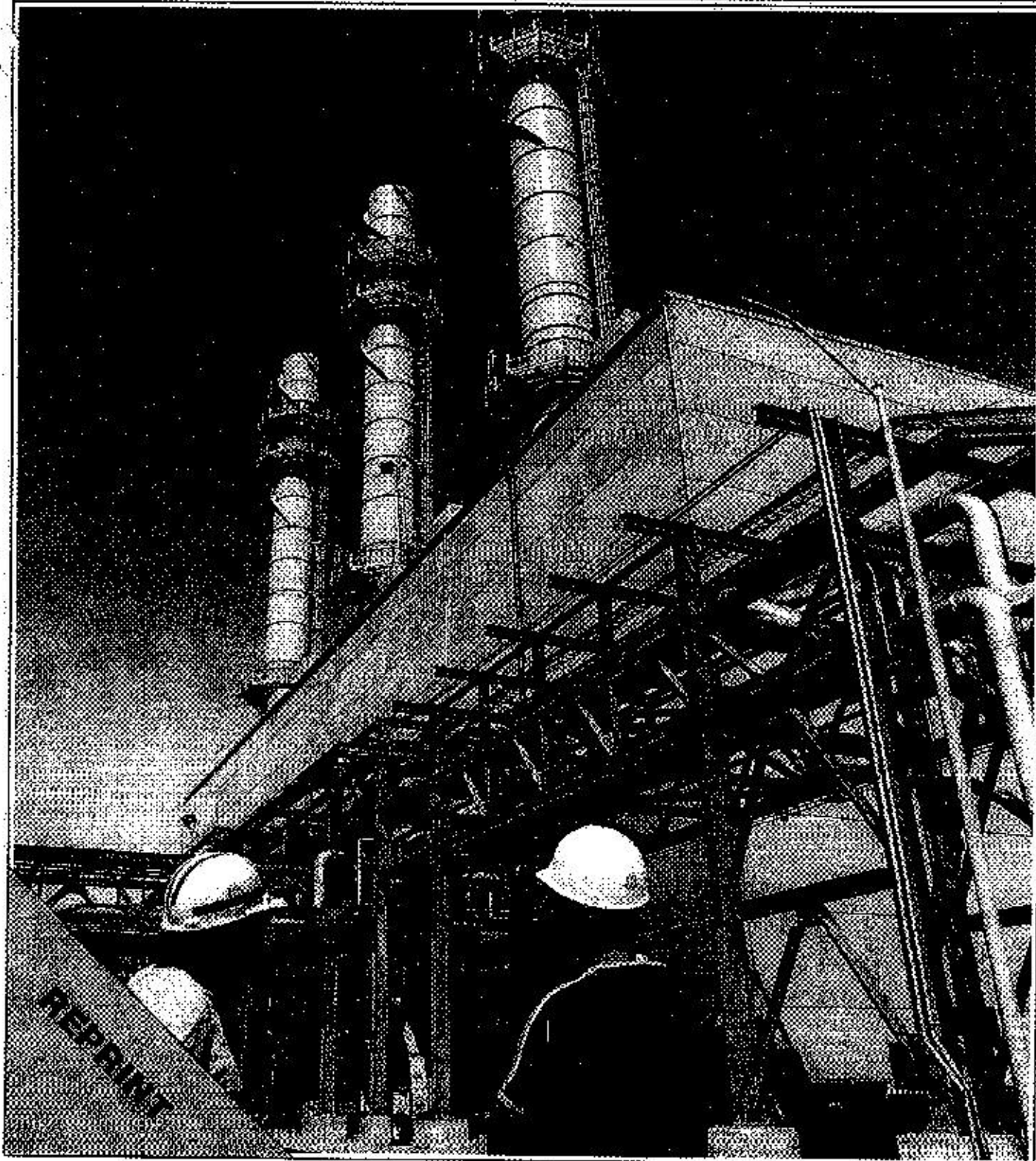


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More to cogen than just building a good plant, developer learns

by Lee Harrison

Altresco's state-of-the-art, low-emission, super-quiet facility for GE in Pittsfield, MA, was delayed and threatened by too little, almost-too-late PR and attention to neighborhood considerations.

The ad said, "It's Hard to Love a Power Plant," and unfortunately for Altresco, the Denver company developing a cogen facility for General Electric in Pittsfield, MA, the ad was right on target.

Altresco ran the ad as part of a brief public relations campaign earlier this year to explain to the community why it should support its nearly completed \$185 million, 160-MW, gas-fired plant. But the limited public relations campaign did little to quell a brouhaha over the size of the building that houses the generating equipment, the height of its three exhaust stacks, and the proposed route of the natural gas pipeline that is needed to supply fuel to the plant.

In short, Altresco found that cleaning up Pittsfield's air was not enough to endear it to the residents. It is also necessary to develop a comprehensive public relations program that takes the community into its confidence and keeps neighborhood groups up to the minute on changes in plant design.

The plant, which still lacks a permanent supply of natural gas, began operating on a limited basis in July -- only slightly behind schedule. Pending approval of a route for a natural gas fuel line, which could come this month, and resolution of a lawsuit filed Aug. 1 by a local couple, full operation could come late this year or in early 1991.

Few would have guessed that Altresco would run up against a buzz saw of public opposition when plans for the cogeneration facility that will supply steam and power to GE were first announced back in late 1987.

GE, which employs some 3,000 people in Pittsfield, was under federal order to shut down its old oil-fired boiler plant

by 1991 and switch to a less polluting source of process steam and power. A clean-burning, gas-fired cogeneration facility that would eliminate smoke and 90 percent of the company's sulfur emissions, some 600 tons per year, seemed a logical choice. Further, the plant would also supply power to the New England grid, which experts predict could experience shortages in the 1990s. And the community seemed very much behind the project.

Additionally, "this plant has every bell and whistle," says William R. Williams, Altresco's president. From its advanced ammonia NOx-reduction system to its elaborate sound containment design, the Altresco facility is state-of-the-art. In all, says Altresco project manager George Lehner, "we've probably spent \$12 to \$14 million on pollution control and sound attenuation."

There's no denying that Altresco went to great lengths to minimize environmental impacts. The basic power plant, which consists of three GE 40-MW Frame 6 gas turbines, three Deltak unfired heat recovery steam generators equipped with Mitsubishi selective catalytic reduction (SCR) for NOx control, and a 44-MW steam turbine, will by itself markedly reduce air pollution in the Pittsfield area. The plant, which will burn from 31,500 to 40,000 MMBtu of natural gas per day, will replace GE's old #6-oil boilers and generate slightly more than 160 MW of electricity, most of which will be sold to the New England grid. At base-load output the HRSGs will produce up to 250,000 lb/hr of steam, at 250 psig and 435°F, which will be used to heat GE industrial buildings and to provide its plastics division with

process steam.

Making the plant as quiet as possible was also one of Altresco's goals. Plant design specs called for a maximum noise level in the adjacent residential neighborhood no more than 10dB above ambient levels. When ambient noise at the site is 38dB, plant noise had to be silenced to no more than 48dB.

To meet those specs, the company chose to enclose the plant. The walls are six-inch-thick, high-density concrete, and the interior surface of the concrete roof and portions of the wall are lined with sound-deadening fiberglass.

Of course, this meant that heat buildup inside the plant became a potential problem. So Altresco had Fluor Daniel, its engineering/construction firm, design an elaborate ventilation system, one that minimized wind noise, to cool the plant. "We also have a lot of outdoor equipment, like water pumps, that are designed for quiet operation," says Lehner. "There's almost no gear or bearing noise."

The plant's mechanical draft, counter-flow cooling towers also were designed for quiet operation. "They have enlarged cells to increase their cooling capacity with lower air flow," Lehner says. "Even the fans operate at lower than normal speeds to reduce air noise, and we put sound-absorbing baffles around the base of the towers to further minimize noise." The company even built a sound-barrier wall on one side of the plant to reduce noise levels in a nearby school yard and residential neighborhood.

As part of its plan to reduce NOx emissions, Altresco installed an unusual ammonia injection system that delivers an aqueous ammonia solution to the HRSGs. The ammonia is stored as a 28 percent aqueous solution at atmospheric pressure. More commonly, ammonia is stored as anhydrous ammonia at very high pressures. "Our system is much safer than a pressurized system," says

Lehner. "If there is a leak, the ammonia won't form a vapor cloud as quickly or as large -- or as concentrated."

For additional safety the ammonia solution is stored in a 9,000-gal. tank. "It's sized small to minimize the risk if there is a spill," Lehner says. The tank is surrounded by a concrete containment structure, which comes complete with several layers of hollow polyethylene balls that will float on the ammonia solution to minimize evaporation in the event of a spill. "If we do have a spill," says Lehner, "you would smell it, but you wouldn't be overcome."

Ironically, Altresco appears to have been the victim of its own good intentions. "Most cogeneration plants have no buildings, and we started out with a sound wall only," said Williams. "But after modeling we determined it wasn't quiet enough. We had a choice. We could either raise the wall to over 100 feet in height or put a roof over the plant. We chose to build a roof."

The company initially sought and received permits from the city to construct a building 70 feet high with stacks 130 feet tall. But during the detailed design phase the company found it needed a larger building to do the job.

As a result, the new building is 83 feet high, 13 feet higher than the city permit allowed. But that was only part of the company's troubles. Because the Massachusetts Department of Environmental Protection requires exhaust stacks to be 2.5 times higher than the height of the building housing the generating equipment, Altresco was forced to raise the height of its stacks to 208 feet, 70 feet higher than allowed by the permit.

On May 15, 1989, the MDEP notified the Pittsfield Health Department of the increased building and stack heights. The Health Department routinely filed the communication from the state and never notified the Pittsfield Planning Board, building inspector, or Zoning Board of Appeals of the changes. In July, whether

he knew of the changes or not, Pittsfield's building inspector issued a building permit for an 83-foot-high building.

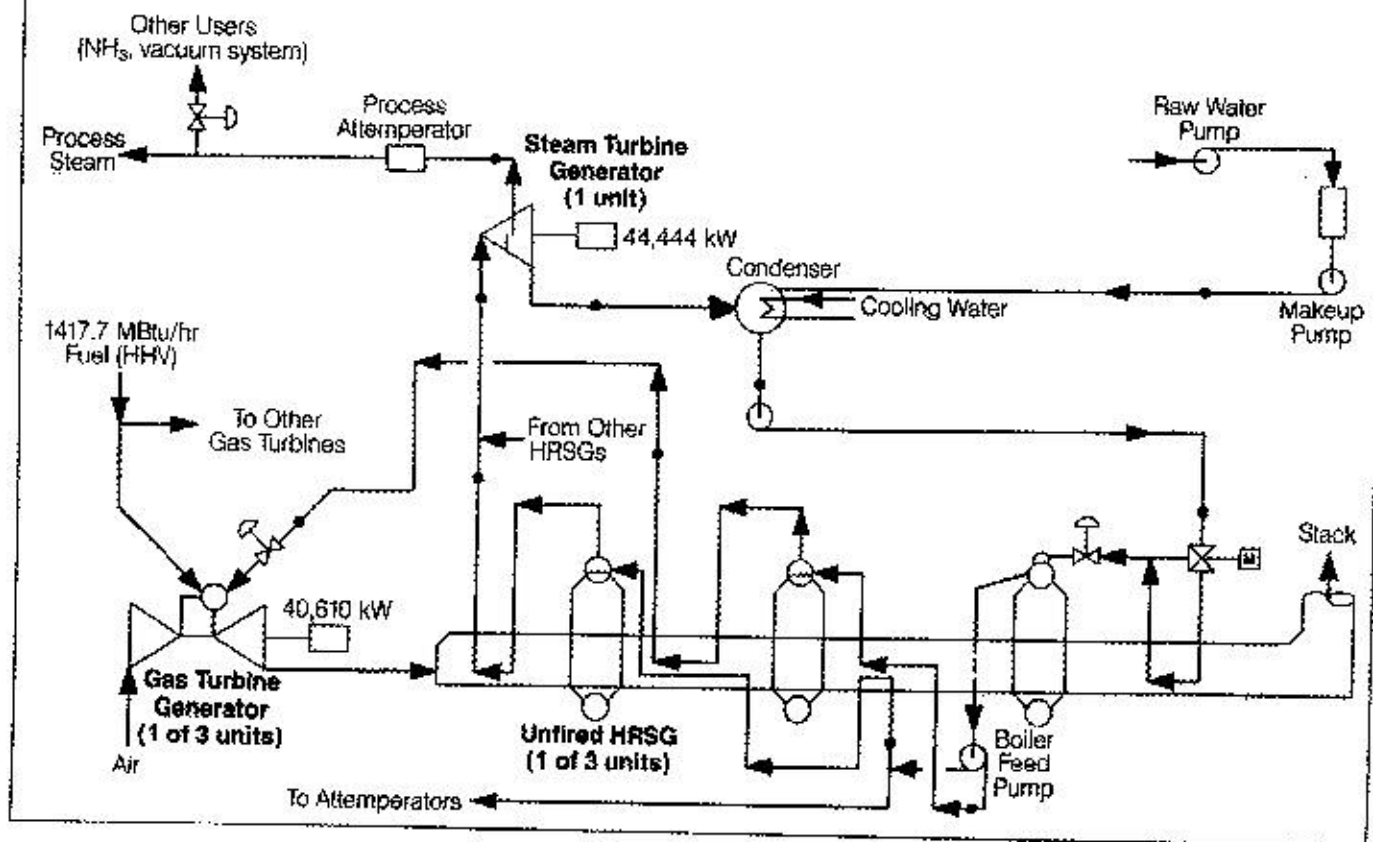
On Aug. 31 of last year, Altresco's attorneys officially informed the ZBA of the changes in building and stack heights. A month later, with Altresco beginning work on the changes, the ZBA wrote the company suggesting that it resubmit its plans, which it agreed to do.

By December, the increased building size and stack height were all too evident, and public resentment of the plant was growing. Neighbors referred to the plant, which is lighted at night, as "the Queen Mary on the Housatonic," a nearby river, and they made their feelings known to Altresco executives at a neighborhood meeting.

Two days later the local newspaper reported the discrepancy between the plans on which the original city permits were based and the size of the facility under construction.

Altresco gas turbine powered cogeneration plant

At 48°F ambient and sea level the plant is site rated at 166,274 kW gross output — 121,830 kW gas turbine and 44,444 kW steam turbine — with an LHV heat consumption of 1290.2 MBtu/hr (1417.7 MBtu HHV) on natural gas fuel. Heat to process is 108.3 MBtu/hr. Fuel chargeable to steam is 126 MBtu/hr (HHV); fuel chargeable to power is 8013 Btu/kWh (HHV). Net plant output, after allowing for 5100 kW auxiliary power consumption, is 161,174 kW.



By this time charges that Altresco had hidden the real size of its building and stack height were rampant. But the company was not the sole target of local anger. Citizens also expressed resentment towards the city government, which some believe had "rolled over and played dead" for Altresco.

The next week Pittsfield's building inspector issued a stop-work order on the project. The company protested, calling the decision "unnecessary, untimely, and legally incorrect," but it continued construction.

"That was my darkest moment," says Williams. "There was a perception in Pittsfield that we misrepresented the size of the building, that we were sneaky about the stack height." In retrospect, Williams says, "I would do much more with public relations, deal more with

neighborhood groups. And I would try to do more engineering earlier. Of course, we couldn't get funding to do more engineering at the time. But now both we and the state know more about doing this kind of project."

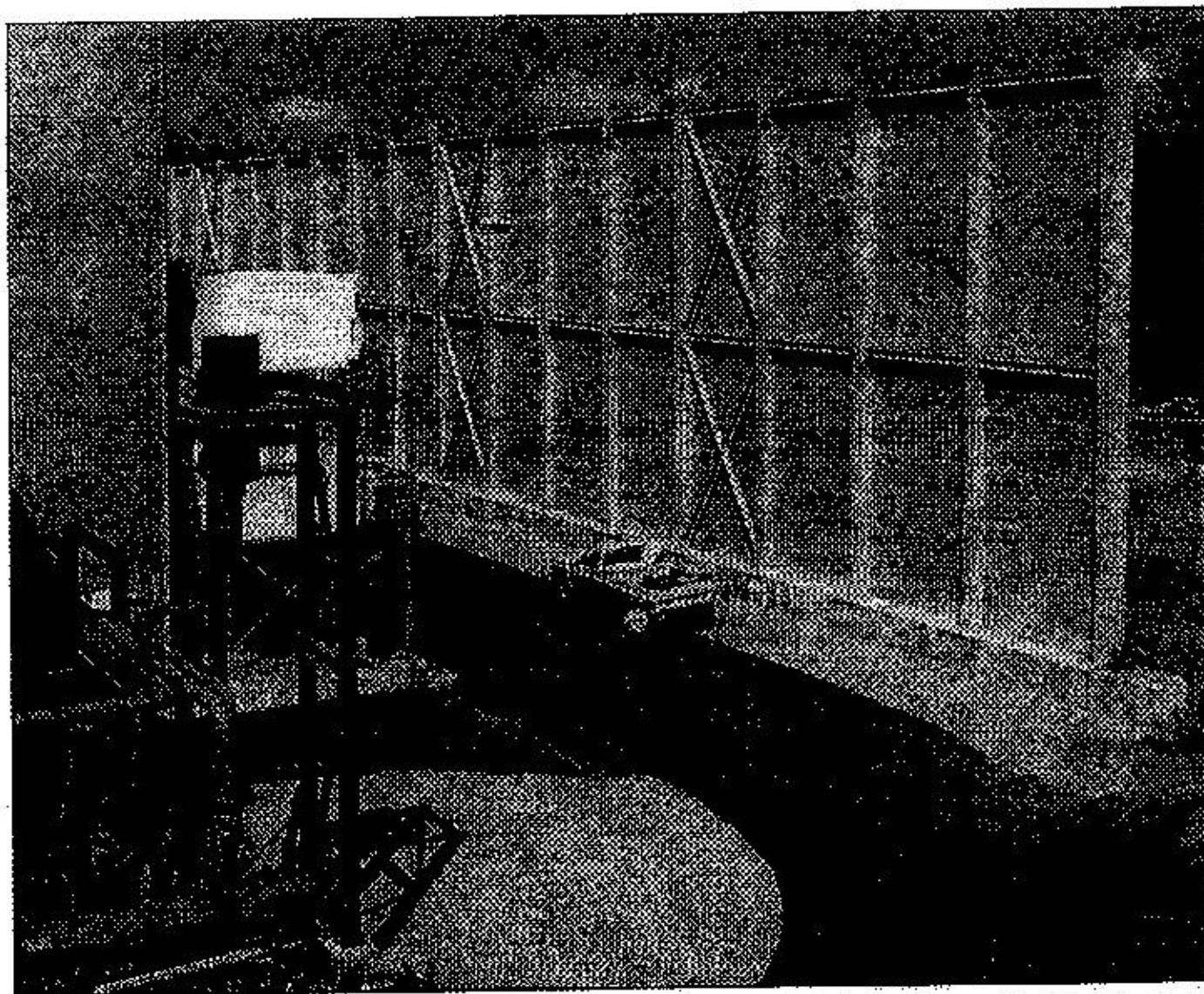
Altresco, however, had more to worry about than just the height of its stacks and the size of its building.

In 1988 the state had waived the requirement for a project environmental impact report because the company had performed extensive environmental studies and because the plant would reduce air pollution. By March, the tidal wave of negative publicity forced state officials to request additional information from the company on the power plant building and stack, air quality, water supply, waste water handling, and PCBs -- the ground surrounding Altresco's site

had been contaminated by GE years earlier. The company submitted the information in early May, and in June the state approved the report.

Also in June, almost a year after Pittsfield's building inspector first issued Altresco a permit for construction -- and with the plant all but complete -- Pittsfield's Planning Board approved a revised site plan for the project. That done, the city's Zoning Board of Appeals was clear to review Altresco's application for an amendment to its building permit. The ZBA approved the amendment, but it slapped the company with a \$40,000 fine for not following city procedures.

The route Berkshire Gas Co. chose for a 12-inch-diameter natural gas pipeline to supply fuel to the plant also had the natives up in arms. The line ini-



To meet design specs that called for no more than a 10dB increase in ambient noise levels in the adjacent residential neighborhood, Altresco chose to enclose the entire facility -- and to construct this sound-barrier wall.

tially proposed by the company ran 11.5 miles along roadways from the New York state border, through residential neighborhoods in the town of Richmond, then through Pittsfield to the plant.

"The company chose a route that would avoid environmentally sensitive areas," says a knowledgeable source, "but it happened to be a route that would also disturb a lot of people." Critics voiced concerns over safety because the proposed line was larger and would carry gas at a higher pressure -- 500 psi -- than lines typically found in residential areas.

The route, which had been approved by the state Energy Facilities Siting Council, also passed through a city park. Under Massachusetts law the city council had to ask the state legislature to grant an easement through a public park. And that's when all hell broke loose.

The council, with several members abstaining because of ties to GE or Altresco, voted to seek the easement. Opponents of the gas line were outraged, and for the first time in memory were able to secure more than enough signatures, 5,000 in all, to put the issue on a public referendum in June.

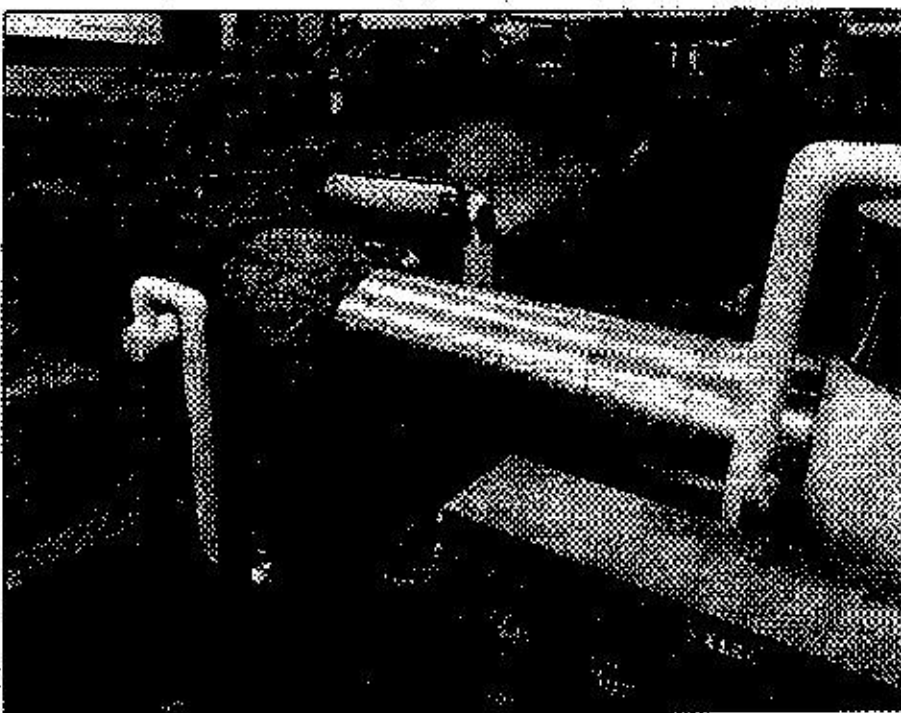
Bowing to public opposition, Altresco and Berkshire Gas Co., the pipeline builder, withdrew the route from consideration, forestalling the referendum. Pittsfield Mayor Anne E. Wojtkowski assembled a special task force to find a route that would satisfy all parties. "We're sitting down and working with people who were overlooked," said Williams said at the time. "We're grateful to be able to work with everybody as a team."

That task force has nearly completed its work. Altresco officials talked with landowners along the compromise route, which is essentially cross-country rather than along town roads, and the company expects to present the route publicly in August. If the route gains the blessing of Berkshire County residents, it will be submitted to the state Energy Facilities Siting Council for final approval. Assuming the state concurs, the long, tortured saga of Altresco's first cogeneration plant will be completed.

"We're already working on our second plant for GE in Lynn, Massachusetts," says Williams. "It's a different design, 240 MW, without the same redundancy. We're going to apply what we learned in Pittsfield."



Sound-deadening fiberglass padding lines the six-inch-thick, high-density concrete walls of Altresco's steam turbine building. Below, Altresco's 44-MW GE steam turbine.



The Problem-Solver Behind Altresco

Bill Williams, the president of Altresco (Alternative Resources Co.), started his career out West, selling bearings and motors to coal mines, but really, he says, "I got paid to solve other people's problems. I would identify things to improve operations or fix things."

Williams got into real estate on the same premise: "I would investigate to learn what sort of real estate people were

looking for and find it. It wasn't hard making money, but it wasn't very satisfying. It was an empty thing."

Then in 1984 a friend interested Williams in energy. "He was involved with windmills and the like, which was all very opportunistic and depended on tax credits," says Williams. "It was fine if you didn't make any money, but I've never operated that way."



An Altresco worker examines one of three 40-MW GE MS6001B gas turbines. In all, the Altresco facility will generate slightly more than 160 MW of electricity and reduce 90% of GE's sulfur emissions in Pittsfield.

Williams saw cogeneration as a real opportunity, and he took a year to study the business. He felt he had the ability to build power plants cheaper than utilities could. "I felt I could turn it into a real business, something long-lasting," he said.

A search for power generating plants to acquire brought Williams to Western Massachusetts, where General Electric was facing a consent order to shut down its existing oil-fired boilers.

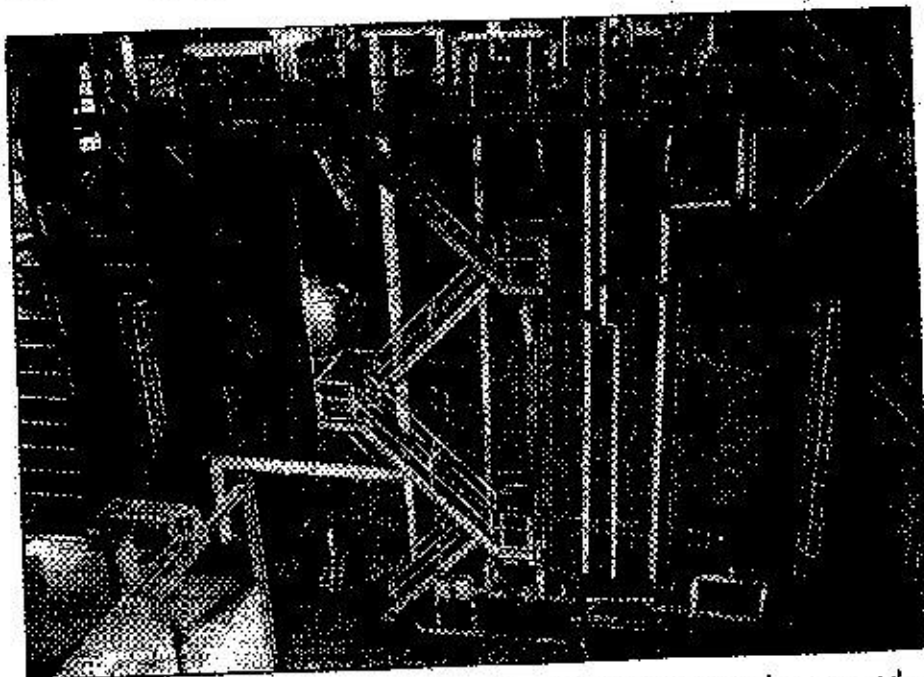
"A lot of people were trying to figure

out cogeneration at GE," he says. "The weakness was the gas supply. You needed to acquire gas at less than the full retail price so you could sell power competitively and sell steam to GE. We spent a lot of time looking at the project, and finally found a way to do the project so everybody is a winner."

The key, says Williams, was his ability to make a deal with Canadian gas producers for a direct purchase of gas. "By having a direct purchaser," says Williams, "the producer has a definite sale and a definite revenue stream."

The deal, which involved separate agreements with seven Canadian gas producers and four Canadian and U.S. pipeline companies, took about a year to complete. "Total capital expenditure on the gas pipelines will be about \$400 million," Williams says. "But the 20-year value of the gas is about a billion dollars."

Williams and his team spent most of 1986 putting all the pieces together, and in November 1987 he announced the project. "A lot of times it all seemed overwhelming," he confides. "But no way I'd go back to real estate. I'm doing something I believe in. It's a very personal thing for me."



One of three DeltaK unfired HRSGs in Altresco's gas turbine building. At base output the three HRSGs will generate up to 250,000 lb/hr of steam.