

IRPA 12th Congress

**Perspectives on Nuclear Energy and
Radioprotection in Argentina.
The industry vision.**

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- 1. Argentina's Profile**
- 2. Argentine Energy Plan**
- 3. Today's Nuclear Argentina**
- 4. Argentine Nuclear Plan**
- 5. Regional Integration**
- 6. Radioprotection, Now and Ahead**
- 7. Conclusions. Argentina's Key Targets**

1. Argentina's Profile

Area: 2,800,000 km² (the world's eighth largest country)

Population: 40,000,000 inhabitants



- Enough energy resources for supplying the domestic demand.
- Its education model has made it possible to rapidly adjust to new and diverse international technological advances.

2. Argentine Energy Plan

Since 2003 Argentina's GDP
electric power demand 8.8% annual rate
7% growth.

Since 1991 electric power generation and distribution has been privatized, except for the Nuclear System.

The nuclear sector, without investment for 20 years, has reduced its share:

| | |
|------|-------|
| 1990 | 15.5% |
| 2007 | 6.0% |

Energy Plan Objectives

- **Ensure power supply capacity: at competitive prices for industries and at affordable prices for the population.**
- **Ensure that energy policies common to the different sources safeguard the safety and preservation of the environment at sustainable levels.**



3. Today's Nuclear Argentina

- Two NPP Atucha I (1974) and Embalse (1985)
- Uranium dioxide conversion plant (Dioxitek S.A.)
- Fuel element fabrication facility (CONUAR S.A.)
- Zircaloy tube fabrication facility (FAE S.A.)
- Industrial heavy water plant (ENSI).
- Pilot uranium enrichment facility (Pilcaniyeu).

3. Today's Nuclear Argentina

- Reactors and Cyclotrons for radioisotope production..
- Argentina designed, built and sold research reactors to Peru, Algeria, Egypt and Australia.
- High class universities such as the Balseiro Institute and the Sábato Institute.

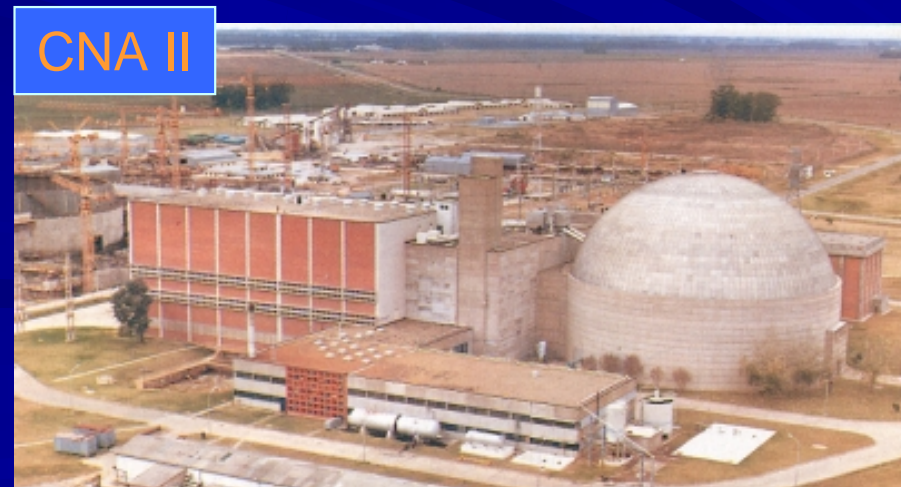


4. Argentine Nuclear Plan

for the near future:

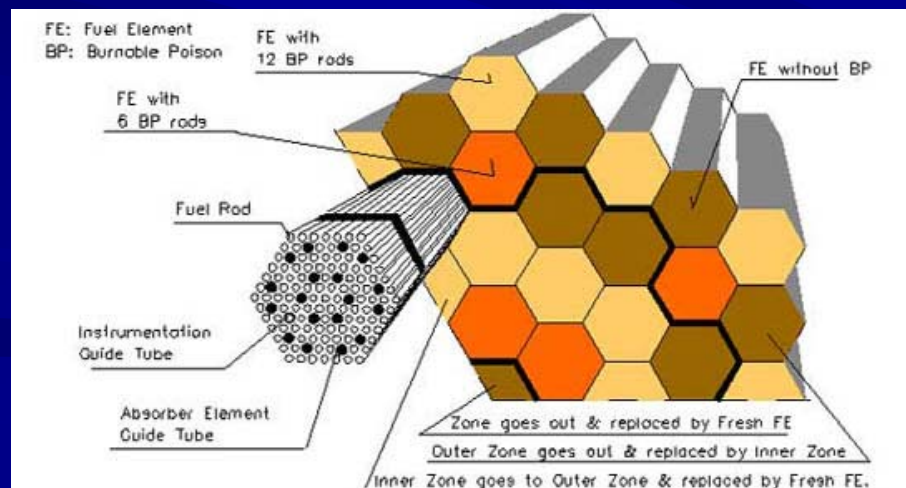
- Complete the construction of Atucha 2 Nuclear Power Plant (700 MW PHWR) by 2010.
- Embalse NPP (CANDU 600) life extension.

The implementation provides incentives for the local industry to be involved in the nuclear activity.



4. Argentine Nuclear Plan

- Completing the CAREM reactor's construction (Nuclear Power Plant prototype). This is a Low Power NPP (25 MW).
- Resuming the uranium enrichment process.



4. Argentine Nuclear Plan

Industry Vision

- Argentina should clearly evince its future interest in fourth-generation reactors, particularly high temperature ones (HTR and VHTR) devoted to hydrogen production or hydrogen/electricity cogeneration.
- It will be necessary to generate attractive conditions for private investment in all the Projects:
 - competitiveness vis-à-vis other generation sources
 - safety conditions
 - limited risks.

5. Regional Integration

To accompany a sustained integration of energy projects within

- the MERCOSUR policy framework**
- the new alliance of countries manifested through the UNASUR treaty.**

Brazil and Argentina signed a Joint Statement including Nuclear Cooperation in 2008.

5. Regional Integration

Both countries have the necessary nuclear infrastructure for ensuring the joint development of nuclear projects with regional scope.

Now, it is necessary to agree on regulations and standards common to all MERCOSUR countries.



6. Radioprotection, Now and Ahead

Argentina has proved to be reliable in every nuclear safety and radioprotection aspect, according to the strictest international criteria.

The most important goal:

to follow the procedures protecting individuals and the environment even under production pressure.

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6. Radioprotection, Now and Ahead

At Conuar, we have formed a team comprised by our specialists in Safety and Radioprotection and Union representatives who have a proven vocation for safety.

Nevertheless, industries perceive that important changes must be generated in terms of control and management requirements.

6. Radioprotection, Now and Ahead

Conuar has closely followed up research done on the stochastic effects caused by low doses arising from manipulating natural uranium materials.

The major policy implication of a non-threshold relationship in the case of stochastic effects is that some finite risks must be accepted at any level of protection.

6. Radioprotection, Now and Ahead

The IAEA GS-R-3 Standard defines the requirements for a Management System integrating safety, health, environmental, security and economic elements.

In Argentina, the Nuclear Regulatory Authority has instructed the application of this IAEA standard in our Nuclear Fuel Facility (CONUAR S.A.).

6. Radioprotection, Now and Ahead

CONUAR/ FAE is a CNEA Group's factories

Manufacture of

- nuclear fuel elements**
- main components of Argentine reactors**
- zircaloy, titanium alloy and incoloy tubes**

It has supplied fuel elements to Argentine nuclear power plants for the last 26 years.

6. Radioprotection, Now and Ahead

Over 20 years ago, CONUAR S.A. incorporated the application of Management Systems into its strategic decisions as an improvement tool.

- From the beginning IAEA 50-C-QA Standard

- 1995 ISO 9001 Certification. TÜV Cert (Germany)

- 1999 ISO 14001 Certification. TÜV Cert (Germany)

- 2001 OHSAS 18001 Certification. TÜV Cert (Germany)

6. Radioprotection, Now and Ahead

In 2002

TÜV-Cert (Germany) certified that CONUAR and FAE have an

Integrated Management System

which complies with all the requirements of ISO 9001

(Quality), ISO 14001 (Environmental) and OHSAS 18001

(Occupational Health and Safety).

6. Radioprotection, Now and Ahead



New different challenges

- **Generation gap between old and new employees after an stand-by of 20 years.**
- **New cultural profiles.**

6. Radioprotection, Now and Ahead

New employees come from a post-Chernobyl's accident culture

Many of the young nuclear industry workers demand new educational methods for avoiding risks at the workplace.

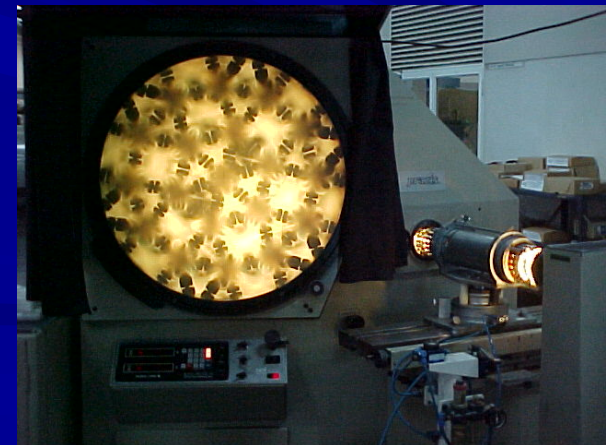
In the new generations (urban areas), there are new risks:

- the increase of addictions**
- epidemic caused by new social origins**
- terrorism**
- new cultural behavior among young people.**

6. Radioprotection, Now and Ahead

Conuar has developed new personnel recruitment, induction and training models:

- Knowledge Management Programs
- Creativity Programs
- Continuous Improvement Programs



6. Radioprotection, Now and Ahead

It is very important to create an integrated culture of standards (Safety, Quality, Security and others) in the industries.

Radioprotection methodologies for risk prevention improved and that outstanding results were obtained.



6. Radioprotection, Now and Ahead

Emphasis put on radiological environmental protection. Environmental Protection has displaced occupational safety from the center of attention.

Radioactive materials are the object of regulations by the Nuclear Regulatory Authority and also the Environmental Authorities, generating new and greater challenges for the industry.

6. Radioprotection, Now and Ahead

Radioprotection has been the guarantee for the people and the communities.

The media has become a social reference of what is "true" or "false".

The entire industry has to lead the battle against the greenhouse effect.



6. Radioprotection, Now and Ahead

Looking ahead, a sustainable nuclear market will need to be reliable and competitive.

Reliability is essential for stakeholders to promote its growth and facilitate the access to financing for new projects.

Competition will make it possible that private investment crowds out or partners with governmental organizations to generate new projects.

7. Conclusions

Argentina's Key Targets

- **Safety culture is the new paradigm which is the basis for the nuclear industry of the future.**
- **It is essential that we make society and the communities aware of the unique advantages of nuclear energy.**
- **A realistic vision of the new generations will let us adjust training, recruitment and monitoring programs.**



7. Conclusions

Argentina's Key Targets

- **Competitiveness will be essential for sustained growth.**
- **Industry growth must be stimulated by sharing the available nuclear infrastructure in the region.**
- **Lastly, a nuclear green bond, representing the battle against the greenhouse effect and promoting investment in new NPP, should be created.**

