



## Colt Engineering - Edmonton to share the World Class 2005 Power Plant of the Year Award with EPCOR and TransAlta



### "World Award"

#### 2005 Best Coal-Fired Project of the Year

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Although much of North America's electricity is generated by large coal-fired power plants, new construction of coal-fired plants has been a hard sell for the past 15 years or more. Thought of by many as a threat to the environment, coal-fired generation has taken a back seat to cleaner natural gas-fired generating technologies. However, coal's negative reputation is beginning to change and this year's Best Coal-fired Project of the Year Award winner, Genesee 3, is helping prompt that change in Canada and across North America.

Genesee 3, the most advanced coal-fired facility in Canada, is located about 40 miles southwest of Edmonton, Alberta, and features the first use of supercritical technology in Canada. The plant has an efficiency rating of 43.6 percent and a gross heat rate of 8253.6 kJ/kWh. In addition, it boasts an enhanced technology suite that brings greenhouse gas emissions down to the level of a natural gas combined-cycle plant. The plant is co-owned by EPCOR and TransAlta, and is operated by EPCOR.

When proposed in 2000, no new coal facilities had been approved in Western Canada in 20 years. "Alberta was Canada's only deregulated market for power generators," said Brian Vaasjo, EPCOR's executive vice president. "With a rapidly expanding economy, peak electricity demand has risen 5 percent per year since 1999. EPCOR responded by proposing Genesee 3. To make Genesee 3 a reality, EPCOR had to demonstrate that coal had a future as an environmentally responsible choice. To do this, we proposed Canada's first supercritical boiler and voluntarily invested \$90 million in clear air technologies to significantly improve environmental performance."

In addition to convincing regulators that Genesee 3 was a good thing for Alberta, EPCOR also wanted to make sure the public felt good about the project. "We were fortunate in that we already had a presence in the community with Genesee 1 and 2," said Vaasjo. "Through the years, we have enjoyed good relations with local residents and stakeholders, but we did not take this for granted as we proposed a third unit at Genesee.

"We consulted extensively with the community, operating on the premise that we could not provide too much information or be too busy to listen. Issues were systematically identified and addressed in advance of the regulatory process. As a result of this upfront work, the regulator was able to complete its public hearing on Genesee 3



From Left to Right: Gerry Hayes - Colt Project Director, Dave Wruck - Colt Construction Manager, Gary Woods - TransAlta Manager of JV Operations, Al Pettican - EPCOR VP Major Projects, Menobuho Goto - Hitachi, Sheldon Myhre - Hitachi VP Sales, Jody Acton - Hitachi Project Manager

For SO<sub>2</sub> control, in seven days," Vaasjo added. "The key learning for us was the importance of building relationships and dealing with issues as best we could – early on in the process – rather than leaving them until the regulatory forum, which tends to be adversarial in nature."

Coal for Genesee is trucked to the site from the nearby Genesee mine. The coal is fed to the once-through Benson boiler at 230 tons/hour, producing more than 3 million pounds of steam per hour at 1,058 F and 3,770 psi. The supercritical boiler enables the plant to be 18 percent more efficient than the average Alberta coal unit, resulting in 18 percent less CO<sub>2</sub> emissions. "EPCOR has agreed to further offset Genesee 3's emissions down to the equivalent of a natural gas combined-cycle unit — about 375 kg/MWh, or 62.5 percent below the Alberta average," said Vaasjo. "Offsets are acquired from a variety of sources."

units. Genesee committed to a 78 ng/J SO<sub>2</sub> standard, well below the current Alberta standard of 180 ng/J and also below the original design level of 90 ng/J. NO<sub>x</sub> control is achieved using the Benson boiler's low-NO<sub>x</sub> burners, combining staged combustion and overfire air to reduce NO<sub>x</sub> emissions by 40 percent. Finally, the fabric filters at Genesee will achieve particulate matter levels of 0.13 kg/MWh, well below the 0.47 kg/MWh levels achieved by the electrostatic precipitators at the existing Genesee units.

technology. This flue gas desulfurization technology reduces SO<sub>2</sub> emissions by 70 percent compared to existing coal-fired

From groundbreaking to reaching full load in December 2004, Genesee 3 was constructed in just 36 months, on time, under budget and with an industry-leading safety record, a feather in the cap for the project owners, Hitachi Canada, the principal contractor, Colt Engineering, the owner's engineer, and all of the participating subcontractors. The accomplishment is noteworthy because while Alberta's oil sands sector is fueling \$84 billion in major construction, the industry is experiencing labor shortages and significant cost overruns.

According to Vaasjo, Genesee 3's fast-tracked construction helped mitigate the risks of developing in a deregulated market. "And, it proved that coal plants can be built faster to compete with natural gas," Vaasjo added.

**Genesee 3 was one of Alberta's busiest and safest construction sites.** The construction team included 42 contractors, 16 unions, and a peak workforce of 2,100. To build the supercritical boiler, EPCOR's contractor Hitachi Canada brought timesaving modular construction methods developed in Japan. Largely unfamiliar in the Canadian power industry, these procedures involved fitting together complete sections of floors with many pre-installed components at ground level. Cranes then hoisted the assembled components up to be bolted in place. This typically allowed 20 to 30 components to be lifted into final position at the same time.

Vaasjo believes Genesee 3's biggest success is that it takes the industry one step closer to the next generation of clean coal plants and, ultimately, emission-neutral coal plants. "It has introduced an important step-change proving that, with improvements in technology, coal can be a secure, cost-competitive and environmentally responsible source for electricity generation where it is available."

Colt's Responsibilities:

- Safety Leadership
- Overall Construction Management
- Owners Engineer for Hitachi Contract Compliance
- Detailed Engineering for All Balance of Plant Facilities