1. Introduction

In the last 30 years INVAP was involved in several Research and Production Reactor tendering process around the world obtaining ample experience in satisfying the most diverse requirements both on technical and logistics issues raised by Clients, Regulatory Bodies, Future Users and the nuclear industry of the country where the facility is being deployed.

Such experience has allowed INVAP to acquire a set of technical and management skills, which are fundamental to ensure the delivery of a product in due time, under specifications and within the budget allocated.

2. Design Capabilities

INVAP’s core experience is in water moderated, pool type reactors. It has designed and built facilities using MTR or rod type fuels; downward, upward or natural circulation specifications and within the budget allocated.

The Reactor tendering process around the world obtaining ample experience in satisfying the facility is being deployed.

Reactor specifications and requirements are more or less the same, but the way to approach them is different, always keeping in mind the following approach:

- Design simple and reliable;
- Minimize technical risks by relying on proven technologies;
- Follow the IAEA Safety Requirements and Best International Practices;
- Fulfill the Nuclear Regulation of the country where the reactor will be built.

One of the lessons best learned by INVAP is the excellent agreement between calculations and measurements is the reason to have a fast and reliable commissioning process. The high confidence in the calculation methodology is a powerful tool to reduce the commissioning stage to a short period aimed only to integrate systems.

3. Managerial Aspects

On the managerial aspects, the main lesson learned by INVAP from all the projects successfully completed has been the need to adequately support the client during the design, construction, licensing and early operational stages, toward developing and establishing those logistics issues required to ensure a safe and efficient operation.

This is an area of activities often overlooked, or its relevance underestimated, which has shown to be essential not only in countries without previous nuclear activities, but also in those which have experience in managing their own nuclear installations. This is an area of activities often overlooked, or its relevance underestimated, which has shown to be essential not only in countries without previous nuclear activities, but also in those which have experience in managing their own nuclear installations.

To this end, INVAP has developed an Integrated Logistic Support (ILS) area, whose function is analyzing the specific needs of each project to ensure that all aspects required to produce a seamless transition towards a routine operational status are taken care of.

In the managerial area, services developed under the ILS area were successfully delivered and implemented, to the following organizations currently running reactors deployed by INVAP:

- ANSTO (Australian Nuclear Science and Technology Organization).
- HCR (Haut Commissariat à la Recherche of Algeria, nowadays replaced by the Centre de Développement des Techniques Nucléaires of the Ministry for Scientific Research in Algeria).
- AEA (Atomic Energy Authority of Egypt).

4. Conclusions

INVAP has participated in several projects worldwide covering a wide range of facilities, designed in accordance with the requirements of our different clients.

For complying with these requirements, INVAP developed special skills and technical capabilities to deal with different fuel assemblies, core cooling systems and reactor layout arrangements. One of the key features is the solid calculation line developed and validated against measurements on every reactor designed by the company.

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Other refurbishment, upgrade and update projects worldwide also feature some of the products developed by INVAP ILS, the most required service being the staff training both in our headquarter and in the client premises. Altogether, hundreds of scientists, engineers and technicians were trained by INVAP including nationalities such as Egyptian, Australian, Algerian, Iranian, Libyan, Romanian and Saudi Arabian.

Along its trajectory INVAP became mature enough to be recognized by the international community as a world-class nuclear supplier.