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April 19, 1984

W3P84-0985
3-A1.01.04
Q-3-A30.15

Director of Nuclear Reactor Regulation
Attention: Mr. G.W. Knighton, Chief
Licensing Branch Number 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford Steam Electric Station - Unit Number 3
Docket Number 50-382
Modifications to the Circulating Water System
Intake Structure

Reference: NUREG 0779 - Final Environmental Statement
Related to the Operation of Waterford Steam
Electric Station, Unit No. 3; September 1981

Dear Mr. Knighton:

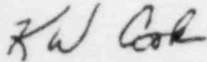
During the initial trial operation of the Waterford Steam Electric Station - Unit Number 3 (Waterford 3) Circulating Water System (CWS), it became apparent that the intake was not properly handling trash and debris. Large sized debris entered the traveling screen bay area, resulting in the traveling screens being subjected to a trash loading for which they were not designed, debris backing up in the screen wash troughs, and reentering the intake structure upon discharge. Attached is a letter to the Environmental Protection Agency (EPA), a follow up to a telephone discussion, describing modifications to the CWS intake structure which were designed to alleviate these problems, and presenting our analysis of potential environmental effects and their impact on the EPA's favorable 316(b) decision. These modifications were also discussed with John Lehr of your office, with respect to their impact on the NEPA review and the conclusions which are discussed in Section 5.6 of the Final Environmental Statement. Both the EPA representative and Mr. Lehr agreed preliminarily with our assessment that the modifications present no adverse impact on the respective analyses; however both parties reserved official comment until reviewing our formal submittals. As our letter to the EPA provides a detailed description of the modifications and our analysis thereof, we ask that you refer to the information contained in the attached letter for your review. As was requested by Mr. Lehr, we will forward a copy of the EPA's findings for inclusion in your NEPA review.

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Should you have any questions or require further information on this subject, please contact Ms. Chadi D. Groome, of our Nuclear Licensing Office at (504) 363-8997. Thank you for your time and attention.

Very truly yours,



K.W. Cook
Nuclear Support & Licensing Manager

KWC/CDG/pco

Attachment

cc: E.L. Blake, W.M. Stevenson, J.T. Collins, D.M. Crutchfield,
J.H. Wilson, G.L. Constable, J. Lehr



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April 18, 1984

W3P84-0894
3-A25.01.02

Mr. Oscar Cabra
Chief, Industrial Permits Section
U.S. Environmental Protection Agency
Region VI
Interfirst Two Building
1201 Elm Street
Dallas, Texas 75270

SUBJECT: Waterford Steam Electric Station - Unit Number 3
NPDES Permit Number LA0007374
Modifications to the Circulating Water
System Intake Structure

REFERENCE: Louisiana Power & Light Company
Demonstration Under Section 316(b) of the
Clean Water Act for Waterford Steam Electric Station -
Unit Number 3; April, 1979

Dear Mr. Cabra:

In April, 1979, Louisiana Power & Light Company (LP&L) submitted demonstrations under both sections 316(a) and (b) of the Clean Water Act for Waterford Steam Electric Station - Unit Number 3 (Waterford 3). Both the thermal effluent limitations and intake structure were approved pursuant to their respective sections of the Act. This letter is submitted regarding the 316(b) demonstration.

Waterford 3 is currently in its preoperational testing phases. During the initial trial operation of the Circulating Water System (CWS), it became apparent that the intake was not properly handling trash and debris. Large sized debris entered the traveling screen bay area, resulting in the traveling screens being subjected to a trash loading for which they were not designed, debris backing up in the screen wash troughs, and reentering the intake structure upon discharge. Modifications have been effected to the intake structure and canal which should ameliorate the situation. LP&L has reviewed these design changes with respect to the Waterford 3 316(b) demonstration and is seeking your concurrence that these modifications do not affect your favorable 316(b) decision.

The modifications, detailed below, have been designed to reduce the amount of trash and debris entering the intake canal and structure and to facilitate removal of that which does. Specifically:

1. The three inch diameter pressure equalizer holes at the outboard face of the intake canal sheet pile wall have been covered with wire mesh screens of one inch square openings.
2. The trash racks have been modified to provide a three inch bar spacing rather than the current six inch spacing. A mechanical rake system has been installed to clear the trash which accumulates in front of the bar racks.
3. Auxiliary lips have been added to the traveling screens to improve the debris removal capability of the screens.
4. Modifications have been made to the traveling screen trash trough to allow the debris to be washed out of the system more readily. The trough was installed with a 90° angle at the discharge (downriver) end which caused material to accumulate in the trough rather than washing down the gutter. The right angle has been modified to a curve and the head drop increased. The gutter was reoriented slightly to accommodate this change (see attached drawing).

Of the described modifications, only the first two have the potential to impact the 316(b) analysis. LP&L has determined that although negligible at most, any effect on the aquatic community would be of a positive nature. This can be explained simply in that the modifications are designed to reduce the quantity and size of material entering the CWS, therefore fewer living organisms will be drawn into the system along with less trash and debris. However, a more detailed assessment of the impact of these modifications was undertaken, and specifics relating to their effect on entrainment and impingement are presented for your review.

Entrainment Effects: Only those organisms which are small enough to pass through the most restrictive barrier to the CWS will be subject to entrainment within the system. This barrier is the 1/4-inch clear openings in the traveling screens, the size of which has not changed since the original analysis. Therefore, unless the number of organisms of the appropriate size reaching the traveling screens is changed, the entrainment analysis remains unaffected. As neither the volume of water withdrawn from the river, nor the water withdrawal characteristics of the intake are affected by the modifications, the number of organisms which will be drawn into the system with the water is unaffected, and the analysis remains valid.

Impingement Effects: Impingement effects can be demonstrated for those organisms which can pass through the less restrictive barriers at the mouth of the intake canal at the river face and the bars of the trash racks, but are too large to pass through the traveling screens, and therefore impinge upon them. The impact of these modifications on the projected impingement rates is explained in the following paragraphs.

The wire mesh screens placed across the pressure equalizer holes in the skimmer wall to prevent large debris from entering the intake canal will also prevent larger fish from entering the intake canal, traversing the trash racks and subsequently impinging upon the traveling screens. Fish which might otherwise have passed through the pressure equalizer holes may instead become temporarily impinged upon the screens which cover them, but it is likely that the swift currents of the Mississippi River will wash these fish from the wall within a short time.

The reduced spacing of the bar racks will decrease the amount of cross sectional area available across the racks by approximately 8%, resulting in a corresponding increase in velocity of intake water across them. This increase in velocity will tend to increase the amount of fish drawn through the racks and impinged on the traveling screens, although neither the increase in velocity nor the resultant increase in impingement rates is expected to be significant. In addition, the closer spacing of the bar racks significantly reduces the size, and therefore the number of fish which can pass through this barrier into the traveling screen bays and impinge upon the screens. This effect will be most pronounced during high river stages, when the level of the river rises above the top of the intake canal skimmer wall.

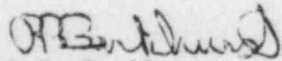
In summary, the impingement rate estimates which are contained in the 316(b) demonstration should remain valid despite the modifications to the intake structure. Those estimates were based on intake system capacity, structural design and fish community structure. These modifications will not affect the system capacity nor the fish community. Although the structural design is somewhat modified by the changes, the primary features of the system remain unchanged. Approach velocity for this analysis was considered to be most critical at the entrance and forebay. Velocities at the entrance will not be affected by the modifications and those at the forebay will increase minimally. Impingement rates will be somewhat increased for those fish capable of passing through the fixed screen at the entrance of the intake as a result of the increased velocity across the bar racks. However, it is felt that more fish will be precluded entrance into the intake canal and traveling screen bays than impingement due to increased velocities at the bar racks will increase. Thus the net effect should be a decrease in impingement rate.

Mr. Oscar Cabra
W3P84-0894
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These modifications, and their impact on the 316(b) demonstration were discussed with Mr. Robert Vickery of your office. He agreed preliminarily that there appeared to be no adverse effect on your 316(b) decision; however he reserved judgement pending review of the formal submittal. The Nuclear Regulatory Commission (NRC) was also apprised of these modifications, and is also in preliminary agreement with our assessment, but will review our submittal with respect to their findings in the Final Environmental Statement. We are forwarding a copy of this letter to the NRC, and will likewise forward a copy of your assessment, as the NRC will consider your position as part of their NEPA review. A review of our Section 10 (Rivers and Harbors Act) Permit indicated that these modifications can be made within the provisions of the permit, therefore no notification to the Army Corps of Engineers is required.

Should you have any questions or require further information on this matter, please contact Ms. Chadi D. Groome of our Nuclear Licensing office at (504)363-8997. Thank you for your time and attention.

Very truly yours,



R.P. Barkhurst
Plant Manager-Nuclear

RPB/CDG/pco

Attachment

cc: J. Dale Givens

cc: J. Dale Givens, Administrator
Water Pollution Control Division
Office of Environmental Affairs
Louisiana Department of Natural Resources
P.O. Box 44066
Baton Rouge, LA 70804

bcc: R.S. Leddick
S.A. Alleman
F.J. Drummond
K.W. Cook
M.J. Meisner
C.D. Groome
F.W. Manhart
A.P. Carter
Central Records
Nuclear Records (2)
Licensing Library

DATE 7-24-83

SHEET 2796.360 OF 653
DEPT. NO. 653

APP. BY DATE
CLIENT LOUISIANA POWER & LIGHT
PROJECT WATERFOOD-#3
SUBJECT CWS-INTAKE STR. TRAVELING SCR. TROUGH MODIFICATION

SCHEME-2

