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June 10, 1980

Re: Indian Point Unit No. 2
Docket No. 50-247

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Denton:

Attachment A summarizes the actions taken in order to comply with the 120 day requirements in the NRC Confirmatory Order of February 11, 1980. All the necessary confirmatory documentation is available at the plant site for your, or Resident Inspector's, review.

Very truly yours,

John D. O'Toole

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ATTACHMENT A

E. The following measures shall be completed within 120 days of the date of the Order:

1. The licensee shall examine key plant system vulnerability areas and possible operator dependent areas with the intent of maximizing the reliability in the subject areas. Specifically, the licensee shall:

a. Verify that the sump for ESF recirculation is free of debris and determine if flow test verification was initially performed. If not performed, explore means to verify. Review existing procedures and training on recirculation alignment and RWST refill.

Response: The Indian Point plant design is unique in that there are two separate sumps inside containment (the recirculation sump and the backup containment sump) either of which can be used for recirculation following a loss of coolant accident. The recirculation sump is located on the west side of the reactor, while the containment sump is located on the south side, some 90 degrees away from the recirculation sump. The recirculation sump (as shown in the attached drawing 9321-F-2503) is located in a missile shielded barrier inside the crane wall, and is well protected against flying debris. Most of the grating area that feeds the sump is inside the missile barrier. This physical arrangement reduces the chance of debris clogging the gratings. The grating over the trenches outside the missile barrier alone provides sufficient area for water flow. The recirculation sump also incorporates baffles and a screen to further exclude any particles greater than one quarter inch in diameter from getting into the recirculation pump suction. The other sump is the Containment Sump which is also located inside the crane wall. This sump serves as a back up for the recirculation system by utilizing the Residual Heat Removal (RHR) pumps. The Containment Sump has a grating area that will produce, according to analysis, a water flow velocity of less than 1 ft./second when both RHR pumps are operating. The trenches outside the crane wall with an area of approximately 300 square ft. will collect water and feed into the sump via a 2 ft. wide trench which penetrates the crane wall.

After the last refueling operation, the floor and grating over trenches and sumps in the containment were inspected and verified to be free of debris. The only debris that might be of any concern is insulation material that may be stripped off piping and equipment in the immediate vicinity of a high energy pipe break. The balance of the insulation in the containment should maintain its integrity following an accident due to the metal sheathing over the insulation material. The insulation on piping in the containment is fabricated in sections and covered with stainless steel jacketing. Only a limited number of sections would be affected, and of this limited number, not all would break up and become transportable debris.

Following a break, the recirculation pumps would not be started until the containment floor is flooded with water to at least one foot above the floor elevation. After all water has been injected into containment, the flooded level would be at least four feet above the containment floor elevation. Since the water velocities across the floor are low, solids heavier than water would settle on the floor and would not be drawn into the pump suction. As most of the insulating material inside the crane wall is hydrous calcium silicate type (approximately 90%) which absorbs water very rapidly, it would also behave as a solid heavier than water. Solids lighter than water would float on the surface of the water and move slowly toward the sump. It is very unlikely that these light materials would be drawn into the sumps due to the low velocity through the sump grating even when half of it is blocked by debris. Since flow through the recirculation system will return directly to the containment via the pipe break or the containment spray, the water level in the containment is expected to be constant during the recirculation phase. Very fine particles that can pass through the pump suction screen would not harm the pumps or plug up the nozzles.

Based on the above evaluation, the two sumps as designed and constructed should remain essentially free of debris.

Verification of the ESR recirculation sumps flow by testing was not originally required for Indian Point No. 2. Consequently, an analysis has been performed to verify adequate flow to the ESF recirculation pumps during all modes of post DBA operation. The analysis is based on conservative assumptions of saturated liquid in the sump and atmospheric pressure in the reactor vessel. It is based on certified pump performance curves and as-built system piping configurations.

The analysis demonstrates that for one or two pump operation for either of the two sumps, there will be adequate NPSH for the pumps to supply at least the minimum required cold leg injection flow and containment spray header flow.

Although it is highly unlikely that a significant amount of debris will collect on the sump gratings as discussed above, the analysis verifies that with up to 50% blockage of the sump gratings, the recirculation system will provide the required flow.

Procedures including the recirculation alignment were revised as a result of the TMI Owners Group recommendations. All licensed operators received retraining in these revised procedures in accordance with Section A.7.2 of the Confirmatory Order.

As noted above, the Indian Point plant design is unique in that there are two separate systems provided for recirculation following a loss-of-coolant accident (LOCA). There are two separate sumps inside containment. Two recirculation pumps inside containment draw from one sump while two RHR pumps outside containment can take suction from the other sump. Because of this unique design feature, it is believed that recirculation will be established subsequent to a LOCA and that refilling the RWST would not be necessary. However, RWST refill can be accomplished in the same manner as normal makeup to the RWST via a tie connection to the Chemical and Volume Control System downstream of the boric acid blender. This operation is covered in SOP 10.11, Filling, Draining, and Flushing the SI System. During LOCA conditions, the amount of water discharged to containment via containment spray and/or safety injection is sufficient to insure adequate core cooling utilizing the internal or external recirculation systems.

b. Review administrative check and verification procedures for assuring that the two single failure points (manual) valves in AFWS supply line are in the correct position.

Response: The two condensate valves of note are included in COL-51, Locked Valve Checkoff List, and administratively their positions are verified monthly to be in the locked open position. The position of these valves is also verified monthly during the performance of PT-M23, the Motor Driven Auxiliary Boiler Feed Pump Test.

c. Impose an administrative order requiring expeditious shutdown whenever an independent train of the auxiliary feedwater system and any one of the following are inoperable: All backup sources of offsite power, the diesel generator supplying power to the other independent train or either of the other trains of the auxiliary feedwater system.

Response: Operating procedures POP-2.1 and SOP-21.3 have been revised to require that the Unit shall be placed in a hot shutdown condition within the next 12 hours and subsequently cooled to below 350°F using normal operating procedures whenever an independent train of the auxiliary feedwater system and any one of the following are unavailable or inoperable:

1. All backup sources of offsite power.
2. Diesel generators which are required for the operation of the remaining auxiliary feedwater trains.
3. One of the remaining trains of the auxiliary feedwater system.

d. Develop station blackout procedures addressing:

i. grid dispatcher actions
ii. reactor operator actions
iii. diesel generator repairs

Response: Station blackout procedures presently exist. These procedures direct the operator to maintain the unit in a safe condition. Continuous contact between the control room and both the district operator and the system operator is available, so that all involved personnel are fully informed of actions taken during a system blackout. Diesel generator repairs are determined by Technical Specification requirements under all possible conditions. Actions required by the grid dispatcher are covered by Engineering Orders as follows:

E.O. 4400 - System Restoration Plan
E.O. 4461 - Buchanan Startup
E.O. 4479 - Operating Connections for Buchanan

These orders have been in effect prior to the Confirmatory Order of February 11, 1980, and are being supplemented by a procedure which will detail the specific steps that are followed when utilizing the gas turbines as alternate power supplies to the station.

e. Assure that DC-powered lighting is available at the steam-turbine driven auxiliary feedwater pump.

Response: DC-powered lighting is available at the steam turbine-driven auxiliary feedwater pump.

f. Verify that the gas turbine station has black-start capabiltiy.

Response: Each gas turbine has black start capability.

g. Review causes for, and procedures and operator training required to diminish, the overall number of reactor and main feedwater trips.

Response: Reactor trips have been under constant review since the beginning of plant operation. As a result, steam generator level control was identified as a prime cause of reactor trips particularly at low power level. Consequently, a low-flow feedwater bypass system was installed, which alleviated the problem to some extent. Subsequent to that, problems with the recirculation lines from the main boiler feed pumps caused numerous trips. Repairs to the valves in these lines have corrected the problem.

SOP-21.1, Main Boiler Feedwater and Steam Generator Level Control, has been reviewed and found to be appropriate. Operators are currently trained on the Simulator in the methods of controlling steam generator levels.

The continuous review of reactor/main feedwater trips is assured by both our Significant Occurrence Report (SOR) system and our management audit of operations, which are designed to identify problems and to channel efforts toward their expeditious resolution.

h. Develop or review procedures to restore main feedwater promptly after a trip and to mitigate the consequences of an ATWS event (e.g. emergency boration and CVCS control).

Response: Emergency Procedure E-3, Loss of Coolant, was revised on March 19, 1980 to reflect the use of Condensate Pumps to supply main feedwater when the main feedwater pumps cannot be used.

A revision to E-14, Emergency Boration, was issued on April 30, 1980 to address the use of emergency boration to mitigate an ATWS event.

i. Review administrative controls on the manual valve(s) whose misalignment could fail all ECCS.

Response: There is no single valve which, if misaligned, could fail all ECCS. However, misalignment of valve 846, the outlet from the RWST, could conceivably cause a partial failure of ECCS. Because of its importance, therefore, this valve is included on COL-51, Locked Valve Checklist. This valve is verified to be opened during performance of monthly RHR and SI surveillance tests.

2. A review of control room emergency procedures shall be conducted for the purpose of improving these procedures from a human factors engineering standpoint. Improvements which can be attained by modifying procedures shall be implemented within the 120 days. Control room displays shall also be reviewed for the purpose of identifying improvements which will increase the operators' ability to assess plant conditions. A report will be submitted to describe the improvements recommended and the schedule for their implementation.

Response: Con Edison and PASNY have jointly contracted with the Essex Corporation to make a study of plant emergency procedures from a human factors engineering standpoint. Essex found our procedures, which were originally written and upgraded to conform with ANSI Standard 18.7 and Regulatory Guide 1.33, technically correct and adequate for present uses. However, Essex undertook the task of rewriting these procedures utilizing a different format. Their new format is being reviewed by our staff for applicability and possible implementation following the next refueling outage. Essex Corporation also recommended a filing system change for storage and use of emergency procedures in the Central Control Room. The use of an open file, conspicuously labeled, has replaced the former binder system.

Concurrent with their procedure review, Essex Corporation reviewed the control room displays for the purpose of identifying improvements which will enhance the operator's ability to assess plant conditions. The control room displays were reviewed and eight items were identified as being of primary human engineering interest, with resolutions as follows:

1) Accessibility of procedures as discussed above, and a solution has already been implemented.

2) Demarcation of functionally related components: labeling controls indicators and instruments, painting sections of the control panels in various colors, and highlighting panels with demarcation lines. The Essex Corporation has been contracted to physically complete this task, with an expected completion date of January 1, 1981.

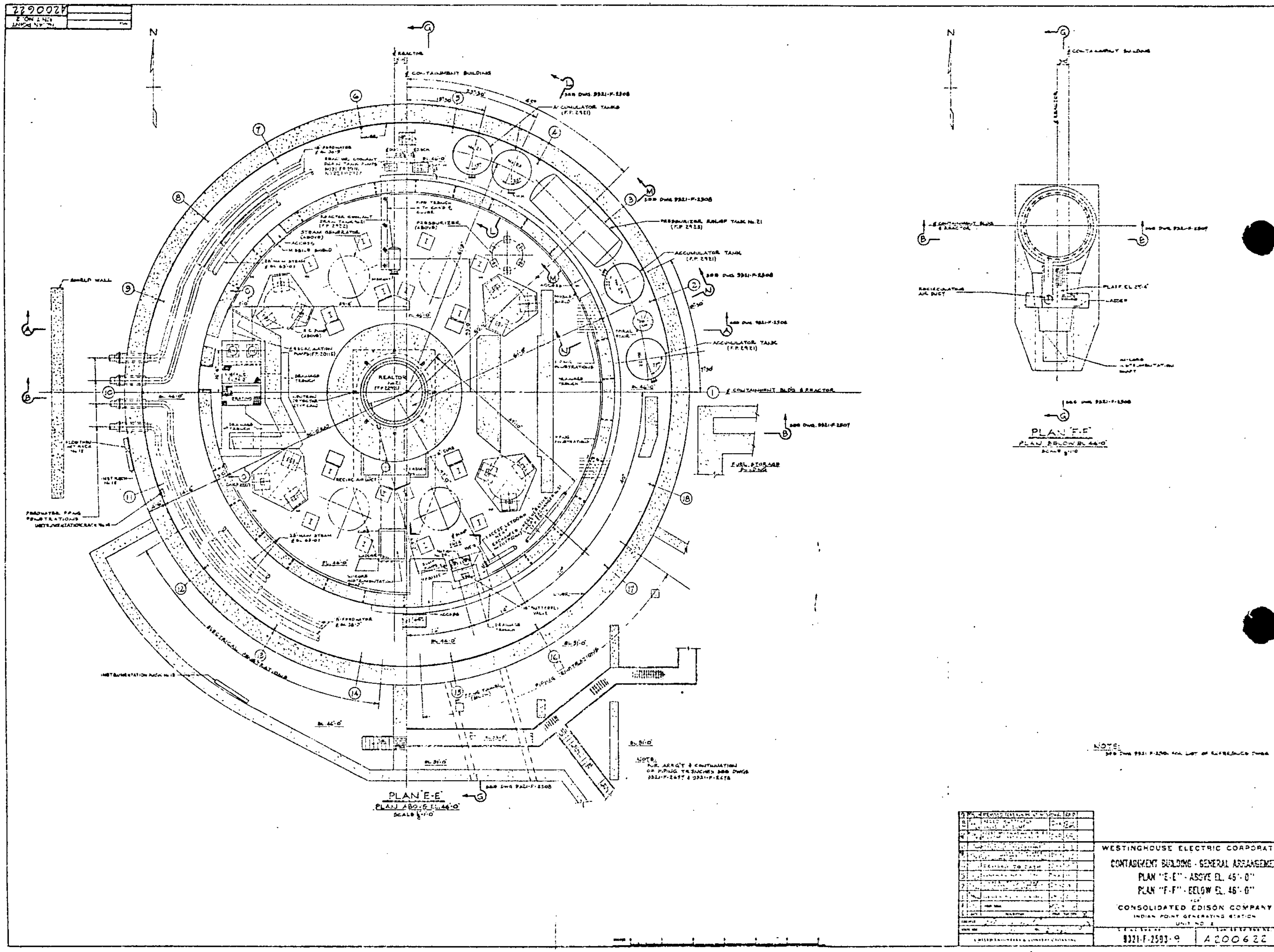
3) Control use convention inconsistencies: use of demarcation and conspicuous labeling and the installation of a different type handle on those controllers and switches which are inconsistent with standard convention. These modifications will be accomplished during the upcoming refueling outage, scheduled for January, 1981.

4) Essex Corporation indicated a lack of control feedback. Upon review by our staff, it is felt that feedback is sufficient to provide the operator with necessary information and indications for determining control response.

5) Control display association obscurities will be clarified in the demarcation effort which is expected to be completed by January 1, 1981.

6) Essex noted in some cases a lack of lamp test capability. We have taken steps in this regard by changing the "bright-is-right" lights on the Safeguard Panel. Further effort in this area will be the subject of an engineering feasibility study, which should be completed by December, 1981. At that time we can further schedule our efforts toward providing the recommended capability.

7) and 8) The question of the annunciator audible alarms and their location in relation to equipment controls is the subject of a current study of our entire annunciator system at Indian Point 2. Upon completion of this engineering study, an implementation schedule will be defined. This study is expected to be completed by December, 1981.



PLAN "E-E"
PLAN ABOVE EL. 46'-0"
PLAN "F-F"
PLAN BELOW EL. 46'-0"
REACTOR
FUEL STORAGE
ELECTRICAL PENETRATIONS
PIPING PENETRATIONS
WESTINGHOUSE ELECTRIC CORPORATION
CONTAINMENT BUILDING - GENERAL ARRANGEMENT
PLAN "E-E" - ABOVE EL. 45'-0"
PLAN "F-F" - BELOW EL. 46'-0"
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