Feature

Fulfilling Our Commitment to Stable Supply

The J-POWER Group is committed to ensuring constant supplies of energy. Making certain we fulfill this commitment is the mission of J-POWER Group employees all over the world.

Akiba Transmission Line

The Mission of J-POWER Group Employees

The arena in which J-POWER Group employees operate spans national borders. Charged with the mission of providing stable, constant supplies of energy, they work day and night toward that end. Sometimes they sweat under the intense pressure to find answers with barely enough time, personnel, or other resources. Some are stationed away from their families or obliged to work at night and sleep during the day. Despite these harsh conditions, each performs his or her mission with dedication, working diligently behind the scenes to keep the power on in our lives.

Tokyo

Central Load Dispatching Center

Sadao Tsutsui
Central Load Dispatching Center
Power System Operation Department

"The system operators on duty get on the phone to confirm that day's supply-and-demand situation with the power companies, the weather conditions with the control centers, and the next day's operation curve with the thermal power stations. As shift supervisor, I supervise the staff and confirm the issues to be taken over to the next shift. The Central Load Dispatching Center (CLDC) where I work is a busy place, but on the surface there's nothing more peaceful. Then suddenly an alarm goes off in the control room. The operator on the phone says, "Excuse me. I'll call you back later," hangs up, and we focus all our attention on the blinking lights of the monitoring panel on the wall in front of us. That's a moment of high tension."

To efficiently operate the J-POWER Group's 67 electric power facilities nationwide, the CLDC stays in close contact with regional electric power companies and passes on appropriate operating instructions to each power station. At present the CLDC performs these duties around the clock, in three shifts. Where hydroelectric power stations are concerned, the work involves adjusting their generating plans on a weekly, daily, or hourly basis to keep the dam water levels high without having to waste water through discharge when it rains. In the case of thermal power stations, generating power often has to be reduced when equipment is being repaired, and a major job of the CLDC is to coordinate the schedule and contents of power stations' operations with power companies. When transmission lines are knocked out by lightening, causing power outages, work at the CLDC becomes highly charged as the staff race with time to fix the problem as quickly as possible.

"The work we do at the CLDC involves keeping a sharp eye on the power system monitoring panel that shows us the operational conditions of every facility all over the country, while also keeping in mind the constantly changing supply and demand situation, weather conditions, water flow conditions, and repair schedules. We do all we can to respond appropriately to every sort of situation, keeping in mind that J-POWER depends on those of us at the frontline to ensure a stable supply of electric power—which is to say that the industrial activities and daily lives of power users depend on us, too."

Kanagawa Prefecture

Isogo Thermal Power Station No. 2 Unit Construction Office

Masaharu Fujii
Mechanical Engineering Group
Isogo Thermal Power Station
No. 2 Unit Construction Office

Hiroyuki Uchinaga
Electrical Engineering Group
Isogo Thermal Power Station
No. 2 Unit Construction Office

The Isogo Thermal Power Station, built under Japan's domestic-coal-use policy, began commercial operation in 1967. In the more than three decades since then, it has provided a stable supply of electric power, primarily to the Tokyo area. Since 1996, however, the J-POWER Group has been proceeding with projects to replace the aging plants utilizing J-POWER's advanced thermal power technologies to meet the requirements of an environmental improvement program based on the Yokohama city government's "Yokohama 21st Century Plan ."

To meet day-by-day electricity demand, the power station is responsible for continuing to provide a stable supply of electric power during the construction of new plants. To this end, J-POWER has employed a sophisticated "build, scrap & build" method: The old power station (530 MW) continued operating while the new No. 1 unit (600 MW) was being built, and then was scrapped as soon as the new No. 1 unit started commercial operation. Then the new No. 2 unit (600 MW) is being built on the site occupied by the old facility. The construction is carried out in an environmentally friendly fashion, furthermore, concrete debris from demolition work and coal ash generated during operation are utilized as aggregate for the concrete sub-slab poured between the bedrock and the foundation of the new unit. Construction of the new No. 1 unit was completed and began commercial operation in 2002, taking over from the old plants. J-POWER is currently proceeding with construction of the new No. 2 unit whose commercial operation is scheduled for 2009, while placing top priority on maintaining stable operation of the new No. 1 unit.

"Unlike in ordinary power station construction projects, we have the new No. 1 unit already operating on the site, so we have very limited space in which to store our construction materials and so forth. For that reason we need to draw up a very detailed construction plan so that we are supplied only with the construction materials requested just in time" (Masaharu Fujii, Mechanical Engineering Group). To maneuver within this small site, it is sometimes even necessary to rebuild the roads in the power station in accordance with the construction progresses. Many J-POWER Group departments and sections are involved in the construction of the new No. 2 unit, and they coordinate closely with one another to ensure that construction proceeds on schedule at each stage.

A 96-day-long regular inspection of the new No. 1 unit is scheduled to begin in the spring of 2008. Modifications to connect the equipment and systems of the new No. 1 and No. 2 units are scheduled to be carried out during this limited time. The new No. 2 unit construction team and the new No. 1 unit operation and maintenance team are currently engaged in preparations for this work in close coordination with one another.

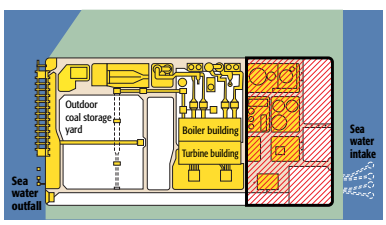
"One of the modifications is a rearrangement of the Operation Center's layout and so forth to accommodate the new No. 1 and No. 2 units. The Operation Center is the core of operation and monitoring at the power station, and we need to rearrange it as an integrated system that brings the two units into accord, so that there's no visual or operational inconsistency in the operation and monitoring system of the two units" (Hiroyuki Uchinaga, Electrical Engineering Group).

When the replacement project is completed in 2009, the new power station will provide electric power totaling 1200 MW (the total of No. 1 and No. 2 units).It will be reborn as an environmentally friendly power station, thanks to the incorporation of state-of-the-art technologies and equipment, including the application of some of the world's most advanced high-pressure and high-temperature steam conditions for achieving higher plant efficiency and a dry-type desulfurization system using activated coke. The entire J-POWER Group is working together to ensure its successful completion.

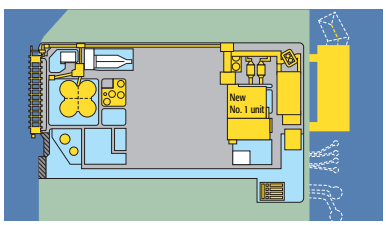
Operation Center

Build, scrap & build method

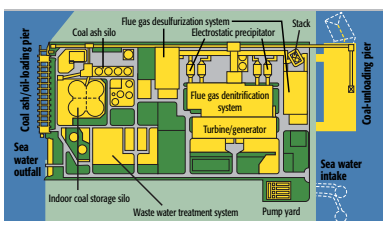
New No. 1 unit built while old power generating facility continues operating
Outdoor coal storage area scaled back and coal ash silo built on cleared area. Old tanks, etc., then removed and new No. 1 unit built on cleared site.



Old power generating facility scrapped after new No. 1 unit starts up.
Old power generating facility scrapped after new No. 1 unit starts up, clearing site for new No. 2 unit.



Replacement project completed after new No. 2 unit commenced commercial operation
New No. 2 unit currently under construction on site from which the old facility was cleared. In the final phase, No. 1 and No. 2 unit operation systems are to be integrated.



Enhancing Reliability of Hydroelectric Power Stations

Hideaki Sagara
Electrical Engineering Office
Civil and Electrical Engineering Department

Hydroelectric power stations consist of civil structures, such as dams, waterways, and penstocks, as well as generating equipment, such as water turbines, generators, and switchgears. The lifetime of the generating equipment is shorter than that of the civil structures made of concrete and steel, but high reliability is required, since generating equipment outages may directly cause instability of power supply.

The J-POWER Group works diligently to maintain the reliability of our generating equipment, carrying out check-ups and overhauls to check for any trouble or deterioration and responding with appropriate repair or replacement.

"When I was a student, just about the time I was beginning to think about where I might work after graduation, I went on a tour of the Sakuma Power Station. That was when I became interested in J-POWER and power station construction. Since joining the company, I've been involved in construction and maintenance at sites in Japan and overseas. Feasible hydropower sites have already been developed in Japan, so effective utilization, maintenance, and operation of existing facilities is more important, and with the recent trend toward deregulation of the electric power industry, greater efficiency and cost-cutting have become imperatives. When we upgrade facilities, it's not sufficient just to replace equipment. We have to try to make it better than the original in terms of reliability, functionality, and efficiency.

"The conventional approach to refurbishing equipment is to replace each unit as it ages or sustains damage, but we've adopted a new approach. By upgrading all the major electrical equipment at once, we're able to reduce costs, provide reliability and mechanical performance comparable to that of new power stations, and transform it into a more competitive power station. We've been able to realize this plan by marshaling all the hydropower maintenance and construction technology that the J-POWER Group has developed over many years."

The maintenance technologies and ideas developed in Japan are also being put to use in overseas facilities. For example, efforts to improve reliability and efficiency at a pumped-storage power station owned by the J-POWER Group in the Philippines have contributed to the plant's stable operation and enhanced competitiveness.

Pirrís–Costa Rica

Pirrís Hydroelectric Project

Kenji Yokokawa
Costa Rica Office
International Power Business Department

Since July 2003, J-POWER has been providing consulting services for the Pirrís Hydroelectric Project being built by the Costa Rican Electricity Institute (Instituto Costarricense de Electricidad, or ICE). Specifically, we have assisted with detailed design and construction supervision.

Costa Rica is a Central American country, a little larger than the island of Kyushu in Japan, and with a population of about 4.3 million. Known for its coffee, bananas, and ecotourism industries, Costa Rica depends on hydropower for about 90% of its electric energy, with geothermal power, wind power, and thermal power supplying the rest. With electricity demand growing at a rate of about 6% annually, the country must add 100 MW to 150 MW to its power system network every year.

"Having worked here for about four years now, I'm more aware than ever of the time it takes for decisions and action in the *hasta mañana* culture of these Latin countries. The bidding system here has its own unique aspects—for example, the General Comptroller can order the bidding halted or call for a rebid at any stage—making the bureaucratic process extremely time-consuming."

The Pirrís Hydroelectric Project has been designed on a large scale, with a 113-meter-high dam, a 10-km-long power tunnel, and a capacity of 128 MW. At present the facility is 60% complete, and construction is proceeding, with the startup scheduled for 2010. On April 19, 2007, the power suddenly went out all across Costa Rica. For two weeks beginning the day after the blackout, ICE was obliged to impose a cut in peak demand through a nationwide electricity rationing program. The immediate causes of the blackout were said to be a decline in hydropower supply capacity owing to a major drought, lack of reserve capacity owing to malfunctions at several thermal power facilities, and breakdown of transmission equipment in a certain region. "Completing the Pirrís Hydroelectric Project on schedule is truly the highest imperative from the standpoint of ensuring a stable supply of electric power in Costa Rica. As we continue with the project, I want everyone involved to share my firm resolve to permit no further delays as we work together to fulfill our mission."