

The Spanish Nuclear Group for Cooperation: A Story of Success

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The SNGC (Spanish Nuclear Group for Cooperation) is an alliance founded in 2006 for commercial cooperation between Spanish nuclear companies in order to join efforts for the commercial promotion in the Chinese market. This alliance was originally formed by Enusa Industrias Avanzadas S.A. (ENUSA), Tecnatom S.A. and Equipos Nucleares S.A. (ENSA). In 2008 Ringo Válvulas S.L. joined the alliance, and in July 2008 the Nuclear Group for China AIE was incorporated with each of the four companies holding a 25% share. Subsequently, as explained below, the legal name was changed to Spanish Nuclear Group for Cooperation AIE and the trade name of Spanish Nuclear Group/China was maintained as a brand for activities in this country.

Spanish companies that manufacture nuclear equipment and have synergic activities are represented in the SNGC and this is why they are interested in taking part in it.

The SNGC is open to temporary or permanent collaborative initiatives with other Spanish companies in the nuclear sector, whether or not they are equipment manufacturers, to boost the Spanish nuclear industry's presence in China or other emerging countries.

Its incorporation in July 2008 was motivated by the expectations for strong growth presented by the Chinese market (which is in the lead of the worldwide nuclear renaissance, as China has 17 operating nuclear power plants, more than 27 under construction and others in the design phase, and the country currently shows a need for this energy to be able to maintain its long-term industrial capacity; around 58 reactors will be operative in 2020 and 31 will be under construction that year), as well as by the experience that some of the partners had at that time in supplying equipment and technology to this market.

In this context, the SNGC partners have important synergies thanks to the fact that their product and service portfolios complement each other and to the previous successful experiences in specific collaborations between them on both the national and international markets.

With the creation of this consortium, these four Spanish companies aim to develop and secure their business internationally, primarily in a constantly growing market of great strategic importance such as China. The consortium enables the partners to optimize their commercial efforts and complement their product and service offerings so as to provide their clients with more integrated, competitive products and services. In addition, it has helped consolidate the Spanish companies that are members of SNGC AIE as a substantial group in the global nuclear industry. Another very important point that was considered is market size and the fact that the corporate group would help achieve a critical mass that would make the partners visible both to potential customers and to the Spanish Administration.

Spanish nuclear companies have been operating in the Chinese market for 25 years, ever since they first attended the Beijing Nuclear Trade Show in 1987. This event ended with a fantastic trip inside China that we will remember all our lives and that was organized by the Chinese Nuclear Society, with visits to the nuclear facilities in Xian, Sichuan and Shanghai.

By 1989, the Spanish nuclear companies were separately offering in China the following goods and services: operator training, steam generators, fuel transport casks, valves, irradiated fuel pool storage racks, heat exchangers, control rooms and their simulations, pre-service and in-service reactor inspections, fuel inspection equipment, etc.

After all those years, the four Spanish nuclear companies decided in 2006 to join efforts to, first of all, jointly approach the Chinese market (Spanish Nuclear Group for China) and later the group was expanded to other countries and was renamed Spanish Nuclear Group for Cooperation.



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He is currently the General Manager of SNGC.

MEMBER COMPANIES OF THE SNGC

The Spanish companies are ENSA, ENUSA, RINGO VÁLVULAS and TECNATOM (see Figure 1).

Although they are well known throughout the nuclear world, following is a brief summary of their key businesses. A detailed description of their capabilities is provided hereinafter.

ENSA: Manufacturer of large, heavy equipment to strict quality requirements. Primarily NSSS components: reactor vessel, steam generators, etc., as well as fresh and spent fuel racks and casks. Service Division: Maintenance services, contingencies and repairs.

ENUSA: Fuel manufacturer. Complete reload & core design, advanced core & fuel design, fresh & irradiated fuel management, on-site fuel service, in-service tests & inspections.

RINGO VALVULAS: Manufacturer of high quality valves for nuclear power plants (and other facilities with highly demanding requirements, e.g. cryogenic installations).

TECNATOM: Wide range PSI & ISI services portfolio, NDT & Robotic

Technology Development, ISI equipment manufacture, Operation & Maintenance training, planning of engineering support, Control Rooms, Simulation & Testing.

HISTORY OF THE SNGC

The history of the SNGC can be briefly summarized as follows:

- 2006: Alliance between
 - ENSA
 - ENUSA
 - TECNATOM
- March 2008: RINGO
 - RINGO included in the alliance
- July 2008: Consortium
 - Formally incorporated as a partnership according to the Spanish legal figure "Asociación de Interés Económico - AIE".
- May 2010:
 - Extension to other countries

(Spanish Nuclear Group for Co-operation), mainly:

- India
- Latin America
- South Africa

MAIN FACTS ABOUT THE CONSORTIUM ORGANIZATION

The consortium organization can be summarized as follows:

- Commercial alliance, non-profit.
- Legal entity: Consortium.
- Contracts awarded to the companies, not to SNGC.
- President: rotates among the companies.
- Vice President: former President.
- Full time GM: former ENSA VP for BD.
- Administrative, other support from the companies
- Office in Beijing

MAIN PRODUCTS AND SERVICES SUPPLIED BY THE SNGC COMPANIES

Table 1 is a schematic illustration of the most important products and services that the SNGC can offer.

JOINT SNGC ACTIVITIES

The joint SNGC activities can be summarized as follows:

- General marketing efforts.
- Marketing coordination.
- Commercial promotion.
- Participation in exhibitions.
- Delegation coordination, including delegations of Chinese clients visiting our companies in Spain and of joint visits by SNGC members to Chinese companies in China.
- Market news research and scope.
- SNGC newsletter publication and distribution.
- New opportunities. New alliances, etc.
- Finance. Export credits, etc.
- Government programs.
- The SNGC has a local staff in Beijing for follow-up, contacts, marketing, etc. in China.

Details of Some Activities:

Trade Fairs

In all these years, the SNGC members have taken part in the different Chinese nuclear trade shows, usually together with the Spanish Nuclear Forum, an organization that represents the interests of most Spanish nuclear companies, and supported by the Spanish Institute of Foreign Trade (ICEX).

This year, 2013, the fair has been held in Shanghai.

In 2012 the fair was held in Beijing.

In 2011 the fair was held in Shenzhen. Figure 2 shows some photos of this fair.

From April 6th to 8th 2011, the four companies of the SNGC - ENSA, ENUSA, RINGO VÁLVULAS and TECNATOM - participated in the International Nuclear Exhibition 2011 held in Shenzhen (Guangdong) in the Popular Republic of China. The group was supported by the "Foro de Industria Nuclear Española" and the Spanish State Agency ICEX.

In the booth, the four companies of the SNGC displayed their capabilities and references for the supply of equipment and services for nuclear power plants. The booth was visited by a large number of Chinese nuclear entities in search of further collaboration in Chinese nuclear development.



Figure 1.

	ENSA	ENUSA	TECNATOM	RINGO
• Design engineering.	✓	✓	✓	✓
• NSSS components, spent fuel casks and racks.	✓		✓	
• Licensing.	✓	✓	✓	✓
• Construction and start-up	✓		✓	
• Nuclear fuel cycle.		✓		
• Pre-Service and In-Service inspection and testing.		✓	✓	
• Control rooms and simulators			✓	
• NPP operation support.		✓	✓	✓
• Outage services.	✓	✓	✓	
• NPP Maintenance.	✓	✓	✓	✓
• Valve components.				✓
• Spare part management.			✓	✓
• Nuclear waste and decommissioning.	✓	✓		
• New reactors.	✓	✓	✓	✓

Table 1. Products and services that the SNGC can offer.

This is all meant to underline the excellent level of collaboration with the Spanish Nuclear forum and the ICEX

Chinese Delegations in Spain

One of the most important activities the SNGC has carried out over the years has been to welcome Chinese nuclear industry delegations in Spain. There have been more than 30 delegations.

Signature of Collaboration Agreements (MOU)

Over the years, more than 10 MOUs have been signed with various Chinese agencies and companies, meetings have been held and major contracts have been awarded. Some of these MOUs are as follows:

- Xi'an Nuclear Equipment Co. Ltd. (XNE), capital goods manufacturer.
- China Nuclear Power Research Institute (CNNPRI).
- China Jianzhong Nuclear Fuel Corp. (CJNF), which operates the Yibin nuclear fuel factory.
- CNNC broad scope MoU SNGC General Agreement with CNEA at Shenzhen.
- NPIC MoU for irradiated fuel inspection equipment.
- Suzhou Nuclear Power Institute
- China Technology Engineering Company.
- Nuclear Power Institute of China.

Figures 3,4 & 5 shows some of the signing ceremonies.

Chinese Internationalization

Also of great interest is the aim of Chinese nuclear companies to internationalize and the potential alliances they could enter into with the Spanish nuclear industry/ SNGC.

The four companies wish to intensify the collaboration with the Chinese market in the ambitious nuclear program that China is developing. Once again, and this has been recognized by our Chinese clients on several occasions with their orders, we underline our strengths in this Chinese nuclear market: quality and experience, technological independence and flexibility and a medium size that complements the capabilities of the Chinese industry.

Internal Weekly News Bulletin and Fact Sheets

Of special mention is the news bulletin that SNGC issues on a weekly basis for the exclusive use of its part-



Figure 2. ICEX/FORUM/SNGC Stand in the 2011 Shenzhen Nuclear Trade Show

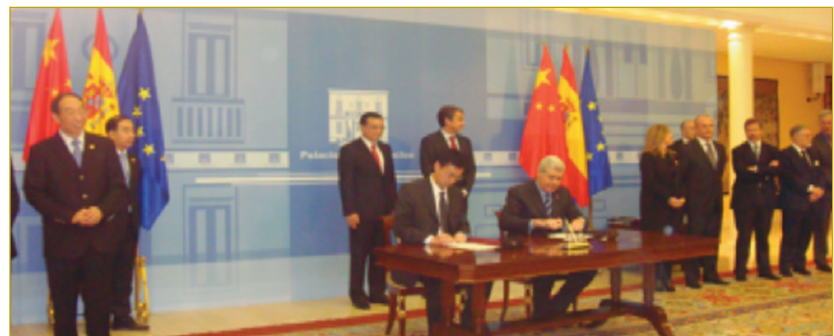


Figure 3. ENSA's former President and SEC Director Yu Jian Guo sign the contract for the Sanmen steam generator supply (AP-1000) in the presence of former Spanish Government President Mr. Rodríguez Zapatero and the current China State Council Prime Minister, Li Keqiang. (January 2011)

ners. Its purpose is to report in great detail, and with the greatest possible market orientation, the nuclear news on our target markets published that week.

On the other hand, the group periodically issues, for its members' use, fact sheets on different nuclear power sectors and organizations in the countries covered by the group's activities. These fact sheets are available to all the members in a cloud computing application, along with all the data on our contacts (current and potential customers).

Website and Newsletter

The SNGC maintains a very active Website – www.sngc.es – in Chinese and English that we invite anyone to visit.

Very recently we have launched this same Website only in Chinese but from a Chinese server: www.sngc.com.cn. We invite our Chinese clients to visit this website as it will be easy for them to access.

We are also distributing a newsletter every two months to our current and potential customers in our line of business which reports on the member companies' main accomplishments during those two months.



Figures 3 & 4. SNGC signs agreement with CNEA at Shenzhen in March 2011 (left) and Signing Ceremony of the Cooperation Agreement between Tecnatom and NPIC, 2009 (right).

OTHER DETAILS ON THE SNGC COMPANIES

General

Some noteworthy points include the following:

- The highly competitive Chinese market due to the presence there of the world's leading suppliers, as well as the already very developed local enterprises prepared to compete on the international market.
- The diversity of existing plant designs in China that requires technological, regulatory adaptation, etc., to be able to take part in tenders and that evidences the competitiveness of the Spanish capital goods industry.
- The benchmarking this entails for the SNGC member companies.

Workforce

Further details about the group companies include the combined workforce, which is summarized in Figure 5.

Capabilities and Technology Transfer

The technology transfer & localization capabilities are important for the group. These can be summarized as follows:

TECNATOM

- Pre-service & in-service inspection and testing engineering.
- Qualification and dedicated engineering of Safety Class components.
- Development and supply of control rooms and simulators.
- Training management of licensed personnel & non-licensed/plant staff.
- Plant life management and plant life extension programs.

ENUSA

- Advanced fuel design and manufacturing.
- Fuel manufacturing and inspection technology and equipment.
- On-site fuel handling, inspection and repair.

ENSA

- Steam Generators, Reactor Pressure Vessels and Internals manufacturing.
- Spent Fuel Racks and Casks and Fresh Fuel Casks manufacturing.
- NPP repair and maintenance services and procedures.
- NPP waste management equipment supply and techniques and procedures.
- Design, manufacturing, supply and installation of heat exchangers.

RINGO VALVULAS

- Nuclear Safety-related valve manufacturing
- Spare parts and valves services.

This capability and support for technology transfer have already been demonstrated in ENSA projects (manufacturing of steam generators and racks) and TECNATOM projects (incorporation of a joint inspection company as explained above and creation of a wholly owned TECNATOM firm in China to design control rooms and simulators).

International Experience of the SNGC Companies

Historical Experience

The SNGC members companies have diverse Worldwide Experience @ NPPs.

- References in more than 35 countries
- Covering all current reactor technologies: BWR, CANDU, PWR, VVER, etc.

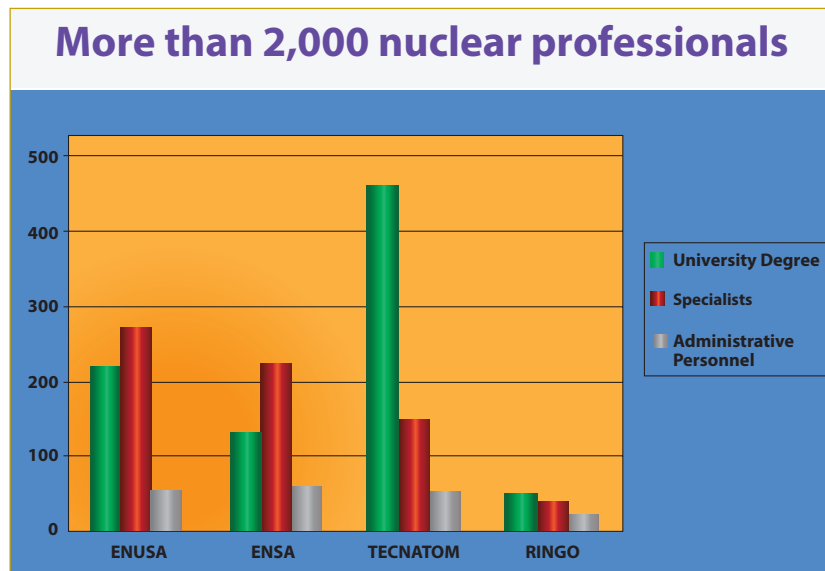


Figure 5.

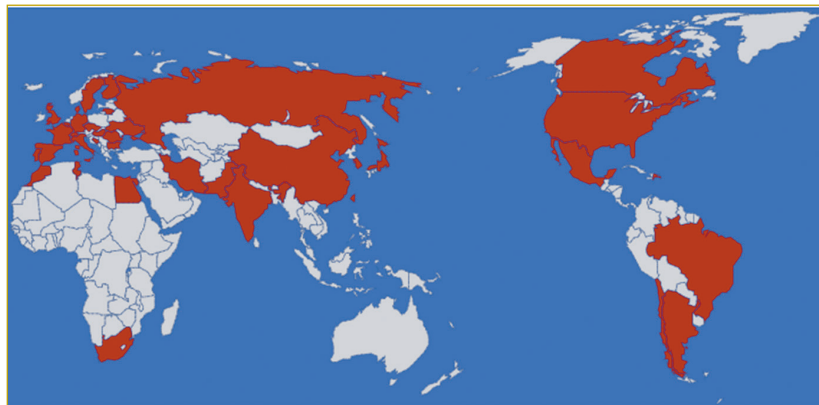


Figure 6.

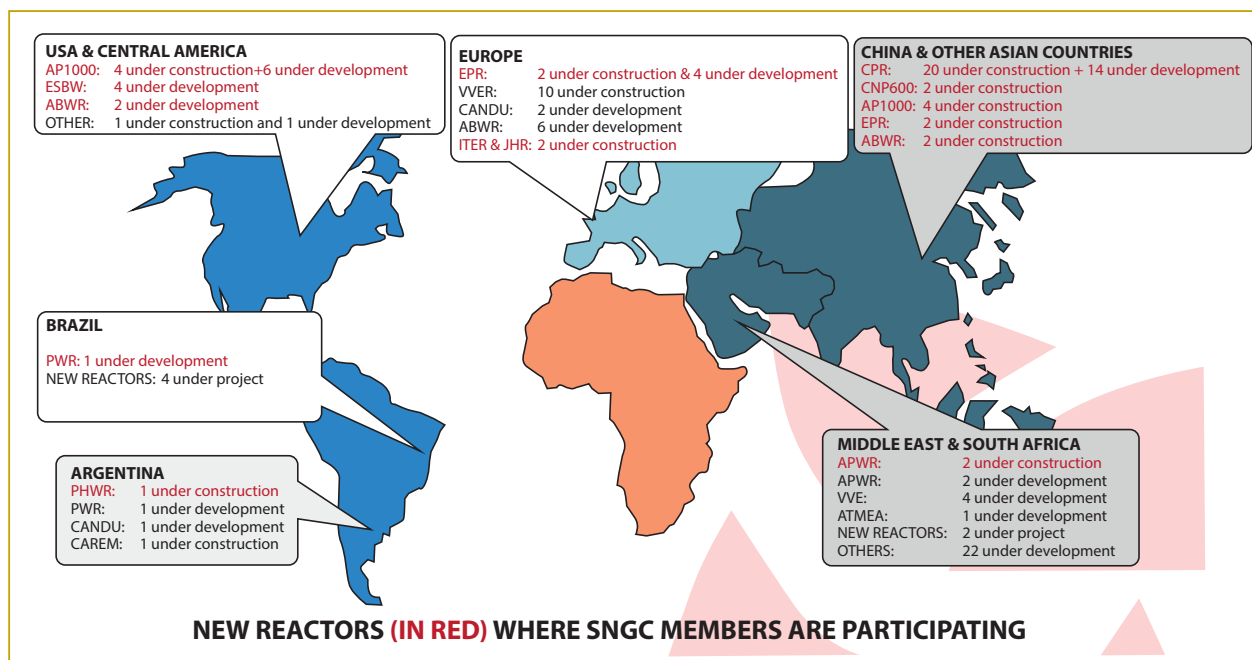


Figure 7.

- Proven participation in design and construction of parts for new reactors – ABWR, EPR, AP-1000, HTR, etc. – with highly qualified staff according to several national standards
- Equipment & component delivery and services provision
 The worldwide presence of SNGC Members at New Nuclear Projects is very important, as seen in Figure 6.

Worldwide Presence of SNGC Members at New Nuclear Projects

In figure 7 you will find interesting information about the participation of the Spanish Nuclear Group for Cooperation in new nuclear projects around the world.

CONTRACTS AWARDED TO SNGC COMPANIES IN CHINA

Following are the purchase orders obtained to date by the four group companies in the Chinese market:

TECNATOM

- Qinshan I operators training
- Joint Venture CITEC: PSI/ISI Ling Ao I and II NPP and all new CPR1000 after Ling Ao
- Control rooms for Fuqing, Fangshan and Hainan NPPs.
- NPIC Electric penetrations for European NPPs.

ENSA

- Steam generators for Qinshan II NPP units 1- 4

- Spent fuel racks for Ling Ao 3&4.
- Spent fuel transport cask for Daya Bay to Lanzhou.
- Hainan NPP steam generators.
- Taishan NPP (EPR) heat exchangers.
- Sanmen steam generators.

RINGO

- Qinshan 1&2 valves.
- Spare parts for CNEIC

ENUSA

- Fuel rod ultrasonic inspection equipment for the Yibin Fuel Plant.

We should also mention in particular that one of our companies – TECNATOM – has set up a joint venture – CITEC – with the Guangdong Group subsidiary named SNPI Suzhou Nuclear Power Research Institute – SNPI – for inspection of nuclear power plant main components, reactor vessels, steam generators, etc.; this venture is operating very successfully and has performed the PSI/ISI in all the CGN Group plants. TECNATOM has also opened an office (Representative Office) in Beijing which very shortly will become a Wholly Owned Foreign Enterprise – WOFE – of TECNATOM under Chinese law and where around 20 Chinese engineers work.

We can also say that, of the 17 reactors that are currently operating in China, 9 have equipment or services supplied by the group companies. And of the 28 reac-

tors under construction in China, there are, for the time being, 9 that will have equipment and services provided by the group companies, and to these we should add the equipment for the Yibin Fuel Plant.

CONCLUSIONS

The SNGC, as we have seen above, is not a supplier. The member companies are the suppliers.

The SNGC is a Business Development tool for the four companies and it boosts the capacity of the four companies to be present in the emerging markets.

In conclusion, following are some arguments to choose SNGC members companies as a supplier:

- Wide range of capabilities, products and services.
- Capabilities covering:
- NSSS
- Fuel
- Main Components.
- Independent from leading original equipment manufacturers
- Innovative technologies and modern facilities
- Offering advanced in-house technologies for NPP and new reactors
- Capable/focused on technology transfer to local organizations
- Collaborative models based on international cooperation. ■