

Floating electric power generation plants

EPC Venezuela

Engineering, procurement and construction (EPC) of all Design and build port facilities, Electrical interconnection to substations, utilities and the auxiliary installations outside battery limits (OSBL), including Telecomm platform and tele protection systems, as well as the replica of the control systems placed on shore areas.

Two floating power plants, (FPP) of 170 MW nominal capacity each, were also installed for CORPOELEC, Electricidad de Caracas (EDC), within the power generation complex Josefa Joaquina Sánchez Bastidas (Tacoa), located in the State of Vargas, Venezuela.

The main challenge was the project schedule; this work was to be built in 12 months, we had to dredge and move 700,000 m3 of submarine material, to put more than 54,000 tons of rock for the works of marine protection, to construct a high voltage (230kV) transmission line of 8 km for the electrical interconnection, designing and installing on shore a replica of the control system, building of the control room, designing and installing a telecomm platform for the interconnection, including a redundant loop around the complex, and design of the pipeline to supply Diesel from a ship, install pipes for demineralized water, all this works were necessary to receive two floating power plants the largest in the world up to that time.

Moreover, this project was executed without a previous engineering development, neither Conceptual, nor Basic and Detailed Engineering, since it was born from form an electrical emergency.

Due to the topography and space availability, final floating power barge and related equipment placement was a complete challenge.

EXECUTIVE SUMMARY

THE CLIENT

CORPOELEC:

National Electric Corporation, a state-owned holding company created in 2007 to consolidate the electric power sector in Venezuela.

EDC:

It is the integrated electricity company for Caracas, Venezuela and surrounding areas, with more than 1 million connections. It was acquired by AES Corporation in 2000 and sold to the state-owned oil company PDVSA in 2007, which now owns 93.62%.

CHALLENGES

SOLUTIONS

Engineering works were developed essentially as Field engineering with close interaction with Client as well as the Power barge manufacturer. Construction activities were executed with special attention on Safety, Environment and Quality criteria in order to assure safe works, friendly environment and avoiding reworks. Mutual confidence was a key factor for quality paper works since, works were developed without interruption due to paper activities and filing works.

Implementation of an aggressive procurement plan was determinant to ensure early arrival and availability of equipment and materials. Alliance with major construction subcontractor specialized in marine works was a key to ensure availability of construction resources.

3 shifts of work were established for the marine excavation, as well as 2 work shifts for the construction of the marine breakwater with rocks, all the pipe and its supports were prefabricated outside the work site and the manufacture of the high voltage towers were started Very early as well as all the demand for electrical equipment to be installed in the substation that would receive the energy of these barges. The final result was both power barges were providing electrical energy at 100% capacity to National Electric System, ahead schedule, within 12 months. By the way, the unique project concluded on time as part of the electrical emergency projects developed in Venezuela at that era.



The project was implemented with a very accelerated plan to meet the goal, many activities in parallel and multiple work fronts as well as multilocation areas, at the same time had close coordination with the manufacturer of Floating Plant Generation, in order to ensure a very Fast and effective connection.