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JUN 22 1972

Docket No. 50-286

Richard DeYoung, Assistant Director for Pressurized Water Reactors, L

CONSOLIDATED EDISON COMPANY OF NEW YORK, INDIAN POINT UNIT NO. 3
REQUEST FOR ADDITIONAL INFORMATION

Attached is a request for additional information prepared by the Auxiliary and Power Conversion Systems Branch. The questions resulted from a review of the FSAR revised to Supplement No. 2 dated April 3, 1972.

Additional attention by the applicant is directed to the need for consideration of plans for in-service inspections, tests and detailed nondestructive examinations of high pressure-high temperature steam and feedwater piping and components. In addition, a clearly delineated in-service nondestructive examination program for high-stressed turbine rotating members is necessary. It should include standards for definition, determination and resolution of indications deemed of critical crack size.

Although the current Blue Book schedule calls for this question list to be available on October 20, 1972, we believe that an earlier issuance of these questions to the applicant would allow a recycle of an additional round and thereby reduce any potential delays. Thus, the applicant should respond to this request by August 25, 1972, to allow for our review prior to October 20, 1972.

Original signed by:
Robert L. Tedesco

Robert L. Tedesco, Assistant Director
for Containment Safety
Directorate of Licensing

Attachment:
As stated

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OFFICE ▶	L:CS:APCSB	L:CS:APCSB	L:CS			Memo.
SURNAME ▶	LConnery:af x7391	C. Long	R. Tedesco			
DATE ▶	6/20/72	6/21/72	6/21/72			

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Request for Additional Information

9.0 AUXILIARY AND EMERGENCY SYSTEMS

9.11 Provide component design and operation data for the Chemical and Volume Control System (CVCS) letdown nonregenerative heat exchanger (Tables 9.2-3 and 9.3-4). Describe the safety significance of the shell-side and tube-side operating pressures, and the function and sensitivity of the radioactivity monitors on the shell-side cooling water.

9.12 Provide component design and operation data for the CVCS Boric Acid Blender (Table 9.2-3), and the code to which it is designed and fabricated.

9.13 Provide component design and operation data for the CVCS Batching Tank (Table 9.2-3). Describe the steam jacket of the Batching Tank separately if the design codes differ between tank and jacket.

9.14 Describe the automatic and manual control features of the hydrogen supply to the CVCS Volume Control Tank, the amount to be supplied, and the logic of pressure control.

9.15 Describe the normal ratio of hydrogen to water vapor, and the safety precautions to avoid a flammable concentration in the CVCS Volume Control tanks, and the pressure relief piping to Holdup Tank No. 2.

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

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9.16 Describe the precautions taken while venting gases from CVCS Holdup Tank No. 2 to the Waste Disposal System, and the precautions for controlling the percentage of hydrogen in the vented gases.

9.17 Provide the design requirements for the resin retention screens and Johnson screens in the CVCS coolant purification system mixed-bed, and cation-bed demineralizers. Delineate the differential pressure requirements for the fully clogged retention screen. Describe the precautions and plans for clean-up, should resins be released through the retention screen and require the filter down-stream to function as a retention screen.

9.18 Provide the design considerations to facilitate CVCS filter removal, minimizing personnel exposure and simplifying transfer of handling.

9.19 Provide a process and instrumentation diagram of the gas-stripper boric acid evaporator package. Provide component design data for the instrumentation, components, and controls. Describe the design and operation including handling of concentrated boric acid, liquid waste, and solids.

9.20 Describe the method provided to maintain heat in close tolerance areas of the canned rotor type boric acid transfer pumps to prevent saturated (cold) boric acid binding.

9.21 Describe the meaning of the 2,000 thermal step change design criteria for the CVCS excess letdown heat exchanger. Define the term step change, and explain the design considerations to minimize the effect of this service condition. Explain the in-service inspection methods planned to verify equipment condition.

9.22 Provide an evaluation of the consequences of CVCS mixed-bed demineralizer shell failure occurring prior to flushing and recharging. Assume the most contaminated unit under normal operating conditions yet within the technical specifications. Describe the methods for draining liquids, collecting resins, and minimizing personnel exposure.

9.23 Explain and provide examples to clarify the statement on the Component Cooling Loop (CCL) that, "The loop design precludes any significant reduction in the overall design reactor shutdown margin when the loop is brought into operation for decay heat removal or for emergency core cooling by recirculation." (FSAR Page 9.3-2).

9.24 Provide on a P&ID those systems and components which have a designated emergency function and are a part of the CCL.

9.25 There is carbon steel material, austenitic stainless steel and other equivalent corrosion resistant material found in the CCL. Describe the corrosion inhibitors for the closed circuit water, the provisions taken against galvanic action, the pH control, and provision for clean-up, should a heat exchanger leak radioactive fluid into the system.

9.26 Discuss the reasoning why the CCL pumps are not listed as essential electrical loads, following a simultaneous incident and loss-of-offsite power.

9.27 Explain how Coolant Sampling System operations can be accomplished in the event of failure of the air supply to the diaphragm operated sampling valves inside the containment (Figure 9.4-1).

9.28 Discuss whether the Fuel Handling System (FHS) conforms to the recommendations of AEC Safety Guide 13, Fuel Handling Facility Design Basis, and provide a basis regarding the acceptability of the design.

9.29 Provide the two designs for the FHS new and spent fuel storage rack details which assures that the proper fuel can only be inserted in the proper rack. Are both racks designed to Category I seismic conditions?

9.30 Describe the modes of failure considered in the design of the spent fuel cask crane and containment crane such as breaking of cables, lifting slings, sheared shafts, keys and stripped gear teeth and brake failures. Also discuss the limitations and control that will exist in handling objects over an opened reactor vessel.

9.31 Provide a drawing and detailed description of the restraints between FHS handling cranes, bridge and trolley structures, and their respective rails.

9.32 Give examples of the FHS statement (FSAR Page 9.5-11) that it will be impossible to carry any object over the spent fuel storage area with either the 40 ton or 5 ton hook of the fuel storage building crane.

9.33 Describe the applicable codes and standards used in the design, fabrication, installation, and testing of the FHS crane, rails, supporting structures, bridge, trolley, hoists, cables, lifting hooks, special handling fixtures and slings. List the design load rating, preoperational test load, maximum operating loads and test loads that will be used throughout the life of the facility. Is this equipment designed to Category I seismic conditions?

9.34 Assuming the maximum drop height, discuss, with the aid of drawings where appropriate, the consequences of dropping,

a) the reactor vessel head into an opened reactor vessel, and

b) the plenum or upper core barrel assembly into an opened reactor vessel.

9.35 Provide a heat balance diagram of the normal and emergency load requirements on the Service Water System (SWS).

9.36 Evaluate the SWS design with AEC Safety Guide No. 27, Ultimate Heat Sink. Point out areas of agreement with the guide, and in the case of differences, provide the basis regarding acceptability of the present design.

9.37 Provide specific reference to the applicable codes and standards to which the Fire Protection System (FPS) has been designed.

9.38 Describe the FPS detection features provided for the control room, the area below the operating level of the turbine-generator and the facility ventilation systems. Describe the fire extinguishment methods used in the relay room, cable spreading room, and for cable tray runs.

9.39 Describe the FPS construction features, i.e., fire barrier walls, automatic fire doors, noncombustible material, spatial separation, that have been used to minimize the potential for fires.

9.40 Discuss the accessibility, with respect to radiation, toxic combustion products, etc., of all areas which rely on manual fire protection, and identify these areas.

9.41 Discuss the design considerations that were evaluated for extending the FPS for Unit 1 to Unit 3, and include a single failure analysis for this system.

9.42 Describe the basis of the sizing of the two 1500 gpm FPS pumps with respect to supplying the maximum sprinkler/deluge demand plus simultaneous hose and hydrant demands. Also specify the operating pressure of the fire pumps.

9.43 Specify the distance between the FPS yard hydrants servicing Unit 3.

9.44 Describe how the design of the FPS assures that the normal or accidental operation of the system does not cause an unsafe condition (i.e., flooding of safety related equipment).

9.45 Describe the capability of the facility drainage system to control and store FPS sprinkler/deluge output which may become radioactively contaminated.

9.46 For all tanks that contain gas under pressure, i.e., nitrogen, hydrogen, oxygen, air, and carbon dioxide, provide the following: a) the design and operating pressure, b) the maximum pressure of the gas supply, c) the location of the tank, d) the maximum total energy released if the tank should rupture, e) the possibility of the tank or parts of the tank to act as a missile, f) the protective measures taken to prevent a tank failure, and g) the protective measures taken to prevent the loss of function of adjacent equipment essential for a safe and maintained reactor shutdown.

9.47 Provide a process and instrumentation diagram showing isolation, interlock, and emergency provisions, for the Compressed Air System (CAS).

9.48 Provide a summary of CAS component design and operation data.

9.49 Delineate the systems essential to plant safety serviced by the CAS instrument air and service air system. Provide a failure mode and effects analysis on essential system performance.

9.50 Provide a process and instrumentation diagram of the Heating System (HS) showing all package boilers serving the common system (Indian Point Units 1, 2, and 3). The diagram should have the steam loads delineated as well as the fuel, fuel supply, a location of the fuel tanks, and their cross connections.

9.51 Delineate alternate HS steam circuits available to preclude the consequences of failure of the one circuit.

9.52 Determine the mean low winter temperature expected to exist inside the Diesel Generator Building with and without the Heating System in service. Describe means, if necessary, to avoid freezing of the jacket cooling water, and delineate the engine capability to start within the time required at the temperatures expected.

9.53 Provide a process and instrumentation diagram showing method of shut-off, fire protection provisions, filters, and capability to meet single failure criteria for the Primary Auxiliary Building Ventilation System (PABVS).

9.54 Provide component design and operation data for the roughing filters and HEPA filters in the PABVS.

9.55 Provide a process and instrumentation diagram showing method of shut-off, fire protection provisions, filters, and the capability to meet the accident condition (FSAR Page 9.9.1-3) for the Control Room Air Conditioning, Heating and Ventilation System.

10.0 STEAM AND POWER CONVERSION SYSTEM

10.6 Provide process and instrumentation diagrams for the following systems:

a. Main, Reheat, and Turbine Bypass Steam System

b. Main Feed and Condensate Return System

c. Bleed Steam and Heater Drains

d. Auxiliary Steam and Heating System

e. Site Boiler Steam Distribution System

f. Condenser Air Removal and Gland Steam and Exhauster System

g. Circulating Water System

h. Turbine Auxiliaries Cooling System

i. Demineralized Water and Chemical Treatment System

j. Auxiliary Feedwater System

10.7 Clarify if the condenser system is designed to accept 50 percent of full steam flow through the turbine simultaneous with the remaining 50 percent of full steam flow passing through the steam bypass valves.

10.8 Clarify (Page 10.1-2) what is meant by the term, "condenser isolation." What heat removal capability is available during this abnormal condition?

10.9 Provide the conditions determining availability of the main condenser to accept steam from the steam bypass valves. Delineate the signals, alarm points and automatic actions, which permit discharge of steam through the steam bypass valves, or through the power operated relief and code safety valves, or from one or all means simultaneously. Provide a discussion of the safety significance of the alternate methods and their combined use.

10.10 Clarify whether the local manually operated isolation valves provided at each turbine steam bypass control valve are normally open or normally closed. Describe the logic of the normal valve position.

10.11 Describe the design basis for four power operated relief valves, their relieving capacity, and the twenty code safety valves, and their relieving capacity. Describe their manifolding, and the effect of reaction forces should all relieve simultaneously.

10.12 Provide an evaluation of the consequences of the reactor system transient expected to occur assuming that all power operated relief valves fail to open.

10.13 Provide a description of tests on the free swinging disc steam line isolation valves, and on the flow rate venturi intended to limit steam line blowdown following a steam line rupture. Provide a diagram and explain how reverse flow of steam closes the non-return valve. List set-points and differential pressures. Evaluate the possibility and consequences of valve closure caused by an abnormal operational event causing pressure reduction rather than an accident-caused condition.

10.14 Describe the bases for the steam generator stop check valve and the steam generator check valve design leakage rates and the acceptance criteria for shop and in-plant tests. Indicate the in-plant testing frequency.

10.15 Describe, with the aid of drawings, the bulk hydrogen storage facility including its location and distribution system. Include the protective measures to prevent fires and explosions during operations such as purging the generator, as well as during normal operation.

10.16 Provide a description and operating information for the air ejector exhaust monitoring system. Discuss the diversion scheme where air ejector exhaust is automatically diverted to the containment. With the aid of drawings, discuss the measures provided to prevent, a) pressurizing the containment, and b) continued release to the atmosphere on failure of equipment intended to divert the gases to the containment.

10.17 Provide your plans regarding the in-service inspections planned for the high pressure-high temperature piping, valves, pumps, and heat exchangers in the main steam and feedwater systems. Identify the program for what is to be inspected, the method of inspection, test, and/or nondestructive examination, and the frequency of in-service inspection.

10.18 Provide your plans regarding the in-service inspection program for the turbine-generator. Identify the program for what is to be inspected, the method of inspection, test, and nondestructive examination. Delineate the frequency (maximum-minimum) of in-service inspection. As a part of the overall program to be provided, the following information is required to assure that thorough precautionary steps will be taken to detect impending failures before they occur. For the last stage low pressure turbine wheels, describe the calculated crack size, and its location and orientation as well as its rate of growth just before attaining critical crack size. Discuss the methods that will be employed to detect these cracks and the frequency and sensitivity of the in-service inspections using these techniques.