

The Spanish Nuclear Industry in the Export Market

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One of the objectives of the Nuclear Forum is to support the activities of the Spanish nuclear industry. Participating in congresses and trade fairs, presenting its capabilities and managing institutional support are some of the activities carried out by the Nuclear Forum to achieve this objective. The presence of the Spanish nuclear industry in international markets is indicative of its capabilities and its potential in the nuclear renaissance. The current economic juncture, the situation of international markets and the way new nuclear projects are contracted all make it advisable to strengthen joint actions in order to maintain the competitiveness needed to ensure permanence abroad. This article describes the evolution of the industry, the challenges posed by the international environment, and some actions that would be advisable.

Because of the growing demand for energy and the need to secure the electric supply, decrease energy dependence and address environmental challenges, more and more countries in the world are backing the use of nuclear power. The consolidation of these programs will only be possible with an industry that is prepared to face the challenges of building new power plants.

QUALIFICATION OF THE SPANISH NUCLEAR INDUSTRY

The history of the nuclear industry in Spain dates back to the decade of the 70s, following the decision to undertake a program of nuclear power plants in the country, and during the years in which the last plants were built the industry grew significantly in terms of infrastructure, job creation, training of specialized personnel, work methods, etc. At its most active moment in the decade of the 80s, 20,000 people were working on the sites of the nuclear power plants. Added to this figure were the jobs in the engineering firms and fuel manufacturing, large component and equipment companies, a number estimated to be up to five times higher than the number of people directly involved in plant construction. All this activity implied a major effort of technology assimilation and organizational development, which led to the consolidation of the following elements:

- An Administration responsible for the permits, and a technically competent and qualified Nuclear Safety Commission overseeing compliance with the Spanish nuclear legislation and international conventions and responsible for issuing the binding reports for the permits granted by the Administration.
- Electric utilities responsible for building and operating the plants that facilitate interrelations between the vendors and coordinate their activities in UNESA.
- Branch offices in Spain of the nuclear systems vendors.
- Engineering firms, essential collaborators of the owners and in charge of the overall design of the plant, of specifying the components and, when necessary, of managing procurement and supervision of manufacturing and services.
- Equipment vendors, initially operating on the basis of the existing industry and later by addition of new capabilities.
- Construction and erection firms, which were already established and which adapted without difficulty to the new quality requirements demanded by nuclear activities.
- Specialized service firms, in charge of in-service inspection, training and execution of special non-destructive tests during manufacturing.
- Third party inspection companies that certify conformance with industrial standards.
- Large component manufacturer (ENSA), with capacity for vessels, steam generators, casks, exchangers, etc., and with the most advanced technologies and quality controls.

- Fuel manufacturing and waste management organizations (ENUSA and ENRESA), which manage the complete fuel cycle from mining operations to storage.

This industrial fabric made it possible to achieve significant levels of national participation in the construction of the nuclear power plants, ranging from percentages of 40-45% in the construction of the early plants, contracted on a turnkey basis, to the last plants in which the responsibility for project execution was assumed by the owners with the help of engineering firms, with up to 86% national participation. This fact has led the IAEA to select Spain as an example for countries launching their nuclear programs as a country that had an exemplary nuclear program of industrial promotion.

Once past the plant construction phase in Spain, the nuclear industry has continued to support the operation of the Spanish nuclear power plants with engineering activities, specialized services and fuel and equipment supplies. The ongoing modernization of our facilities, with annual investments approaching €300 M in the Spanish nuclear fleet, has enabled the Spanish plants to operate with performance indicators at their highest levels, and at the same time has given the industry access to the most advanced capabilities and tools available on the market. At present, the nuclear industry directly and indirectly employs some 30,000 people in our country; the figure in the European Union as a whole is 400,000.

EVOLUTION OF THE SPANISH NUCLEAR INDUSTRY TO EXPORTING

In the early years of nuclear industrial development in Spain, international activities were considered as marginal because there was a large long-term program in our country. However, with this national activity, the Spanish nuclear industry was preparing itself to be able to target the international market, since the entire technical structure of standards, specifications, qualifications, execution, inspections and documentation used to build our nuclear power plants was taken from the country of origin of the reactor design, allowing the industry to familiarize itself with international design and manufacturing methods.

The knowledge of codes and standards from the United States, Europe and international bodies is an important asset when entering foreign markets. In Spain we have organizations holding the ASME "N" seals and qualification to work with other associated nuclear codes.

Another important issue for foreign participation is that the Spanish companies are not linked to any one nuclear systems vendor. In other words, they can work, and in fact do work, for all of them. The range of countries and technologies broadens as more experience is gained.

Another noteworthy element that has boosted the country's presence abroad is the multidisciplinary nature of Spain's

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industrial capabilities, which cover practically all the specialties in areas of planning, engineering, construction, supplies, licensing processes, startup, operating support, modifications, component supply, waste management systems, decontamination, dismantling, etc., etc. This fact gives the Spanish companies a big advantage when exporting nuclear goods and services, especially to countries that are beginning their nuclear deployment.

Among these generic considerations, there is a singular fact that really helped to drive our international expansion, i.e. the Advanced Reactor Program of the decade of the 80s, which enabled the Spanish industry to take part in the reactors being developed in the United States during that decade. This project, coordinated by UNESA through the DTN and supported by the Ministry of Industry in the execution phase, was the beginning of a close collaboration with Westinghouse and General Electric that provided a knowledge from the very beginning of the reactor designs that are now in the process of design and/or construction certification and that has endured to date.

INDUSTRY COORDINATION, SUPPORT FOR NUCLEAR EXPORTS AND PROSPECTS

In this international venture, the industry has relied on institutional support. The Institute of Foreign Trade (ICEX) has sponsored participation of companies in group pavilions in trade fairs, congresses and promotional activities. In these activities, the Spanish Nuclear Forum has coordinated their presence in these events.

Another line of support has come from the Spanish Export Credit Insurance Company (CESCE), which in recent years has provided insurance coverage for the financing of different nuclear exports to emerging countries. These credits are managed by the exporting companies, including in the bidding phase, thus contributing to their appeal.

There has also been considerable support for the Eastern European countries, which needed resources to modernize their facilities. Different sources of funding have been made available for this purpose, in this case from Europe, e.g. programs TACIS and PHARE and loans from the European Bank for Reconstruction and Development, as well as Euratom grants and different bilateral agreements.

Under the conditions described above, the participation of the Spanish nuclear industry in the nuclear programs being

launched around the world, as well as in a possible relaunch in Spain, should be maintained and even increased. However, to make this possible, certain issues must be taken into consideration, such as the following:

- The advisability of maintaining competitiveness, with controlled production costs, and of having institutional support for exports that will give us good opportunities in international markets.
- The advisability that Spain take part in international projects launched for technological development and the projection of nuclear power around the world, such as projects GEN IV and GNEP promoted by the United States, as well as in the initiatives of the European Union, such as the European Industrial Initiatives (EII) and similar, maintaining the participation in the IAEA's INPRO. It is in these programs where strategies are defined and developing technologies are learned. Initiatives such as the above mentioned Advanced Reactor Program are of great interest.
- It would also be advisable for the Government to send positive signals in favor of nuclear power. It is not easy to enter countries that are committed to nuclear power from a country where the development of this energy is not considered as an energy strategy.

If these aspects are not taken into consideration, we could encounter difficulties in the long term and miss the opportunity to take advantage of the capabilities and acquisitions that we have been able to maintain up to now.

CONCLUSIONS

There is no doubt that we are witnessing a worldwide nuclear renaissance, with an increasing number of countries that wish to access this technology. The Spanish companies formed in the Spanish program contribute to the export market and are preparing themselves for a greater participation in this nuclear renaissance. However, market conditions are changing and survival abroad will require an effort to maintain competitiveness and capabilities through participation in international programs and institutional support. Just as in the past, the Nuclear Forum is open to all kinds of initiatives that could help to support the success of Spanish companies in this select, demanding market. ■