Peter Zarakas
Vice President

Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, NY 10003
Telephone (212) 460-3000

July 14, 1980

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

Director of Nuclear Reactor Regulation
ATTN: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Varga:

The Attachment to this letter provides our response to your May 20, 1980 letter requesting additional information concerning the effects of flooding due to failure of non-Class I seismic equipment.

Should you or your staff require any additional information or clarification, please let us know.

Very truly yours,

Peter Zarakas
Vice President

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ATTACHMENT

Response to NRC's May 20, 1980 Request for Additional Information Concerning the Effects of Flooding due to Failure of Non Seismic Class I Equipment

Consolidated Edison Company of New York, Inc.
Indian Point Unit No. 2
Docket No. 50-247
July, 1980

NRC REQUEST FOR ADDITIONAL INFORMATION
ON FLOOD PROTECTION FOR INDIAN POINT
NUCLEAR GENERATING PLANT, UNIT 2
MAY 20, 1980

NRC REQUEST NO. 1

In our September 26, 1972 letter, we requested that you review the Indian Point Nuclear Generating Plant, Unit No. 2 to determine whether the failure of any non-seismic Category I equipment, could result in a condition such as flooding that might potentially adversely affect the performance of safety-related equipment required for safe shutdown of the facility or to limit the consequences of an accident. Your December 18, 1972, Jan. 20, and Feb. 18, 1975, responses indicated your investigation was limited to the failure of non-seismically designed equipment, i.e., your Class III.

Provide the results of a similar investigation of potential flooding problems for your seismic Class II system components or demonstrate that they will not fail during a seismic event and thereby preclude unacceptable flooding.

RESPONSE

In our responses to your September 26, 1972 and December 18, 1974 letters, emphasis was placed on the consequences of failure of our Seismic Class III systems since these systems are not specifically designed for seismic events. Our previous investigations did, however, consider potential flooding which might occur due to failure of our Seismic Class II systems. The corrective measures reported to you in our December 18, 1972, January 20, 1975 and February 18, 1975 letters are sufficient to protect against the consequences of failure of Seismic Class II, as well as Seismic Class III, systems.

Although we considered potential flooding effects due to failure of Seismic Class II equipment, we note that such failure is not expected to occur during a seismic event. As described in Appendix A to the Indian Point Unit No. 2 FSAR, Class II equipment is designed for the operating basis earthquake (ground accleration of 0.05g acting in the vertical and 0.1g acting in the horizontal planes simultaneously). Due to the difference in allowable stress limits, loading combinations for the operating basis earthquake are actually more stringent than those for the safe shutdown earthquake. In addition, Class II piping has been installed and supported using the same criteria as Class I piping. For these reasons, failure of Class II systems during a seismic event should be precluded. Nevertheless, as a result of your May 20, 1980 letter, we have re-investigated the potential for unacceptable flooding caused by failure of Class II systems.

Appendix A to the FSAR indicates those systems and components which are classified as Seismic Class II. The nuclear pipe schedule was reviewed to assure that all Class II lines were considered. Below is a list of Class II components/systems and a discussion of potential flooding effects associated with their failure.

A. Pressurizer Relief Tank

This tank is located inside containment at El. 46'-0". The capacity of the tank is $1800 ft^3$. Failure of the tank could cause limited flooding at El. 46'-0". However, as shown in Figure 5.1-4 of the FSAR, a drainage trench is located adjacent to the tank. Also, there is no safety-related equipment in the vicinity of the tank which could be adversely affected by the potential flooding. The operator would be alerted to tank failure in various ways. Pressurizer Relief Tank level, temperature, and pressure are indicated in the Central Control Room (CCR). There is also an alarm in the CCR for low tank level. Finally, flooding in the containment would be brought to the attention of the operator through indications from the containment sump level indication system and the leak detection systems described in Section 3.1.F of the Technical Specifications. No operator action, however, would be required to protect safety-related equipment from flooding caused by failure of the tank.

B. Spent Fuel Pit Cooling Loop

This loop is located in the Fuel Storage Building. A break in the loop during operation of the spent fuel pit pump could cause flooding. However, the water available for flooding is limited since the pump suction connection is near the top of the spent fuel pit. Water from a break in the loop would either drain back into the pit, flow to the trailer truck area and out the overhead door to the yard at El.80', or else be carried away by the floor drains located at Elevations 70' and 80' of the Fuel Storage Building. Also, there is no equipment in the Fuel Storage Building susceptable to damage by flooding that is required for safe shutdown of the reactor or mitigation of the consequences of an accident. For these reasons, unacceptable flooding would not be caused by failure of the spent fuel pit cooling loop.

C. Sampling System

This system provides samples of reactor coolant and other liquids for laboratory analysis. Sampling lines of 3/8 inch stainless steel tubing run from the pressurizer, reactor coolant loop hot legs, accumulators and the recirculation pumps discharge to the Sampling Room at El.80' in the Primary Auxiliary Building (PAB). Sampling lines for the steam generator blowdown are of 3/8 and 1/2 inch tubing and run to the blowdown tank area at El.62' of the Fan House. These lines from the primary containment are provided with containment isolation valves which, with the exception of the steam generator blowdown lines, are normally closed. Samples from outside containment are also routed to the Sampling Room in the PAB. These include samples from the residual heat removal (RHR) loop, the volume control tank gas space, and the inlet and outlet of the letdown demineralizers. Finally, local sampling points are provided at various locations.

All Seismic Class II lines and components of the Sampling System were re-reviewed to determine the possible flooding effects due to their failure. Considerations included the size of the lines and components, their location with respect to safety-related equipment, nominal flowrates of the lines and the drainage provided in the buildings. It was determined that potential flooding due to failure of the Sampling System would not adversely affect the performance of safety-related equipment.

D. Seismic Class II Portions of the CVCS System

Class II portions of the CVCS system include the boric acid batching tank, the chemical mixing tank, the monitor tanks, the monitor tank pumps and associated piping. The batching tank and chemical mixing tank are on El.98' of the PAB. These tanks are small, 400 and 5 gallons, respectively and their failure would not cause any adverse flooding. The three (3) monitor tanks each hold 7500 gallons and are located outdoor at El.81' on a concrete deck above the Waste Hold-Up Pit, directly east of the PAB. The three (3) monitor tank pumps are located at El.68' of the PAB. Each pump has a flowrate of 60 gpm. Consideration was given to failure of the monitor tanks, the monitor pumps suction line, and the monitor pumps discharge lines during pump operation. Taking into account the location of the monitor tanks, the overly adequate drainage systems of the PAB, and the location of safety-related equipment, it was determined that potential failure of the monitor tanks and associated piping/components would not adversely affect the performance of safety-related equipment.

E. Seismic Class II Portions of the Primary Water Make-Up System

The only appreciable flooding could be caused by failure of a primary water make-up pump discharge line during pump operation or failure of the discharge line from the flash evaporator product cooler. The primary water make-up pumps are located on El.68' of the PAB and the flash evaporator product cooler is on El.80' of the PAB. The flowrate in the discharge line of the pumps could be as high as 150 gpm while the flow from the flash evaporator product cooler could be 91 gpm. The drainage features of the PAB (i.e., numerous 4" floor drains and open stairwells) could easily handle such flow and prevent any damage to safety-related equipment.

In summary, we have re-reviewed the Seismic Class II components/systems of the plant and have investigated the potential flooding effects that could be associated with their failure. It has been determined that the performance of safety-related equipment would not be adversely affected.

This study of Seismic Class II equipment complements our previous study of Class III equipment reported to you in our December 18, 1972 letter.

NRC REQUEST NO. 2

With the aid of legible, as built, plan and sectional drawings of the turbine building and other structures that house essential equipment and which are connected to the turbine building by potential flood water flow paths:

a. identify and locate on the drawings all system components, essential in attaining and maintaining a safe shutdown or that are required to mitigate the consequences of an accident, whose function may be threatened by the maximum uncontrolled release rate of main condenser circulating water in the turbine building;

b. identify and locate on the drawings all potential flood water pathways from the turbine building to other areas housing equipment essential in attaining a safe shutdown or required to mitigate the consequences of an accident.

c. describe and discuss the basis for concluding that flooding in the turbine building will not exceed the 15'-6" elevation; and

d. describe and discuss the number and location of the flood level alarm switches which alert the operator to take the corrective actions. The discussion should include the measures taken to provide assurance that a single failure will not be undetected and will not disable the system should it not be detected and corrected;

RESPONSE

Enclosed are copies of the following drawings of the Turbine and Control Buildings of Indian Point Unit 2

Dwg. No.	Title
9321-F-2006-6	Turbine Bldg & Heater Bay GA, Plan at El.15'-0"
9321-F-2005-5	Turbine Bldg & Heater Bay GA, Plan at El.36'-9"
9321-F-2008-5	Turbine Bldg & Heater Bay GA, Cross Section
9321-F-1381-17	Control Bldg, Floor Plan & Sections

Our December 18, 1972 letter stated that no safety-related equipment was located in the turbine building. A portion of the alternate shutdown system, which is presently being installed, will however be routed through the Turbine Hall at approximately Elevation 28'. Flooding due to a break in a circulating water line in the turbine building would not affect performance of this system. Flooding from such a break could, however, affect performance of the 480 volt switchgear at El.15' of the Control Building if the water level were to rise to El.15'-6". The 480 volt switchgear is the only safety-related equipment that could be adversely affected by uncontrolled release of the circulating water. Operator action would be required to keep the flood level below El.15'-6". This action would consist of shutting down the circulating water pumps by operating the pump breakers from either the CCR or locally at the 6.9KV Breaker Panel on El.15' of the turbine building. Flooding could also be relieved by locally opening the El.15' rollup doors to the yard. These doors are at the north and south ends of the Unit 2 turbine building and at the south end of the Unit 1 turbine building.

We have indicated on the pertinent drawings the potential flow path of flood water from El.15' of the turbine building to the 480 volt switchgear in the Control Building.

Redundant level alarm switches located in the condenser pit area of the Unit No. 1 turbine building will alert the control room operator if flooding occurs in the area. The redundant switches are mounted on opposite sides of the pit and are set to actuate if the water level in the pit rises to 6 inches above the deck; i.e., to El.1'-6". Measures have been taken to assure that a single failure would not disable the flood alarm system. The conduit and cable runs for the two switches are physically separated and go to two completely separate annunciator panels in the control room. In addition, the switches and annunciators are tested at monthly intervals to assure single failures will not go undetected.

NRC REQUEST NO. 3

Describe and discuss the actions that must be taken by an operator following an alarm and the time available to carryout these actions before the consequences may become unacceptable.

RESPONSE

Following an alarm from the level switches in the Unit No. 1 condenser pit area, the emergency procedure calls for an investigation to determine ruptured lines. When such lines are found, the procedure calls for isolation of damaged sections for repairs. Failure of a circulating water line in the turbine building would cause the worst flooding situation. As stated in our December 18, 1972 letter, the flood water would reach El.15'-6" and possibly endanger the 480 volt switchgear about ten minutes after the line break. The ten-minute figure was based on a complete guillotine break of a circulating water line, with water flowing uncontrolled into the turbine building at a flowrate equal to the rated flow of a circulating water pump. This is a very conservative assumption. First, failure of a circulating water line is unlikely since the piping is operated at low pressure. However, if failure did occur, it would probably take place at the expansion joint on the inlet to the condenser. As discussed in the response to NRC Request No. 4, for this failure a portion of the circulating water flow will pass through the condenser and be unavailable for flooding. Also, we have not taken any credit for the two 4-inch drains in the switchgear room. The ten-minute figure is therefore quite conservative, and the actual time period would be somewhat longer.

A break in a Unit No. 2 circulating water line would actuate the level alarm switches in the Unit No. 1 condenser pit about three minutes after the break. The operator in the control room would therefore have seven minutes to turn-off the circulating water pump in the broken line or open a door to the yard to prevent the flooding from reaching an unacceptable level. The seven-minute figure is a minimum value since there is a nuclear plant operator (NPO) assigned on a 24-hour basis to the conventional portion of the plant. It is reasonable to assume that this NPO would notify the control room operator of the flooding situation prior to actuation of the level alarm switches. The control room operator would therefore have at least 7 minutes and probably 8 or 9 minutes to turn-off the circulating water pump or open a door to the yard before the flooding would reach an unacceptable level.

Even in the unlikely situation that the 480 volt switchgear is flooded, the reactor can still be put into and maintained in hot shutdown by the alternate safe shutdown capability which is being installed and will be completed by the end of the fourth refueling outage (early 1981). This capability is described in the NRC's Safety Evaluation Report for Fire Protection which was issued on January 31, 1979. Shutdown will be possible independent of switchgear room, the electrical penetration area, the electrical tunnel, the cable spreading room and the control room. This capability will include instrumentation for pressurizer pressure and level and for steam generator level, control and power for auxiliary feedwater, and control and power for reactor coolant makeup and boration. Additional details of the alternate safe shutdown capability are in Section 4.10 of the Safety Evaluation Report.

NRC REQUEST NO. 4

Your December 18, 1972 response indicates that the flood level alarm switches for Unit 2 will be located in the Unit 1 portion of the shared turbo-generator building. Further, your response indicates that due to the location of the flood level sensor a three minute time delay is introduced before the alarm is initiated should the failure occur in Unit 2 and that within ten minutes of the beginning of the flooding incident the flood level will reach elevation 15'6" where essential equipment is located. In regard to the above:

(i) what was the assumed flooding rate?

(ii) would the 180,000 cubic feet of water flood the combined Unit 1 and 2 turbo-generator to elevation 15'6"?

RESPONSE

In obtaining the three and ten-minute values, we assumed an open ended guillotine break of a circulating water line. The flooding rate was taken as 140,000 gpm, the rated flow of a circulating water pump. These are conservative assumptions. It is very unlikely that a circulating water line will fail since the piping is operated at low pressure. However, if failure did occur, it would probably occur at the expansion joint on the inlet to the condensers. This joint is located at El.13', and has a diameter of 96 inches and a height of 12 inches. Considering the location of the joint and its limited height, a portion of the circulating water flow will pass through the condenser and be unavailable for flooding. In addition, no credit was taken for the 4" drains in the switchgear room. The 140,000 gpm value is therefore conservative.

Following failure of the circulating water line, the water level would rise in the pipe tunnel at El.3'-3" of the Unit No. 2 turbine building. When the level reaches El.15' the water will spread out over an expanded area to El.15' of the Unit No. 1 turbine building and then spill into the Unit No. 1 condenser pit which contains the above-mentioned level alarm switches.

We estimate that 180,000 cubic feet of water would fill the combined Unit No. 1 and Unit No. 2 turbine buildings to El.15'-6".

NRC REQUEST NO. 5

Assuming the pumps and or valves fail to be actuated following a failure in the circulating water system barrier, what would be the maximum elevation of the flood water in the turbine building and other structures housing essential components? Identify (i) the essential system components that would be threatened should this flood level be reached; and (ii) describe and discuss the consequences that may follow should they become disabled. The discussion should include the 480 volt switchgear located in the control building.

RESPONSE

The only essential system component that could reasonably be expected to be affected by a failure in the circulating water system barrier is the 480 volt switchgear at El.15' of the control building. Other essential equipment in the control building is at considerably higher elevations. For example, the essential batteries are located at El.33'.

The 480 volt electrical system provides power to required safeguards equipment (e.g., safety injection pumps, component cooling pumps, residual heat removal pumps). The 480 volt switchgear should therefore be protected against unacceptable flooding. The response to NRC Request No. 2 discusses the operator actions necessary to protect the switchgear from an uncontrolled release of circulating water. Such action consists of tripping the circulating water pump in the broken line or opening a door to the yard. Since there are no valves in the main circulating water lines of Unit No. 2, valve closure to prevent unacceptable flooding is not relevant.

Additionally, an alternate safe shutdown capability is being provided which will allow the reactor to reach and maintain hot shutdown independent of the 480 volt switchgear. A discussion of this capability is contained in the response to NRC Request No. 3.

NRC REQUEST NO. 6

With the aid of legible, as built, Primary Auxiliary Building plan and section drawings:

a. locate the systems and components within the building that may cause flooding;

b. indicate what would be the maximum potential flood flow rate and flood levels resulting from the failure of the components you designate as Class II or Class III;

c. identify and locate all equipment, essential in attaining and maintaining a safe shutdown or in mitigating the consequences of an accident, that may be threatened by flood waters;

d. describe the measures taken to preclude the flood waters from reaching the essential equipment; and

e. describe and discuss the means provided to alert the operator of the occurrence of a flooding event and the steps the operator must take to maintain the unit in a safe operating or shutdown condition.

RESPONSE

Enclosed are copies of the following drawings for the Primary Auxiliary Building (PAB):

Dwg. No.	Title
9321-F-2510-19	Primary Auxiliary Bldg. GA-Plan
9321-F-2511-17	Primary Auxiliary Bldg. GA-Sections

Our December 18, 1972 letter discusses in considerable detail the potential for adverse flooding in the Primary Auxiliary Building and the measures we have taken to preclude same.

First, the PAB is designed so that flooding from any elevation will result in the water draining to the lowest elevation in the building (Elevation 15'). This is assured by the numerous 4" floor and hub drains provided throughout the PAB and also by the stairwell flow areas. Revision 1 to our report "Review of Indian Point Station Fire Protection Program", submitted to the NRC on April 15, 1977, discusses in detail, on an area by area basis, the drainage provided in the PAB as well as in other portions of the plant. In short, the drainage provisions of the building are such that the only safety-related equipment that could potentially be affected by flooding are the residual heat removal (RHR) pumps located at El.15'.

Performance of the RHR pumps would be affected if the water level reached El.19'. As reported in our earlier letters, flooding to this elevation is precluded by modifications we have made to the door to the transformer yard. The 4 1/2" high and 44" wide flap installed at the bottom of the door will allow water to drain to the yard at El.18'- 8" and prevent any adverse buildup of flood level, thus protecting the RHR pumps from flood damage.

A complete failure of the non-Class I line in the PAB with the largest nominal flowrate would cause flooding at a rate of 200 gpm. The drainage provisions of the building outlined above will preclude damage to any safety-related equipment in the event of such a failure.

The aforementioned fire protection report discusses, on an area by area basis, the safety-related equipment in the PAB. On the enclosed general arrangement drawings we have circled safety-related equipment in red. Specific items circled include the charging pumps, the boric acid tanks and transfer pumps, the containment spray pumps, the safety injection pumps, the component cooling heat exchangers and pumps, residual heat removal pumps, and safety-related motor control centers and control panel. Non-Class I tanks and other components which may potentially cause flooding are circled in green. As mentioned in our December 18, 1972 letter, the combined volume of the tanks is so small that their failure would cause negligible flooding. Flooding consequences from failure of the other components and associated lines are also negligible.

Flooding in the PAB would be indicated to plant personnel in several ways. First, significant loss of water from a system may cause abnormal readings from the system's process instrumentation. Also, since any flooding in the building will drain to the lowest elevation, major flooding would be indicated by water flowing out of the door to the yard at El.18'-8". Finally, there is a nuclear plant operator (NPO) assigned on a 24-hour basis to the nuclear portion of the plant. This NPO makes routine tours through the PAB and other nuclear-related areas of the plant, and would observe any abnormal leakage from the plant systems.

As discussed above, the drainage provisions of the PAB are such that no operator action would be required to maintain the unit in a safe operating or shutdown condition.

NRC REQUEST NO. 7

In an attempt to establish if any automatic means has been provided to trip the Unit 2 circulating water pumps in the event of a barrier failure, it is noted that the October 31, 1972 response for Unit 1 indicates that the failure of the rubber expansion joint would cause the pump head to increase which in turn would lead to an automatic pump trip due to overcurrent. Does the Unit 2 circulating water system also act as described above? If so, provide additional information on how the failure of the rubber expansion joint would increase the required head.

RESPONSE

The Unit No. 2 circulating water pump motors are protected by instantaneous and time delay phase and ground overcurrent relays and thermal overload relays which will automatically trip any affected pump. Failure of a circulating water line, however, would not necessarily trip these relays. Therefore we have not taken any credit for automatic pump trip following a barrier failure.

NRC REQUEST NO. 8

Certain instrumentation and control systems, in conjunction with operator actions, will be relied upon to prevent flooding of safety-related equipment in the event of a failure of non-Category I equipment or the inadvertent actuation of portions of the fire protection system. Describe the extent to which the design of these instrumentation and control systems incorporates the following features:

a. system redundancy (including identification and separation of redundant equipment) and the capability to perform the needed safety functions assuming a single failure;

b. the capability of functioning during and after design basis events such as earthquakes, accidents and anticipated operational occurrences;

c. testability during normal reactor operation;

d. electrical power provided from class IE power systems; and

e. equipment qualification testings and quality assurance provisions to insure reliability in the operating environment (i.e, item b).

RESPONSE

The level alarm switches in the Indian Point Unit No. 1 condenser pit will alert the CCR operator of a break in a Unit No. 2 circulating water line. As described in the response to NRC Request No. 2, there are two redundant switches mounted on opposite sides of the condenser pit. Conduit and cable runs from the two switches to the CCR are physically separated and go to two completely separate annunciator panels in the CCR.

The electrical power for the level alarms is provided from two independent Indian Point Unit No. 1 battery systems.

The switches and CCR annunicators are tested at monthly intervals. Testing may be performed during normal reactor operation.

The level switches are Magnetrol Model No. TF-201-FEPVP-XY-SIM3DC. They are furnished with an explosion and vapor proof switch housing and employ magnet actuated dry contact switches. The level switches are designed for a maximum liquid temperature of 250°F and are therefore appropriate for the operating environment.

Regarding flooding due to inadverent actuation of portions of the fire protection system, we reviewed those locations in the plant which are protected by water spray systems. These locations are as follows:

a) Main and Unit Auxiliary Transformers - Located outdoors, actuation of the fire protection system would not adversely affect any safety related equipment.

b) Diesel Generator Building - As discussed in the response to NRC Request No. 9, the drainage provisions of the building are sufficient to prevent any flood damage to safety-related equipment due to actuation of the water spray system.

c) Electrical Tunnel, El.68' in PAB to El.33' in Control Building
A closed-head, pre-action sprinkler system is provided for cable trays. A 10" floor drain at El.33' will prevent adverse flooding.

d) Charcoal Filters - Spray fire protection systems are provided for various charcoal filters. A separate drain system is provided for the charcoal filters for the PAB and Containment Ventilation Systems located in the Fan House. Two (2)-100gpm sump pumps provide drainage for the containment fan coolers charcoal filters located at El.68' of containment. Two (2) 4" floor drains provide drainage for the charcoal filter in the gas stripper room exhaust system located at EL.81'-8" of the boric acid evaporator building.

In short, due to adequate drainage provisions, inadvertent actuation of portions of the fire protection system will not adversely affect safety-related equipment. Reliance upon instrument and control systems and operator action is not necessary for protection.

Further discussion of the Indian Point Unit No. 2 fire protection system is in Revision 1 to our report "Review of Indian Point Station Fire Protection Program" submitted to the NRC on April 15, 1977 and the NRC's Fire Protection Safety Evaluation Report (SER) dated January 31, 1979. The fire protection system is, for the most part, Seismic Class III. However, as discussed in Section 4.3.1.7 of the SER, fixed fire suppression systems have not been installed where their operation or failure could cause unacceptable damage to safety-related equipment. For example, floor drains sized to remove expected fire fighting water flow have been provided to prevent flooding. The SER concludes that the protection provided to safety systems from the effects of suppression system water is acceptable, provided we install certain baffles in the electrical tunnel. These baffles have been installed.

NRC REQUEST NO. 9

With the aid of legible, as built, Diesel Generator Building plan and section drawings:

a. locate the systems and components within the building that may cause flooding;

b. indicate what would be the maximum potential flood flow rate and flood levels resulting from the failure of the components you designate as Class II or Class III;

c. identify and locate all equipment, essential in attaining and maintaining a safe shutdown or in mitigating the consequences of an accident, that may be threatened by flood waters;

d. describe the measures taken to preclude the flood waters from reaching the essential equipment; and

e. describe and discuss the means provided to alert the operator of the occurrence of a flooding event and the steps the operator must take to maintain the unit in a safe operating or shutdown condition.

RESPONSE

Enclosed are copies of the following drawings of the Indian Point Unit No. 2 Diesel Generator Building:

Dwg. No.	Title
9321-H-2250-6	Diesel Generator Bldg GA Plan
9321-H-2251-5	Diesel Generator Bldg GA Sections

Safety-related equipment within the diesel generator building includes the three (3) diesel generators, along with associated day tanks and control panels. The diesel generators are not required for safe shutdown if offsite power is available. If offsite power is interrupted, at least one diesel generator would be required for safe shutdown.

The fire protection system in the diesel generator building has the potential to cause flooding. This system consists of wet pipe automatic sprinklers installed in the sump area beneath the diesel engines and on the day tanks. Actuation of the fire protection system would not, however, endanger the safety-related equipment since the drainage provisions of the building are sufficient to preclude buildup of any flood level. As shown on the General Arrangement Plan drawing, five (5) sump pits are provided in the floor at El.67'-0". These sump pits are connected to a 12" drain which runs to the discharge tunnel. The adequacy of the drainage system was noted in our December 18, 1972 letter and also in the NRC's Fire Protection Safety Evaluation Report issued on January 31, 1979. In addition, the diesel engines/generators and control panels are located at least five feet above the El.67' floor.

As reported in our December 18, 1972 letter, actuation of the fire protection system in the diesel generator building is annunciated and alarmed in the CCR. The control room operator would therefore be alerted of the system's actuation regardless of whether actuation occurred inadvertently or as a result of a fire. In the latter case, the CCR operator would also receive alarms from the fire detection system.

Operator action to protect the diesel generators from flooding is not required since the drains in the diesel generator building are sized sufficiently to preclude buildup of any flood level.

NRC REQUEST NO. 10

Your December 18, 1972 response indicates that safety related equipment is located in the fuel storage building.

With the aid of legible, as built Fuel Storage Building plan and section drawings:

a. locate the systems and components within the building that may cause flooding;

b. indicate what would be the maximum potential flood flow rate and flood levels resulting from the failure of the components you designate as Class II or Class III;

c. identify and locate all equipment, essential in attaining and maintaining a safe shutdown or in mitigating the consequences of an accident, that may be threatened by flood waters;

d. describe the measures taken to preclude the flood waters from reaching the essential equipment; and

e. describe and discuss the means provided to alert the operator of the occurrence of a flooding event and the steps the operator must take to maintain the unit in a safe operating or shutdown condition.

RESPONSE

Enclosed is a copy of the following Fuel Storage Building drawing:

Dwg. No.	Title
9321-F-2514-10	Fuel Storage Bldg GA, Plans & Evaluations

As mentioned in the Response to NRC Request No. 1, a break in the spent fuel pit cooling loop during operation of the spent fuel pit pump could cause flooding of the fuel storage building for a limited period of time. This flooding, however, would not compromise any equipment essential in attaining or maintaining a safe shutdown or in mitigating the consequences of an accident.

The primary effect of failure of the spent fuel pit cooling loop would be the loss of cooling capability to the pit. This is of no consequence since the slow heatup rate of the spent fuel pit would allow sufficient time to provide adequate alternate cooling while the cooling loop was being restored. As stated in Section 9.3 of the FSAR, several hours would be available for restoration of cooling capability.

A break in the spent fuel pit cooling loop would be indicated to the CCR operator by a spent fuel pit level alarm and/or a spent fuel pit high temperature alarm. Pit temperature is also indicated locally.

In summary, operator action would not be required to protect essential equipment from flooding caused by failure of the spent fuel pit cooling loop.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MEMORANDUM FOR: TERA CORPORATION

FROM: US NRC/TIDC/DOCUMENT MANAGEMENT BRANCH

SUBJECT: Special Document Handling Requirements

☐ 1. Please use the following special distribution list for the attached document.

☒ 2. The attached document requires the following special considerations:

☐ Do not send oversize enclosures to the NRC PDR.

☐ Only one oversize enclosure was received - please return for Regulatory File storage.

☒ Proprietary information - send only non-proprietary portions to the NRC PDR.

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Mike

TIDC/DMB Authorized Signature

cc: DMB Files

DOCKET NO. 50-247

DATE: 10/14/80

NOTE TO NRC AND/OR LOCAL PUBLIC DOCUMENT ROOMS

The following item submitted with letter dated 10/7/80 from Con. Edison Co. is being withheld from public disclosure in accordance with Section 2.790.

PROPRIETARY INFORMATION

Planned transition to LOPAR Fuel

SHARON Hunt
M/S-016

Distribution Services Branch