

Power Generation among the Mangroves

First Gen Corporation, through its subsidiaries, First Gas Power Corporation and FGP Corp. (First Gas), is running an exemplary power station near the area known as the “Center of Marine Biodiversity” in Batangas Bay in the Philippines. As partner in charge of operating and maintaining the plants, Siemens helps to ensure smooth operations in the large and complex facilities.

By Justus Krüger



The First Gas power stations Santa Rita and San Lorenzo in Batangas, about 100 kilometers to the south of Manila, Philippines, are a most unusual sight. A large mangrove forest nestles up to the plants. The flues of the power-generating facilities appear to be growing out of a lush tropical forest. A flock of Chinese egrets floats gently over the mighty turbine halls. “The egrets were not observed in the area before we built the plants here,” says Ignacito Panzo, Senior Manager for Quality, Environment, Safety and Health at First Gas. “A few years after First Gas started operations and rehabilitated the mangrove area, the egrets began to feed in the mangroves and vegetation areas adjacent to the power plants.” Panzo explains that the environmental programs at the First Gas plants of Santa Rita and San Lorenzo include cleaning the beaches, cultivating mangroves – a protected plant species in the Philippines – and monitoring the state of the natural environment and its biodiversity in the perimeter of the plant. “When we

took over the site to clear it for the construction of the plants, a number of abandoned fish ponds were there,” Panzo recalls. “That area is now covered by 9 hectares of mangrove forest.” Since First Gas moved in, the biodiversity on the site has increased significantly. “This year, we even had sea turtles laying their eggs on the shore right in front of the plant for the first time in many years,” says Panzo. Batangas Bay is an extraordinary place. The waters close to the power plants are home to the world’s highest concentration of marine shore fish biodiversity. Because of this, the area has been dubbed the world’s blue-water version of the Amazon River Basin. First Gas officials are aware of the responsibility that this entails. “We are very committed to supporting and running programs to conserve the plant and animal species in the Batangas Channel and in the area around the plant,” says Jon Russell, Executive Vice President at First Gen Corporation (First Gen), the parent company of First Gas. In conjunction with the

International Union for Conservation of Nature (IUCN) and Kent Carpenter, Global Marine Species Assessment Director at IUCN, First Gas has achieved very encouraging results. “What we are seeing is that species which were absent before the plants started operations are now coming back to the Batangas area,” says Russell. “We are also working closely with experts from the University of the Philippines. They have identified various species that were previously rare in the area.” An increase in biodiversity is not usually the type of effect that people associate with putting a power plant into operation. It is possible, however, because First Gas is consistently making successful efforts to look after and improve the local environment. And because the company’s plants in the Batangas Bay area are world-class facilities, the emissions from them ever since they started operation in 2000 have been not only well below the limits of the local regulating authorities, but also lower than those recommended by the World Bank and other international agencies.

From the Beginning: Siemens O&M

Built by Siemens in two phases – first Santa Rita, then San Lorenzo – the power plants have a capacity of approximately 1,500 MW. First Gen is the leading clean and renewable energy company in the Philippines, with an installed capacity of 2,822.4 MW, more than half of which comes from the Santa Rita and San Lorenzo plants. The company accounts for approximately 18.8 percent of total installed capacity in the Philippines today. In addition to its gas-fired plants, First Gen also operates hydroplants, is planning a number of wind parks and is the world’s second-largest producer of geothermal energy, expecting soon to take the global number-one position. From the beginning, First Gas tasked Siemens with operating and maintaining the facilities in Batangas on the basis of a full-scale operations and



First Gas extended its service contract with Siemens for another 15 years in June 2010. Siemens’ goal is to uphold the zero degradation concept that marked the first decade of O&M on steam and gas turbines.



Efficient O&M services ensure low emissions at the Santa Rita power plant near Batangas City.



Photos: Daniele Mattioli / Agentur Anzenberger



Siemens handles plant administration on a day-to-day basis. The heart of the installation is the control room.

maintenance (O&M) contract. This contract ran out after ten years. In June 2010, First Gas and Siemens signed a new contract to cover the next 15 years of operation. This model – under which a power producer delegates O&M to a second party – is a fairly common one. Big utilities opt for it, as do – more frequently – independent power producers such as First Gas that are running a business model different from that of public utilities. “Our projects are project financed, so we have a lot of interested lenders. It is of course important to our lenders as well as to us to have a qualified company operating and maintaining our assets,” says Russell. “Our colleagues at Siemens are well known for their engineering prowess and take pride in the quality of their service. They did a great job on the first phase, so naturally we were keen to look at them for the second phase also.” The plants in Batangas have performed very smoothly and reliably, says Russell, “and we need to make

sure that this continues.” That is precisely the purpose of the O&M contract with Siemens. As a global organization, Siemens Energy Services is at the forefront of technology in the field. The company currently has O&M arrangements supplying more than 15,000 MW worldwide from Taiwan, Indonesia and Singapore to Morocco and Algeria, England, France, Spain and the Americas, among others. Those O&M contracts are centrally led from the headquarters in Orlando, Florida, for O&M Services in the Americas and in Erlangen, Bavaria, for O&M Services in Europe, Africa, the Middle East and Asia in order to leverage a global exchange of experience. Under the agreement in Batangas – the largest and most complex O&M project within Siemens Energy Services – Siemens is in charge of running the plant on a day-to-day basis. This includes ensuring and safeguarding smooth daily operations of the facilities as a whole and in every detail. It also includes reducing planned and

unscheduled outage times, taking care of technological upgrades and overhauls, and identifying potential problems before they even occur. “While we do not hope for problems, we are aware that if anything comes up, Siemens has the service and technological resources to make sure that all issues are solved. Usually they apply them to avoid disturbances. But if anything arises, we know that Siemens will solve the issue,” says Russell.

Zero Degradation Concept

Ensuring smooth operations and asset protection, needless to say, is key for Siemens. “Ours is an experienced, competent and well-trained plant operation and maintenance staff. Not contractors we have pulled in from here and there. They are genuine Siemens staff,” says Trevor Wade, CEO at Siemens Power Operations Inc. (SPOI), the special-purpose company that Siemens set up for the O&M project in Batangas. Wade is in charge of the Siemens side of the O&M agreement in Batangas.

Photos: Daniele Mattioli / Agentur Anzenberger

Apart from running the administrative side of the project, he is also very proud of the engineering competence of his team in Batangas and of Siemens at large.

Major interventions periodically conducted by Wade’s team, supported when necessary by specialists from around the world, include overhauling the power train consisting of gas turbine (GT), steam turbine and generator, the HRSG and the balance of the plant. “Overhauls are based on GT equivalent operating hours (EOH), where you need to change a certain number of turbine blades and replace other hot gas path components, for example. In short, we do a complete overhaul of the unit,” Wade explains. In addition to the comprehensive overhauls, the Siemens team suggests upgrades and modernizations to First Gas. The reason for this is that throughout its life cycle, a power plant is not a static entity, but is subject to smaller and larger enhancements and refinements as the technology continues to develop over the years. “Part of our job is to keep the customer informed on what upgrades would make sense and, if he approves, install them for him,” says Wade. This includes upgrades such as the Compressor Mass Flow Increase, which leads to capacity gains, and, as a future option, thermal performance improvements.



“Performance over the past ten years has followed a zero degradation concept.”

Trevor Wade, CEO, Siemens Power Operations Inc.

The overhauls, upgrades and the attention to performance pay off for First Gas. “What we have put into practice here in terms of performance is a zero degradation concept over the past ten years,” says Wade. “Degradation,” a purely technical term in this context, designates the decline in output over the years that comes with normal wear and tear. When Siemens builds a power station, such as for First Gas in Batangas, part of the initial projections in the planning is a so-called degradation curve, which predicts the productivity decline that is to be expected and guarantees that the decline will not exceed the prediction. “Of course, there is some margin in that guarantee. But if you can maintain the plant cap at a level close to that guarantee level, you’re doing a good job,” says Jon Russell. “In Siemens’ case, the net result is in fact roughly 7 percent better than the guarantee level. These 7 percent amount to the equivalent of a medium-sized power plant,” he adds. “Someone once described the Siemens plant as being like a fine wine. It actually improves with age.” Approximately 3 percent of the excess productivity in the past ten years came from good operational practices, while the other 4 percent came from equipment upgrades that lead to capacity growth and efficiency gains, First Gen estimates. “We are



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Jon Russell, Executive Vice President, First Gen

expecting that Siemens will be able to achieve a similar performance going forward,” Russell says. “And I think Siemens is better placed than anyone else to be able to do that. Because a third-party provider doesn’t have access to the ins and outs of the technology that Siemens has. Siemens set the bar very high in the first phase. We expect them to clear that bar and go on to a new record. We are expecting good things from Siemens.”

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Further Information

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