REGIONAL WORKSHOP ON SAFETY OF RESEARCH REACTORS DECOMMISSSIONING ACTIVITIES: PROJECT PLANNING,MANAGEMENT,REGULATORY REVIEW AND SAFETY ASSESMENT

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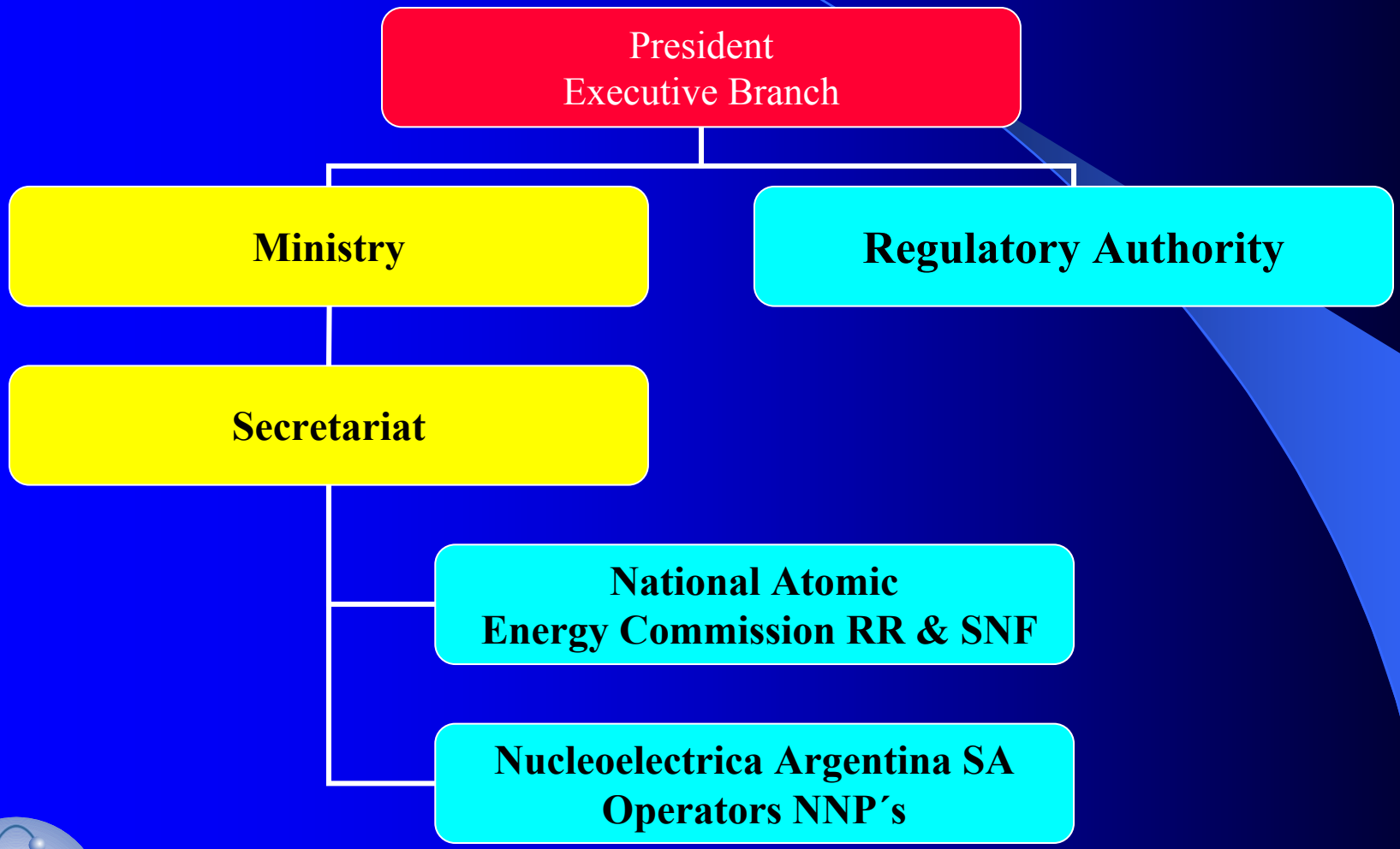
Organization Chart



OUTLINE

- Nuclear Facilities
- Legal Frame
- Local Scenario
- Works in Progress

NNP´s, RESEARCH REACTORS, FACILITIES AND CRITICAL ASSEMBLIES

NUCLEAR INSTALLATIONS	NUCLEAR INSTALLATIONS	NUCLEAR INSTALLATIONS
Atucha1 NNP	DIOXITEK UO2 Conversion Plant	UF6-UO2 Conversion Plant
Embalse NNP	ECRI Fuel Elements for ResearchReactors	Co 60 Plant
RA0 Critical Assembly	CONUAR Fuel Elements for NNP´s	Mo99 Plant Production
RA-1 RR Pool Reactor	U Enriched Lab	Radioisotopes Plant Production
RA3 RR Radioisotopes Production	U Enriched Processing Lab	Accelerator TANDAR
RA4 Research Reactor	Industrial Irradiation Plant	Irradiation Plant for Hazardaus Waste
RA6 Research Reactor	UO2 Pellets production Lab	Radiochemistry Lab
RA8 Critical Assembly	Waste Managemnt Area	
U Enrichment Difussion Plant	Hot Cells Lab	

LEGAL FRAME

According to chapter I, Art. 2.e of the National Law Nº 24804 ruling nuclear activities CNEA " Is responsible for determining the procedure for decommissioning Nuclear Power Plants and any other relevant radioactive facilities."

The implementation the Nuclear Law, states that CNEA is responsible for decommissioning of all relevant radioactive facilities in the country, at end of life.

LOCAL SCENARIO

- **Background**

There is not a Decommissioning plan for any facility.

There are not a final repository for LLW and ILW.

There are many structural components from the NPP's which must treated and other which must be removed because design problems or ageing.

WORKS IN PROGRESS

The main activities are focused in:

Preliminary planning and radiological characterization f or research reactors small nucler facilities.

Evaluate the amount of waste of each facility.

Decommissioning of small facilities and building restoration.

Characterize structural components ,valves, flanges, and other contaminated materials.

Selecting Decontamination Techniques

Evaluate the decontamination and the treatment of the liquids generated.

The objetive is to achieve in a reasonable time, the technical capability required to evaluate and decide on the best alternative for the Decommissioning of given Nuclear Facilities, taking into account the amount of radioactive waste generated.

WORKS IN PROGUESS

CHARACTERIZATION AND EVALUATION OF RADIOACTIVE AND NON RADIAOCTIVE WASTE FOR RR RA1

RESEARCH REACTOR RA-1

Commissioned en 1958
225 Fuel rods U235 enriched at 20%
Open Tank
40 Kwt

Preliminary Decommissioning Plan:

A.- Facility description

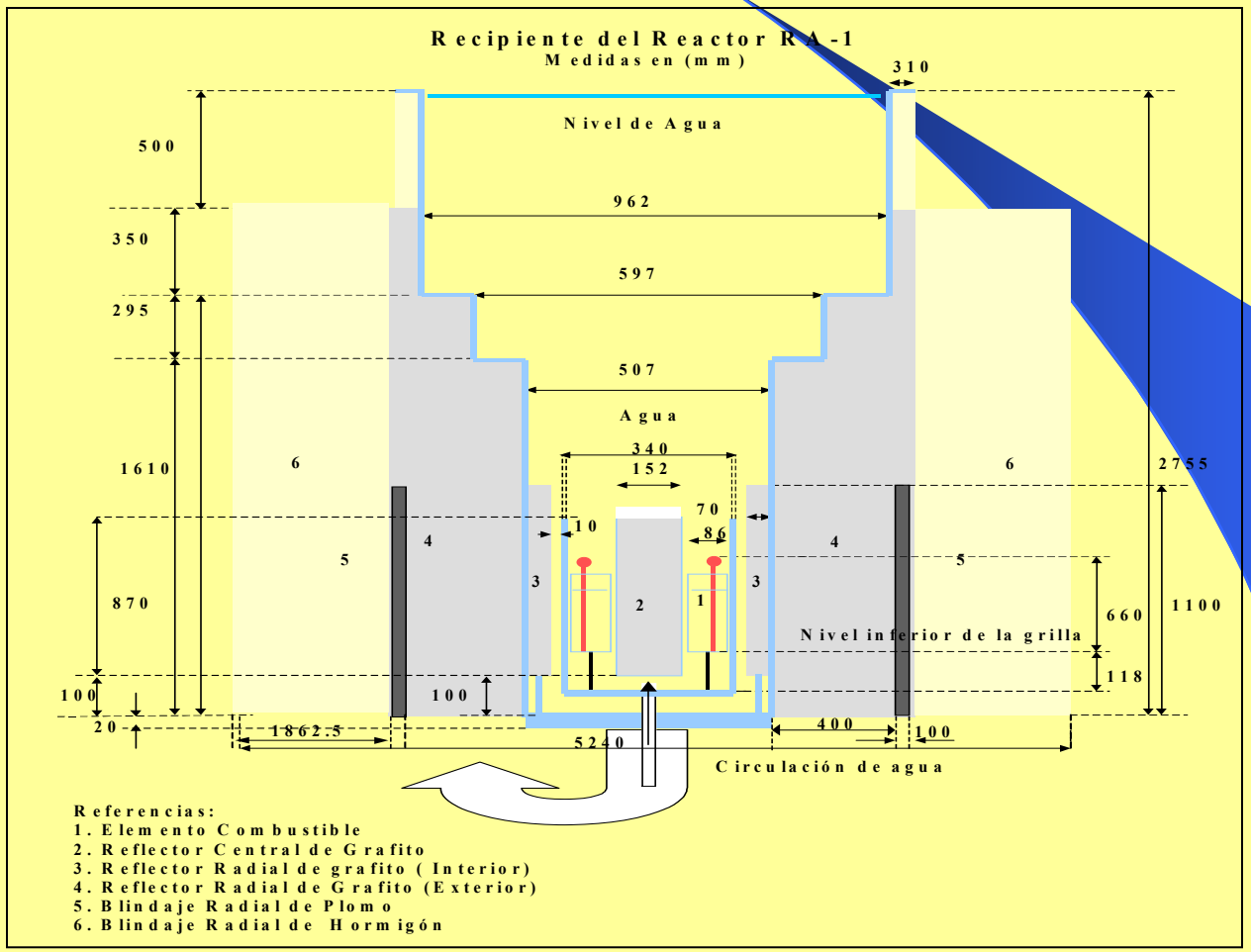
Operational History

Systems and Equipment

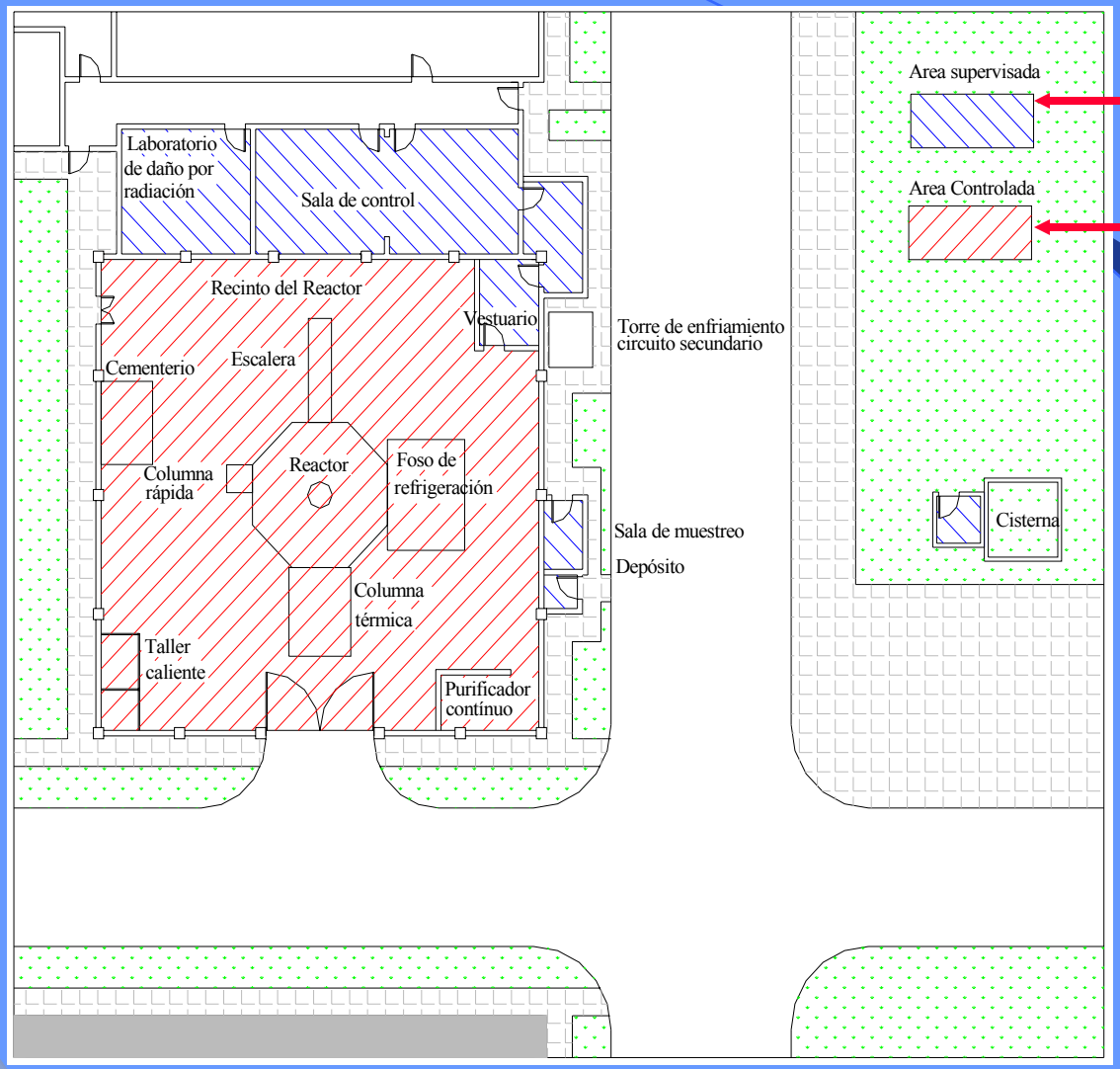
Characterization and quantification of radioactive waste and and non-radioactive material.

B.- Decommissioning Strategy.

CROSS SECTION RA I



LAY OUT Reactor Building



Supervised Area

Controlled Area

DECOMMISSIONING PLAN for RR RA1

FACILITY DESCRIPTION

.- Physical descripcion of the site and facility

Zone Classification
Radioactive Inventory :

Core: 235 Fuel Elements
4 Control Rods (Cd)
1 Source Be

Parts and Components: Internals
Rod Mechanism
Shielding
Primary Circuit
Hot Workshop
Test Facilities
Tank and Accesories
Metals: 5300 kg
Graphite: 3300 kg

Concrete: 190.000 kg

FACILITY DESCRIPTION ctd

.- Operational History

In process

.- Systems and equipment

In process

.-Radioactive and toxi material inventory

In process

DECOMMISSIONING OF SMALL FACILITIES AND BUILDING RESTORATION

HISTORY

Between 1968-1970 a Reprossesing Plant was commissioned to separate Pu 239 from the RA-1 spent fuel. About 0.5 Pu /11,7kg U.

5 m3 of liquid waste were generated and sent to a Radioactive Waste Management Facility before its conditioning.

This facility was never used again from that time.

DECOMMISSIONING OF SMALL FACILITIES AND BUILDING RESTORATION

TODAY:

More than 80 m3 of Low Level Liquid Waste are in the site.

All the staff and workers are retired

Few documents are available

The information was only collected by talking with people with good memory

DECOMMISSIONING OF SMALL FACILITIES AND BUILDING RESTORATION

TOPICS:

Characterization Goals

Characterization plan

Historical Site Assessments

Sample and Analysis Procedures

Exterior Surveys

Final Report

DECOMMISSIONING OF SMALL FACILITIES AND BUILDING RESTORATION

Characterization Goals

Determination of the current radiological and hazardous status of the facility

Assessment of the decommissioning cost, schedule, waste volumes, and radiological dose to workers.

Assessment of environmental, and health and safety risks

Characterization Plan

Radiation fields for all areas, equipment and structures associated.

Contamination levels for the expected range of radionuclides.

The radioactive inventory.

DECOMMISSIONING OF SMALL FACILITIES AND BUILDING RESTORATION

Historical Site Assessments

Sources of information ?????

Facility operating records (event reports,, spill records, effluent release reports, operators shift logs,, waste management records)

Employee interviews (operating staff, administrative staff, retired employees)

Regulatory staff (site inspectors, license/permit agencies)

Construction photos

Historical Site Assessments:

Main Problems

- Inadequate records
- Responsibility for spills, accidents, cover-ups.
- Conflicting information
- Failing personnel memories
- Changing regulatory limits (earlier less restrictive requirements permitted releases

Next Steps:

- Sample and Analysis Procedures
- Exterior Surveys
- Final Report → **REGULATORY BODY**

CHARACTERIZE STRUCTURAL COMPONENTS , VALVES, FLANGES and OTHER CONTAMINATED MATERIALS

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Steps: Classification and characterization

Works in progress:

Decontamination for Wooden and Metallic Structures:

Wooden structures: Electric plane: conventional tool used by carpenters. The shavings produced are put in drums and conpacted and the main srtucture release from regulatory control.

Metallic Structures: Chemical Method

Electrochemical method

Ultrasonic with chemical agents

Mechanical method

Decontamination by Abrasion in Vibratory Tumblers

The system is based on a chemical-mechanical action which is used to smooth, clean and polish metals.

Samples to be treated, solid abrasive media and liquid media are set up into a metallic vessel.

Liquid media contains surfactans and detergentes which "captures" the suspended particles produced by the impact with the abrassive media.

Metallic Decontamination ctd

Vibration is generated which produce a wave con the abrasive media

Pipes, metals structures, woods were tested.

Abrasive materials such as aluminium oxide, silica are known as “chips.

DF : 10-30

DECONTAMINATION by ABRASION in VIBRATORY TUMBLERS

Laboratory Machine

Dimensions: 850 mm x 1100
Vessel Volume 120 liters
Power: 1HP
Secundary Waste:
liquid: 1 liter/hr
Dry Solid waste: 0,260gr/hr

Industrial Machine

Dimensions: 1600x600x700mm
Power: 8 HP

THANK YOU FOR YOUR ATTENTION