THE CAREM REACTOR: CONCEPT AND CURRENT STATUS

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CONTENT

1) ANTECEDENTS
2) MAIN OBJECTIVES
3) THE CAREM REACTOR
4) POST FUKUSHIMA ACTIONS
5) CAREM LICENSING
6) PREPARING THE SITE

ANTECEDENTS

1) THE PROJECT BEGAN DURING THE 80´s

2) AUGUST 2006: A PRESIDENTIAL DECREE DECLARED "THE CONSTRUCTION AND START-UP OF THE REACTOR CAREM PROTOTYPE" OF NATIONAL INTEREST

3) NOVEMBER 2009: THE NATIONAL LAW 26,566 DECLARED AGAIN THE NATIONAL INTEREST FOR THE CAREM PROJECT , AND STATED CNEA TO BE IN CHARGE OF ITS MANAGEMENT

MAIN OBJECTIVES

1) TO FINALIZE THE DESIGN, TO CONSTRUCT AND TO START-UP THE CAREM PROTOTYPE

2) TO RECOVER CNEA EXPERTISE AND TO CREATE THE NECESSARY INFRAESTRUCTURE TO DEVELOP LARGE PROJECTS

3) TO DEVELOP NATIONAL SUPPLIERS IN ORDER TO STRONGLY INCREASE THE ARGENTINE PARTICIPATION IN THIS PROJECT AND IN THE FUTURE ONES

THE CAREM REACTOR

ARGENTINE EXPERIENCE IN NUCLEAR REACTORS

Experimental and research reactors

Nuclear power plants

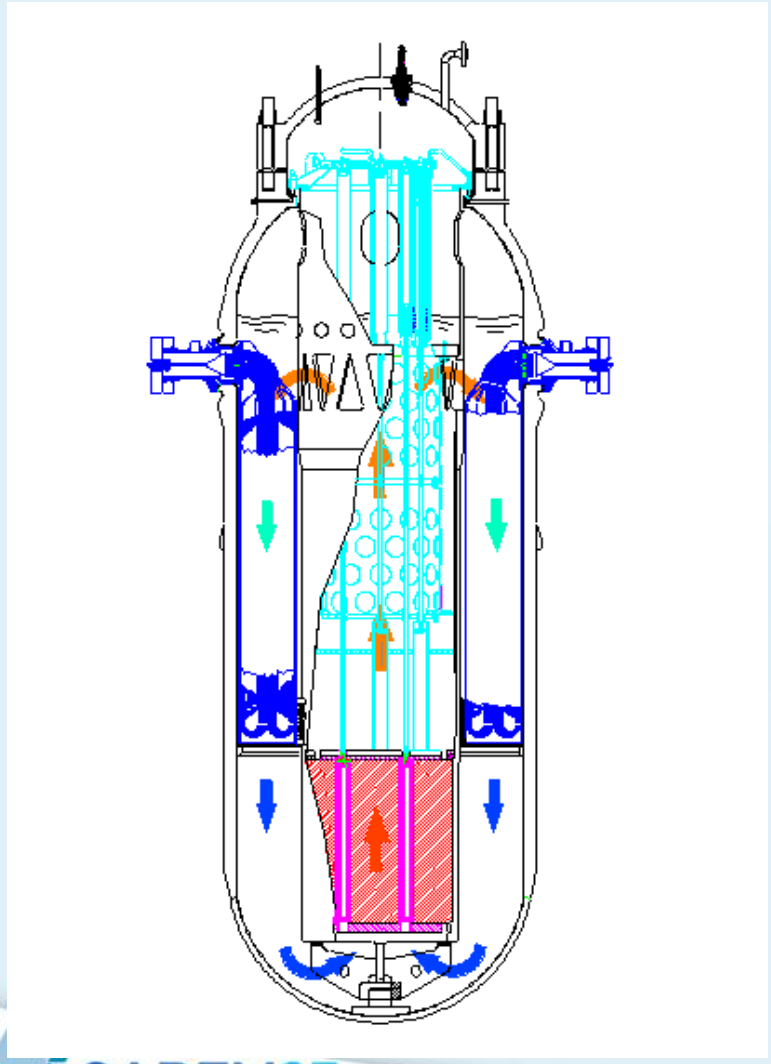
Experience in design, construction and operation as well as export

Experience in operation and maintenance

CAREM

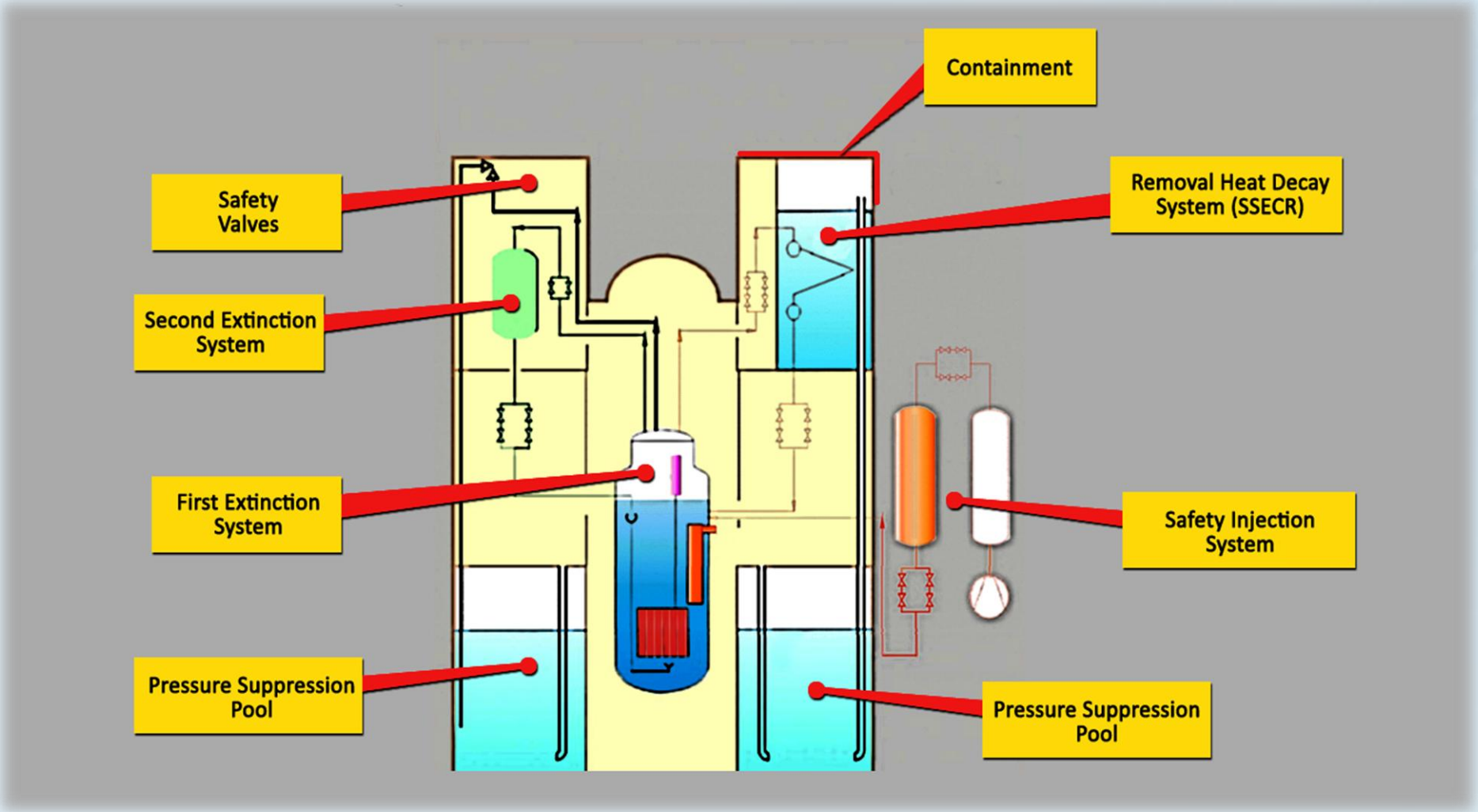
FIRST POWER REACTOR 100% DESIGNED IN ARGENTINA

THE CAREM REACTOR
Distinctive Features



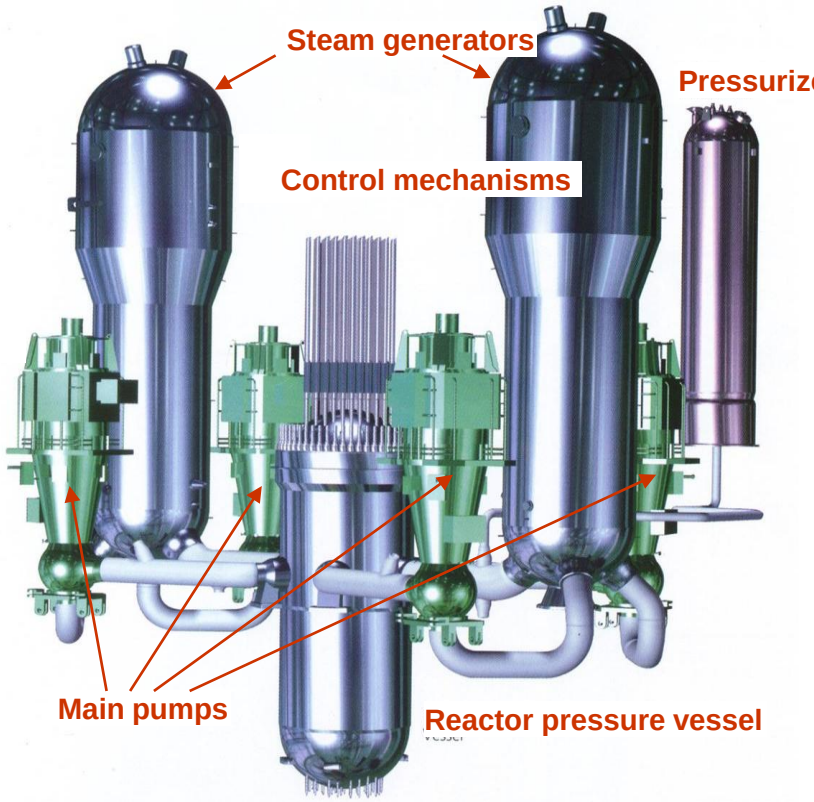
- Integrated primary cooling system
- Primary cooling by natural circulation
- Self-pressurized
- Safety systems relying on passive features

THE CAREM REACTOR

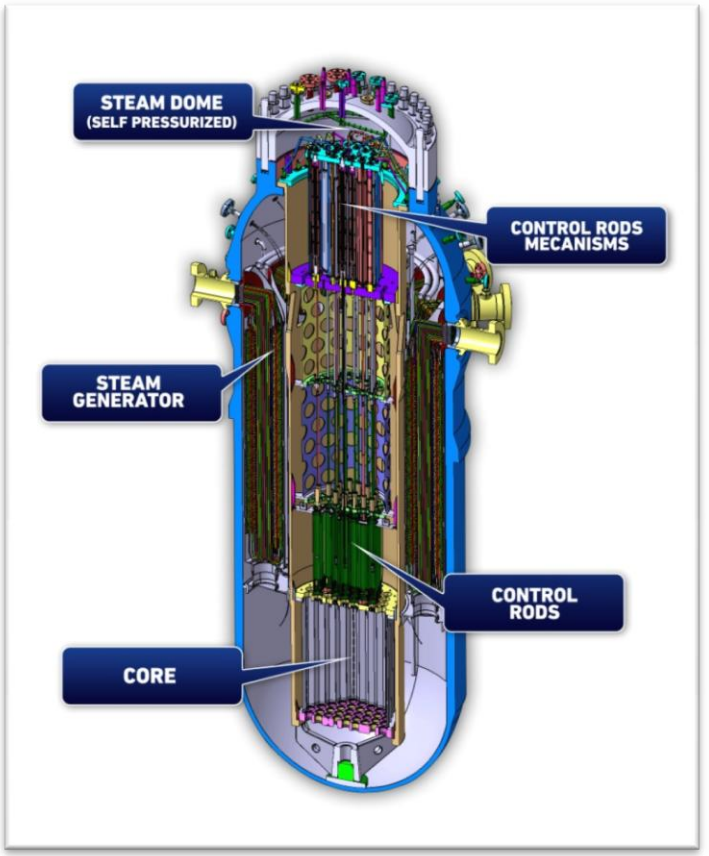


THE CAREM REACTOR

COMPARISON OF CAREM VIS-À-VIS CLASSICAL PWR



CLASSICAL PWR



CAREM

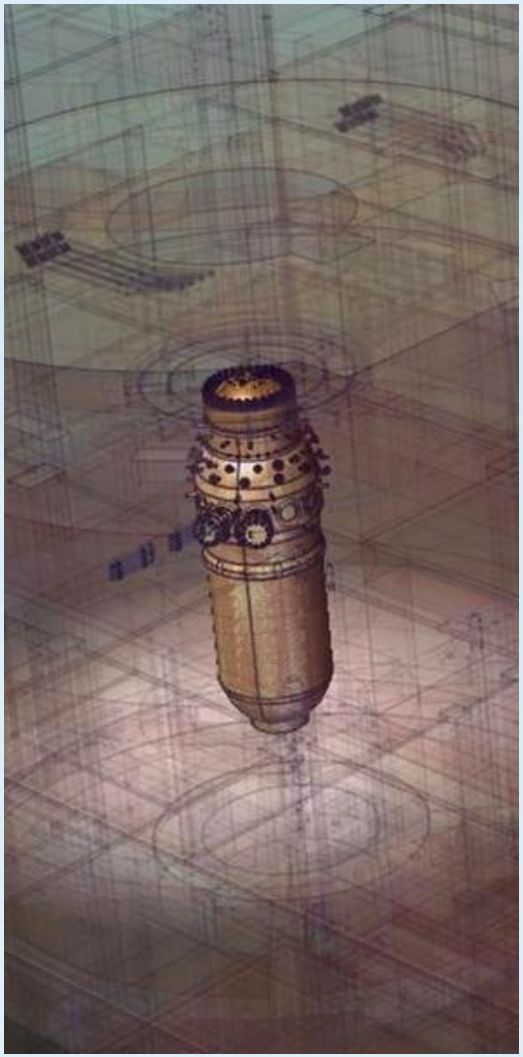
THE CAREM REACTOR

COMPARISON CAREM / CLASSICAL PWR

	CAREM	CLASSICAL PWR
Primary Circuit	Integrated	External (Loop)
Pressurizer	No (Self-pressurized)	Yes
Primary flow	Natural	Forced
Control Mechanisms	Hydraulics (internal)	Magnetics (external)
Safety Systems	Passives	Actives

THE CAREM REACTOR

- **CAREM: First nuclear power reactor designed 100% in Argentina**
- Located in the range of **low and medium power**. First prototype: 27 MWe
- Construction, operation and maintenance **relatively simple**: ideal for countries starting in nuclear matters
- Appropriate for **isolated regions** or far from main cities. Other applications: **seawater desalinization**; supply of electrical energy to **industrial poles** demanding high power; **steam supply** for industrial use or house heating
- **Emphasis on safety**: passive systems; primary circuit integration + control mechanisms + steam generators inside the same RPV; cooled by means of light water; natural convection (pumps are not required)



POST FUKUSHIMA ACTIONS

CAREM-25 prototype

- The design was reviewed considering Fukushima experience
- The following topics were considered:
  - Seismic requirements
  - Loss of heat sink
  - Black-out

POST FUKUSHIMA ACTIONS

Seismic Design

- The design basis earthquake was reviewed.
- A risk based criteria was used.

Loss of heat sink and black-out

- CAREM-25 considers in it design base the loss of heat sink and black-out during the grace period.
- Provisions are considered to allow after the grace period core decay heat removal using the fire extinguish system or an autonomous system.
- Provisions are considered to allow after the grace period containment cooling using the fire extinguish system or an autonomous system.
- Provisions are considered to allow after the grace period electrical supply to safety related systems using autonomous generation systems.

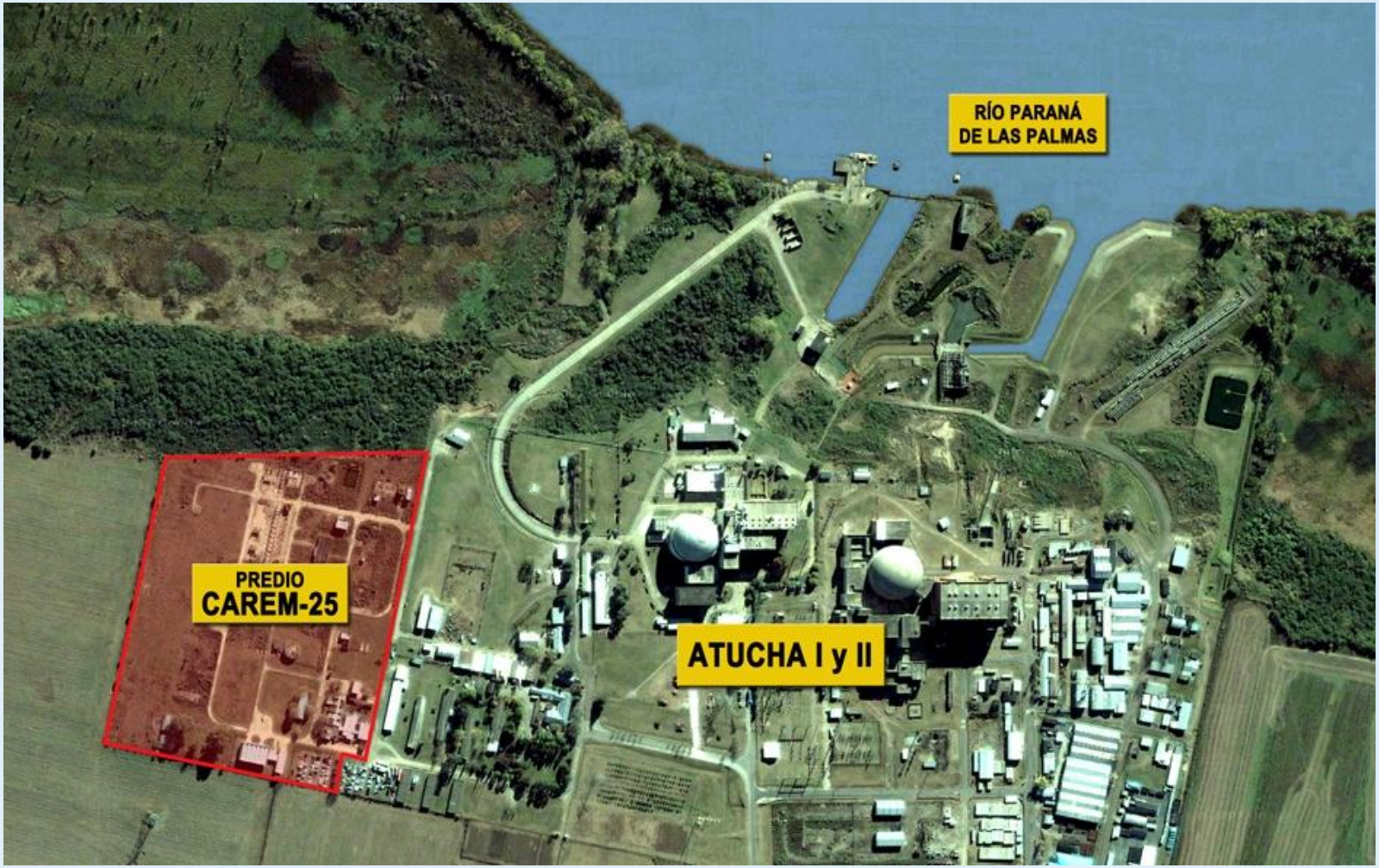
CAREM 25 LICENSING

In 2010 the ARN has approved a new licensing scheme for prototype NPPs in the frame of “non-routinary practice”.

The aim is to ensure that CAREM Prototype reaches the standards set forth in the applicable regulations taking into account the peculiarities of a NPP that will be the first of the kind.

Documents have being provided to the Regulatory Body according to the new scheme. ARN has reviewed them and comments and requests were made. A reviewed version has being provided to ARN.

PREPARING THE SITE



CAREM25

Comisión Nacional de Energía Atómica

Ministerio de Planificación Federal, Inversión Pública y Servicios
Presidencia de la Nación

PREPARING THE SITE

DIGGING

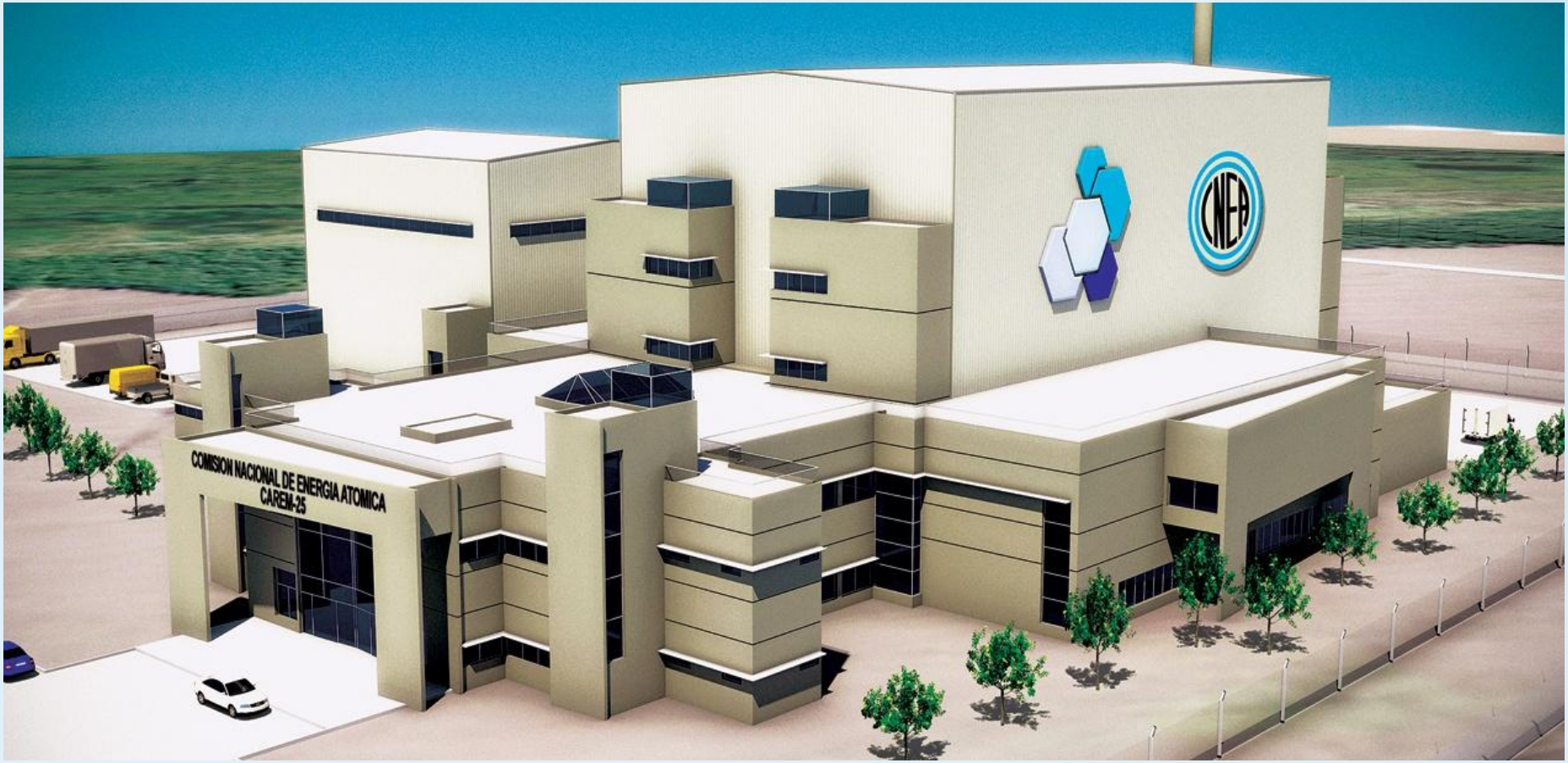
PREPARING THE SITE

DIGGING

PREPARING THE SITE

DIGGING

REACTOR AND BOP BUILDINGS



THANKS FOR YOUR ATENTION

Comisión Nacional
de Energía Atómica

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