Empire Generating Company

Empire Generating Project

Contact Information:
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Location
Rensselaer, New York, USA

Project Type
EPC for 635 MW Power Plant

Empire Generating Project

Project Description

CH2M HILL performed integrated engineering, procurement and construction for the environmentally-friendly Energy Capital Partners combined cycle power plant in Rensselaer, New York. The Empire plant has a peaking capacity of 635 MW. The total value of the plant which was more than $500 million.

This power station is one of the cleanest and quietest combined cycle plants in the country.

Equipment installation for the power station began in early in 2009 and became fully operational on August 31, 2010.

The plant included two GE 7FA combustion turbines, two Alstom triple pressure heat recovery steam generators and one GE D-11 reheat steam turbine. The plant is fueled by natural gas with low sulfur fuel oil as back up. The combustion turbines and the steam turbine are enclosed in a building.

The project scope includes a 345 kV switchyard, 8 miles of transmission line, a 4.5 mile gas line, and a 28-inch diameter grey water pipeline from Albany County's sewage treatment facility under the Hudson River.

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Frank A. Tracy Combined Cycle Plant

Contact Information:
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NV Energy
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Location
Reno, Nevada, USA

Project Type
541 MW Combined Cycle Power Plant

Frank A. Tracy combined cycle plant

Project Description

NV Energy (formerly Sierra Pacific) awarded CH2M HILL the EPC contract for a new 541 MW combined cycle facility at the existing Frank A. Tracy combined cycle plant, 18 miles east of Reno, Nevada. The state-of-the-art plant is the largest power project constructed in northern Nevada in 24 years and will use one-third less natural gas than the existing generating unit. It will help increase the utility's generating capacity by 50 percent and reduce the state's dependence on expensive power purchases from out-of-state suppliers.

The project achieved a significant safety milestone by expending 1.5 million safe work hours during construction with zero lost-time accidents. A strong culture of safety, communication, and collaboration from the craft laborers at the Northern Nevada Building Trades, CH2M HILL staff, and the NV Energy project team was responsible for the project's outstanding safety record.

Value Added Services

Examples of the value added by CH2M HILL include the following:

- Detailed execution planning and local construction contracting strategy incorporated the use of skilled subcontractors from adjacent states, since most of the workforce in the area is focused on the hotel and entertainment industry.
- Utilizing successful contingency plans and workarounds when raw materials such as structural steel, piping, and electrical cable deliveries were delayed allowed the project to remain on schedule.

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NV Energy

Frank A. Tracy Combined Cycle Plant

Aerial view of facility

GE Frame 7FA and single GE D-11

- Developing a plan whereby the majority of the piping and conduit was installed underground before placing the larger equipment reduced site congestion during construction allowing more site work to be performed earlier and achieving schedule optimization.
- An improved arrangement for the administration and warehouse buildings, compared to the contract requirements, was provided.

Features

The gas-fired facility utilizes two General Electric Frame 7FA combustion turbines, one D11 steam turbine, two Nooter-Erickson heat recovery steam generators, and an air-cooled condenser for water savings.

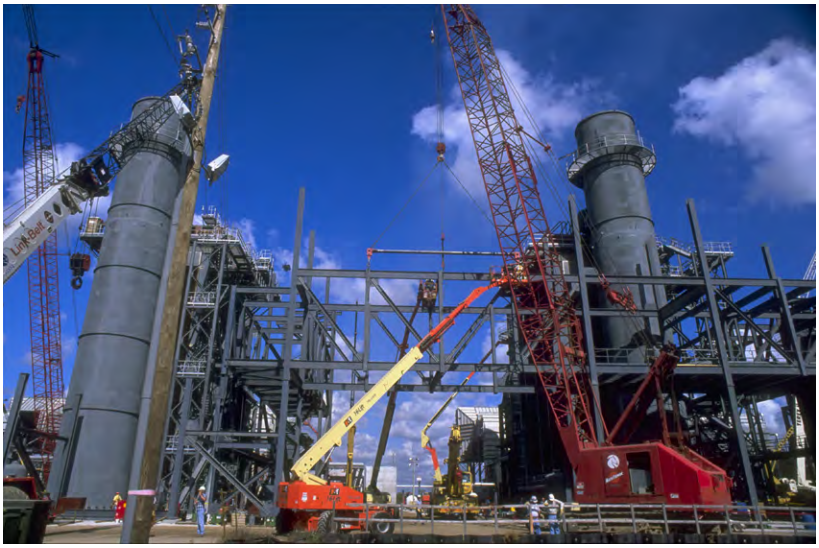
The project execution plan—an integrated EPC approach with an early focus on plant constructability—was based on a fast-track, 24-month construction schedule. At peak construction, the project employed an average of 500 skilled workers. CH2M HILL was also responsible for startup, testing, and initial operation of the facility.

Florida Power & Light

Fort Myers Repowering Project

Location
Ft. Myers, Florida, USA

Project Type
Construction for Repowering 7FA Power Plant



Ft. Myers Repowering Project

Project Description

CH2M HILL provided electrical and mechanical construction services for repowering at Florida Power & Light Company's Fort Myers Power Plant in Florida. The facility was repowered by adding six General Electric 7FA combustion turbines and six heat recovery steam generators that provided steam to an existing 125 MW steam turbine generator and an existing 400 MW steam turbine generator.

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Calpine

Westbrook Project

Location
Westbrook, Maine, USA

Project Type
340 MW Combined Cycle Project

Westbrook Project

Project Description

CH2M HILL was General Contractor for General Electric Power Systems for the installation of two GE Frame 7FA 170 MW combustion turbines, one 180 MW steam turbine, and two Vogt-Nem HRSGs. The Westbrook Energy Center, owned by Calpine, produces 540 megawatts of electric power in combined-cycle. The Project was started in March 1999 and was construction complete in February 2001.

Value Added Services

During the initial stages of the Project, CH2M HILL encountered an excessive amount of rock during excavation. To capitalize on this negative, we mobilized a rock crushing activity to utilize the rock for gravel around the site. The Project was challenged by a lack of laydown space. CH2M HILL had to obtain offsite space and develop a comprehensive logistics plan to schedule deliveries to the site to optimize installation and minimize double-handling.

Project Specifics

CH2M HILL was challenged with working in the cold environment of Westbrook, Maine, where annual snowfalls often exceed 100 inches. Our construction approach included fast-tracking the building construction to allow as much work inside a heated area to improve craft productivity. The entire power island was inside the building, including the gas turbines, steam turbine and heat recovery steam generators.

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CIANBRO

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Darling Downs Power Plant Project

Contact Information:
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Location
Queensland, Australia

Project Type
630 MW Power Station

Aerial View of Darling Downs

Project Description

CH2M HILL and GE Energy were awarded a U.S. $660 million (AUD $780 million) engineer, procure, construct contract for Origin Energy's 630 MW Darling Downs Power Station in Queensland, Australia.

The plant operates from single-fuel plant firing coal seam methane gas and utilizes an air-cooled condenser for the plant's primary cooling system. Now complete, the plant is the largest gas-fired power plant in Australia, producing enough power to supply 400,000 homes.

The power station is air-cooled, meaning it only uses 200 mega litres of water a year, around two to three percent of the water used by a typical water-cooled coal-fired power station.

"I would like to take this opportunity to thank GE and CH2M HILL for delivering a power station of obvious high quality and for the cooperative working relationship that commenced at the start of the project and has continued right through to the end. The contribution to the DDPS project of CH2M HILL's people has been very significant not just in terms of representing CH2M HILL but also in terms of their personal commitment to deliver to a very high standard.

CH2M HILL has a unique culture that makes working with your people a pleasure, something that I have not experienced with other contractors over the years. Hopefully we can catch up again one day on another job somewhere."

--- Robert Connell, Project Director - DDPS, Major Development Projects for Origin Energy

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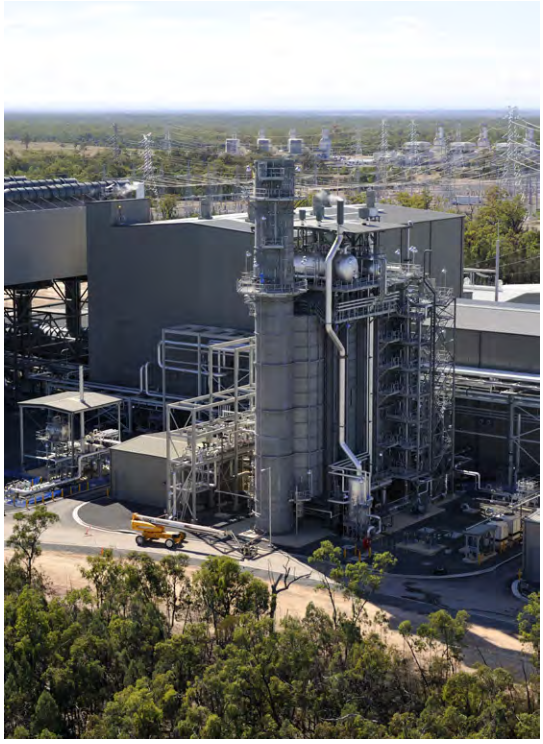
Origin Energy

Darling Downs Power Plant Project

CH2M HILL performed the engineering, design, and procurement of the offshore “balance of plant” equipment for the project, integrating with the GE-supplied three Frame 9E gas turbine generators, a C7 steam turbine generator, the plant control system, and three heat recovery steam generators. CH2M HILL performed all construction work of the project as well as supplying equipment, components and materials.

“We are pleased that our consortium team of CH2M HILL and GE successfully completed Origin Energy’s new power station,” said Don Zabilansky, president of CH2M HILL’s power business group. “This is a marquee project for CH2M HILL and GE and demonstrates our capabilities in the Australian market.”

Plant construction began August 2007. Commissioning was performed in early 2010, with commercial operation in June 2010.



High Bridge Project

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Location
St. Paul, Minnesota, USA

Project Type
570 MW Combined Cycle

High Bridge Combined Cycle Plant

Project Description

CH2M HILL was selected to provide integrated engineering, procurement and construction (EPC) for the High Bridge combined cycle plant located on the banks of the Mississippi River in St. Paul, Minnesota.

POWER Engineering

2008 Best Gas-Fired Plant

The 2x1 MH1 501F plant is natural gas fueled and uses river water for direct cooling. The entire plant, which can be seen from downtown St. Paul, is enclosed in an aesthetically pleasing building.

Value Added Services

Examples of value CH2M HILL has brought to Xcel Energy on this project include:

- Accelerated schedule due to a unique execution plan that involved erecting most portions of the building first. This allowed for higher labor productivity on the turbine island during the winter months. The execution plan also addressed the challenges of working within a very small site.
- Unparalleled safety record for a power project in Minnesota. CH2M HILL received the VPP OSHA Award for achieving 250,000 man-hours without a lost time accident.
- Proven ability to manage labor and subcontractors in a union environment.

"CH2M HILL's approach to project safety, planning, and management have been very impressive. Personally, I consider High Bridge Combined Cycle Plant a nearly perfectly executed project. My compliments and congratulations to CH2M HILL for a job well done."

-- David Wilks, Xcel Energy President

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Project Specifics

CH2M HILL executed the engineering and procurement for this project from its office in Atlanta, Georgia, and managed construction activities with an on-site construction management staff. More than 400 union craft personnel, as well as other subcontractors, were hired during the peak of project construction.

View from downtown St. Paul of Xcel High Bridge Plant

View from Mississippi river of Xcel High Bridge Plant

PINNACLE WEST ENERGY

Silverhawk Power Plant

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Location
Las Vegas, Nevada, USA

Project Type
570 MW Combined Cycle Power Plant

Silverhawk Power Plant

Project Description

CH2M HILL was the engineering, procurement, and construction (EPC) contractor for a 570 MW combined cycle power plant located on a 90 acre parcel of land 22 miles north of Las Vegas, Nevada. CH2M HILL and the owner—Pinnacle West Energy—worked as a team to achieve a high quality, best value project, including the use of flexible contracting options and incentives.

CH2M HILL was responsible for engineering, procurement, BOP equipment delivery, construction, startup, testing, and initial facility operation. In addition, we were responsible for plant control system programming, including operator training, and we shared the responsibility for plant permitting with the client.

Value Added Services

Examples of value added by CH2M HILL include the following:

- Experience – As the second consecutive power plant successfully completed for Pinnacle West Energy, we provided:
  - Proven experience in combined cycle plant design, construction, and commissioning
  - A proven construction plan and the ability to achieve the schedule
  - Labor management expertise, assuring an adequate supply of workers at a predictable cost and productivity

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- Schedule – Completed the project one month ahead of the original date.
- Budget – Completed the project under budget.
- Safety – Logged over 1.1 million man hours with zero lost time accidents.

Features

The facility was equipped with the following:

- Two Siemens 501F combustion turbine generators
- Two Alstom heat recovery steam generators, each triple pressure and equipped for supplemental duct firing
- A GE D-11 reheat condensing steam turbine generator
- A large 40-cell, air-cooled condenser
- A zero liquid discharge facility

The Silverhawk project was selected by *Power Engineering* magazine as the International Project of the Year.

PINNACLE WEST ENERGY

West Phoenix CC-5 Project

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Location
Phoenix, Arizona, USA

Project Type
530 MW Combined Cycle Power Plant

Project Description

CH2M HILL was the engineering, procurement, and construction (EPC) contractor for Pinnacle West Energy's 530 MW combined cycle power plant located 10 miles west of Phoenix, Arizona.

CH2M HILL was responsible for engineering, procurement, BOP equipment delivery, construction, startup, testing, and initial facility operation. In addition, we were responsible for programming of the plant control system and operator training.

Arizona power plant at night

Value Added Services

Examples of value added by CH2M HILL include the following:

- Schedule – The fast-track schedule necessitated an integrated EPC approach that launched the project with an intense constructability review process and a small percentage of complete drawings and specifications. Construction management worked "in lockstep" with the discipline engineers to produce highly constructible and cost-effective designs as the project advanced in the field.
- Change Orders – Held change orders to approximately 1% of the project's value, with the largest change order resulting from a transfer of scope from out-of-scope work assignments.
- Safety – Logged over 1.4 million man hours with zero lost time accidents.

Features

The facility was equipped with the following:

- Two nominally rated 175 MW utility grade Siemens 501F combustion turbine generators
- Two Kawasaki heat recovery steam generators, each equipped for supplemental duct firing
- Siemens condensing steam turbine generator
- Ten-cell wet cooling tower

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Florida Power & Light

R.I.S.E.P. Project

Location
Johnston, Rhode Island, USA

Project Type
500 MW Combined Cycle Project

R.I.S.E.P. project

Project Description

CH2M HILL was construction contractor as part of a team on the EPC contract to FPL Energy for this project in Johnston, Rhode Island. The 500 MW 2X1 “F class” combined cycle project utilizes two Siemens-Westinghouse 501FD gas turbines, one condensing reheat steam turbine, and two triple pressure HRSGs with SCR.

Value Added Services

The Project was built with the labor costs being high compared to other parts of the country, CH2M HILL was challenged to identify ways of improving field productivity and lower craft peak demands. Modularization was a key area of focus. One of the areas for modularization was the pipe racks. Racks were fabricated on the ground to reduce ironworker fabrication in place. Additionally, pipefitter and electrician work was then implemented installing pipe, conduit and tray prior to lifting the rack into its location.

Levelizing the work force as much as possible was another focused area. With significant construction going on in the New England region, particularly because of the “Big Dig”, labor was a scarce commodity. CH2M HILL developed detailed plans to schedule work so that once particular skilled craft were mobilized, the workforce could be retained for the duration of their need.

Cold and inclement weather was a major consideration during the planning and scheduling process. The plant design required a building to encompass the gas and steam turbines. With this in mind, CH2M HILL focused on getting the structural steel erected and building enclosed prior to winter, improving efficiencies of craft during the winter months.

The Project was extremely successful in the area of Safety, having completed the milestone of one million manhours without a lost time accident.

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