

SNGC EVOLUTION FOR A NUCLEAR CHANGING WORLD

The Spanish Nuclear Group for Cooperation (SNGC) is an alliance created in 2008 by four leading Spanish nuclear companies (Enusa Industrias Avanzadas, Equipos Nucleares, Ringo Válvulas and Tecnatom) to combine efforts for their commercial promotion in China, first, and later, to follow also the evolution of the international markets.

SNGC its creation was motivated by the expectations for robust growth presented by the Chinese market (which was leading the worldwide new build projects) as China showed a need for this energy to be able to maintain its long-term industrial capacity, as well as by the experience that some of the partners had at that time in supplying, individually, equipment and technology to the Chinese market.

In this context, SNGC has enabled its shareholders to optimize their business development and marketing efforts and complement their offerings to provide their clients with more integrated and competitive products and services. Another very important point that was considered was the huge Chinese market size and the fact that SNGC would help achieve a more important critical mass that would make the four companies visible both to potential Chinese customers as well as to the Spanish Administration.

The member companies of SNGC are well known throughout the nuclear world. Their complementary products and service capabilities constitute a wide global portfolio that is very attractive for their clients. Furthermore, their international exposure for more than 25 years provides a very interesting background of very different types of projects in more than 35 countries.

SNGC ACTIVITIES AND PROJECTS IN CHINA

China has been the first market where SNGC has been focused, developing activities such as:

- Marketing coordination and research as well as commercial promotion.

- Participation in exhibitions and trade fairs.
- Delegation coordination, including visits of Chinese delegations to Spain and of joint visits by SNGC members to Chinese companies in China.
- SNGC newsletter edition and distribution in English and Chinese.
- Intergovernmental coordination and identification of financing and export funds (Table 1 and Photo 4).

As a consequence of these activities, several Memorandums of Understanding have been signed with different Chinese companies and institutions and, most importantly, many contracts have been signed and projects executed. The more relevant ones have been the following:

- **TECNATOM**
 - Joint Venture CITEC: PSI/ISI CN Ling Ao, Ningde, Hongyanghe, Yangjiang, Fangchesnggan, Taishan.
 - Control rooms for Fuqing, Fangjianshan and Hainan NPPs - CNNC.
 - Control room Back-up panels for Yanjiang 5&6 NPPs - CGN.
 - Training of plant operators and supervisors of Sanmen and Haiyang NPPs - CNNC and SPIC.
 - Back up panels for Fuqing 5&6 NPPs - CNNC.
- **ENSA**
 - Steam Generators for Qinshan II 1-4 NPP - CNNC.
 - Design, licensing and manufacturing of Spent fuel racks for Ling Ao 3&4 NPPs - CGN.
 - Spent fuel transport cask for Daya Bay NPP - CGN.
 - Steam generators for Hainan NPP - CNNC.
 - Heat exchangers for Taishan NPP - CGN.
 - Steam generators for Sanmen NPP - CNNC.



EDUARDO AYMERICH

Managing Director

SPANISH NUCLEAR GROUP FOR COOPERATION (SNGC).

He is a graduate of Industrial Engineering from the Polytechnic University of Madrid with post-graduate studies of Génie Atomique in France and at Rensselaer Polytechnic Institute in New York. He holds also an Executive MBA from IESE-Madrid. He has served for more than 35 years in different companies in the business consulting and nuclear sectors, with a strong focus on international operations.



	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 room and simulator			✓	
• NPP operation support		✓	✓	✓
• Outage services	✓	✓	✓	
• NPP Maintenance	✓	✓	✓	✓
• Valves components				✓
• Spare part management			✓	✓
• Nuclear waste and decommissioning	✓	✓		
• New reactors	✓	✓	✓	✓

Table 1.

- Spent fuel transport cask for URC-CGN.
- Boric Acid Columns for Taishan NPP - CGN.
- RINGO VÁLVULAS
 - Different valves for Qinshan 1&2 NPP - CNNC
 - Spare parts for valves for CNEIC - CNNC
- ENUSA
 - Fuel rods ultrasonic inspection equipment for CJNF - CNNC (Yibin factory).
 - SICOM-COR fuel inspection equipment for SNPI - CGN.
 - Eddy current fuel inspection equipment for CJNF - CNNC (Yibin factory).
 - SICOM-UT fuel inspection equipment for SNPI - CGN.

Nowadays, additional fields of collaboration are currently being assessed and developed with different Chinese companies in other areas such as Nuclear Fuel (handling & disposal, fresh and used fuel inspection), Services (training, outage, valve diag-

nosis, maintenance), Engineering (incident analysis, safety culture, failure monitoring) and Operation (severe accident management, spare part management) (Photo1).

NEW ACTIVITIES

In addition to this successful track record of very diverse types of projects in China, SNGC decided in 2015 to diversify its activities in additional regions to follow the latest trends of market development. These new actions have been basically oriented to:

Support the Chinese companies in their efforts to be present on the international market

Based on the experience gained in their domestic market, several Chinese companies are participating in most of the international new build projects. This is an unfamiliar environment and obviously a major challenge: new languages, business cultures, regulations, local supply chains, etc... Given

the SNGC international experience in more than 35 countries, we are building with them a new relationship to apply our vast experience in developing nuclear projects abroad. We are offering support in very different fields (Photos 2 & 3):

- Applicable Rules & Regulations.
- Applicable Industrial Standards.
- Applicable Laws regulating Contracts with supply chain.
- Tax Optimization (Onshore & Offshore Contracts vs. Single Contract).
- Contractual and Working Languages.
- Licensing & Permitting.
- Taxation (Corporate, VAT, double taxation, expatriation terms, ...).
- Visas & Working Permits for expatriates and relatives.
- Transportation & Customs.
- Financing aspects, Export Credit Agencies, Contribution of the Spanish Administration Export Agencies (ICO and CESCE).

In summary, the SNGC Group is willing to collaborate with the Chinese companies in third countries projects, contributing with goods and services. This participation should improve the project competitiveness and smooth the project launching and execution, given that the SNGC companies have an important overseas experience and, in many cases, bring also a cultural affinity and long-term relationship with many countries.

Focus on other countries where nuclear new build plans are developed

In recent years, the new build projects have gradually shifted to other regions, especially in Middle-East and Asia. Although financing aspects are key concerns for many countries, plans seem to progress when this issue



Photo 1.



Photo 2.



Photo 3.



Photo 4.

is solved. It is then important to have a good local positioning to be able to participate, whoever the contract winner is. In that sense, SNGC is developing business and commercial actions in most of them.

Argentina: CNNC has recently signed a final agreement with NASA, the public nuclear electrical utility, in order to build 2 new reactors: Atucha III, with a CANDU reactor and a Hualong One reactor

that will likely be built at a new site. This is also a major challenge for the local nuclear industry, that besides its current participation in the CAREM project, will need extensive external support to be ready to complement the Chinese supply chain. SNGC has signed an agreement with ADIMRA, the main industrial association in Argentina, to support and transfer technology to local companies willing to be part of these new build programs (Photo 5).

United Kingdom: 3 new build programs are progressing at different paces but numerous opportunities will develop, normally in partnership with local industry. It is then important to have upstream contacts to be adequately positioned when necessary.

Turkey: SNGC has signed a memorandum Of Understanding with the Nuclear Industry Association of Turkey to promote innovative cooperation opportunities associated with the joint development, design, testing, licensing and construction of pressurized water and small modular reactors (Photo 6). Additionally, Tecnatom has joined the Turkish Technical Support Organization (TTSO) in the area of training.

South Africa: the nuclear new build plans are still uncertain because of recent judicial decisions (that are



Photo 5.



Photo 6.

forcing to relaunch the requests for quotation to the numerous interested countries), as well as of financing needs to support the huge program envisaged. Although the uncertainty regarding the timeframe to solve these problems is significant, SNGC has already made contacts with the Nuclear Industry Association of South Africa (NIASA) to offer its support and, in that way, be available when required.

Additionally, but at a lower scale, SNGC is also following with interest the initial plans in other countries such as Romania, India, Saudi Arabia, Mexico and Brazil where project time scales seem further away in time.

CONCLUSION

SNGC is a Business Development Tool for its shareholders that is boosting their individual capacities in the international emerging markets.

Having accumulated all this international experience, SNGC should be considered a reliable partner, with the following characteristics:

- Wide range of combined capabilities of Products & Services
- Independence from main Original Equipment Manufacturers
- Quality and continuous improvement approach
- Innovative technologies and modern facilities
- International focus with knowledge of standards and culture of many countries
- Flexible case by case approach and orientation to technology transfer ■