ATTACHMENT I

PROPOSED TECHNICAL SPECIFICATION CHANGES

Power Authority of the
State of New York
May , 1978

3.10 CONTROL ROD AND POWER DISTRIBUTION LIMITS

Applicability:

Applies to the limits on core fission power distributions and to the limits on control rod operations.

Objectives:

To ensure:

1. Core subcriticality after reactor trip,
2. Acceptable core power distribution during power operation in order to maintain fuel integrity in normal operation and transients associated with faults of moderate frequency, supplemented by automatic protection and by administrative procedures, and to maintain the design basis initial conditions for limiting faults, and
3. Limit potential reactivity insertions caused by hypothetical control rod ejection.

Specifications:

3.10.1 Shutdown Reactivity

The shutdown margin shall be at least as great as shown in Figure 3.10-1.

3.10.2 Power Distribution Limits

3.10.2.1 At all times, except during low power physics tests, the hot channel factors defined in the basis must meet the following limits:

$$F_Q(Z) \leq (2.17/P) \times K(Z) \text{ for } P > 0.5$$
$$F_Q(Z) \leq (4.34) \times K(Z) \text{ for } P \leq 0.5$$
$$F_{\Delta H}^N \leq 1.55 [1 + 0.2 (1-P)]$$

where P is the fraction of full power at which the core is operating. K(Z) is the fraction given in Figure 3.10-2 and Z is the core height location of F_Q.

3.10.2.2 Following initial core loading, subsequent reloading and at regular effective full power monthly intervals thereafter, power distribution maps, using the movable detector system, shall be made to confirm that the hot channel factor limits of this specification are satisfied. For the purpose of this comparison,

3.10.2.2.1 The measurement of total peaking factor, F_Q^{Meas}, shall be increased by three percent to account for manufacturing tolerances and further increased by five percent to account for measurement error.

3.10.2.2.2 The measurement of enthalpy rise hot channel factor, $F_{\Delta H}^N$, shall be increased by four percent to account for measurement error. If either measured hot channel factor exceeds its limit specified under Item 3.10.2.1, the reactor power and high neutron flux trip setpoint shall be reduced so as not to exceed a fraction of rated power equal to the ratio of the F_Q or $F_{\Delta H}^N$ limit to measured value, whichever is less. If subsequent in-core mapping cannot, within a 24-hour period, demonstrate that the hot channel factors are met, the reactor shall be brought to a hot shutdown condition with return to power authorized only for the purpose of physics testing.

3.10.2.3 The reference equilibrium indicated axial flux difference for each excore channel as a function of power level (called the target flux difference) shall be measured at least once per equivalent full power quarter. The target flux differences must be updated each effective full power month by linear interpolation using the most recent measured value and a value of 0 percent at the end of the cycle life.

3.10.2.4 Except during physics tests, during excore calibration procedures and except as modified by Items 3.10.2.5 through 3.10.2.7 below, the indicated axial flux difference of all but one operable excore channel shall be maintained within a $\pm$ 5% band about the target flux difference. The indicated axial flux difference will be maintained less than + 10.0% at full power with the allowed axial flux difference increasing by 0.65% for each 1% reduction in power.

F_Q^E, Engineering Heat Flux Hot Channel Factor, is defined as the allowance on heat flux required for manufacturing tolerances. The engineering factor allows for local variations in erichment, pellet density and diameter, surface area of the fuel rod and eccentricity of the gap between pellet and clad. Combined statistically the net effect is a factor of 1.03 to the applied to fuel rod surface heat flux.

$F_{\Delta H}^N$, Nuclear Enthalpy Rise Hot Channel Factor, is defined as the ratio of the integral of linear power along the rod with the highest integrated power to average rod power.

It should be noted that $F_{\Delta H}^N$ is based on an integral and is used as such in the DNB calculations. Local heat fluxes are obtained by using hot channel and adjacent channel explicit power shapes which take into account variations in horizontal (x-y) power shapes throughout the core. Thus the horizontal power shape at the point of maximum heat flux is not necessarily directly related to $F_{\Delta H}^N$.

An upper bound envelope of 2.17 times the normalized peaking factor axial dependence of Figure 3.10-2 has been determined consistent with Appendix K criteria and is satisfied by all operating maneuvers consistent with the technical specifications on power distribution control as given in Section 3.10. The results of the loss of coolant accident analyses based on this upper bound normalized envelope of Figure 3.10-2 demonstrate a peak clad temperature below the 2200°F limit. [2]

When an F_Q measurement is taken, both experimental error and manufacturing tolerance must be allowed for. Five percent is the appropriate allowance for a full core map taken with the moveable incore detector flux mapping system and three percent is the appropriate allowance for manufacturing tolerance.

In the specified limit of $F_{\Delta H}^N$ there is a 8 percent allowance for uncertainties which means that normal operation of the core is expect to result in $F_{\Delta H}^N \leq 1.55/1.08$. The logic behind the larger uncertainty in this case is that (a) normal pertubations in the radial power shape.

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4. Axial power distribution control procedures, which are given in terms of flux difference control and control bank insertion limits, are observed. Flux difference refers to the difference in signals between the top and bottom halves of two-section excore neutron detectors. The flux difference is a measure of the axial offset which is defined as the difference in normalized power between the top and bottom halves of the core.

The permitted relaxation in $F^N_{\Delta H}$ allows radial power shape changes with rod insertion to the insertion limits. It has been determined that provided the above conditions 1 through 4 are observed, these hot channel factors limits are met. In Specification 3.10.2, F_Q is arbitrarily limited for $P \leq 0.5$ (except for low power physics tests).

The procedures for axial power distribution control referred to above are designed to minimize the effects of xenon redistribution on the axial power distribution during load-follow maneuvers. Basically, control of flux difference is required to limit the difference between the current value of Flux Difference (ΔI) and a reference value which corresponds to the full power equilibrium value of Axial Offset (Axial Offset = ΔI/fractional power). The reference value of flux difference varies with power level and burnup but expressed as axial offset it varies only with burnup.

The technical specifications on power distribution control assure that F_Q upper bound envelope of 2.17 times Figure 3.10-2 is not exceeded and xenon distributions are not developed which at a later time, would cause greater local power peaking even though the flux difference is then within the limits specified by the procedure.

The target (or reference) value of flux difference is determined as follows. At any time that equilibrium xenon conditions have been established, the indicated flux difference is noted with part length rods withdrawn from the core and with the full length rod control rod bank more than 190 steps withdrawn (i.e. normal full power operating position appropriate for the time in life, usually withdrawn farther as burnup

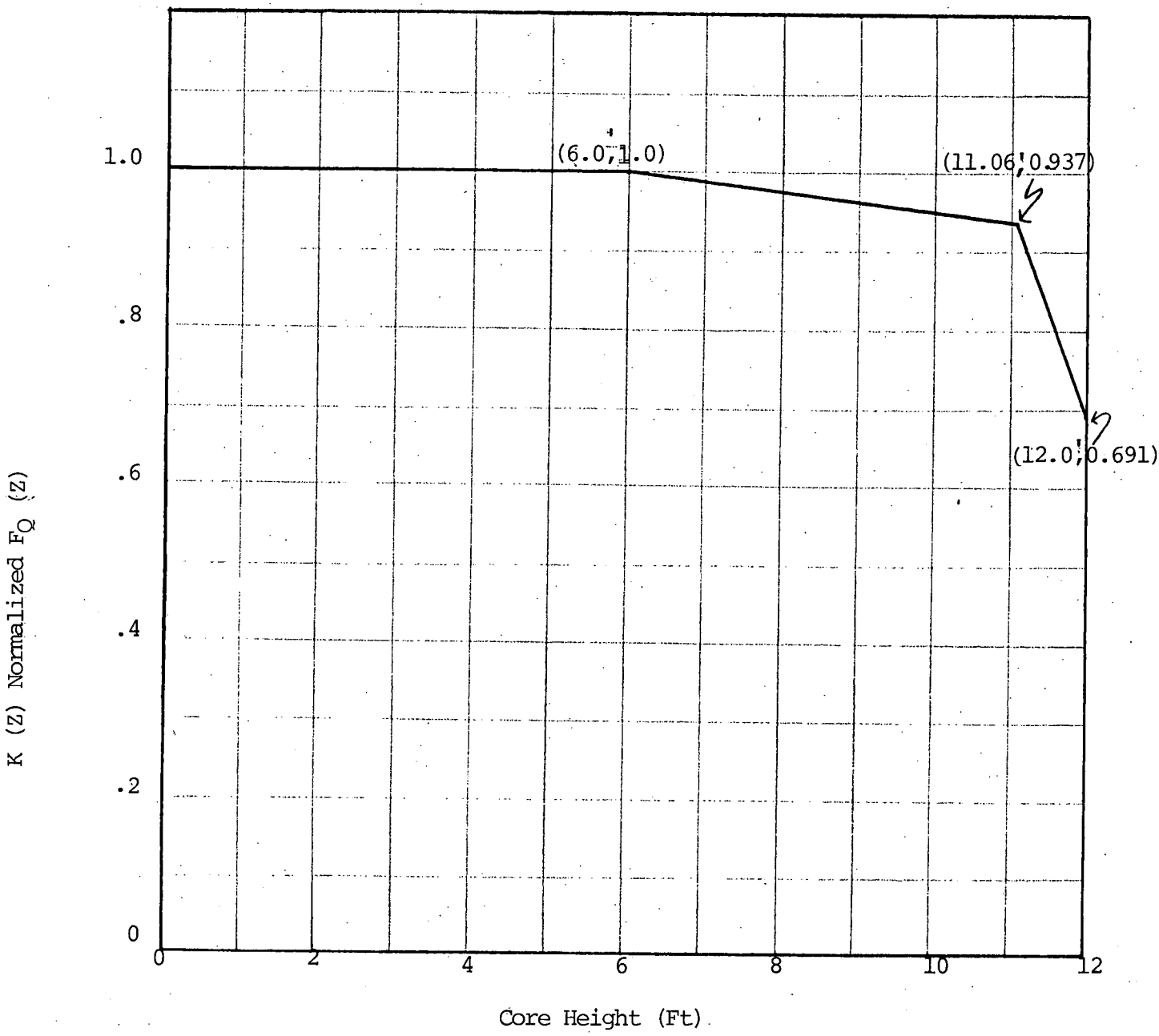


Figure 3.10-2 Hot Channel Factor Normalized Operating Envelope.

Amendment No.

ATTACHMENT II

ERRATA TO SAFETY EVALUATION

SUBMITTED APRIL 7, 1978

Power Authority of the
State of New York
May , 1978

ERRATA

The Safety Evaluation transmitted as Attachment II to the Application for Amendment to Operating License submitted by the Power Authority to NRC on April 7, 1978 (IPO-66) should be modified as follows:

1. Page 3, paragraph 1, line 4, change from "...limit of $\leq$ 2.32 x K(Z)..." to "...limit of $\leq$ 2.17 x K (Z)..."
2. Page 5, Section 3.1 line 8, change from "... below 2.32 x K(Z)..." to "...below 2.17 x K(Z)..."
3. Page 10, Section 4.1, paragraph 2, line 2, change from "... to (12.0,0.647)..." to "...to (12.0,0.691)..."
4. Page 10. Section 4.1, paragraph 3, line 2, change from "... less than + 12.5% at ..." to "... less than +10.0% at ..."
5. Insert attached Figure 2-Hot Channel Factor Normalized Operating Envelope.
6. Insert attached Figure 3-Full Length Rod Insertion Limit 100 Step Overlap Four Loop Operation.

FIGURE 2

Hot Channel Factor Normalized

Operating Envelope

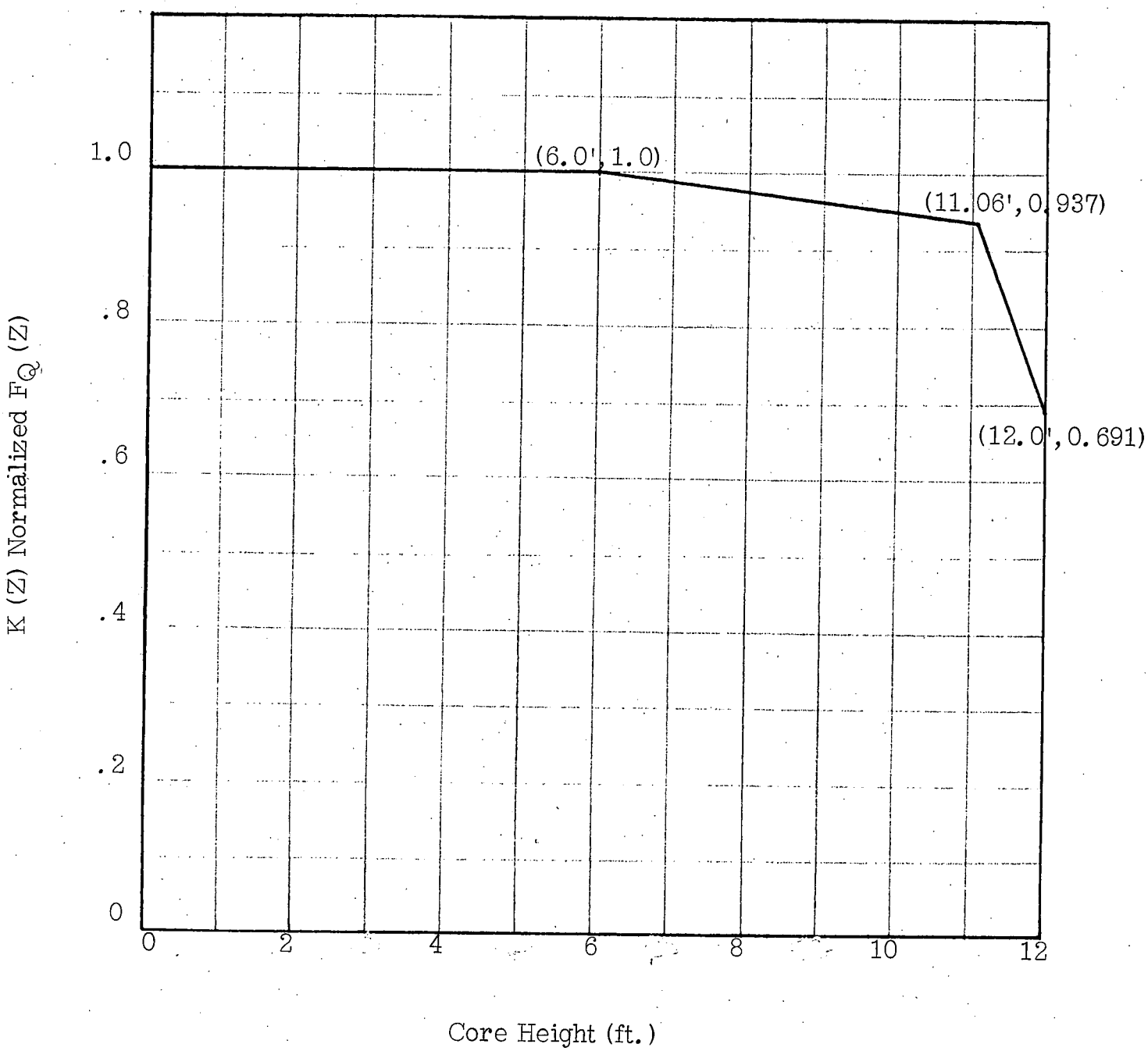
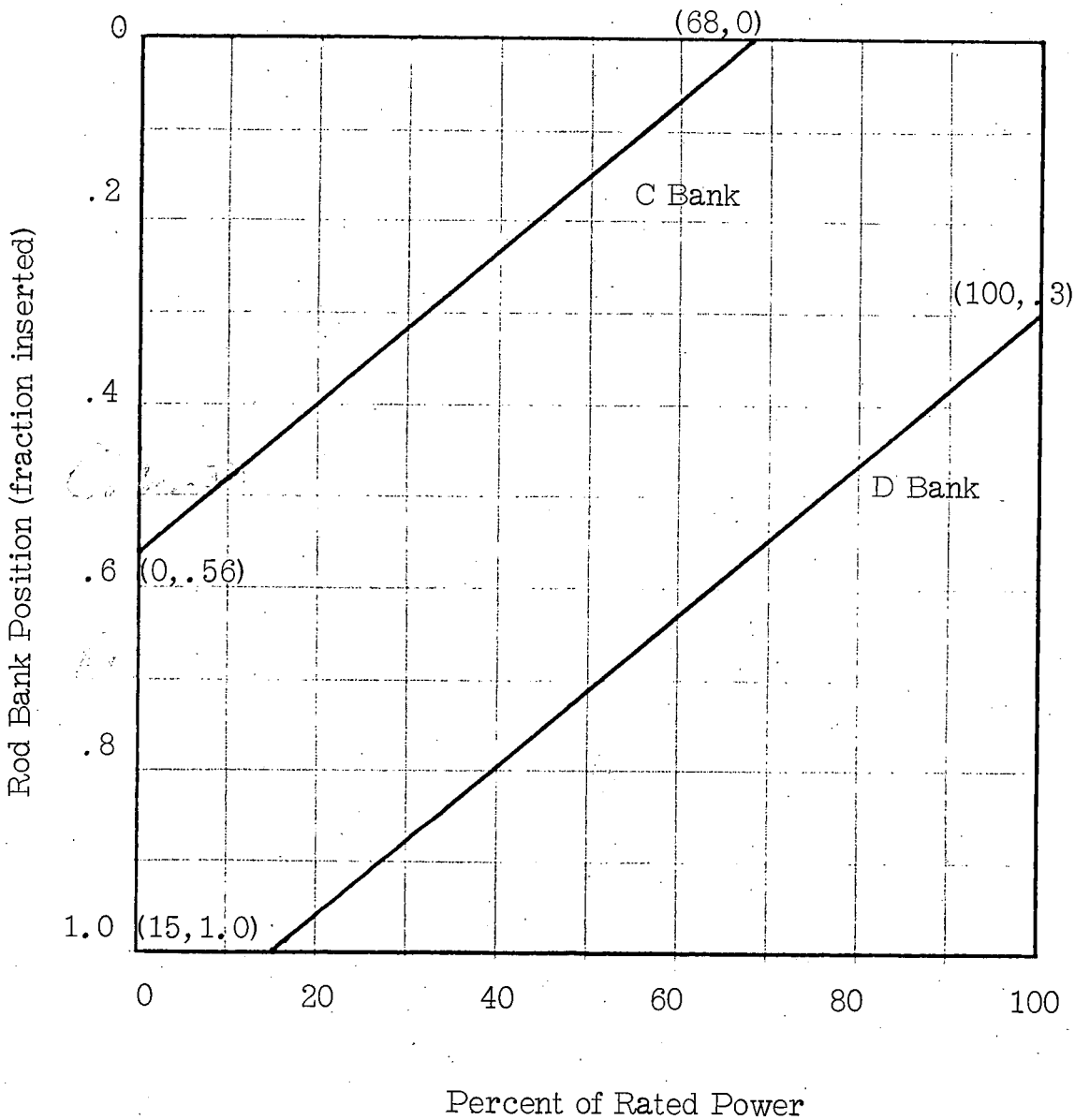


FIGURE 3

Full Length Rod Insertion Limits 100

Step Overlap Four Loop Operation



Note: Banks A and B are fully withdrawn at zero power.

9. Wilverding

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THE NEW YORK TIMES, TUESDAY, MAY 16, 1978

Plans by Lilco for 2 Nuclear Plants Win Approval of Washington Panel

By IRVIN MOLOTSKY

Special to The New York Times

HAUPPAUGE, L.I., May 15—The Federal Atomic Safety and Licensing Board has approved virtually all aspects of two nuclear generating plants in Jamesport, L.I., and, in doing so, has severely criticized Suffolk County's opposition as containing misrepresentations and misstatements.

The Long Island Lighting Company, which plans to construct the two plants at a cost of $3.6 billion, said today that it expected to receive the final Federal permit within a month.

However, construction cannot begin until it receives a state permit, and June Bruce, a spokesman for Lilco, said the utility did not know when to expect it. She emphasized, however, that the company was confident of receiving a state permit.

Mrs. Bruce took note of the Federal board's criticism of the actions of the county, which had obtained a reopening of hearings, and asserted, "Taxpayers' money is being spent on a happening instead of a serious inquiry into the need and safety of the plant."

The board, which is part of the Federal Nuclear Regulatory Commission, issued its decision in Washington last Tuesday, but it was not received by Lilco until last Friday and not released by the utility until today.

Comments by County Executive

John V. N. Klein, the Suffolk County Executive, said he had not yet received a copy of the decision and could not comment on it at length today. But he said he was not surprised by it. "My understanding is that the commission has never disapproved an application, so we expected the approval," he said. "The commission is dedicated to nuclear power."

The two Jamesport plants, which are to have a capacity of 1.15 million kilowatts each, have been opposed by Suffolk County and the League of Women Voters, among others.

They have questioned the plants on grounds of need, safety, cost and effect on the environment. During three years of hearings on the proposal, more than 40,000 pages of testimony were taken. Until today, the opponents had been heartened by Lilco's recent decision postponing the completion dates of the plants from 1984 and 1986 to 1988 and 1990 because of lowered estimates of the growth of electrical demand. This, the opponents asserted, showed that there was cause to doubt the need for the two plants.

However, the board said that, even if there was no need for added capacity, the nuclear plants were desirable because they reduced the "dependence on oil in general and foreign oil in particular."

The board's language in rejecting the Suffolk County case, which had been marshaled by a consultant, Irving Like, was sharp. For example, it said the county's arguments were "redundant," indicated a "serious misunderstanding" of some factors and "mistake the record in several important respects."

It said the county "either misunderstood or misrepresented" positions taken by its staff. One Suffolk contention, it said, "is without merit and, at best, is premature." The testimony of one county spokesman was called "largely irrelevant."

Mr. Klein responded to this criticism by saying: "We went in with the intention to be an active, aggressive participant. The commission does not understand that and our motivation. The county didn't go in with the intention of winning friends, and the presentation could be construed by some as abrasive."

VOICE OF THE PEOPLE

Nuclear Plant

To The Editor:

The Power Authority is going ahead to build the Cementon Nuclear Plant. PASNY knows they will get approval to build from the NRC who never refused a license yet even on a fault.

How long are we the people in NYS going to let these dictators like the NRC and PASNY get away with this kind of action. We must live with these dangerous Nuclear plants, radioactive material in our backyard. Also the radioactive pollution in the Air, Water and Soil for miles around.

Then they will pile up more radioactive waste, low level and high level around the plant with no place to hide it or process in this beautiful Catskills.

Why are PASNY and the rest of the Private Electric Companies so bent on Nuclear when its going sky high in price from over a billion dollars to over two billion. The cost of Uranium is also soaring. Then we have the danger of meltdown or a direct hit by some terrorist or an enemy Bomb.

I hope that the people realize that they have to pay for these plants, which cost billions of dollars, yet won't cost PASNY a cent. The Big Wigs get rich and the poor are paying higher electric rates and taxes. This is a high price to pay for energy we don't need in the Catskills, at this time or in the distant future. If the people really conserve electricity, they will pay a higher rate for conserving, a penalty. Conserving must start at the top by not building more plants than we need. We the people should not pay for stand by power, or a higher rate while PASNY has intention of sending wholesale electricity out of NYS while we are getting ripped off.

PASNY is going to raise the rates in Plattsburgh, N.Y. at the Fitzpatrick nuclear plant, from $3.00 to $6.50 per kilowatt month. More than double. What happened to the cheap nuclear energy they promised. I said it more than three years ago, but nobody was listening that nuclear was not going to be cheap or safe.

If PASNY is going to raise the rates more than double in December, what can we expect from the private electric utilities, who pay real taxes and PASNY doesn't.

It won't be long before PASNY will be raising the rates at the No. 3 nuclear plant when it's ready to pay its own way, soon.

As soon as Cementon goes up, there will be more 765 KV lines and the Prattsville plant to follow.

PASNY never did get a license to build the dangerous 765 KV line nor a license to energize it. They only got a working permit by the PSC. Does PASNY really need a license?

Come on people, show up at the Cementon rally on May 24. We can stop them right in their tracks.

When we go to the polls soon, let's vote these Legislators, Gov. Carey out of office and anybody else who is pro-nuclear. Ask the men running for office if they are pro-nuclear before you vote. Let's make sure these men we put in office, work for the people and not for Exxon or the Chase Manhattan Bank.

We pay these legislators the Gov. their wages with our taxes and we must insist they work for us the people.

Get in touch with your representative now they are going to vote on Gov. Carey's Bill to rush the nuclear plants. We the people have done a good job of stopping them. But it seems we are dealing with dictators.

Sincerely,
Al Scarpa

readers write

Full of Energy

Dear Editor:

It is regrettable, in the face of all the unresolved problems with nuclear power, the only argument nuclear proponents have is "we need the energy for jobs." Using the same simplistic reasoning, if all that is needed for a job is energy, then every place there is an electrical outlet should also have a "job."

New York State now has a surplus of electrical energy at peak times. So much energy, in fact, that it is being sold out of state. The Power Authority of New York state that proposes to build a nuclear plant at Cementon, is now selling 45 percent of its hydro-power to just two energy-intensive, labor-poor industries producing aluminum, yet 95 percent of the energy used to produce aluminum could be saved by recycling it.

So it is not how much energy you have that creates jobs— it is how you use that energy.

Also for jobs you need a market, and that New York certainly has. In fact New York State seems to be the market for the world. If anyone wonders where all the jobs have gone, just read the country of origin on the label the next time you shop. Shoes, sweatshirts, TVs, toys, nails, etc. all come from SOMEWHERE ELSE. Even 85-90 percent of New York's food comes from out-of-state. Is energy so much cheaper in Japan, Rumania, etc. that they can produce and transport products cheaper than you could produce and ship them within New York State?

The question of productive full employment is much more complex than just another construction project. To be permanent, a job must be both socially and environmentally compatible. Nuclear power is neither.

ANNA E. WASSERBACH
Chairman, New York
Federation for Safe
Energy