

THE HIFRENSA SITE OF VANDELLÓS I NPP, BASIS FOR A NEW FUTURE

V. ALBET

This article presents the HIFRENSA Site in Vandellós as the "basis for a new future" and explains the process developed to achieve this new reality. This includes a brief description of the site, an explanation of the analysis that has been carried out on installation reuse, and a review of the potential uses.

Finally, it reflects on the strategic value of the Site that gives meaning to all the business efforts and actions undertaken by HIFRENSA to manage the future value of this asset both for the company itself and for society in general.

SITE DESCRIPTION

Location

The land owned by HIFRENSA is located inside the municipal district of Vandellós-l'Hospitalet de l'Infant to the south of Baix Camp (Tarragona). The properties as a whole form a estate that runs along a coastal strip bordered on the north by the railway and the Barcelona-Valencia highway, and by the Barranco de Bassa Nova and the land occupied by CNV-II in the direction parallel to the coast.

This land is accessed by:

- Highway. On the N-340 from Barcelona-Cadiz, directly on an existing marked detour in the vicinity of the plant (p.k. 1.123,6), or else indirectly on the A-7 superhighway at the l'Hospitalet de l'Infant exit that connects up to the N-340.

- Railway. On the Valencia-Tarragona railway by means of a switch at the Vandellós-Hospitalet stop on this line.

- Sea. There is no port, but there is a pier in the Vandellós II zone.

The site is located 34 Km. from the Tarragona port, 28 Km. from the Reus airport, and 121 Km. from the Barcelona airport.

Zones to be considered in the Vandellós HIFRENSA site:

- Vandellós I NPP zone. This includes the area of the nuclear power plant and annex facilities, and is delimited by the Barranco de la Lleira, the railway, the Barranco de la Bassa Nova and the coastline; this zone is classified in the General Urban Development

Plan of Vandellós and l'Hospitalet de l'Infant as urban land. The zone's surface area is 217,262 m², without counting the 26,000 m² of maritime-land zone and territorial waters that HIFRENSA owns under an administrative concession.

- Zone between VANDELLÓS I NPP and VANDELLÓS II NPP. This corresponds to the area delimited by the Barcelona-Valencia railway, the Lleria Barranco, the grounds of Vandellós II NPP and the sea. This zone's area is 210,000 m² and is affected by the exclusion radius of Vandellós II NPP. Its urban qualification is "programmed developable".

- Zone between the CN-340 and the BARCELONA-VALENCIA RAILWAY. Its area is 130,381 m², and it is delimited by the access to Vandellós I NPP, national highway CN-340, and the Barcelona-Valencia railway. Its urban qualification is "programmed developable".

ANALYSIS OF THE USE/REUSE OF THE VANDELLÓS I NPP INSTALLATIONS

After the order was issued to close the facility and before it was transferred to ENRESA for dismantling and decommissioning, HIFRENSA decided to thoroughly examine the advisability of maintaining the different installations and buildings existing on site for the purpose of reusing them in the future.

General Issues Addressed

The possibilities for new installations and different topologies were considered, as well as a possible schedule for commissioning them. The extent of reuse varied appreciably depending on the typology of the installation.

The following factors were also included as part of these general considerations:

- Maintenance of the installations to be conserved for future reuse. In order for the installations and components slated for reuse to be in good condition when the time arrives, they would have to be part of a maintenance program.

- Spare parts. One of the major drawbacks of reusing components after a prolonged period of time is the lack of spare parts.

- Issues concerning image and environmental improvement. Dismantling Vandellós I NPP would be the first experience of this kind undertaken in Spain. Experiences of this kind are even very limited worldwide. Therefore, all eyes would be on the dismantling process and the final outcome on the physical environment. Maintaining equipment for reuse would preclude leaving the environs of the remaining nuclear zone clear after level 2 dismantling and would not contribute to giving an impression of full site recovery.

- Interference with ENRESA's work. Maintaining the installations or equipment for subsequent reuse would cause problems and interfere with ENRESA's general dismantling program.

All these factors made it advisable to limit to a minimum the installations to be maintained outside the scope of the dismantling and decommissioning plan.

Analysis Conclusions

Having weighed all the factors involved, it was concluded that it was not

worth maintaining any of the energy installations for potential reuse during the final closure phase of level 2 dismantling.

On the contrary, the following actions are advisable:

- Recovery of a few singular equipment units before and during development of the Dismantling and Decommissioning Plan for subsequent sale to third parties.
- Sale of selective components and scrap from conventional installations.
- Permanently undertake all kinds of legal actions to maintain the status of industrial site for use for electric power production.
- Maintain the roadway and railway infrastructures.
- Maintain the underwater intake, the seawater discharge and the pumping station building, although all mechanical equipment in the latter can be dismantled.
- Maintain certain areas of logistic interest.
- Maintain the 400 Kv. power line between the site and external yard.
- Maintain the rights to water supply and storage tanks (two 7,500 m³ tanks).

POTENTIAL SITE USES

The analyses carried out on potential site uses took the following into account:

- They address the Site as a whole and not only the double fenced area of the Vandellós NPP that defines the site of this facility.
- They are based on industrial-energy use in accordance with the provisions of the General Urban Development Plan for the Site.
- They address the impact of the exclusion radius of Vandellós II NPP and the Vandellós I NPP Dismantling and Decommissioning Plan.
- The Ministerial Order of the Ministry of Industry and Energy dated January 28, 1998 authorized transfer of the Vandellós I NPP installations from HIFRENSA to ENRESA for the latter to execute the plant's Dismantling and Decommissioning Plan. The dismantling underway is an IAEA level 2; upon completion (2002), 80% of the transferred land will be returned to HIFRENSA under conditions of "freedom of use", and only the reactor casing and surroundings will remain as a restricted zone under ENRESA's guardianship.

All transferred land will be released after level 3 dismantling, which will be

executed after a latency period of some 25 years as of completion of level 2.

Review of Different Energy Sources

It should be noted that the outlook set forth in this section focuses exclusively on electric power producing facilities, which does not mean that industrial-energy facilities should be dismissed.

- *Solar Energy:* Of the possible alternatives, this is undoubtedly the one involving the lowest specific power and the highest cost, and therefore it is of little interest even though both the environmental impact and the time required for commissioning are the lowest compared to other options.

- *Wind Generation:* Electric energy would be generated by means of air-generator batteries. The greatest advantage of this system is that clean, economic electric energy can be generated. The factors conditioning an eolic system are those concerning minimum required wind speed and minimum number of operating hours a year. The Site does not satisfactorily meet these conditions.

- *Coal-Fired Plants:* Pulverized coal units required heavy investments, which means they must operate for a sufficient number of hours; this is offset by the fact that they are not very sensitive to the price of fuel, which stays relatively low and stable as there are significant coal reserves around the world. Therefore, this option could be appealing in the mid/long term.

The factors to be evaluated for a possible implementation of this type of electric power producing unit include gross water consumption, coal supplies, slag and solid waste removal, and finally the need for a scrupulous design to minimize the environmental impact in terms of gaseous emissions, liquid and solid discharges, and visual appearance and integration with the environs.

On the other hand, installation of a pulverized coal-fired plant involves an annexed coal transportation infrastructure (railway, port, trucks, etc.).

- *Combined Cycle Plants:* Combined cycle plants feature the following general characteristics:

- Very low investment costs and very short construction times compared to pulverized coal-fired plants and above all compared to nuclear power plants.

- Very high performance (55%).
- Relatively reasonable current price of gas.
- Installation with intrinsically reduced environmental impact.
- The gas supply does not involve any logistic problems due to the proximity of the Mediterranean gas pipeline with enough capacity for the consumption of the proposed units.

- *Mixed Combined Cycle and Coal-Fired Plant Alternative:* Another possible solution, from the standpoint of diversification, would be a mixed alternative, i.e. Combined Cycle + Pulverized Coal-Fired Plant.

- *Nuclear Power Plants:* Without undertaking an analysis of the conditions that must be met for implementing a new nuclear power plant on the Site, the following aspects should be noted:

- The intermediate zone between Vandellós I NPP and Vandellós NPP is affected by the exclusion radius of Vandellós II NPP.

- The DGE granted a site permit some time ago for building a nuclear unit in this zone which never materialized.

- The General Urban Development Plan allows for construction of nuclear power plants on the Site.

Due to the above and exclusively from the standpoint of licensing, implementation of a nuclear power unit in the intermediate zone would be theoretically possible, although it should be dismissed due to other important conditions of social acceptance.

- *Installable Power:* To conclude the review of potential possibilities for direct electric power production on the Site, it should be noted that, in the event that "intensive" production modalities are chosen, the installable power would range from 2,000 to 3,000 MW.

STRATEGIC SITE VALUE

In the past, the Site's strategic value was not exhausted with implementation of the plant. Later DGE site licenses for building two new nuclear units underlined this value. The Vandellós II NPP project was born, part of the HIFRENSA site was sold for that purpose, and this resulted in the current Site situation as described in this article.

At present, the Site's strategic value continues to surpass the strategic value inherent in the Vandellós I NPP site.

On the other hand, there are currently two essential factors regarding electric energy production that have a very direct influence on the characteristics of the site for potential implementation:

- The electric industry is going through a very dynamic phase characterized by intense competition and a strategy of diversification and customer fidelity.

- We are experiencing a phase of continued evolution and technological improvement of modular electric power producing facilities, which require short implementation times and moderate investments per installed Kwe and have a high energy performance.

The combination of these two factors shapes today's most plausible range of actions: modular direct electric power production and mixed industrial-energy uses, i.e. co-generation.

The HIFRENSA Site fulfills the intrinsic, strategic values of the present time, on the understanding that these situational values would also be fulfilled if the strategy was changed to implementation of large electric power producing units.

HIFRENSA's Site Management Policy

The end value of a site is closely linked to the strategic needs existing at all times and the ability of this site to satisfy these needs. This level of suitability for needs is in part a result of the "intrinsic" characteristics and the actions in defense of the patrimony that the Owner has taken in managing this site in order to keep it available under first-rate conditions.

The basic courses of action that HIFRENSA has established in its continued efforts to maintain the Site's value are as follows:

- Permanently undertake all legal and administrative actions to maintain its status as an industrial/energy site.
- Obtain, maintain and renew administrative concessions that add value to the Site. In this respect, it should be noted that an extension up to the legally established limit was obtained of the maritime-land zone and territorial waters, which safeguards the coastal defense, pumping station and discharge canal.
- Provide the water and electricity supplies that have been deemed optimum under all circumstances.

Thus, HIFRENSA is a founding member of the Ebro River Water Consortium and has maintained reasonable rights to overall water supplies to the Site, of which it has devoted a minimum portion to the current needs of Vandellós I NPP.

As part of the policy of optimizing relations with the environs and specifically with the Municipality of Montroig, the supply from the wells located in this municipality is not used and the corresponding installations have been transferred to this municipality.

The power supply was resized to tailor it to new Site needs, which at present is supplied by two 25 Kv. lines, although the 400 Kv. line linking the plant-yard is maintained but without voltage.

- Establish a "good neighbor" policy that results in mutual benefits.

Thus, in conjunction with Vandellós II NPP, a policy of sharing the meteorological towers was implemented. An agreement was also reached whereby Vandellós II NPP uses certain Site infrastructures which today should be considered as a Site asset.

- Keep the rail link to RENFE operative. This not only involves maintaining the Site's internal rail infrastructure, but also negotiating with RENFE the link's future operation and prevent it from disappearing.

- Optimize the transfer of Vandellós I NPP to ENRESA. For purposes of regulating the rights and obligations that HIFRENSA and ENRESA mutually confer on each other as of the time the installations located inside the plant's double fence are transferred, in 1997 the parties signed and legalized the "Transfer Agreement". This agreement identifies the transferred installations and the scope of activities to be carried out by ENRESA as part of the dismantling and decommissioning Plan. It also identifies the balance of infrastructures not to be dismantled:

- 400 Kv line.
- Seawater pumping station.
- Raw water tanks and water distribution ring.
- Roadway and railway infrastructures.
- "Archive and new office" building.

This document also defines the final status of the Site at the time it is returned to HIFRENSA, for "freedom of use" at the end of levels 2 and 3, respectively (configuration, and urban, radiological and soil mechanics requirements), and it identifies the maintenance actions to be undertaken

by ENRESA that affect the Site and its access ways.

The Agreement safeguards HIFRENSA's entrance rights to the Site, as well as its right to information on the evolution of dismantling work and other legitimate rights deriving from its condition of Owner.

Provide at all times the maintenance required for the upkeep of access ways, infrastructures, services and fencing that affect the Site as a whole.

Finally, it should be noted that to undertake the patrimonial actions mentioned above, the Owner must provide for the specific, orderly allocation of certain highly efficient, responsible human resources with long-term dedication.

HIFRENSA is currently undertaking an orderly process of closure, and this "order" should fully guide the development of its patrimonial actions in order to ensure that its legitimate heirs are left not only with properties and infrastructures in a suitable condition, but also with complete, perfectly traceable dossiers. We are convinced that these continued efforts have been, are and will be the best service we can provide to allow for the reuse of the Vandellós I NPP Site, so that an excellent basis is made available for creating a new industrial energy future in the Vandellós-I/Hospitalet de l'Infant zone.



Victor Albet is an Industrial Engineer with a degree from Barcelona's ETSII (1974) and a graduate of the IESE's Enterprise Management school (1991). In 1974 he joined FECSA's Planning and Development Department, in 1982 became head of Network Studies, and in 1987 occupied the post of Planning Director in this company. In 1994, he became General Director of Hispano-Francesa de Energía Nuclear, S.A. (HIFRENSA). Since 1996, he has been President of UNESA's Nuclear Communications Committee and a member of the Nuclear Forum's Executive Committee. He 1996, he took over the Management of Nuclear Affairs at FECSA. Since early 1997, he has been Vice-President of the Board of Directors of the Asociación de Desarrollo Tecnológico Nuclear (DTN).