

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

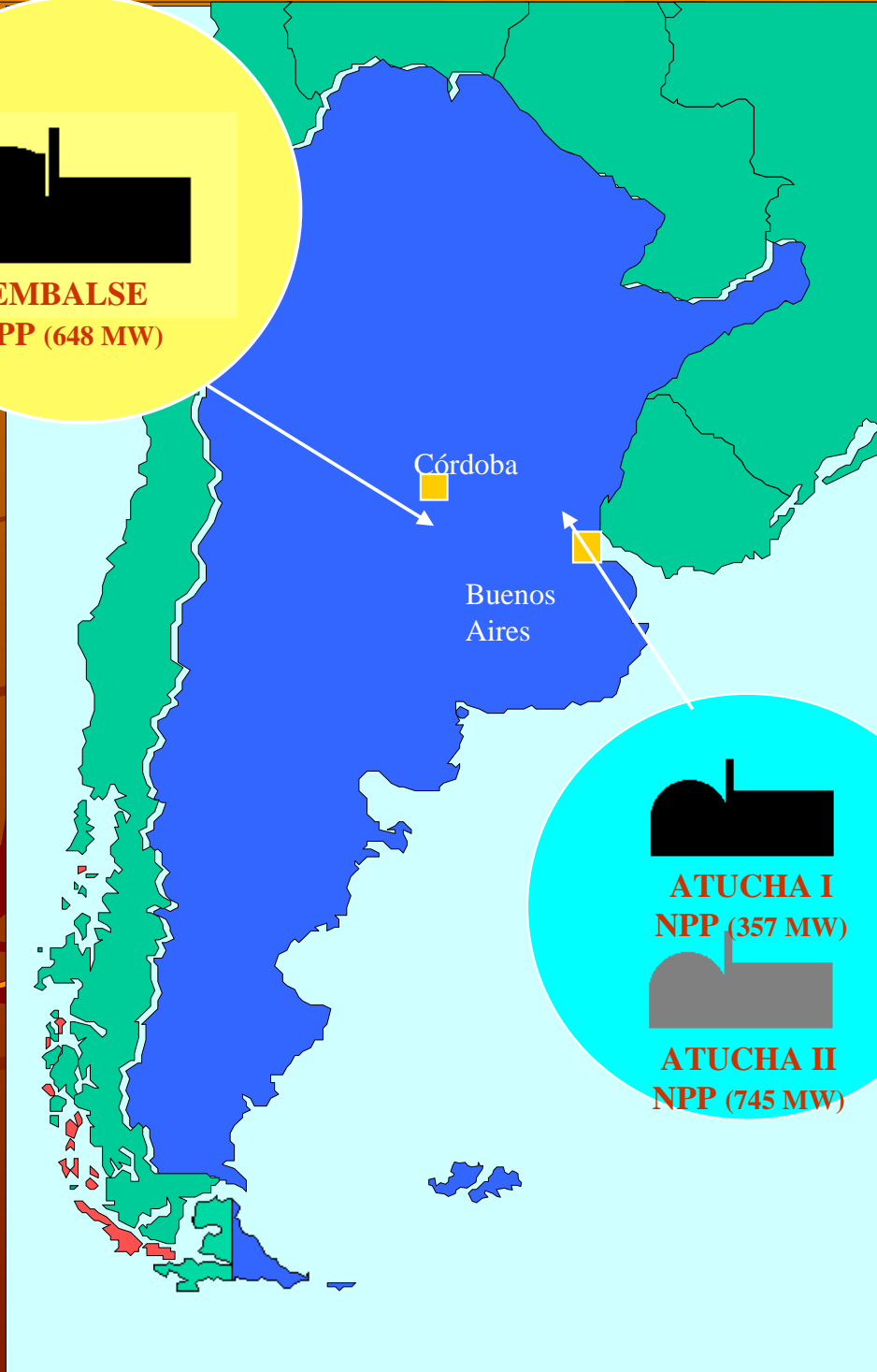
**DIFFERENT LEVEL OF KNOWLEDGE FOR
PERSONNEL**



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



**EMBALSE
NPP (648 MW)**



Argentina



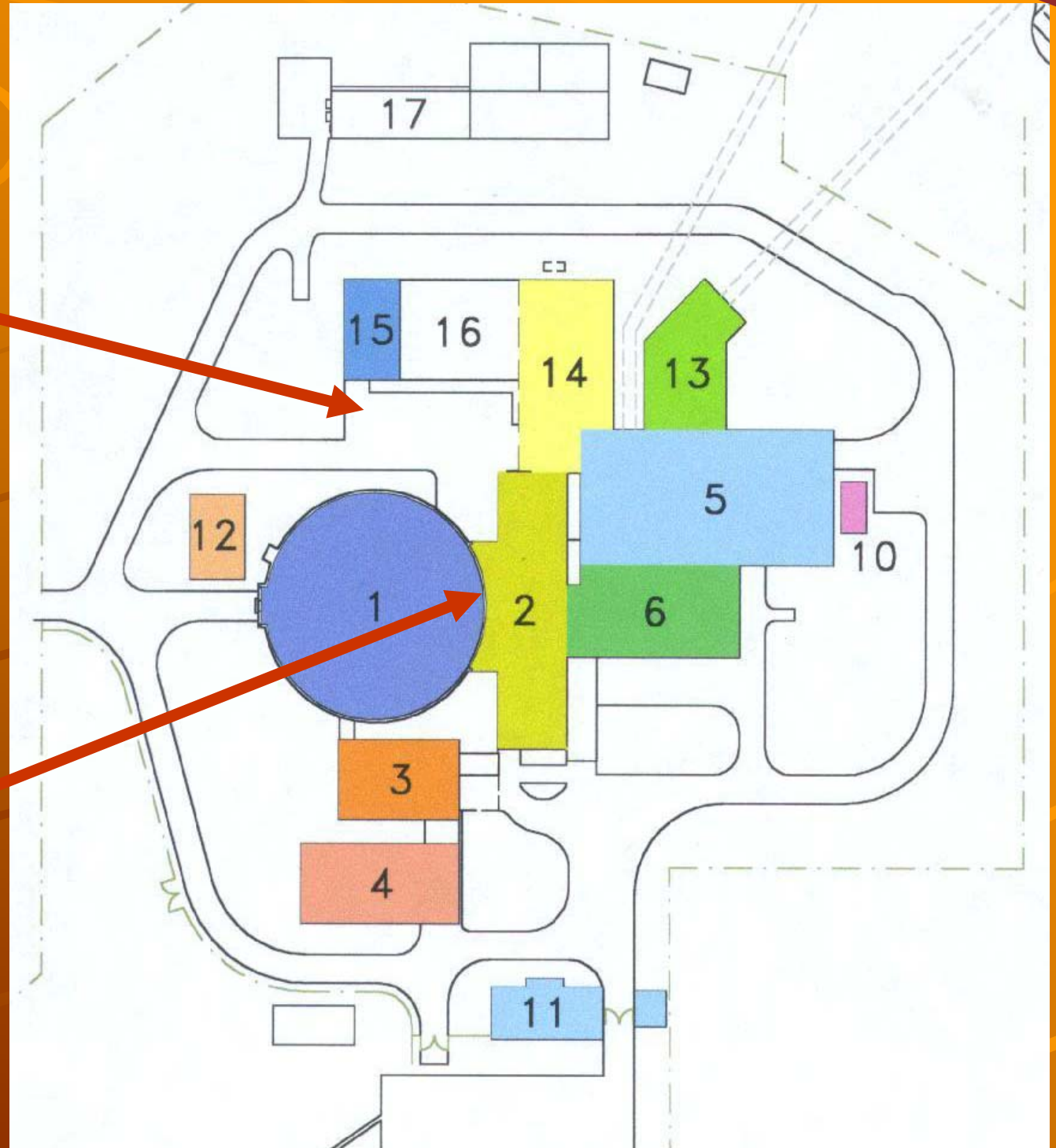
**ATUCHA I
NPP (357 MW)**



**ATUCHA II
NPP (745 MW)**

ATUCHA NPP

Conventional
Area



1

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:

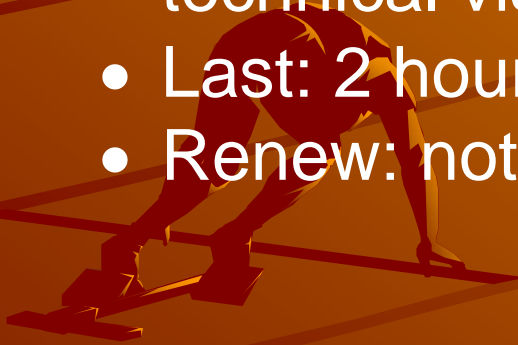
Use of safety shoes, helmets, protective glasses, smoking areas, etc.

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



3

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 interaction. 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 iodide 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

