

Hydro Conference New York State

by DAVID BROWN

On April 26, 1979, the New York State Energy Research and Development Authority (ERDA) held a conference in Albany on "small" hydro-power opportunities in New York State.

The conference was held in Rockefeller's "Egg", an extremely energy intensively lit (no recessed spotlights) conference room that was filled with representatives of the press, private investors, members of numerous engineering firms and a small number of "appropriate technology" proponents, such as myself.

The conference was a slick affair, with profuse graphic displays promoting hydro utilization and tables heaped with multi-colored sugarey pastries and huge coffee pots. Although the conference was generally well organized; not running any further behind the agenda than one might expect for an endeavor of this size, it was immediately obvious that those of us who were interested in grassroots, homestead and small village size applications of hydro technology were in for a disappointment. It seems that ERDA loosely defines "small" hydro units as units that can produce from 0.50 megawatts to 1.5 megawatts of electricity costing approximately \$50,000 per hydro unit for the hardware costs alone.

The average homestead consumption is 200-500 KW hours per month (Kilowatt=1000 watts, Megawatt=1 million watts).

The representative from ERDA who was questioned about homestead and other grassroots applications of hydro-power said that the state considered these grassroots usages as "mini hydro" applications, and indicated that the conference was clearly not concerned with that sort of application of hydro-technology.

Although this was a disappointing note, it was even more disappointing to realize that ERDA is still obsessed with the large, capital intensive, centralized production and distribution of electrical power and was not applying its bountiful and sophisticated resources to the research and demonstration of a smaller community based, locally self-reliant hydro-electrical systems.

What is also disturbing is that in the late 1800's and early 1900's there were as many as 100 hydro turbine manufacturers in New York State alone. Many of these producing "mini" hydro turbines and generators. Today there are apparently less than five manufacturers of hydro turbines nationwide, none of them producing "mini" hydro turbines, to my knowledge.

It is heartening to note, though, that there are several foreign manufacturers that produce "mini" hydros, two of which, Barber Hydraulic Turbine Ltd. and Water Wheel Erectors Ltd., were represented in the manufacturers exposition at the conference (see access to resources this article).

HYDRO-POWER IN NEW YORK STATE

New York State ERDA sponsored an inventory of potential hydro electric sites in New York State. This study, completed by the Polytechnic Institute of New York eight months ago, examined 1,672 sites statewide and found a total of 754 sites with undeveloped hydropower capacity that could produce a total of 3,000 megawatts of electricity. 468 of these sites have existing dams with a capacity of 1,507 megawatts. Each site has a capacity of over 0.50 megawatts and over half would require little or no change in engineering works or storage and minimal alterations in the river (3,000 megawatts is approximately 10% of New York's energy consumption). Eight of these sites will be completed by December 1979, with a targeted generating capacity of 285 megawatts within the next few years.

Lt. Governor Mario Cuomo spoke about New York's general commitment to the development of small hydro power and noted the apparent "collapse of the United States energy plan" He went on to say that New York is even more dependent on foreign oil in 1979 than we were during the 1973 Arab oil embargo. What did we learn?

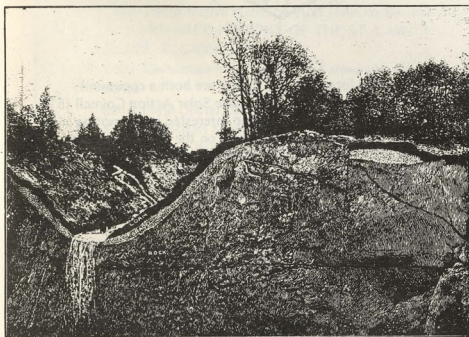
Congressman Hamilton Fish, 25th Congressional District, underlined the general national "rekindling of interest in hydro power," and called it one of the "last competitive, safe, and environmentally sound sources of power." Congressman Fish predicted a minimum increase in generation by hydro power nationwide of an additional 1500 megawatts by 1985.

He also applauded the new simplified Federal Energy Regulatory Commission's (FERC) licensing procedures. FERC's licensing procedures have historically been devastating for any good sized power generating unit. While this bureaucratic nightmare protects us in the case of the almost 14-year time span involved in licensing a nuclear facility, it has also historically been a major barrier in hydro development. Much has changed in the face of our present energy crunch and FERC has taken the initiative to streamline their licensing procedures for hydros so that instead of a 3 to 4 year licensing delay, one can expect a "small" (0.50 megawatt to 1.5 megawatt) hydro unit to be licensed in 8 months to one year.

The FERC licensing procedure interacts with the Army Corps of Engineers (if hydro installations are in recreational areas) and the U.S. Department of Fish and Wildlife's licensing mechanisms, to protect the environment. Some of the environmental considerations related to small hydro development relate to the Federal Clean Waters Act - Section 401 regarding discharges into navigable waterways.

Some of the environmental impacts discussed at the conference were changes in the streams, aeration, sedimentation in backflowed waters, and a discussion about the controversy surrounding hydros as possible "point source" pollutants.

Al Eipper, a representative from the Federal Fish and Wildlife Service, also discussed the use of fish ladders and even fish elevators in installations that interfered with the natural movements of certain game fish.



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One of the real low points of the conference for me was the presentation by Gerald Rhodes of Niagra Mohawk, although NiMo can be credited with the planned development of 200 additional MW over the next 15 years.

Mr. Rhodes made a lengthy and questionably accurate presentation regarding the advantages of nuclear-steam generation plants over hydro facilities and therein made predictions for increases in demand for electrical energy in New York that were approximately 25% higher than projections by most other reliable sources.

Mr. Rhodes also took a few digs at the "Adirondack Parks Forever Wild" protection and added that "we [NiMo] have always placed priority on protection of our natural environment." That statement was real news to this author. NiMo representatives also covered every doorway at the break following Mr. Rhodes' presentation, distributing booklets, produced by NiMo, that contained some very questionable capital costs comparisons between hydro and nuclear generating plants.

Mr. Rhodes ended his presentation with this very tactical rationalization: "We must not be hypersensitive and over-protective when it comes time for hard decisions."

Other interesting quotes drawn from conference presentations included one from Parker D. Mathusa, Program Director of New York State ERDA when he called the lighting in the "Egg" an "extreme waste of energy", and one from Stanley Lewand, a delightfully candid and knowledgeable Vice President of Chase Manhattan Bank, when he said, "I'm obscene. We had an increase of 73% in profits at the Chase Manhattan Bank and I'm obscene because I work for them."

In retrospect, the conference was a beneficial experience. We all had access to some good contacts in the hydro industry and in the State energy bureaucracy.

I feel that New York State ERDA is doing some extremely valuable research in alternative energy, but I still am disappointed in their continued support of nuclear power and their general lack of research and support for small scale locally self-reliant energy systems and small *passive, residential* solar applications. New York State ERDA has done some infinitely valuable work in the Alternative Energy field, though, and I recommend watching the New York State ERDA *REVIEW*, a quarterly publication about energy matters in New York State and ERDA's work in developing energy alternatives. The *REVIEW* also has regular announcements of energy project reports including one in the March issue about the "New York State Solar Energy Atlas".

In view of the incredible numbers of small, fast flowing low head streams around New York State, I feel that we should look towards researching the utilization of networks of "mini" hydro units that could be plugged into the existing electrical grid to provide power for homesteads and the utilities through the "take or pay" system using electrical Gemini type inverters by which the utilities would buy any power not used by the small producer and would supply power in times of low generation capacity.

I will be researching the possibilities of developing such a model somewhere in rural New York State and will look forward to reporting on hydro applications in future issues of *ROOTDRINKER*.

Some small hydro projects that you may wish to visit:

Cornell University, Ithaca, Tompkins County, New York
Aubury, Cayuga County
Potsdam, St. Lawrence County
Oak Orchard, Medina, Orleans County
Wadhams, Essex County
Wevertown, Warren County
Rensselaerville, Albany County (has 54 horsepower water turbine powering a grist mill)

Contact New York State ERDA at Rockefeller Plaza, Albany, NY 12223 for further site information. Also, the Department of Civil and Environmental Engineering, Polytechnic Institute of New York, Brooklyn, New York has computerized data on dam sites for potential hydroelectric applications throughout New York State. Contact your local planning agency or regional planning board and suggest they request a copy of Polytechnic's "Assessment of Hydropower Restoration and Expansion in New York State." Report 78-6 contains some preliminary cost estimates and institutional, financial, environmental, legal and technical problems. Heavy reading! There were 13 sites noted in my county (Madison) alone.