



TECNATOM INTERNATIONAL TRAINING CENTER (ITC)

Tecnatom International Training Center (ITC) was created in 2011 to fulfill the increasing demand of training services outside Spain. This meant a new instructional workforce certified at different technologies, that has delivered training for NPP personnel in USA, China, UAE, Brazil or Finland among other countries. The ITC instructors are also involved in the training of personnel from Nuclear Regulatory Authorities, Newcomers and Educational institutions as well.

The most important project in the history of the ITC, has been recently signed with Horizon Nuclear Power to serve as the Training Support Partner (TSP) for two ABWR units at the Wylfa Newydd site located at the Isle of Anglesey in north Wales. The TSP will consist of a consortium led by Tecnatom and partnered with General Electric-Hitachi and Gen2.

Tecnatom S.A. was established in April 1957 to support the Spanish Nuclear sector at different areas such as operation, training or inspection among others. Over the years, 60 years now from then, the company has been expanding beyond the Spanish borders, having a current market breakdown of 44% abroad over the total business.

As part of this external expansion, the **International Training Center (ITC)** was created in 2011 to fulfill the

increasing demand of training services overseas. Instructors recruitment, selection and hiring were carried out during 2010 and 2011 to acquire the workforce required to accomplish this new challenge. As a result, around 15 junior engineers with strong communication skills, creative profile and proficient in foreign languages were newly hired during those years. Additionally, 10 people that already belonged to Tecnatom and that met the described features, joined the ITC resulting in a



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He has a Bachelor's degree in Industrial Engineering from Universidad Politécnica de Madrid. He joined Tecnatom, S.A. in 2010 as a nuclear operations instructor within the International Training Center (ITC). He was certified as an SRO AP1000 Instructor by Westinghouse Electric Company, participating in the AP1000 projects in China and USA. He also actively supports the IAEA in international workshops for Newcomers. In June 2015, he turned Project Manager, leading training projects within the ITC. In January 2017, he became the Head of the ITC, position that he left with the signature of the Horizon project in July 2017. Currently, he serves as the TSP Training Manager at the Horizon project in Wylfa Newydd site (North Wales).



Figure 1. First batch of Operation Instructors hired in 2010 for the ITC.



Figure 2. ITC AP1000 Group.

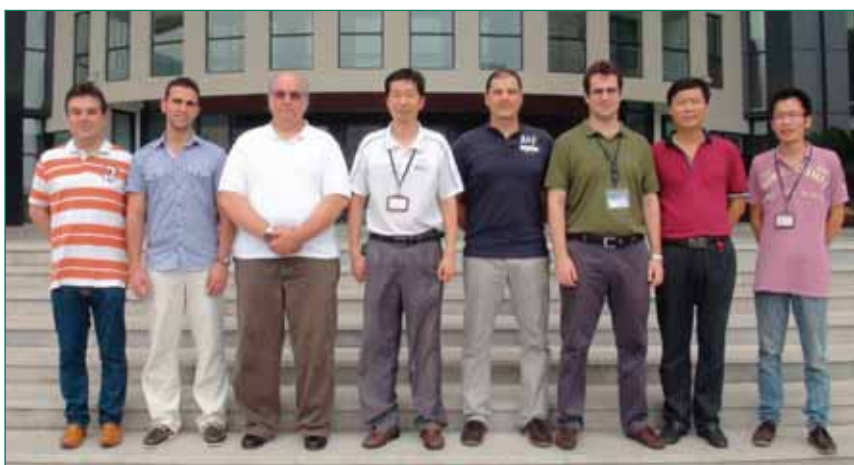


Figure 3 ITC. Instructors in Sanmen NPP (China).



Figure 4. ITC Instructors in VC Summer NPP.

total workforce of 25 operations instructors at the second year of the group creation. These instructors followed a full operations training program at Siemens-KWU, Westinghouse PWR 3L or GE BWR-6 technology, that enabled them to continue with a newer reactor design training program when assigned to a specific project.

The first milestone that triggers the creation of the ITC was the Teaming Agreement signed in June 2010 between Tecnatom and Westinghouse Electric Company, to support Westinghouse at the **AP1000** projects. About a half of the ITC instructors, 14 out of the 25, were qualified by Westinghouse as AP1000 SRO certified instructors, participating in the AP1000 training activities for Vogtle & VC Summer NPP in the USA, and Sanmen & Haiyang NPP in China.

Currently, a group of permanent instructors belonging to Tecnatom USA support the AP1000 training activities locally with variable support from the ITC instructors both remotely and locally.

In parallel with the AP1000 activities, the ITC supported the development of the Full Scope Simulator (FSS) for **Angra I NPP** (Brazil).

The next major international training project took place in 2012 in the United Arab Emirates (UAE) to support ENEC in the **Barakah** Project (APR 1400). Up to 10 instructors were deployed to the Barakah Project from 2012-2015. In early 2017, two years after the termination of the support with ENEC, the ITC has re-taken the relationship with NAWAH to support them at several training activities.

Another important alliance for New Reactors training that has been recently set, is the signature in May 2016 of a trilateral MOU among Tecnatom, Rosatom-CICE&T and JSC Rusatom Service in the field of nuclear education and personnel training. The intent is to support Rosatom-CICE&T and JSC Rusatom Service with training support for the **VVER projects** outside Russia. This relationship, that intends to go further through the signature of a Teaming Agreement between all the parties, has already started with training courses for the Hanhikivi-1 NPP personnel.

Beyond the training for new nuclear projects, the ITC also participate in the nuclear capacity building for **New-comers**.

The ITC supports to the **International Atomic Energy Agency (IAEA)** on



Figure 5. ITC Instructors delivering Nuclear Safety course for Hanhikivi-1 personnel in Helsinki.



Figure 6. IAEA Inter-Regional Seminar at TAMU University (Texas, USA).



Figure 7. Wylfa Newydd site location.

international workshops organized to inform Newcomers and/or countries considering to start a new nuclear project, about the state-of-the-art reactor designs so that they can know from subject matter experts the particularities of each new reactor design. IAEA Generic Simulators are deployed to support these seminars.

Another example of support to newcomers, was the training program requested by the **Ministry of Educa-**

tion and Development of Poland. This internship-training program, in the scope of nuclear power, was delivered to the nuclear qualified personnel from Poland, that would be involved in the training of staff for the construction, operation and maintenance of a potential nuclear power plant in the country. The program covered a wide spectrum of areas involving a nuclear project like power operations, simulation, safety, security, radiation protec-

tion, communications, relation with local communities.

Other activities where the ITC is present, is the training of **Nuclear Regulatory Authority personnel** (Spanish Regulatory Authority in a yearly basis), and the participation at **Post Graduates Courses** with **Universities** and **Companies** (Universidad Politécnica de Madrid and Universidad Politécnica de Cataluña in a yearly basis as well). But the most important project

in the history of the ITC, has been the recent award of a consortium, led by Tecnatom and partnered with General Electric-Hitachi (GEH) and Gen2, to serve as the Training Support Partner (TSP) of **Horizon Nuclear Power** at the Wylfa Newydd site located at the Isle of Anglesey in north Wales. This site will hold two ABWR units beside the two Magnox units currently undergoing decommissioning.

The importance of this international training project is not only in terms of turnover, but also due to the Tecnatom participation in one of the most strategic spots of the nuclear renaissance, the United Kingdom. Besides that, the Horizon project will mean the first nuclear training center fully operated by Tecnatom outside Spain.

The key for being awarded as the choice of TSP rests on the constitution of a strong consortium, that gathers the full range of competences required to achieve the project goals:

- **Tecnatom** has extensive international experience in the delivery of training for nuclear reactor operations, the creation and operation of reactor operations training centers (ROTCs) and the development and application of advanced training tools, including full-scope reactor simulators.
- **Gen2** has extensive experience in engineering and technology training for the UK nuclear sector. In addition, Gen2's track record of partnering with local colleges and universities means that it is ideally placed to facilitate engagement by local training providers in support of this project.
- **GEH**, as the original BWR and ABWR technology expert, brings intimate knowledge and experience of the BWR and ABWR design, operation and maintenance in support of plant-specific training.

In addition, other Tier 2 members such as Accelerant Technologies, AMEC Foster Wheeler and local training and education providers, will support the project strengthening the team capabilities and promoting additional localization wherever possible.

The scope of the project involves the initial and continuing training of all the personnel for the two ABWR units at Wylfa Newydd site. This involves a fixed volume of 480 trainees plus other persons requiring unescorted access to the site.

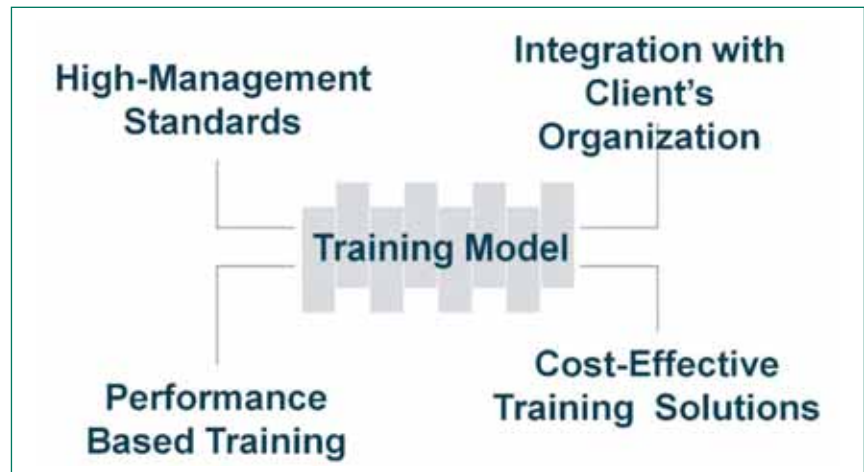


Figure 8. Tecnatom Training Model.

The project will consist of **three** different **phases**.

The **Phase I** will go from the contract signature until the Final Investment Decision (FID), expected in November 30th 2019. This initial phase will be aimed at creating the training system and laying the foundations of the training workforce needed for subsequent phases. The development of the Quality Assurance program and the training procedures, the analysis, design and development of the different training programs, the development of training tools for the most efficient implementation, and the specification for the ROTC, are the major activities to be carried out during this initial phase. This phase will be undertaken by an Initial Development Team (IDT) comprised of four Tecnatom resources (one project Manager and three instructors) deployed at Wylfa, two instructors provided by Horizon, plus one GEH instructor supporting in remote.

Phase II will start with the FID, and will end with all Wylfa personnel fully qualified. All personnel must be fully qualified before the corresponding initial fuel load: 3rd Quarter of 2025 for Unit 1 personnel, and 3rd Quarter of 2026 for Unit 2 personnel. This phase will start with the recruitment, selection, hiring and training of local bachelor engineers that together with the IDT and additional resources provided by GEH and Gen2, will make up the training workforce of the TSP. Once this first batch of local instructors is fully qualified, Wylfa staff training will start until the end of the phase. A second batch of 10 instructors will be hired and trained in the middle of

phase II, forming a total training workforce of around 25 instructors.

Finally, **Phase III** will go from the Initial Fuel Loading on. Continuing Training and initial training for new personnel or staff changing their position is expected for this stage.

The life of the project will last up to 2030, with a potential extension beyond that point. Just like occurred with the AP1000 project, a UK branch is expected to be created after the FID to ease the TSP activities as a local company.

Beyond the baseline approach just described, important **alternative approaches** have been proposed to Horizon. Some of these alternative approaches are the development of the Site Specific FSS, design and construction of ROTC or the recruitment, selection and temporary hiring of Wylfa staff until full qualification.

The key of the ITC success is the use of a **Training Model** polished over years of operating experience in the area of nuclear training. This training model rests on four major pillars:

- Use of High-Management Standards, being an active participant in all international nuclear networks.
- Providing a training service fully integrated with our client's organization.
- Training focused on the trainee performance improvement.
- Implementation of the most cost-effective training solutions:
 - Professional Instructor Profile
 - Flexible training Organization
 - Optimized training Programs through Advanced Training Tools and Methodologies
 - Commensurate Implementation of the SAT Methodology. ■