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50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251
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SUBJECT: Forwards response to NRC RAI to support technical review of util 920225 proposed license amends re OL expiration date.

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Florida Power & Light Company, P.O. Box 14000, Juno Beach, FL 33408-0420

FPL

JUN 2 2 1993

L-93-153
10 CFR 50.90

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Request for Additional Information (RAI) -
Proposed License Amendments
Operating License Expiration Date

By letter L-92-31, dated February 25, 1992, Florida Power and Light Company (FPL) submitted a request to amend Turkey Point Units 3 and 4 Technical Specifications. By letter dated May 21, 1993, the staff requested additional information to support the technical review of the proposed license amendments. The response to these NRC questions is enclosed.

Should there be any questions, please contact us.

Very truly yours,

W.H. Bohlke
Vice President
Nuclear Engineer and Licensing

Enclosure

whb/RJT/rt

cc: S. D. Ebneter, Regional Administrator, Region II, USNRC
R. C. Butcher, Senior Resident Inspector, USNRC, Turkey Point
W. A. Passetti, Florida Department of Health and Rehabilitative Services

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1/1

STATE OF FLORIDA)
) ss.
COUNTY OF PALM BEACH)

W.H. Bohlke being first duly sworn, deposes and says:

That he is Vice President, Nuclear Engineering and Licensing, of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

W.H. Bohlke

Subscribed and sworn to before me this

22nd day of June, 1993.

Susan M. Fey Susan M. Fey CC084807

NOTARY PUBLIC, in and for the County of Palm Beach, State of Florida

My Commission expires Notary Public, State of Florida My Comm. Exp. Feb. 18, 1995 Bonded thru PICHARD Ins. Agency

W.H. Bohlke is personally known to me.

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT UNITS 3 AND 4

RESPONSE TO NRC QUESTIONS

ON THE

PROPOSED LICENSE AMENDMENTS:
OPERATING LICENSE EXPIRATION DATE

RESPONSE TO NRC QUESTIONS

By letter dated May 21, 1993, the staff requested additional information to support the technical review of the proposed license amendments. Enclosed is a summary of the NRC requests for additional information and the response to these requests.

NRC QUESTION 1

For the duration of the proposed license term, confirm the intake structure's functional capability to support the cooling water pumps and to deliver adequate cooling water to safe shutdown equipment during and following a postulated seismic event (refer to Law Engineering Testing Company on corrosion evaluation of Turkey Point intake structure dated December 4, 1986).

RESPONSE

Detailed inspections, repairs, modifications, and preventive maintenance, that have been conducted from 1985 to the present, have ensured that the Turkey Point Units 3 & 4 intake structure can perform its function under all design basis conditions including seismic events. These ongoing activities ensure that the structure will continue to perform its design basis function to, at a minimum, the proposed license expiration dates of July 19, 2012 for Unit 3 and April 10, 2013 for Unit 4. The following is a summary of efforts completed to date and plans for future activities to assure adequate performance of the structure until the proposed license expiration dates and beyond.

The main structural components of the intake structure, which are composed of reinforced concrete, are depicted in Attachment 1. They consist of the foundation, bay walls, horizontal struts including Circulating Water (CW) pump thrust beams, and deck support beams for the Intake Cooling Water (ICW) pumps, CW pumps, and travelling screen equipment.

In 1985/1986, inspections of the structure by FPL identified erosion/corrosion of the CW pump thrust beams, horizontal struts at the 1'-9" elevation, and the deck support beams for the ICW pumps. The most significant degradation was present on the CW pump thrust beams. Due to the degree of damage, the beams were replaced. Repairs were also made to the strut beams at elevation 1' - 9" and to the ICW pump support beams. These members reside in the wet/dry zone which is heavily oxygenated, are exposed directly to intake canal water which has a high chloride ion concentration, and have 3 inches of concrete cover over the reinforcement (as required by the American Concrete Institute (ACI) code of record at the time of construction). Other

elements of the structure, including the bay walls, which have 6 inches of cover, and the struts which are normally submerged, did not exhibit any significant degradation.

In order to develop a comprehensive assessment of the structure, FPL contracted Law Engineering and Testing Company (LETCO) in 1986 to perform a general condition survey. The conclusions of the LETCO report confirmed what had been physically observed in the strut and beam members during the FPL inspections. LETCO's assessment of the bay walls concluded that there was a probability that active corrosion was beginning to occur on the rebar within the bay walls. This assessment was largely based on half cell potential testing and chloride ion concentration tests.

Based on the physical findings and test reports, FPL initiated an inspection and repair program to assure long term performance of the intake structure. The program was founded on the significance of the individual structural members with regard to the overall integrity of the ICW system and the level of degradation that was observed at the time. Repairs were made to the ICW pump deck support beams to restore the protection for the concrete reinforcement, modifications to assure long term performance of the structure were developed, and inspections have continued on the thrust beams, strut beams and bay walls.

In order to develop a plan for the controlled implementation of the modifications, additional testing was performed and all historical data was reviewed by an independent consultant in 1990 (APTECH Engineering Services). Based on this study, FPL issued Specification CN 2.28 in December 1990 to provide a six year plan to direct permanent repairs and modifications. The plan includes the installation of reinforcing beams under the ICW pump support beams, various modifications to features above the deck that will significantly reduce the rate of intrusion of chloride ions into the ICW pump support beams, and performance of regular inspections of the bays, including visual inspection of the bay walls. To date, all modifications to reduce chloride ion intrusion have been completed, 2 out of 4 bays in each unit have received the deck beam reinforcement with the remaining 2 bays to be completed in the upcoming refueling outages, and inspections of the bays have continued with no significant degradation found.

FPL is in the process of developing an inspection procedure to perform additional inspection and testing of the intake bay walls in order to confirm that their structural integrity will not be compromised for the duration of the remaining plant life. Implementation of this procedure is expected to take place during the next refueling outages: Unit 3, Cycle 14 (presently scheduled

to begin March 1994) and Unit 4, Cycle 15 (presently scheduled to begin October 1994). Note that, to date, after several visual inspections of the bay walls from 1987 to the present time, no evidence has been found of degradation.

FPL's commitment to continued surveillance and maintenance of the Turkey Point Units 3 and 4 intake structure will ensure that its design basis function is not compromised for the duration of plant life.

QUESTION 2

Based on the data in your "Special Report-Twentieth Year Tendon Inspection, Hoop Tendons Low Lift-Off Force" dated July 10, 1992, provide confirmation that the prestressing forces in the containments are adequate until the end of the proposed license term.

RESPONSE

Based on information obtained from the Fifteenth and Twentieth Year Containment Tendon Surveillances, the prestress losses for both Turkey Point Units 3 and 4 containment structures are occurring at a rate higher than that predicted in the Updated Final Safety Analysis Report (UFSAR). The higher prestress loss rate has been attributed to an underestimation of the steel relaxation losses. For all tendon groups, the average lift-off forces are above the currently defined minimum effective prestress force required to meet UFSAR design basis requirements. However, the current tendon prestress force loss rate may lead to prestress forces which will fall below the currently documented minimum required design prestress forces before the end of the plant's operating license.

A re-analysis of the Turkey Point Units 3 and 4 containment structures is in progress. This re-analysis is being performed in accordance with the existing design basis as established by the Turkey Point UFSAR, using a design internal pressure of 55 psig. It is expected that this re-analysis will demonstrate the post-tensioning system's capability to comply with the design basis requirements for the service life of the plant (i.e., 40 years from Operating License). This re-analysis will include a higher rate of steel relaxation, representative of the actual conditions occurring at the plant. Additionally, this re-analysis will establish new predicted upper and lower bound limits to which future tendon surveillance lift-off forces will be compared for acceptance. This re-analysis was started in the second quarter of 1993, and is scheduled for completion in the

fourth quarter of 1994.

In the event that the results of the re-analysis do not demonstrate the capability of the post-tensioning system to comply with design basis requirements for the service life of the plant, FPL will develop an alternative strategy to ensure the adequacy of the containment prestressing forces until the end of the proposed license term.

The continued quality and performance of the post-tensioning system will continue to be monitored through the tendon surveillance program required by Technical Specification Surveillance Requirement 4.6.1.6.1, to be performed every five years. Prestress losses during the last several years of service life are expected to be only a fraction of those that occur during the first years after initial tensioning.

NRC QUESTION 3

Describe your maintenance and environmental (mainly humidity) control program for the containment tendon galleries where the vertical tendon anchorages are located.

RESPONSE

As part of the containment tendon surveillances (which are performed every five years, in accordance with Technical Specification requirements), the grease caps, gaskets, and attachment studs for the surveillance tendons are inspected. At least four vertical tendons for each unit are inspected each surveillance; the bottom ends of these tendons are located in the tendon galleries. During the twentieth year tendon surveillances performed in 1992, the corrosion in these areas was found to be within acceptable limits.

In addition, Technical Specifications require that a visual inspection of the accessible interior and exterior surfaces of the containment be performed prior to each Type A Containment Integrated Leak Rate Test (ILRT). Three Type A tests (ILRTs) are conducted at 40 month (plus or minus 10 months) intervals during each 10-year service period. The purpose of the visual inspection is to identify any evidence of structural deterioration which may affect containment structural integrity or leaktightness. Any structural deterioration observed, and any corrective actions, are recorded in accordance with 10 CFR Part 50, Appendix J, Section V.A. Records of previous inspections are reviewed to verify no changes in appearance.

Structural inspections were performed on the Unit 4 containment both prior to and following the 1991 Unit 4 ILRT. During the

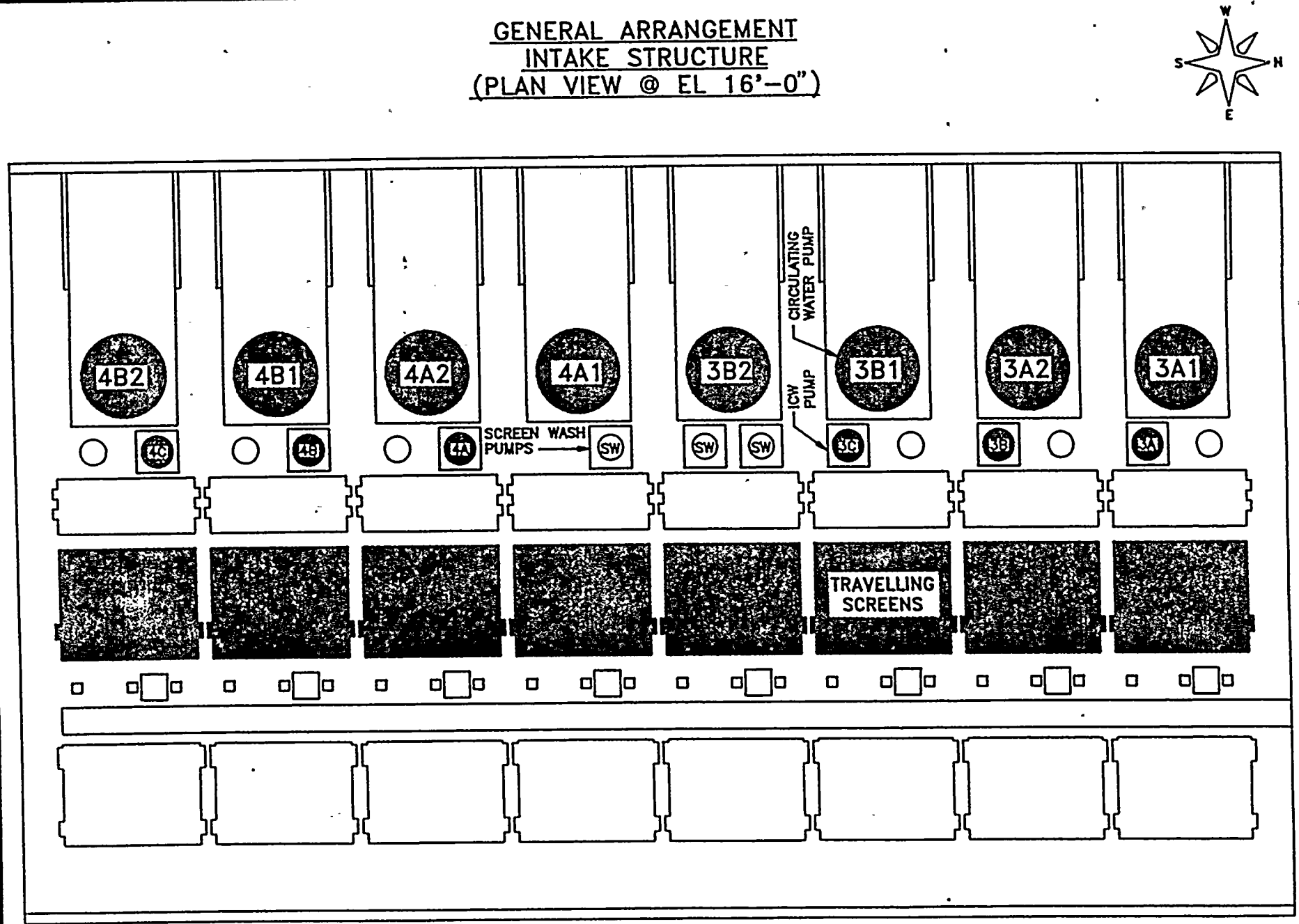
pre-ILRT inspection, the tendon gallery was found to have one inch of standing water. The post-ILRT inspections of the tendon galleries for Units 3 and 4 indicated that they had recently been dewatered and cleaned. Both galleries had high levels of humidity. Some corrosion of the tendon caps and studs was noted (to a minor extent in Unit 4, and to a relatively larger extent in Unit 3). It was concluded that this corrosion was related to high humidity and condensation.

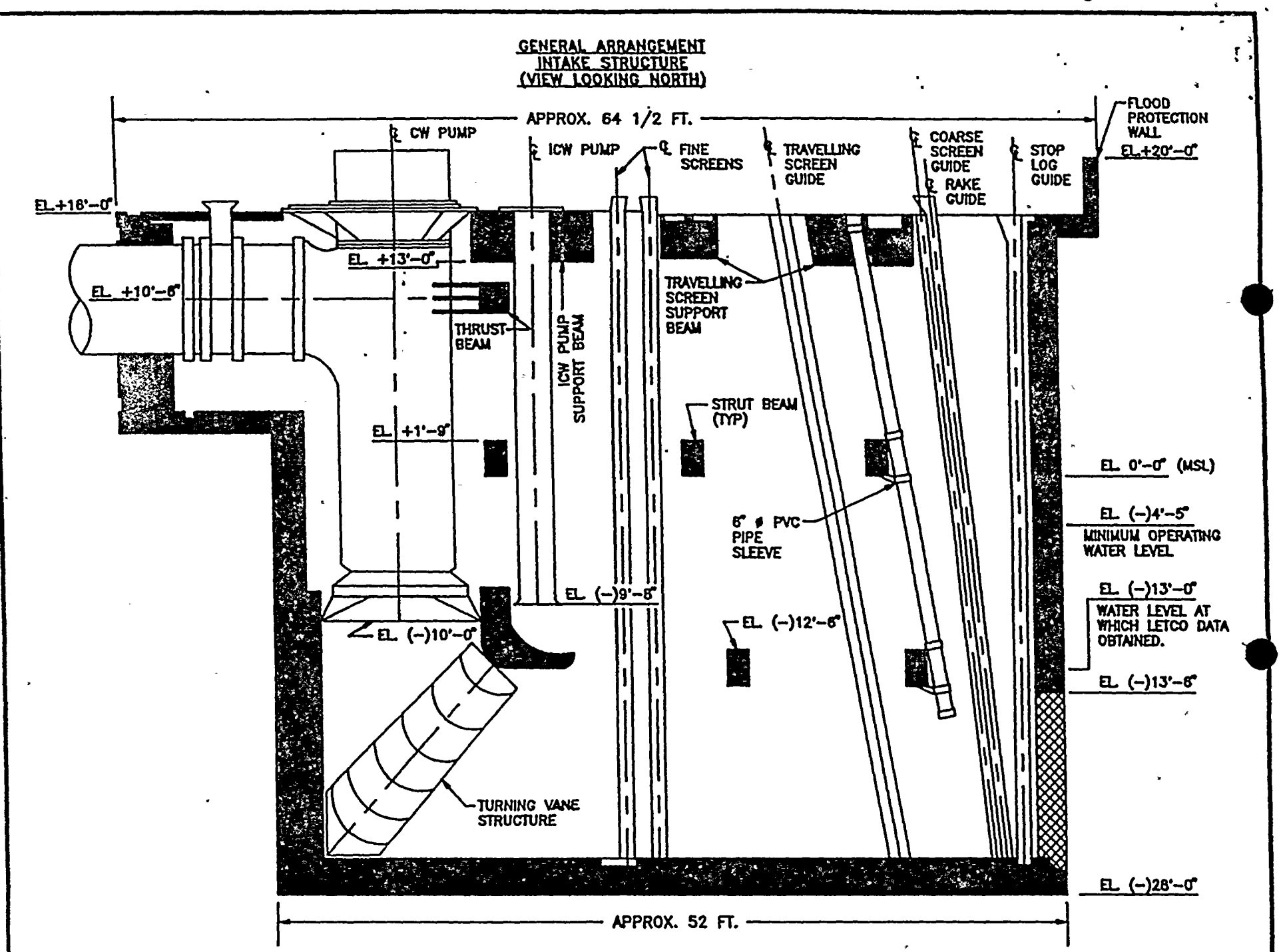
Based on the results of the pre- and post-ILRT inspections, the tendon gallery sump pumps were reconnected in order to eliminate standing water and reduce the humidity.

In addition, procedure 0-SMM-051.1 ("Containment Vertical Tendon Inspection Pit Surveillance") is being revised to include a requirement for visual inspection of the tendon galleries every six months.

The tendon gallery sump pumps will reduce the level of humidity in the galleries, thus acting to reduce the rate of corrosion on the tendon caps and attachment studs. As noted above, frequent inspections will be performed in the tendon galleries (every six months, per procedure 0-SMM-051.1; three times every ten years, per Technical Specification requirements for pre-ILRT inspection; and every five years, per Technical Specification requirements for tendon surveillances). Because of these frequent inspections, any corrosion of tendon caps or anchorage components will be readily observed in time for evaluations to be performed and required corrective actions to be implemented before any effect on containment structural integrity or leaktightness can occur.

GENERAL ARRANGEMENT
INTAKE STRUCTURE
(PLAN VIEW @ EL 16'-0")




GENERAL ARRANGEMENT
INTAKE STRUCTURE
(VIEW LOOKING NORTH)
APPROX. 64 1/2 FT.
CW PUMP
ICW PUMP
FINE SCREENS
TRAVELLING SCREEN GUIDE
COARSE SCREEN GUIDE
RAKE GUIDE
STOP LOG GUIDE
FLOOD PROTECTION WALL
EL.+20'-0"
EL.+16'-0"
EL. +13'-0"
EL. +10'-6"
THRUST BEAM
ICW PUMP SUPPORT BEAM
TRAVELLING SCREEN SUPPORT BEAM
STRUT BEAM (TYP)
EL. +1'-9"
EL. 0'-0" (MSL)
6" ø PVC PIPE SLEEVE
EL. (-)4'-5"
MINIMUM OPERATING WATER LEVEL
EL. (-)9'-8"
EL. (-)13'-0"
WATER LEVEL AT WHICH LETCO DATA OBTAINED.
EL. (-)12'-6"
EL. (-)10'-0"
EL. (-)13'-6"
TURNING VANE STRUCTURE
EL. (-)28'-0"
APPROX. 52 FT.