



The FALCON Consortium:

CONTINUING THE
SUCCESSFUL ITALIAN
ROMANIAN
INTERNATIONAL
COLLABORATION

*Alessandro Alemberti
G. Villabruna, P. Agostini,
I. Turcu, M. Constantin*



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SUMMARY

- **SOME WORDS ON:
ITALIAN-ROMANIAN COLLABORATION
THE CERNAVODA POWER PLANTS**
- **THE FALCON CONSORTIUM:
MAIN GOALS
MAIN ADVANTAGES
MAIN CHALLENGES**



ITALY, ROMANIA AND THE NUCLEAR ENERGY

The story of the ITALIAN-ROMANIAN partnership is now approaching 30 year life.

A very long story of cooperation and success in the nuclear sector with reciprocal benefits.

Romania has been developing a nuclear generation capability of 20% of the electricity demand and is able to compete with other European Countries in terms of electricity costs.

On the other hand, Ansaldo, which in 1987 suffered the cancellation of all domestic orders (for a total of seven Units) thanks to the Cernavoda project was able to save its nuclear knowledge and is now able to present itself in the international market as a supplier of goods and services for the new nuclear power plants presently planned in many countries.

FACING TOGETHER THE DIFFICULTIES

Between 1979 and 1981 both AECL and Ansaldo concluded with the Romanian Government agreements for the first two CANDU Units, under Romanian overall project management.

AECL was on charge of the Nuclear Steam Supply System, while Ansaldo (with GE), was responsible for the Balance of Plant and auxiliary systems of the NSSS.

However the project suffered a stop, followed by a stagnation when the regime finally collapsed.

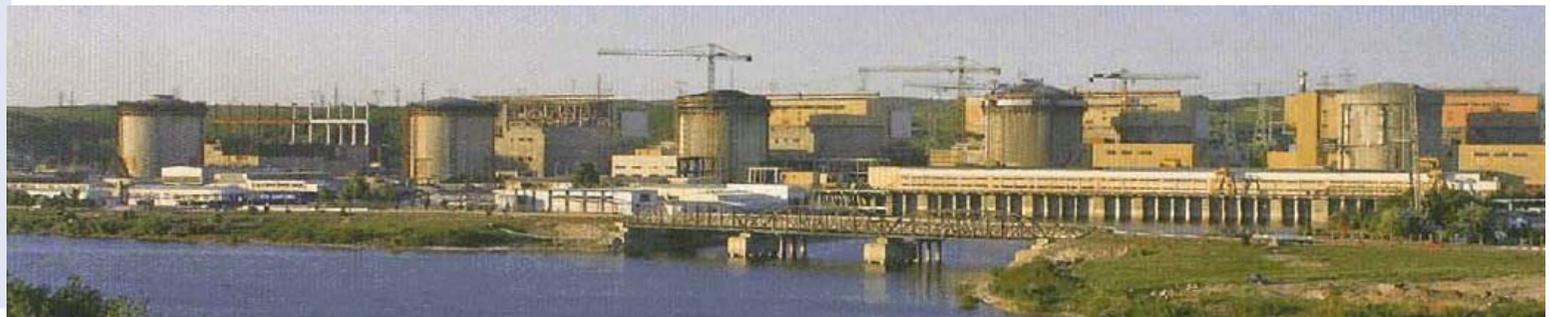
The country recognized that its nuclear program could be an effective way to revitalize the national industry and the government solicited the newly created national utility, RENEL, to find proper solutions to re-launch the project.

In 1990, Ansaldo and AECL formed a consortium to enter a new contract for the realization and commissioning of the first Unit in CERNAVODA.

CERNAVODA 1 and 2

Main results of the agreement:

- The construction and commissioning of Cernavoda Unit **1 NPP, realized adopting CANDU technology** and In operation since 1996.
- The continuous maintenance / surveillance / Improvement that assures the safe production of energy.
- The realization of a new Nuclear Power Station: **Cernavoda Unit 2**, which has reached 100% power in September 2007
- Very important target of availability of the two plants
- Pre-project activities are ongoing for Unit 3 & 4 NPP.



WHAT NEXT ?

With CERNAVODA units 3 & 4 ROMANIA may reach 40% of electricity generated by nuclear power.

But what about the next steps ? What about nuclear waste?

The common solution is to bury in a geological repository which however has to last for hundred thousand years ,, (question: can we really understand, feel this amount of time?)

A possible option is to use the exhausted fuel from existing plants to fabricate fresh fuel for a new, sustainable reactor which will be able to close the fuel cycle.

In principle from this reactor only fission product are extracted (300 years to get back to natural uranium radioactivity) while the fresh fuel is prepared using waste fuel adding natural uranium.

This is the view but how to reach this point?

LFR and the Sustainability of the Fuel Cycle

Within the ELSY and LEADER project an industrial size LFR plant able to produce 600 Mwe was deeply analyzed.

Such plant can be coupled with a specific reprocessing able to sustain the nuclear energy source in the long term.

The European Lead Fast Reactor (ELFR) has been shown able to fulfill this goal in the frame of LEADER project.

However to let this “dream” come true we need to further develop the Lead Technology.

Although ALFRED will use only partially the features of such fuel cycle but it is the first step toward the implementation of Nuclear Energy Sustainability (featuring also a very high Safety level).

THE FALCON CONSORTIUM:

Main goals

Main advantages

Main challenges

The “official” story

In March 2011 the Romanian Minister of Energy wrote a letter to LEADER Project coordinator proposing to host ALFRED in Romania.

Ansaldo response to the Romanian Minister welcome the Romanian proposal and inform of the transmission of the letter of interest to ESNII members.

In June 2013 the sub-secretary of the Italian Minister for Economic Development wrote to commissioner Oettinger to highlight the importance of Alfred in the European context and the intention to use synergies between RTD and infrastructural funds for ALFRED Project.

Response from Commissioner Oettinger received in August 2013 welcome the Italian/Romanian proposal and highlights the importance and the usefulness of the synergies to pool resources and reach the critical mass for project deployment.

The FALCON consortium has been set-up on December 18th 2013 by: Ansaldo Nucleare, ENEA and ICN Construction Site is Mioveni and EU organizations are invited to join FALCON or a technical agreement (MoA).



The “real” story

In reality everything started well before the first official communication.

On April 21 2010 the Kick Off meeting of LEADER project took place in Genova, hosted by ANSALDO.

At that time we still had a demonstrator with no name, it was called ETDR (European Technology Demonstrator Reactor).

At that meeting one of the author of this paper proposed this acronym – ALFRED – which is now worldwide known

At the same time Ansaldo and ICN representatives discussed about the possibility to host ALFRED in Romania.

This is a good example on how a proposal can rise and gain consensus starting from a bottom up approach

**But please,
do not try to identify who**



FALCON GOALS in the first 18th months:

- **Sharing of information and technical review** **ANSALDO**
Main activity include a technical review of ALFRED
- **Licensing and siting preliminary review** **ICN**
First steps with the Safety Authority
- **Cost estimate and schedule review** **ANSALDO**
Overall project cost and schedule
- **Assessment of financial instruments** **ICN**
Pave the way for infrastructural funds
- **Roadmap and implementation plan** **ENEA**
Overall Roadmap and ancillary facilities
- **Promotion initiatives and coordinated actions** **ENEA**
Dissemination and coordinated actions

Due to the strong interest manifested by several European Organizations a Memorandum of Agreement (MoA) has been defined to anticipate technical work already scheduled for the second phase of FALCON:

The interested organization can:

- Contact one of the FALCON members
- Agree on a technical activities program
- Sign the MoA with the FALCON member

All contributions in this phase are expected to be of an in-kind nature.

The aim is to constitute a network of organizations interested in the LFR technology development and ALFRED construction.

FALCON
the main advantages

- an important part of the financial resources for the investment can be supported by the structural/cohesion funds
- Falcon activities will support the existing relevant experience in the nuclear field (both industry and research)
- Falcon is devoted to the implementation of a high technology and consolidation of the position of the country in the nuclear sector
- Falcon will enlarge the experimental infrastructure leading to a deep involvement in Generation IV development
- New jobs will be created in the nuclear sector
- Falcon will be stimulating the national research by active involvement of the R&D organizations and industry in programs of international interest.

To be able to reach the phase of ALFRED construction we will have to face several challenges:

- Include ALFRED project in the strategy of Romania
- Declare South-Muntenia nuclear smart specialization

Such step are pre-requisite to be able to get cohesion funds !!

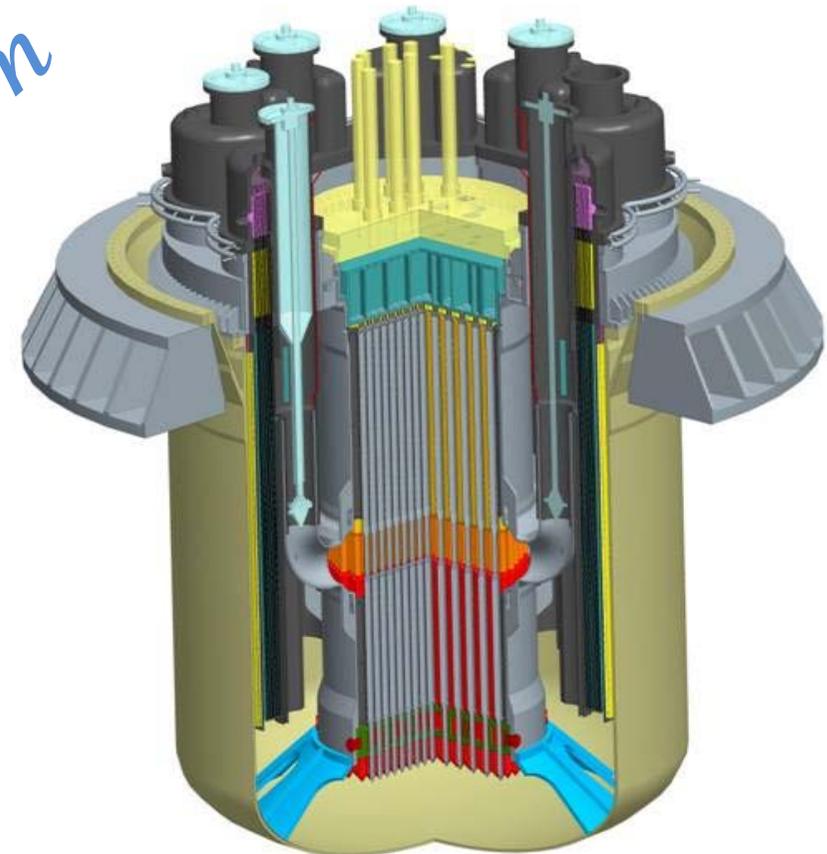
- Develop a new sound configuration of ALFRED
- Be able to erect facilities to support lead technology
- Show the safety features and obtain licensing

It is fundamental to have a transparent and efficient management of all activities.

Activities in Romania and outside should be concentrated on one goal:

the ALFRED development and construction

*Thank you for your
attention*



ALFRED