

**IRPA 12**

**October 2008 – Buenos Aires**


INDOCTRINATION OF OUTSOURCING MAN-  
POWER ABOUT INDUSTRIAL SAFETY AND  
RADIATION PROTECTION . Specific Plant  
Indoctrination. Subjects and validity.

**ATUCHA NPP**

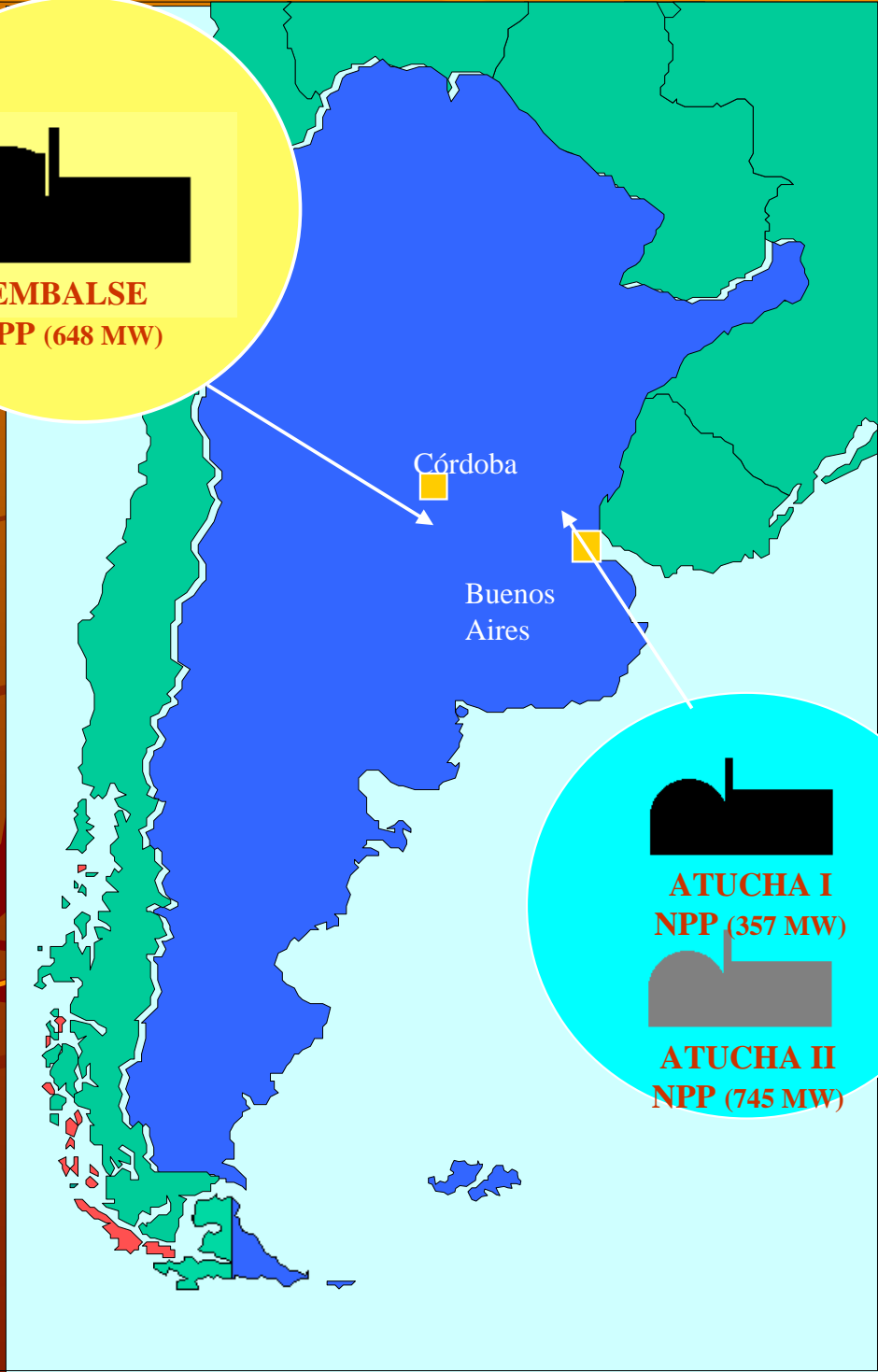
**DIFFERENT LEVEL OF KNOWLEDGE FOR  
PERSONNEL**



**Alejandro SANDA  
RP & SAFETY MANAGER  
ATUCHA NPP**



**EMBALSE**  
NPP (648 MW)



**ATUCHA I**  
NPP (357 MW)



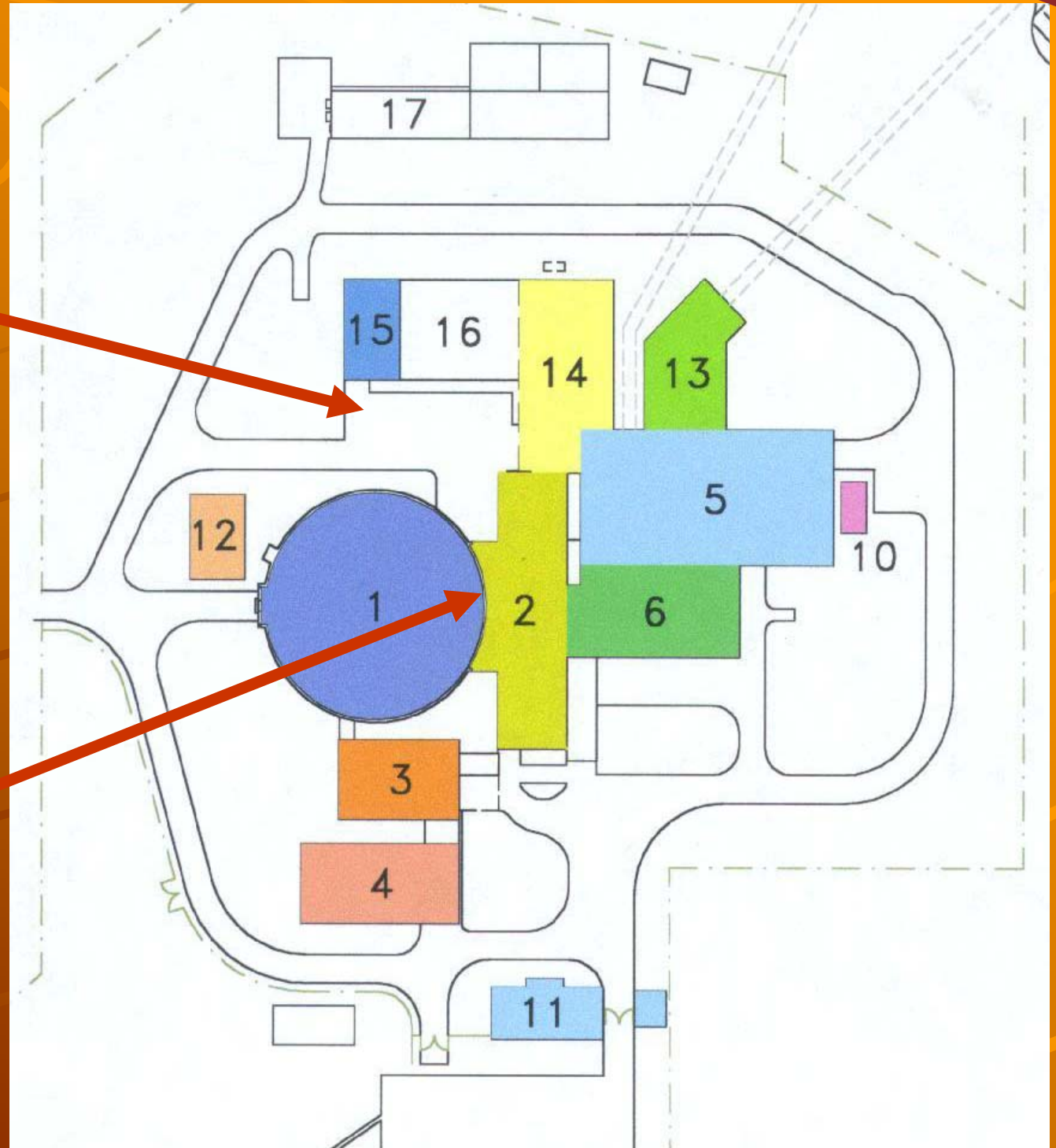
**ATUCHA II**  
NPP (745 MW)

# Argentina



# ATUCHA NPP

Conventional  
Area



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## 1st LEVEL

## BASIC COURSE

- For everybody who have to go into the Plant (conventional areas): contractors, technical visit, etc.
- It allow only “escorted access”
- This course notify Conventional Plant Risks, Emergency Planning, smoking areas, etc.
- Last: 10 minutes, at the Entrance, self assistance Power Point.
- Renew: Person has to attend it each 4 months.

# 1st LEVEL

# BASIC COURSE

## POWER POINT PRESENTATION:

Welcoming

Explain that he/she is authorized for incoming only for Conventional Areas with escort.

Resume of Atucha technical characteristics.

Aerial photo with different areas: free areas – restricted areas -

Emergency Evacuation – Acoustic alarms.

Basic Safety Norms:

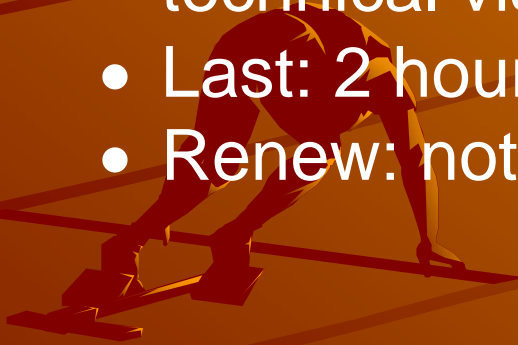
Use of safety shoes, helmets, protective glasses, smoking areas, etc.

2

## 2nd LEVEL


## MEDIUM COURSE

- For everybody that have to go into the Plant (conventional areas) but without escort: often contractors, routine technical visit, etc.
- Last: 2 hours, at the Entrance, with an instructor
- Renew: not necessary



## 2nd LEVEL

## MEDIUM COURSE

- Institutional Video
  - Emergency Plan: sound alarms, meeting points, covers actions during the emergency, etc.
  - Basic knowledge of ionized radiation
  - Industrial Safety. First Aid. Emergency phones.
  - Building location
  - Quality Assurances process
  - Environmental management
- 



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# 3rd LEVEL

# HIGH COURSE

- For permanent personnel

- Last:

Administrative (No professional)	14 hs
Administrative professional	42 hs
Technician	315 hs
Professional	420 hs

- Renew: not necessary



# FOR RADIOLOGICAL CONTROLLED AREA (RCA)

**Knowledge Level**

**Features**

**RED BADGE**

**HIGH**

**Work Supervision  
Visit escort  
Temporal: 4 years**

**GREEN BADGE**

**MEDIUM**

**White Badge escort  
Permanent**

**WHITE BADGE**

**BASIC**

**Only with escorted  
access  
Temporal < 6 month**



# WHITE BADGE

## BASIC

Only with escorted  
access

Temporal < 6 month

- Last: 3 hs
  - With escort permanently
  - Written Test
- 
- Theory classes of: Radiation (external + internal), doses, regulatory dose limits & domestic dose restriction, dose monitoring. Shielding, time and distance. Contamination.
  - Radioprotection Video (30 min)
  - How to enter in Radiological Controlled Area (RCA) Video (20 min)
  - Industrial Safety inside RCA
  - Radioactive Waste Management
  - Administrative Work Permission

# GREEN BADGE

# MEDIUM

# White Badge escort Permanent

- For enter to RCA without escort
- Allow to be “white badge” escort
- Last: 14 hs + 4 hs escorted visit to RCA
- Written Test

How to work ATUCHA NPP

Different type of Buildings: heavy water areas

Emergency Plan: exit doors, organization, responsibilities

Industrial Safety:

Fire Protection, safety belts, dangerous liquid and gases, acoustic protection, electrical risks, gloves, scaffolds, etc.

First Aid: practice

# GREEN BADGE

# MEDIUM

# White Badge escort Permanent

## Radiological Protection:

ALARA, Radiation – Contamination, Whole Body Counter, Urine Sample, Stochastic and deterministic effects, EPD, TLD, RP Good Practices.

## Skill & Drills:

Take in/out gloves, safety shoes, yellow clothes.

Over shoes barriers

Different types of Protective Suits: Pluto, Titan, Donald, Mars, Tyvek.

RCA Visit: go in and go out with an escort.

Written Test

# RED BADGE

# HIGH

Work Supervision  
Visit escort  
Temporal: 4 years

- Allow to supervise tasks in RCA (to have workers in charge)
- Last: 35 hs
- Renew: each 4 years
- Written Test

## 1.- RADIOACTIVE ELEMENTS:

The Atom: atomic mass units. Energy units. Union energy of core. Radioactive disintegration. Alfa and beta disintegration. Gamma emission. Electronic capture. Internal conversion. Isomeric transition. Radioactive decay. Disintegration semi period. Activity. Units.

## 2.- RADIATION INTERACTION WITH MATERIE:

Charges particles interaction. Alfa and beta interaction. Electromagnetic interaccion. Interaction mechanism. Neutron interaction.

## 3.- DOSIMETRIC MAGNITUDES:

Basic dosimetric magnitudes. Emission energy. Exposition. Quality factor. Absorbed dose. Ponderation factors. Equivalent dose in organ and tissues. Effective dose.

**RED BADGE**

**HIGH**

**Work Supervision**  
**Visit escort**  
**Temporal: 4 years**

**4.- DOSIMETRY:**

External irradiation: Estimate effective dose through operational magnitudes.

Internal contamination: enter way. Metabolic model. Calculate equivalent dose in organ. Annual limit incorporation (ALI). Derivate air concentration (DAC).

**5.- RADIATION BIOLOGIC EFFECTS:**

Notions of basic radiobiology. Classification of biology effects.

Deterministic effects. Stochastic effects. Heredity effects. Pre natal effects.

**6.- RADIOLOGICAL PROTECTION FUNDAMENTALS:**

Basic criteria: justification, optimize, limit. Radioactive waste.

Radioactive material transport.

**7.- OCUPATIONAL EXPOSURE MONITORING:**

Area classification. Labeling. Environment monitoring. Individual monitoring of external irradiation. Individual monitoring of internal contamination.



**RED BADGE**

**HIGH**

**Work Supervision**  
**Visit escort**  
**Temporal: 4 years**

**8.- PROTECTION SYSTEMS AGAINST RADIATION:**

Basic techniques of protection: reduce exposure time. Reduce source activity. Shielding.

**9.- DOSE LIMITS:**

Occupational exposure control: dose restrictions. Dose limits. Women occupational exposure .

Public limits: critical group. Dose limits for public. Future dose control due to continues future practices.

**10.- RADIOLOGIC RISK IN RCA:**

Main radionuclides in Atucha. Location of potential sources of radiation and contamination, type of contaminants. Measures and personal protection equipment. Heavy water manage. Safety culture.



**RED BADGE**

**HIGH**

Work Supervision  
Visit escort  
Temporal: 4 years

**11.- GO IN /OUT RCA:**

Go in/out of RCA procedure: persons and equipments

**12.- EMERGENCY PLAN:**

Sound alarms: fire, evacuation, escape, general. What to do.

Emergency plan. Dose limits during an emergency, meeting points, potassium yodure pills.

**13.- LOCATION:**

Knowledge of main components location. Rooms access. Radiological labeling. Emergency exits, stretcher location, emergency telephones numbers.

**14.- PROGRAMING AND PLANNING TASKS:**

Knowledge of failure notification management. Radiological work permit. Equipment deactivation. Equipment for maintenance. Work plan.

**RED BADGE**

**HIGH**

**Work Supervision  
Visit escort  
Temporal: 4 years**

**15.- TECHNICAL VISIT MANAGEMENT:**

Knowledge of visit procedure. Visit circuit.

**16.- INDUSTRIAL SAFETY:**

Fire attack. Different types of fire. How to use an extinguish.  
Supervisor responsibilities in an accident.

**17.- FIRST AID:**

First aid kit. Injured person transport. Traumatism. Hemorrhages.  
Burns. Fracture. Artificial respiration. Cardiac massage.

**18.- ENVIRONMENTAL MANAGEMENT SYSTEM:**

Introduction. Needs. ISO 14001 Norm. Environmental management system in Atucha.

THANK YOU FOR YOUR  
ATTENTION

