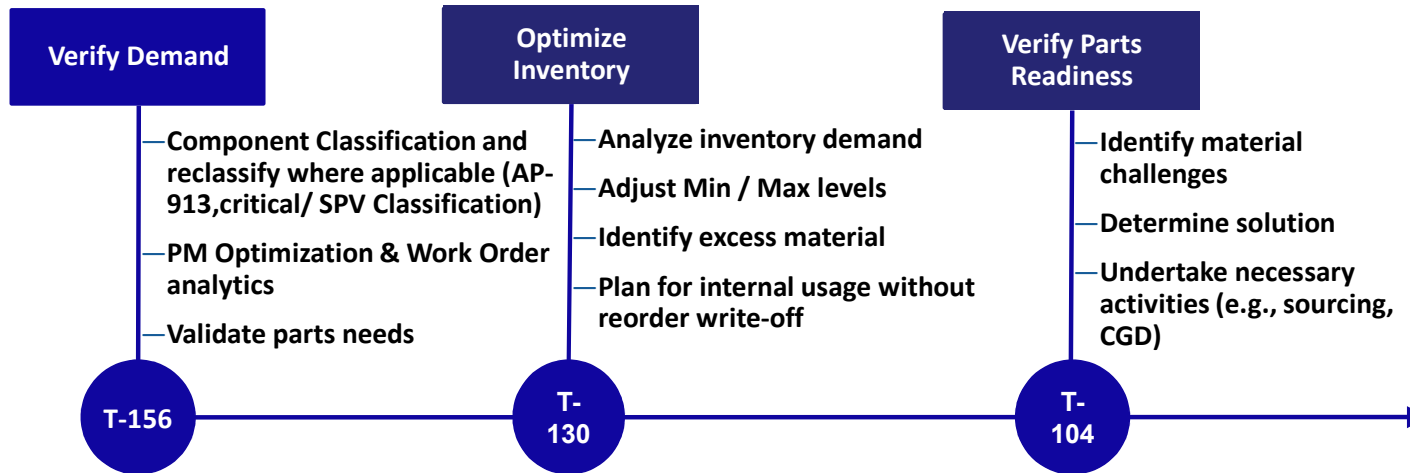
# Strategic planning – Work Management – Inventory Management



Part Verification Review leverages the following key data focus areas:

- Historical Cernavoda part usage
- Cernavoda Bill of Material
- Global Historical part usage
- Global Bill of Material





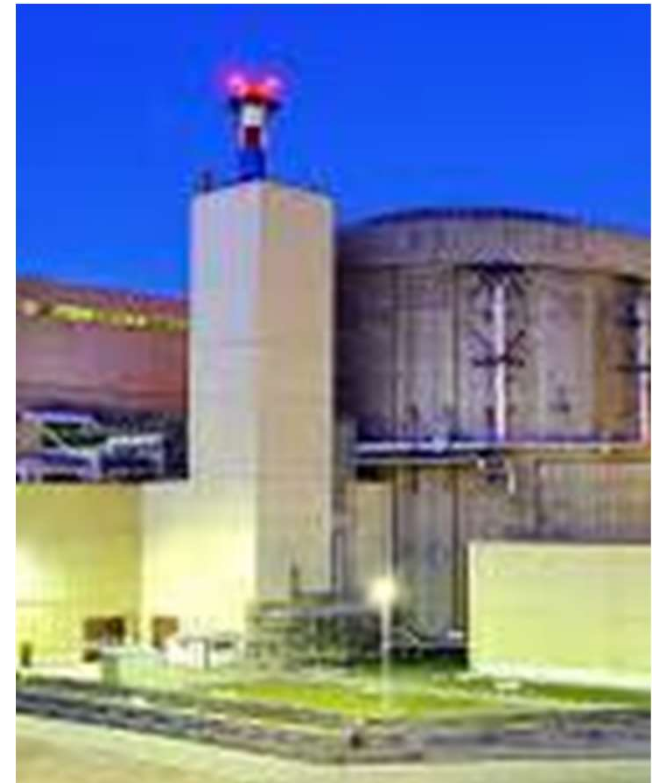
# Supply Chain Challenges

- **Obsolescence – a reality.** Unit 1 is reaching the end of the first cycle of life.
- Most of our **traditional suppliers are no longer in the market**, or they lose their interest in maintaining a nuclear program.
- **No** new potential suppliers;
- Strict legislation when procuring safety related items.



## CGD in Cernavoda NPP

- ❑ CGD is used as an **ultimate alternative** to the traditional procurement from the qualified supplier list;
- ❑ CGD to be used for lower quality class components (quality class 3 and 4);
- ❑ CGD is performed mainly by a third party especially when “special test and inspection” are required. In this case, the dedicator is performing a service “important for safety”;
- ❑ Commercial grade survey is also used when dedication is performed internally.





Thank you!

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