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

JAN 1 8 1973

Docket No. 50-346

The Toledo Edison Company
ATTN: Mr. Glenn J. Sampson
Vice President, Power
Edison Plaza
300 Madison Avenue
Toledo, Ohio 43652

Gentlemen:

In accordance with the Commission's regulations (Section 2.101 of 10 CFR Part 2) we have conducted a preliminary review of your tendered application for an operating license for the Davis-Besse Nuclear Generating Station, Unit 1. We conclude that the application is not sufficiently complete for us to initiate our detailed review. This conclusion is due to the deficiencies in the Final Safety Analysis Report.

We have determined that the FSAR is inadequate principally in the following areas: (1) the radiological dose mitigation aspects of the containment spray system, and (2) the capability of the ultimate heat sink during severe natural phenomena. We have summarized the major deficiencies in Enclosure 1 and have identified by an asterisk those items for which further information will be required prior to acceptance of your application. Also listed in Enclosure 1 are comments relative to technical adequacy which came to our attention during the preliminary review. Those items in Enclosure 1 not identified with an asterisk may be addressed in a reasonable time period.

It should be noted that some information requested in Enclosure 1 is material identified in Revision 1 of the "Standard Format and Contents of Safety Analysis Reports for Nuclear Power Plants" released November 21, 1972. This information was not available to you at the time of the preparation of the FSAR and it was not used as a basis for performing the completeness review of your application. However, as identified in Enclosure 1 this information should be submitted on a timely basis for our consideration in the early stages of our review process.

We have determined that the Environmental Report - Operating License Stage is acceptable. It is noted that Section 16 of the FSAR does not contain non-radiological technical specifications. Approved environmental technical specifications will be required prior to issuance of an operating license for the Davis-Besse plant.

We request that you inform us of the action you propose to take to correct the deficiencies and to indicate the time when your proposed action will be completed so that we may make preliminary plans for scheduling the review of your application. We will review for completeness the additional information which you submit to correct the deficiencies in the FSAR prior to accepting your application for detailed review.

Arrangements will be made with representatives of your company for a meeting at our offices to discuss the results of our preliminary review and the enclosed comments.

Please contact us if you desire any further discussion or clarification of the results of our review.

Sincerely,

A. Giambusso

A. Giambusso, Deputy Director for Reactor Projects
Directorate of Licensing

Enclosure:
List of FSAR Deficiencies and Comments

cc: Leslie Henry, Esquire
Fuller, Henry, Hodge & Snyder
300 Madison Avenue, 12th Floor
Toledo, Ohio 43652

Gerald Charnoff, Esquire
Shaw, Pittman, Potts & Trowbridge
910 - 17th Street, N.W.
Washington, D. C. 20006

Donald H. Hauser, Esquire
The Cleveland Electric Illuminating Company
Post Office Box 5000, Room 610
Cleveland, Ohio 44101

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ENCLOSURE I

DAVIS-BESSE NUCLEAR POWER STATION

LIST OF FSAR DEFICIENCIES AND COMMENTS

2.0 SITE CHARACTERISTICS

2.3 With respect to meteorology, provide the following information:

1. A table of annual average atmospheric dispersion ($\bar{X}/Q$) estimates for 16 radial sectors to a distance of 50 miles from the plant.

2. Evidence that the accuracy of the meteorological measurement equipment to be used in the operational onsite measurement program, especially with respect to the dewpoint measurement, meet the accuracy criteria recommended in Safety Guide 23.

3. A copy of the study of the potential effects of the cooling towers on the environment that is mentioned in Section 2.3.2.3 of the FSAR.

4. A full year of onsite temperature and humidity data with a joint data recovery rate of at least 90 percent as soon as such data become available.

5. In Section 2.3.1.2.8 of the FSAR, the applicant states that high air pollution potential (atmospheric stagnation) conditions occur 20 to 30 percent of the time at the plant site. It is believed by the staff that these values must be in error. Verify the accuracy of this statement.

6. Section 2.3.1 of the FSAR, regional Meteorology, should be titled "Regional Climatology."

2.4.1* Describe site drainage facilities, including the roofs of safety-related structures.

2.4.2.1 Describe the unusual meteorology, surge and waves which occurred in the region in the fall of 1972.

2.4.2.2* Provide the bases for (a) site drainage, including the roofs of safety-related buildings, against heavy rainfall, and (b) the intake canal side slopes, intake, and both sides of the end structure to resist wave action.

* Provide a description of the canal and its terminal structures (profiles and cross sections).

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2.4.3* Provide additional bases for concluding a Probable Maximum Flood on the Toussaint River does not constitute a flood threat to the plant.

* Provide probable maximum rainfall estimates for site drainage and an analysis which demonstrates that overflow (including roof drains of safety-related buildings) will not constitute a flood threat.

2.4.5 Compare the postulated probable maximum meteorological event with the 1972 seiche-causing storm to determine whether the probable maximum event is adequate as an upper limit.

Verify the probable maximum surge model by reconstituting the 1972 surge.

Provide the bases for the wave estimates, including the components attributable to wave action refracted and reflected from and through offshore islands.

Provide estimates of wave action on the lakeside of the intake canal terminal structure and along the intake canal and discuss the potential for wave-induced resonance in the intake canal. (Cross reference Sections 2.4.2.2 and 2.4.8.)

2.4.11* Demonstrate the heat dissipation and inventory capability of the intake canal under the postulated low water surge conditions discussed in Section 2.4.11.6.

* Discuss hydraulic short-circuiting potential under this condition, and under any other postulated condition requiring the use of the canal for total or parital recirculation. Describe the intake and discharge facilities along the canal for this mode of operation.

* Compare postulated environmental conditions with the guidelines suggested in Safety Guide 27, or appropriately cross reference other sections of the FSAR containing such material.

2.4.12 Describe the range of anticipated dilution for normal and inadvertant release to the lake and local public water supplies to adjacent ground water users by direct subsurface movement and by lake recharge of adjacent aquifers.

2.4.13 Provide estima[illegible] [illegible]ficial soil permeabilities in the plant site area and [illegible] lake front near well users.

2.4.14 Because the cooling tower and portions of the water supply system may not be capable of withstanding extremely adverse hydrologically-related events, provide tech specs which assure a cold shutdown in advance of the occurrence of events which could cause the loss of safety systems, or portions thereof, required for operation.

3.0 DESIGN CRITERIA - STRUCTURES, COMPONENTS, EQUIPMENT AND SYSTEMS

3.4 The type or means to accomplish flood protection for Category I safety related equipment and structure access openings located below flow elevation should be provided.

3.8.1 Provide the following information:

1. The design bases for structures other than containment.

2. An evaluation of the effects of an accidental drop of a fuel cask on the spent fuel pool.

6.0 ENGINEERED SAFETY FEATURES

6.2.3* In Sections 15.4.6.3 and 15.4.6.4 of the FSAR, a DRF of 1.7 for 0-2 hours, and 3.6 for 0-30 days is claimed for the iodine cleanup effect of the boric acid spray system. However, these paragraphs are the only places where the iodine removal function of the containment spray system is referenced. Provide the following information:

A description of the iodine removal function of the Containment Spray System

The design basis for the iodine removal function

The system design as affected by the iodine removal function

An evaluation of iodine removal function of the spray system. Specific attention should be given to the evaluation of the effects of spray solution chemistry, drop size spectrum, drop coalescence, steam condensation, drop saturation, iodine partition coefficient, containment coverage, unsprayed volumes, wall effects and mixing in the sump.

Sections 6.2.3.4, 6.2.3.5 and 6.2.3.6 may be covered by reference to previous sections supplied describing the heat removal function of the containment spray system.

6.2.3.2 Provide preliminary piping and instrumentation diagrams of the ventilation and other cleanup systems.

Where building recirculation systems are provided include a discussion of the mode(s) of operation and mixing behavior in the system description. Layout drawings of system equipment and air flow guidance ducts should be provided. Provide the expected initial and final exhaust flow rates and the rate of change between initial and final flow rates, the recirculation rate, and the mixing volume.

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A safety guide on air cleaning systems is being developed currently. Upon publication you should review the material in regard to system components, specifically demisters, heaters, and HEPA filters, downstream of the adsorption unit.

List by type (epoxy, phenolic, zinc, etc.) and manufacturer's designation all known paints used in the containment. In addition list the dry density and surface area covered by each paint. List the total surface area and estimated volume covered by unknown paints. Explicitly state the curing procedures applied or to be applied for each paint. A quality assurance program for paint applications should be detailed in Chapter 17.

Insufficient details and design criteria of the reactor building sump and its intake screens are given. Construction and layout details of the containment sump should include:

1. The degree to which the concept has been or will be verified by experience, tests under simulated accident conditions, or conservative extrapolations from present knowledge.

2. A description of system functions during the entire period required to accomplish the intended purpose (include consideration of component reliability, system interdependency, redundancy and separation of components or portions of the system).

3. Provisions for initial and periodic testing and surveillance.

4. An analysis of the containment sump which describes the flow path and restrictions (including sizes) which a particle would follow in circulating through the different systems which must use the sump as a source.

5. An analysis describing the eventual fate of paint chips or other debris which may enter the sump.

A boric acid spray is used in the plant. Discuss the ability to raise the pH of the spray solution to at least 7 within four hours of the onset of a LOCA to preclude stress corrosion cracking.

6.2.3.4 Provide information concerning the preoperational testing and inservice surveillance program to assure a continued state of readiness to perform for those ventilation and cleanup systems required to reduce the radiological consequences of an accident. Results of tests performed and a detailed, updated program should be provided.

9.0 AUXILIARY SYSTEMS

9.1 Expand the discussion of the design loadings to be withstood by the new and spent fuel storage racks to include crane uplift forces.

Clearly state the seismic design classification of the new fuel storage vault and racks.

Discuss in detail the seismic Class I makeup source to the spent fuel pool (refer to AEC Safety Guide No. 13).

Provide drawings of major components of the fuel handling systems.

9.2* An itemized comparison of the degree of compliance of the design of the ultimate heat sink with the contents of AEC's Safety Guide No. 27 should be provided. Areas of nonconformance should be justified.

9.4 Provide a single failure analysis for all ventilation and air conditioning systems required to function under accident conditions including natural phenomena.

9.4.1 Supply the same information for the control room filtration system as is supplied for the containment air purification and cleanup systems of Section 6.2.3 of the FSAR. Discuss the strategies used to operate the control room ventilation system under all emergency conditions.

9.5.4 The degree of compliance with IEEE-308 with respect to fuel storage capacity should be provided (specifically the seismic classification of the diesel oil storage tank).

11.0 RADIOACTIVE WASTE MANAGEMENT

11.2.6 Present a map illustrating the location of Ohio Fishing District 1 with respect to the discharge canal.

Provide the basis for the statement that a dilution factor of 5000 is conservative.

The text indicates that the dilution factor is 4070 at 8.6 miles--justify the value of 5000 at 5 miles.

11.6.3 Prepare a suitable map showing the site boundary and the location of all sampling points, and indicate either in a table or on the map the types of samples to be taken at each point as well as the sampling frequency. Provide justification of the selection of sampling locations.

Describe the methods by which pulses of radioactivity, with half lives short in comparison to the sampling frequency, will be detected in the environment--for example, milk samples and I-131.

Indicate the [illegible] information on a map of suitable scale (the map showing the [illegible] locations would be acceptable): (a) the location of the nearest residences (within 3 miles) outside the site boundary, (b) the location of the nearest cows, and (c) the location of the nearest possible pasture.

11 A Present the models for the dose calculation to biota.

12.0 RADIATION PROTECTION

12.1.4 Describe the records of inplant area radiation levels that will be maintained and the length of time they will be retained.

12.1.6 Provide estimates of typical yearly external dose rates to plant personnel for normal operation. These estimates can be obtained by supplying the length of time (hrs/wk) personnel are expected to spend in the areas listed in Table 12-5A.

12.2.4 Describe the records of in-plant airborne radioactivity levels that will be maintained and the length of time they will be retained.

12.2.6 Provide estimates of typical yearly inhalation dose to plant personnel for normal operation.

12.3.1 Provide a description of the health physics program organization and the duties of individuals within the organization.

12.3.2.1 Indicate the personnel responsible for issuing radiation work permits and the information necessary for their issuance.

13.0 CONDUCT OF OPERATIONS

13.1.3.2 Resumes are needed for the fifth Shift Foreman and for the Assistant Engineer (Nuclear). The training program for the foreman designee, if different from that listed in Table 13-1, should be provided so that his eligibility for a "cold" examination can be determined.

13.2.4 The retention of records of unlicensed personnel is not addressed.

13.3 The Emergency Plan should be submitted as a separate document with table of contents and appendices (an appendix to FSAR Section 13 is acceptable).

13.3.2.4 Provide copies of written agreements as appendices to the Plan. Have written agreements been concluded with all offsite organizations who will provide emergency assistance to the Station?

13.3.3 Define "regularly" with respect to the testing of communication systems.

13.3.4 Are categories [illegible] "incidents involving abnormal radiation levels" defined in terms of local, Site, and General Emergencies?

13.3.5 Provide numerical values for the action levels listed. Elaborate on the immediate response by the Shift Foreman to local, Site and General Emergencies. Are offsite support groups alerted when a Site Emergency is declared?

13.3.8 Define "periodic" in relation to the review, and the audit of the Plan.

13.3.10 Who provides the emergency transportation of radiation accident victims?

13.7 An Industrial Security Plan should be submitted as a proprietary document, using as guidance Safety Guide 17, "Protection Against Industrial Sabotage," and Proposed Standard ANS-3.3 (Draft No. 4, November 6, 1972), Industrial Security for Nuclear Power Plants.

14.0 INITIAL TESTS AND OPERATION

14.1 Provide a chronological schedule showing the test sequence for both the preoperational tests and the startup and power ascension tests.

14.2 Will the Test Coordinators augment the station staff on shift during the period from fuel loading through commercial operation? If so, provide resumes. If not, what provisions have been made to augment the operating shift crews?

15.0 ACCIDENT ANALYSIS

15.1* The following required information is missing in its entirety. Provide:

1. Estimated course of events, as related to actuation of the containment cleanup function of the spray system.

2. Mathematical model employed to perform the analysis of iodine removal by spray, and the resulting dose reduction factor.

3. Identification of any computer programs used in the analysis.

4. Fission product concentrations in the containment atmosphere and the sump solution (as a function of time) used in the spray iodine removal analysis, particularly their effect on the iodine partition coefficient.

5. Justification of assumptions used with reference to experimental data.

6. System interdependency, particularly the interdependency of containment spray and filtration systems on the dose reduction factor claimed for each system.

7. Results of the analysis of iodine removal by sprays, and the margin of protection provided.

15.3.1 Provide discussions of the method of small leak detection and the time required to evaluate the occurrence and isolate the system or take other remedial action.

15.4.2.2 Evaluate a steam generator tube rupture which results in a leak equal to the primary feedwater makeup capability. Discuss how this event will be detected.

Table 15.4.6-3 summarizes operator exposure during a MHA. The assumptions used in arriving at these exposures are not given. Provide the following information concerning control room protection:

1. An analyses of the thyroid, beta skin, and whole body gamma doses received by control room operators during accident situations. The dose contribution from each separate source of radioactivity should be tabulated. When evaluating the effectiveness of the control room protection features, all types of accidents should be considered; however, only the limiting accidents need be analyzed in detail. As a minimum, calculate the doses received by the control room operator from a loss-of-coolant accident, a fuel handling accident and a waste gas decay tank accident. Clearly describe or reference the method used to calculate the doses.

2. A complete list of assumptions and input data, including:

   (a) The source terms used for each point of release. Consider all potential sources of radioactivity including containment leakage, exfiltration if any, vent releases, penetration leakage and activity which may be transferred directly to the control room from the radwaste and turbine buildings and from other portions of the control building. (See item c.)

   (b) The distances between the points of radioactivity release for each design basis accident and the air intake to the control room.

   (c) An evaluation of the potential for radioactive material, noxious gases, or steam to be transferred directly into the control room from adjacent areas and buildings. This should include a description of all potential paths for transport such as the duct work, corridors, doorways, elevator shafts, etc.

   (d) The [illegible] factors between the release points and the control room air intake (or other appropriate opening). Assumptions as to wind speed and exposure frequency during the course of the accident should be clearly stated. Provide technical references and/or experimental data to justify the factors used in your analysis.

3. Identify toxic material, such as chlorine, that may be stored on or in the vicinity of the site, which, assuming a container rupture, may interfere with control room operation. List the distances between the location of any such material and the air intake to the control room. Provide an analysis of the severity of such accidents, and discuss the steps to mitigate their consequences. The description of the analysis should clearly list all assumptions.