

Primavera P6 Implementation

Case Study:

Central Heating and Cooling Plant Renovation (Skanska)

OnTrack Scheduling developed and managed the project scheduling controls component of the \$181 million central plant renovation for the State of California.

Project Goal

The goal of this project was to bring the State of California's central heating and cooling plant into compliance with its own environmental standards through an extensive renovation of the facilities.

Background

The central plant, located at Seventh and Q streets, services the heating and air conditioning needs of more than 20,000 state employees working in 23 buildings, including the State Capitol. Constructed in 1968, the old plant cooled its huge chillers with water pumped from the ground and then discharged into the Sacramento River. The warm discharge – averaging nearly 6 million gallons a day – occasionally raised the temperature of the river enough to potentially harm aquatic life. In 2002, the Central Valley Regional Water Quality Control Board ruled that the plant was in serious violation of state water quality regulations.

The Process

After the 2002 ruling, the state explored retrofitting or expanding the aging plant, which had already been scheduled for repairs to meet new state standards. Preliminary plans included excavating nearby Roosevelt Park to install an underground water storage tank and build cooling towers along the Sacramento River. Those plans were re-designed amidst community opposition in favor of a plan that located the entire plant on one city block.

Jacobs Engineering was the Construction Manager (CM) for the State of California. OnTrack worked with the project executives, engineers, designers and subcontractors to create the baseline schedule from design to commissioning, including cost loading and resource loading. The stringent scheduling specification established by Jacobs Engineering was the basis for the application for payment.

Deliverables

- Cost Loading: loaded schedule with dollars using the CSI format for the application for payment on a monthly basis.
- Resource Loading: loaded the schedule with manpower for accurate look ahead resources needed.
- Weekly evaluations of critical path and cash flow reports submitted to the State.
- Extensive monthly reporting of cash flows, critical path, look ahead and resource curves.
- Weekly team meetings to implement change orders and mitigation tactics.

After extensive re-design and engineering, the new plant was sited on property immediately adjacent to the old facility. The new plant's ultra-light cooling towers were located on top of the building's roof, with tower walls constructed of fiberglass, and 20-foot-diameter fans built of carbon fiber.

While the plant is currently operational, it is not scheduled for completion until July 2010, at which time the old plant will be demolished and replaced by a small parking lot and a 140-foot-tall water-storage tank. The tank will hold 4.5 million gallons of chilled water, storing it overnight for pumping during hot daytime hours to cool buildings.

The project is currently ongoing and requires weekly and monthly updates and reporting to Jacobs Engineering.

Benefits and Results

The renovated plant is Platinum LEED rated for sustainability and energy efficiency, making it a truly "green" project. It will draw less than 200,000 gallons of water a day with no river discharge, and will also help to alleviate stress on the power grid during hot afternoons, greatly reducing the state's energy bills.

In addition, the new plant plugs into the existing piping network underneath downtown Sacramento to deliver steam, cold water and compressed air via a series of pipes connected to heating and cooling units in state buildings. This approach is much more energy-efficient than the current system in which heaters and air conditioning units are operated for each individual building.

