Greenheck Project Profile

Weston 4, A 500 Megawatt Power Plant

Marathon County, WI (Villages of Rothschild and Kronenwetter)

- **Owner**

  Wisconsin Public Service Corporation,
  a subsidiary of WPS Resources
  Rothschild, WI

- **Engineering and Contracting Firms:**

  Design Procurement and Start-up:
  Black & Veatch
  Overland Park, KS

  Superstructure HVAC:
  Tweet-Garot Mechanical Incorporated
  Green Bay, WI

- **Greenheck Representative**

  Vyron Corporation
  Green Bay, WI

Above: Construction well underway at the 500 Megawatt Weston 4 facility

Right: Greenheck's Utility Duty propeller fans installed.

The Ventilation Challenge

- **Collaborate with multiple firms to design and manufacture a unique, direct-drive "Utility Duty" sidewall fan.**
- **Design the fan to be easily mounted between existing building framework (90" x 90") and provide convenient, side access to the fan and dampers.**
- **Deliver 103 housed fans in phases over six months to match the contractors' precise scheduling needs.**

Scheduled for completion in 2008, the 500 megawatt Weston 4 coal-fired electric generation plant will join three other Wisconsin Public Service Corporation coal-fired power plants that have been in operation since Weston 1 began feeding the grid in 1960. The $752 million Weston 4 plant will use clean coal technology and state-of-the-art emission controls to minimize environmental and social impacts. The giant superstructure requires special ventilation equipment to exhaust the required air volume and to maintain acceptable indoor air quality and temperatures. The ventilation equipment must be capable of withstanding industrial level building vibrations, and have low maintenance requirements.

Greenheck's custom-designed special direct drive "Utility Duty" propeller fans in a 90" x 90" wall housing

Greenheck's Solution

- **Custom-built Direct Drive "Utility Duty" sidewall propeller fan and housing with easy access**

With guidance from Greenheck's local representative, Vyron Corporation, the project's engineers selected Greenheck as the supplier of both the fans and the dampers based on their ability to design a custom product that would meet the building's unique requirements. The project demanded multiple full-scale prototypes to be built within a strict timeline to ensure that the design matched specific requirements. Engineers from Black & Veatch provided excellent detailed guidelines ensuring all components of the design were sufficient. Several on-site visits from the contractor and electrician ensured everything was well understood by all parties, paving the way for an efficient installation process. The visits and prototypes helped the contractors fully understand how the units were designed and built and allowed them to practice installing and wiring the units in a controlled environment. The final design incorporated a special direct drive utility duty propeller housed in a specially designed 90" x 90" wall housing. The custom blade and pitch propeller met the air, sound, and horsepower requirements. The unique oversized access panels provide a means for servicing and maintaining internal components including Greenheck's industrial control dampers (Model ICD-45, utilizing a two-actuator drive system). All damper units were provided with single point wiring to reduce the labor input required by the installing contractors, Tweet-Garot Mechanical Incorporated. The superstructure required 103 of the mammoth fan units with a total weight of over 50 tons. Lifting lugs were installed prior to the units being shipped to allow for easy installation of the large housed fans. Two separate lifting configurations were designed to allow for installation flexibility within the superstructure.

The Results

- Greenheck's custom-designed fan unit with utility duty construction exceeded the design criteria specified. The 103 units have all been delivered on time to match the customer's installation needs, and all fans will be fully operational for the start-up of the 500 megawatt power plant. Completing these tasks proved to be a significant challenge, because of the multiple firms involved, the unique installation and ventilation requirements and the demanding installation schedules. Representatives from all parties were pleased with Greenheck's role in the project.

Jay Swoboda, project superintendent from Tweet-Garot Mechanical Incorporated praised the teamwork of all parties. "Greenheck's experienced engineers had the knowledge we needed to meet the unique ventilation requirements." This project became a reality, he said, "because of the superior coordination, prototyping, and on-site visits."

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