From: Robert J Noiseux
447 S Canterbury Rd
Canterbury, CT 06331

To: Legislative Environment Committee

Date: March 8, 2010

Subj: ***RB 205 AN ACT CONCERNING ENHANCEMENTS TO THE INLAND WETLANDS AND WATERCOURSES ACT.***

Dear Chairman Meyer, Chairman Roy, and fellow Committee Members:

My name is Robert Noiseux. I am from Canterbury and am representing a citizens group called Friends of the Quinebaug River. We thank you for the opportunity to comment on this bill.

In general terms, we support this bill, but **only** if it is amended to encompass the Connecticut Department of Environmental Protection (DEP). I would like to explain why.

For the past several years, we have been active opposing a controversial incineration plant known as Plainfield Renewable Energy (PRE). Our main issue has been the diversion and discharge of water impacting the nearby Quinebaug River. During this process, we have become very disillusioned with the DEP. Specifically, we have witnessed them selectively ignoring materials; materials that could be inconvenient to political goals of the state or materials that should have at least prompted more in depth review of statements being made by the permit applicants.

Although, our issues were many and complicated, we would like to raise a couple examples of particularly egregious standards of review centering around the evaluation of alternatives to power plant water cooling. Our group submitted a significant volume of material to DEP calling into question some of the applicant's assertions. We later learned when a senior DEP staffer testified under oath, that such submissions were not considered by DEP staff. **She clearly stated that the only submissions staff considered were those submitted by the permit applicants.**

- One sample of how badly this procedure served the residents of CT, surrounds the conclusion of the DEP that the proposed power plant's Quinebaug cooled cooling system would annually consume less energy than would an alternate type of cooling system using no water. DEP relied upon a study written by an "expert" paid by the project applicant. His conclusions relied on his own computer modeling, only considered two operating conditions, and were based upon his own assumptions. His conclusions were completely opposite real data gathered by us from two real, operating power plants. The real data was submitted by myself to DEP on Aug 20, 2007 and is attachment 1. Rather than make a more in depth study to see who was right, DEP ignored my data and accepted without question what PRE gave them. We discovered that PRE's study did not consider winter time operation, where air cooling is in practice more efficient than wet cooling (largely due to "free" air circulation caused by natural drafting). This "expert" later testified under oath that, come to find out, he really was not an expert on plant operations. Translation: his study was largely worthless. What did DEP do to correct this oversight? Nothing. They just let it ride. As recently as a couple of weeks ago, the DEP's Director of Water Resources was still making this absurd claim.

- A second example: DEP has concluded that air cooling of power plants is noisy. As recently as a couple of weeks ago, this same DEP official made this claim to some members of this committee. While this may be true of some types of systems, it is not true of many others. Attachment 2 documents submission to DEP an example a successful air cooled plant built in Queens, NY. Where is population density higher than that? Furthermore, attachment 3 was submitted to DEP on 6/29/07 and also contradicts Ms. Ruzicka's statements. At a minimum, the contrary statements should set off a red flag, triggering some questions and prompting additional review. Yet, DEP just ignored these facts, forged ahead with what they had, and now looks ridiculous by taking a position that is not supported by reality. Anyone who has ever visited Lake Road Generating Co in Dayville knows that.

While the case of Plainfield Renewable Energy has, for good reason, received closer public scrutiny than most cases likely do, this is still unacceptable These two small examples make us wonder how widespread in DEP permitting, this type of selective consideration is.

This brings us to RB 205. As written, this bill seeks to hold small municipal wetlands commissions, with meager resources and volunteer members, to a higher standard than that which the State itself, with its huge staff and huge budget, adheres. This "do as I say and not as I do" message is completely unfair and feeds the cynicism that surveys show citizens overwhelmingly feel towards government. It's time for the State of Connecticut to put its money where its mouth is and live by its own rules. Please fix this bill.

Thank you for your consideration.

Respectfully,

/s/ Robert J Noiseux

Attachment 1

YAHOO! MAIL Classic

The issue of wet vs. dry cooling and parasitic load Monday, August 20, 2007 9:52 PM

From: "bob noiseux" <bobnoiseux@yahoo.com>

To: "Denise Ruzicka" <denise.ruzicka@po.state.ct.us>, "Bob Kaliszewski" <robert.kaliszewski@po.state.ct.us>, oswald.inglese@po.state.ct.us

2 Files (683KB)

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Good Day All,

As you all know, the Plainfield Renewable Energy project has expressed a strong aversion to the implementation of an air cooled condenser. They have made many excuses to justify their stance. Many of their reasons have turned out to somewhat ill informed. Here is another example of such:

PRE has claimed repeatedly that air cooled condensers carry a much higher parasitic load than do the evaporative cooling process they propose. This assertion is completely wrong. In fact, air cooling, even in the summer time, has a LOWER parasitic load than does water cooling. This claim can now be documented.

There are a series of sister power plants in Southern New England. For discussion purposes, let's consider two of them, Plant A and Plant B. These are real plants with virtually identical steam cycles, with only one exception. Plant A uses an evaporative type cooling tower (wet cooling) and Plant B uses the type of Air Cooled Condenser documented in the attachments (Please note that the dimensions given in these drawings are sized for steam plants 2.5 to 3 times PRE).

Let's compare some recorded plant values:

Both plants reported ambient temperature of 72 deg at the same time of day on August 20th, 2007.

Plant A needs to circulate water from the cooling tower to the steam turbine condenser and back. This alone requires approx 2,000KW of power (2 pumps consuming 141 amps of 3 phase 4160V power). Plant A must run five cooling tower fans for a loss of 348KW (49 amps of 4160V 3 phase power). A PRE type pumping station for a facility of this size is conservatively estimated to consume about 200KW. Total parasitic load for cooling this plant: 2,548KW (aka 2.55MW). This value is largely static throughout the year. Even in winter months, the only variable would be the 348KW used for fans. In cooler temps, some fans can be switched off. The water pumping losses, however, amounting to 2.2 of the 2.5 MW are always there.

Plant B only needs to push air through a giant radiator. 15 quiet, slow turning fans accomplish this at a total parasitic load of 1,723KW or 1.72 MW (2100 amps of 480V 3 phase power). As outside air temperatures decrease, individual fans can be switched off one at a time. In very cold temps, it is possible that only about half of the fans will be in service. Half the fans consume half the power.

Summary: The air cooled plant is today, in real numbers, using over 800KW LESS for cooling purposes than its water cooled sister plant. This is not a paid "study" created by a consultant based on hypotheticals. These are real values recorded at real plants with no spin.

Air cooling is a proven option that is used not only throughout the world, but in our own back yard.

In view of this, I would again assert that PRE does not qualify for a diversion permit as they simply do not need it nor would the public benefit in any way from allowing a private company to consume this precious and limited public resource we know as the Quinebaug River.

Sincerely Yours,

Bob Noiseux

Attachment 2

From: bob noiseux <bobnoiseux@yahoo.com>

Date: Thu, 19 Jul 2007 13:41:00
To:Denise Ruzicka <denise.ruzicka@po.state.ct.us>
Cc:roger reynolds <rreynolds@cfenv.org>,margaret miner <rivers@riversalliance.org>
Subject: PRE footprint concerns

Dear Ms. Ruzicka:

Recently, the DEP expressed concerns about the proposed footprint of the proposed Plainfield Biomass Plant. It was stated that the DEP would like to see a larger wetland buffer area than the applicant has proposed. Some investigation has yielded precedent for addressing this concern. That solution is air cooling. I have attached examples of two air cooled facilities utilizing roof mounted air cooled condensers. One is a plant similar to PRE, a 30 something megawatt trash burner in Massachusetts. This plant is located along the Merrimac River. Due to past abuses of the Merrimac and unreliable flow rates, this plant was constructed without water diversion provisions. Due to site footprint issues, this plant was constructed with the ACC on the roof.

The second plant is another air cooled facility known as Ravenswood, located in New York. Due to a variety of site issues, including footprint, the developer constructed this plant with a roof mounted ACC.

As you can see, roof mounting an ACC would alleviate site congestion and allow greater buffer area within the plant lot. In addition, the use of air cooling would eliminate the need for habitat disturbances associated with the running of miles of pipeline. Also spared disturbance would be the areas close to the Quinebaug River. Under the water cooled proposal, a road would have to be constructed connecting Packer Rd to the river and a pumphouse and intake structure would have to be constructed near the river banks. Under the air cooling proposal, all impacts of this nature are completely eliminated.

I hope this is useful.

regards,

Bob Noiseux

Profile: KeySpan Corp's Ravenswood Combined Cycle Powerplant, Queens, NY

How to shoehorn 250 MW into a parking lot

KeySpan Corp's (Brooklyn, NY) 250-MW Ravenswood combined-cycle plant will be the first major generating unit commissioned in New York City in more than a decade when it begins startup testing at the end of the year. But it is just the first step in a building plan announced by Chairman and CEO Robert B Catell more than two years ago (see sidebar). He said, "KeySpan has a focused strategy to seek opportunities to develop generating capacity in the New York metropolitan area. In so doing, we will continue to be good neighbors and work closely with local communities."


Robert B Catell

Catell was convinced long before KeySpan closed on the purchase from Consolidated Edison Co of NY Inc (ConEd) of the existing 2160-MW Ravenswood facility's three steam units and peaking gas turbines, that additional generating resources would be needed to help assure New York City's economic growth. Mayor Michael R Bloomberg echoed that need in a speech August 1 when he called for the addition of 3000 MW by 2008 to accommodate growing demand and replace aging units. He encouraged the repowering and expansion of existing facilities rather than construction of greenfield generating plants.

The blackout on August 14 put an exclamation mark on that plan.

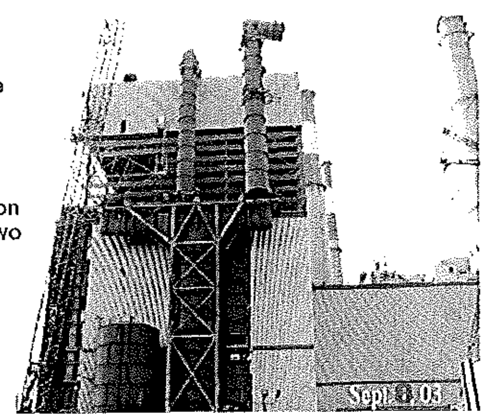
Conceptual design of the combined-cycle unit began in the summer of 1998, when KeySpan was still investigating the purchase of Ravenswood's existing generating assets, according to Howard A Kosel, Jr, senior vice president, KeySpan Energy Development Corp, the business unit responsible for building the company's powerplants. The engineering firm, Burns & Roe Enterprises Inc, Oradell, NJ, was contracted to assist KeySpan in developing a conceptual design, says Project Engineer Richard J Paccione. The assignment was challenging. It included a modification of the design during the licensing process to go from once-through cooling to an air-cooled condenser (ACC). The only space on the site to build the combined cycle was a 2.4-acre parking lot, and the only place available for the ACC was above the plant.


Richard J Paccione

The licensing process. KeySpan acquired the Ravenswood plant in mid June 1999 and filed a pre-application report with the NYS Board on Electric Generation and the Environment—better known as the siting board—for the new unit a few weeks later. Organized public opposition to the project appeared early in 2000. Primary issues were related to air quality in northwestern Queens. KeySpan worked closely with citizen groups to address their concerns. Kosel says a consistent theme of the public hearings was that "if you build a new plant you should offset its emissions by shutting down an existing facility or reducing pollutant discharges elsewhere."

Kosel challenged the company's environmental engineers to reduce further the emissions of nitrogen oxides (NO_x) from Ravenswood's existing steam generators so there would be no increase in discharges from the site when the combined-cycle unit was operating. The solution, announced in April 2000, was the implementation of a $9-million Air Quality Improvement Program (AQuIP) at the city's largest powerplant despite the fact that Ravenswood was already operating well below permit limits.

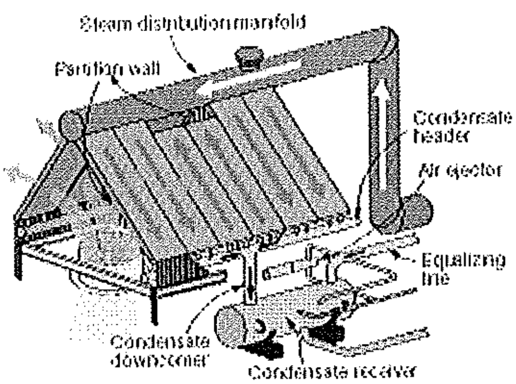
Program involved burner modifications and installation of close-coupled overfire air, plus changes on Unit 30, the well-known 1000-MW "Big Allis" to permit full-load operation on natural gas. The 40-year-old, 385-MW Units 10 and 20 had been equipped to burn 100% gas previously. Bear in mind that the dual-fuel Unit 30 is


The 170-in.-diam steam duct riser on the north side of Ravenswood's new combined-cycle unit terminates in a header that supplies three 98-in.-diam risers. Butterfly-type isolation valves are installed in the two outside risers to shut down one or two sections of the ACC during periods of reduced steam flow

required by the New York ISO (Independent System Operator) to generate a certain percentage of its electricity with low-sulfur oil—the exact amount depends on load—to ensure continuity of operation in the unlikely event that gas supply is interrupted. NO_x reduction from the upgrade program, about 750 tons/yr, is the equivalent of shutting down a 350-MW generating station.

The Ravenswood combined cycle also was designed for cogeneration service. It can accommodate the future implementation of an export steam system tied into ConEd's Manhattan district heating system and the replacement of 50-yr-old packaged boilers owned and operated by ConEd.

In New York State, all elements of powerplant licensing are handled by the siting board's Article X process, explains Brian T McCabe, VP of Generation Development, including the public outreach effort. So once the public's concerns were addressed by AQuIP, KeySpan moved quickly through the licensing effort. The company received accolades for its emissions-reduction effort, including one from the Natural Resources Defense Council. Senior Economist Ashok Gupta, based in New York City, said, "KeySpan is to be applauded for its commitment to integrating improvements into the operation of its existing facilities at Ravenswood. These dramatic improvements show that energy-producing companies really can reduce emissions in response to the needs of the environment and the community."



Operation of the ACC is illustrated above in functional diagram that does not accurately portray the arrangement of components in the system installed at Ravenswood

Site preparation and construction. One of the first things KeySpan uncovered during its survey work for the combined-cycle addition was that the site formerly was the location of a manufactured gas plant and the soil was contaminated. Such facilities were relatively common when gas lighting was popular. After executing a voluntary cleanup agreement with the NYS Dept of Environmental Conservation, the company shipped contaminated soil and excavation materials to a licensed remediation facility.

But that was not the last hurdle impacting site preparation. Underground infrastructure, both live and abandoned electrical cable and oil, gas, and water pipelines, crisscrossed the area and had to be removed or relocated. This included the rerouting—without disrupting service—of two high-pressure gas lines supplying the existing site and relocating the fuel-oil supply line to ConEd's 74th St steam station in Manhattan. Mapping the site was the first task and that was painstakingly slow. It involved hand-digging a trench about 5 ft deep around the construction area to see what facilities were either entering or leaving the site.

Brian T McCabe

KeySpan received approval from the siting board to begin construction in September 2001 and spent the next five months dealing with the underground infrastructure. Next, says Project Manager Jim Marzonie, came the installation of 300 caissons, drilled 12-15 ft into bedrock located 15-20 ft below grade, to support the major equipment, which includes the 3500-ton, roof-mounted ACC.

Construction at Ravenswood was particularly challenging because the site offered virtually no laydown space. To illustrate: Open space was at such a premium that there was only room for one step-up transformer to serve both the 18-kV gas turbine/generator and the 13.8-kV steam turbine/generator instead of the normal two. Even a standard open-air, 138-kV electrical substation wouldn't fit, says Project Engineer Paccione, and an SF_6 gas-insulated substation, which has a much smaller footprint, was installed instead.

Engineer/constructor Stone & Webster Inc, Stoughton, Mass, a unit of Shaw Group Inc, managed the delivery and storage of equipment, on-site and off. The company arranged a just-in-time inventory system with deliveries by land and water to support three days of construction activity by General Contractor Slattery Skanska Inc, Whitestone, NY.

Stone & Webster stored equipment at various locations around the city, but its biggest supply dump was at an old navy pier facility in Bayonne, NJ, with both land and sea access. Some pre-assembly was done in Bayonne, says VP McCabe, such as the fan modules for the ACC. These, as well as the turbines, generators, subassemblies for the heat-recovery steam generator (HRSG), large piping, and the ACC steam ducts, were delivered to the plant dock on the East River by barge.

Combined-cycle design. Ravenswood's new unit is designed as a cogeneration facility, but installed as a conventional 1-by-1, two-shaft combined-cycle plant. It is capable of supplying up to 1 million lb/hr of steam to ConEd's extensive distribution network in Manhattan, but no contract has been signed to date and the auxiliary equipment needed to deliver that steam will not be installed now.

The combined-cycle unit is designed for high reliability. Only proven components were specified. The 171-MW gas turbine is the popular Model 7FA+e from GE Power Systems, Atlanta, Ga; the HRSG is a non-reheat unit built by Kawasaki Thermal Engineering Co, Kusatsu City, Japan, under a license from Vogt Power International, Louisville, Ky; and the steam/turbine generator is a 85-MW unit from Alstom, Midlothian, Va. The cycle, optimized for cogeneration service, has an approximate heat rate of 6500 Btu/kWh (based on the fuel's lower heating value) in combined-cycle service as now arranged.

The supplementary-fired (duct burners from Coen Company, Burlingame, Calif) HRSG was sourced from Japan because of its unique design to accommodate cogeneration service. It has significantly more surface area than the standard boilers for cookie-cutter type combined-cycle plants that filled domestic shops at the time of order. The triple-pressure Ravenswood HRSG produces 1435-psig/1000F at the high-pressure (h-p) superheater outlet, 155-psig steam at the intermediate-pressure superheater outlet, and some 20-psig steam. The selective catalytic reduction (SCR) system provided with the HRSG is designed to limit NO_x emissions to 2 ppm with 5 ppm ammonia slip. Aqueous ammonia is the reagent.


Jim Marzonie

Ravenswood's 20-in. h-p steam line has a 12-in. takeoff, currently blanked-off, to supply the kettle boilers (not installed) that would produce steam for the ConEd main. Shell-and-tube kettle boilers work much like the steam generators supplied for a conventional nuclear powerplant with a pressurized-water reactor. High-quality, h-p steam from the HRSG would be the heating medium to boil treated city water for the steam distribution system. Since there is no return system on ConEd's steam distribution grid, the kettle boilers avoid the expense of using demineralized water to produce export steam.

Demineralized water is used only for normal HRSG makeup and for water injection into the gas-turbine combustor for NO_x control when kerosene is burned. The kettle boiler concept also avoided problems associated with ConEd's chemistry specifications for export steam which disallow amine compounds. These specs could not have been met easily had an extraction steam system been selected.

One final point: When operating in cogeneration service with maximum steam flow of 1 million lb/hr to the district heating system, electrical output from the steam turbine/generator drops to about 10 MW.

Control system. The plant's digital control system, like the HRSG, was of a custom design to accommodate both the combined-cycle and cogeneration configurations, says McCabe. The DCS selected, from Emerson Process Management's Power & Water Solutions division, Pittsburgh, Pa, features the manufacturer's recently enhanced software platform for its Ovation expert control system. Ovation is a key component of Emerson's PlantWeb digital plant architecture for the power generation industry.

Emerson's project manager for the Ravenswood project, Rick Marchionda, says that the system controls process variables as required for safe, efficient, and reliable operation of the plant, its systems, and individual components. Ovation is designed to safely bring the plant from cold start-up to the desired operating condition and then back to cold shutdown. It operates on a Fast Ethernet network, relying on seven human/machine interfaces (HMIs)—one engineer/database server, four operator stations, an asset-management-system station, and a data historian.

Four redundant controllers located in the Ravenswood control room interface with remote I/O cabinets located in the ACC electrical building, HRSG, compressor electrical room, and switchyard control house. Use of remote I/O saved KeySpan a considerable amount of money by eliminating field wiring from these locations back to the control room.

Operator workstation graphics and features built into the historian and asset management system enable the DCS to monitor, display, and record process data received from hundreds of field sensors and communications links. This information, says Marchionda, is used for general process supervision, performance calculations, and record-keeping, including sequence-of-events recording and diagnostics to facilitate plant management and maintenance decisions.

One of Ovation's benefits is that its connectivity features give operators a fully integrated console with the same look and feel as the standalone control systems provided by the major equipment manufacturers. For example, the Ethernet interface to GE's Mark VI gas-turbine control system is seamless, allowing operators access to all GT information on their Ovation workstations in real time.

The system's ability to continually track performance is a particularly valuable management tool in an area like New York City where the cost of fuel is higher than in most areas of the nation. Performance calculations are run periodically for the gas turbine, HRSG, steam turbine, ACC, and integrated plant to determine the following:

- Equipment efficiency as it relates to equipment age, maintenance procedures, and system upgrades.
- Actual equipment performance versus guaranteed performance.
- Impact of changing conditions and/or methods of operation.

Air-cooled condenser. The most distinguishing feature of the Ravenswood combined cycle is its Balcke-Durr ACC, manufactured by Marley Cooling Technology Inc, Overland Park, Kan, which is mounted on the roof of the totally enclosed, space-challenged site. The building's large structural members—including 10.5-ft-deep roof girders—to

PROFILE

KeySpan, ANP form venture to build powerplants

KeySpan Corp, Brooklyn, NY, and American National Power Inc, Marlborough, Mass, announced in early September the formation of a joint venture to build powerplants on Long Island—this in response to the Long Island Power Authority's (LIPA) RFP for new generating capacity issued last spring. Long-term power-purchase agreements would be part of the deal.

The venture combines KeySpan's proposed 250-MW Spagnoli Road project and ANP's proposed 250-MW Brookhaven facility, both of which have been approved by the NYS Board on Electric Generation and the Environment—the so-called siting board. ANP received certification for a 540-MW plant in Brookhaven in August 2002, KeySpan was cleared to build its facility in Melville last May.

Current plans are for Spagnoli Road to begin commercial operation in 2006, the unit at Brookhaven a year later. A second unit at Brookhaven could be built for service in 2008 if market conditions warrant.

KeySpan, the largest distributor of natural gas in the Northeast with nearly 2.5 million customers, is also the largest investor-owned electric generator in New York State. In addition, the company is under contract to LIPA to operate its electric system, which serves more than a million customers. ANP, a subsidiary of UK-based International Power plc, has a portfolio of generating assets in excess of 4000 MW.

accommodate the ACC's 7-million-lb operating weight, give Ravenswood the fortress-like appearance of powerplants built a half-century ago.

The rooftop location dictates that exhaust from the steam turbine be routed to a 14-ft-diam riser attached to the outside of the plant's north wall. About three-quarters of the way to the roof, the riser connects to a header that distributes steam to the three 8-ft-diam risers serving individual sections of the ACC (photo).

Arrangement of the ACC is this way: Three A-shaped condensing rows operating in parallel each have six modules of the type shown in the drawing. Each module, in turn, is served by eight finned-tube bundle assemblies and one variable-speed fan. Air is drawn in an upward direction through louvers on the supporting structure and directed through the tube bundles. The exhaust steam header at the top of the A-frame distributes steam to the tube bundles and the condensate produced drains to 2-ft-diam manifolds at the bottom of the legs.

Note that five modules per row have parallel-flow tube bundles in which the steam and condensate flow downward. The sixth, called a reflux module, features a counter-flow arrangement where uncondensed steam bubbles trapped in the collection headers are vented upward while the condensate produced flows in the opposite direction. Reflux tube bundles increase condensing efficiency.

The main riser delivering steam to the ACC is equipped with spargers for receiving high-, intermediate, and low-pressure steam during turbine bypass at startup. The bypass system, which also includes pressure-reduction/desuperheating stations within the plant proper, was provided by Control Components Inc, Rancho Santa Margarita, Calif. CCI's equipment was specified, says Project Engineer Paccione, because its so-called Drag technology eliminates problems of noise, erosion, and vibration associated with some other types of dump systems.

Noise, of course, is of major concern to owners of powerplants close to load centers. The CCI system is designed to meet Ravenswood's 55-dBA requirement 1000-ft from the plant, thereby permitting nighttime operation of the bypass system. At other ACC-equipped plants, it is not unusual to find noise levels of 110 dBA near the condenser ducting and 70 dBA three-quarters of a mile from the facility. Noise normally associated with the operation of ACCs is muted by the selection of variable-speed fan drives and the selection of specially designed "quiet" fan blades.

Interconnection. During plant construction, a decision was made by KeySpan to petition the siting board and the New York ISO to change the electrical interconnection point from ConEd's 345-kV Rainey substation north of the site to the 138-kV Vernon substation on the south side. An order granting amendment of the Certificate of Environmental Compatibility and Public Need was issued in July 2002 and an amended System Impact and Reliability Study was submitted by KeySpan and approved by both the ISO and ConEd. The SIRS demonstrated that fault-current impacts were less connecting to the 138-kV system than to the 345-kV system.

Engineers were time-challenged to redesign equipment—such as the main and auxiliary transformers, gas insulated substation, and the dielectric cable—to accommodate this change. Modifications approved by ConEd included addition of a new breaker position and associated relay protection house, as well as a fiberoptic communications link to the Vernon substation. Plus, an existing breaker in the ring bus had to be replaced and elevated. Substation modifications were performed by contractors under the direction of KeySpan personnel who worked in close cooperation with ConEd. The 138-kV cable was energized in September 2003. CCJ

Attachment 3

From: bob noiseux <bobnoiseux@yahoo.com>

Date: Fri, 29 Jun 2007 19:30:30
To:Gina.mccarthy@po.state.ct.us
Cc:Lisa.moody@ct.gov, Anna.ficeto@ct.gov, Philip.dukes@ct.gov
Subject: the proposed Plainfield Renewable Energy river diversion

Dear Ms. McCarthy:

Last month, I sent the DEP a letter authorized by the Canterbury political party called Canterbury First (I am the chairman). We have asked that the DEP look into the matter of the PRE facility's proposal to divert water from the Quinebaug River.
In addition to my formal communication to you, as a representative of the party, I have taken some time to justify my personal position on the matter. I believe that the Quinebaug River is Canterbury's greatest natural resource. This resource has a long, troubled history. Despite this, the river is on the mend. Approving this diversion permit will in no way help an impaired river.
That aside, this permit should NOT be approved because it does not meet the threshold of need as established by the DEP. The following letter explains why. If so desired by your agency, I am willing to come to Hartford and personally address these matters.
Recently, I have since been told that PRE, through contact with the Governor's office, is now trying to influence the permit process. If this is true, please do the right thing. People are watching.
Canterbury is a small, rural town. Our residents treasure our vast natural resources. In matters like this, we look to the DEP as a protector of our piece of what is known as "The Last Green Valley". Please do not let us down.
Sincerely Yours,
Robert J Noiseux

The DEP has before it, an application for diverting a portion of the Quinebaug River for usage by Plainfield Renewable Energy (PRE). Their plan is to utilize this water for the cooling tower of a proposed power plant.
According to the DEP:
"When making a decision on a water diversion permit application, the Department must consider those factors listed in the authorizing statutes and regulations including, but not limited to, the environmental effects of the diversion and whether the proposed diversion: 1) is necessary, 2) is consistent with long-range water resource management, 3) is consistent with the state plan of conservation and development adopted pursuant to part I of Chapter 297 of the Connecticut General Statues, and 4) will not impair proper management and use of the water resources of the State."
I cannot speak to items 2, 3 or 4 (although I cannot imagine how a diversion of this magnitude would fit the criteria), but as a licensed, degreed engineer with power plant construction and operational experience, I can shed some light on number 1.
All power plants utilizing condensing steam require a place for the rejection of heat. This occurs within the process where steam leaves the steam turbine and is cooled back into water for reuse in the boiler. For this cooling purpose, water or air can be used.
If water cooling is selected, the plant process does not care where the water comes from, as long as it fits certain chemical criteria and is available in sufficient quantity. In the case of PRE, site contamination has ruled out the use of water from on site wells. The use of the local sewage plant

outflow water was looked at, but according to the developer, this plant could not produce enough water. The next logical choice to evaluate would be the Quinebaug River. The developer has chosen to pursue this option. For reasons to be discussed later, this may not really be the best option.
Despite the fact that air cooling is a well-established and credible technology, the developer has shown he is prejudiced against it. He has offered a series of reasons why he believes air cooling to be inferior to the water cooling. I would like to share his reasons with you along with a reality check for each.
In the PRE Siting Council application, the developer states that air cooling would increase construction costs by about $6 million. This is not true. I had the opportunity to question the developer about this number. Specifically, what does $6 million include? The answer was that included was strictly cooling tower hardware. What came out during a public meeting held in Canterbury on May 16th (the developer and his consultants presented their project to townspeople) was that the $6 million number is extremely inaccurate and highly inflated. A series of costs need to be applied to this $6 million in order to get the TRUE cost increase.

As you will see, water cooling requires a series of support systems which air cooling does not. These costs are:
1. Roughly $3 million to build the long pipeline and pump house. This $3 million is a rosy estimate. The cost per foot can triple when ledge interferes.
2. Water cooling requires chemistry controls. Chemical parameters will require bulk storage of industrial chemicals, monitoring equipment, dosing equipment, plant control interface, and building space. Depending on the control scheme adopted, these systems would be required for at least 3 or as much as 5 different chemicals. Also in the up front cost, should be included the cost of the initial fill-up of these tanks. In the end, I would ESTIMATE the cost for these systems to be in the $300-500,000 range.
3. Relative to the diversion permit and the discharge permits, water cooling requires up front engineering and permitting work. Unfortunately, most of this has been done. However, the cost for this work should be counted against the $6 million price difference.
4. Without water cooling, there is no need to purchase a remote parcel of land (15 acres in Canterbury). The cost of the parcel is unknown, but has most certainly not been considered against the $6 million the plant developer speaks of.
5. Liquid cooling also requires the installation of at least 2 large on-site circulating water pumps. The motors on these pumps would probably be in the 2-400KW range. It is unclear whether these pumps are included in the developer's numbers.

Dollar wise, water cooling may still be less expensive to construct than air cooling, but the number is probably in the $1 million range. As a frame of reference, the developer claims the total project cost will be in the $140-160 million range

At the May 16th meeting, the developer stated that he did not want to use air cooling because the cooling fans are noisy. If this issue is of concern to the DEP, I would suggest either visiting or asking the developer to take sound readings of the air cooled condenser fans of the GT-24 plants. Lake Road, in Killingly, CT, is one such example. Each of the three units has an ACC which is a large, 15 cell version. In total, this facility has 45 such cells. PRE would probably require only one condenser of 6 such cells. My experience has been that these units are comparable in noise to traditional cooling towers.

At the May 16th meeting, the developer stated that he did not want to use air cooling because it is

more maintenance intensive than water cooling. Again, I respectfully disagree. From a mechanical perspective, while air cooling will increase the required number of air fans from 2 (for a traditional cooling tower) to probably 6, water cooling will require a pump house, on site circulating water pumps, and water treatment equipment. From a structural perspective, most modern cooling towers are made of wood. These structures require frequent inspection. An air cooled condenser is made of metal and is in fact much more durable.
At the May 16th meeting, the developer stated that due to wetland constraints, his site cannot accommodate the larger footprint of an air cooled condenser. He produced a drawing which showed his plant to be pushed hard into one corner of the lot. However, plants facing similar constraints have mounted the air cooled condensers (ACC's) on their roof. I would cite the Keyspan owned Ravenswood plant in New York City and the Ogden-Martin owned Haverhill trash burning plant as examples of the successful application of roof mounted ACC's. Looking at the compact site space available for PRE plant systems, utilizing this approach would actually alleviate site congestion. When the option of roof mounting the condenser was raised at the May 16th meeting, one of the developer's attorneys abruptly jumped up and declared that the plant does not have enough roof space to support such a structure. I respectfully disagree. Based on experience, I would estimate the required footprint of an ACC sized for a plant like this to be approx 5400 sq ft.

The developer's next reason for not wanting air cooling is his claimed reduced power output. I do not share his assessment of output reduction (I believe he claimed 4%). I am willing to admit that plant GROSS output will be somewhat reduced during warm weather, however, a power plant is paid for NET output. The difference between the two numbers is called house (or parasitic) load. Without the house load of running the pumping station and on site main cooling water pumps, net output during cold ambient temperatures would most probably be greater than that of a water cooled plant. If this issue is of concern to the DEP, I would suggest asking the applicant to formally address the issue, ensuring that the above points are specifically included in the assessment.

Another point not yet addressed by the developer, is the fact that running an air cooled system is operationally cheaper and cleaner than running a water cooled plant. Air cooling removes the headaches and labor involved in maintaining and monitoring a secure, off-site facility. Air-cooling eliminates the need to handle, store, and consume bulk cooling water chemicals. Air-cooling eliminates the need to constantly monitor plant operation compliance for diversion and discharge permits. Air-cooling eliminates the layer of bureaucracy containing needed audits, possible fines, and paper trail demonstrating compliance with diversion and discharge permits. Air-cooling eliminates the barrage of cooling water chemical testing required of plant operators. Such tests are typically required once per shift, on a 24-7 basis. Air-cooling eliminates the need to dispose of solids removed from river water. And finally, air-cooling produces no visible plume and will not ice up adjacent properties and roadways (during periods of very low temperatures).

With the difficulties associated with diverting river water for this purpose, it would seem that PRE plant is a text book example for air-cooling.