Docket Files

June 1, 1972

SUMMARY STATEMENT

BY THE

DIRECTORATE OF LICENSING

U. S. ATOMIC ENERGY COMMISSION

IN THE MATTER OF

THE CINCINNATI GAS AND ELECTRIC COMPANY

COLUMBUS & SOUTHERN OHIO ELECTRIC COMPANY

DAYTON POWER AND LIGHT COMPANY

WILLIAM H. ZIMMER NUCLEAR POWER STATION

UNIT NO. 1

DOCKET NO. 50-358

On April 6, 1970, The Cincinnati Gas and Electric Company (CG&E), Columbus and Southern Ohio Electric Company (C&SOE), and The Dayton Power and Light Company (DPL), the applicants, filed an application for licenses required for the construction and operation of the proposed Wm. H. Zimmer Nuclear Power Station. The Zimmer station will consist of a single-cycle, forced circulation, boiling water reactor unit, constructed near Moscow, Clermont County, Ohio, 25 miles southeast of Cincinnati, on the Ohio River. The Cincinnati Gas and Electric Company (CG&E) is responsible for the design, construction and operation of the Zimmer plant and is also authorized to act as agent for C&SOE and DPL in all details of construction, including licensing.

When filed with the Commission, the application for the Wm. H. Zimmer Nuclear Power Station, Unit 1, was assigned to the Division of Reactor Licensing which had the responsibility for the safety review and evaluation of applications for construction permits and operating licenses.

During the period since April 6, 1970, the regulatory staff of the Commission has been conducting a technical review and evaluation of the safety of this proposed facility using standards and criteria approved by the Commission. In the course of this review, we have held many meetings with representatives of the applicant and its principal contractor, the General Electric Company, to discuss safety-related aspects of plant design. To this date an estimated 1004 man-days of technical effort have been expended in conducting the review of the Zimmer Nuclear Power Station.

containment design utilizes the over-under vapor suppression concept wherein the drywell is a prestressed concrete steel-lined frustum of a cone and the wetwell or vapor suppression chamber is a right circular cylinder, steel-lined prestressed concrete structure that is located directly beneath the drywell. A secondary containment, the reactor building, is a reinforced concrete structure completely enclosing the primary containment, thereby providing an additional barrier to the release of air-borne radioactive materials.

The waste gases from the main steam condensers and from other sources will be processed in a cryogenic system or ambient-temperature, charcoal bed system for removal and hold-up of radioactive gases. The liquid or liquid entrained radioactive materials normally will be collected and processed in the liquid waste disposal system. The design objective of the gaseous and liquid radwaste systems is to reduce radioactivity concentrations such that the annual average concentrations for routine discharges will be less than 1% of 10 CFR Part 20 limits.

The William H. Zimmer Nuclear Power Station is being designed and will be constructed to be safe under all operating conditions including startup, power generation, power load changes, shutdown, and refueling. In its review the staff has considered a number of postulated accidents, including the loss-of-coolant accident (LOCA). The staff has concluded that the engineered safety features as provided are adequate. We have considered the radiological effects on the environment and conclude that the offsite radiation exposure levels resulting from the postulated accidents are well within established guideline values of 10 CFR Part 100.

All applications for authority to construct nuclear power plants, including the proposed Wm. H. Zimmer Nuclear Power Station, are reviewed by the Commission's Advisory Committee on Reactor Safeguards (ACRS). The ACRS makes an independent review of the safety of the proposed facility and advises the Atomic Energy Commission on the results of its review. Accordingly, the ACRS has reviewed the application. In its letter of September 17, 1971, to the Chairman, USAEC, regarding the application, the ACRS made several comments and recommendations with respect to various technical features of the proposed facility. We have considered each of these as discussed in detail in our Safety Evaluation. The ACRS letter concludes:

> "The Committee believes that the items mentioned above can be resolved during construction and that, if due consideration is given to these items, the Wm. H. Zimmer Nuclear Power Station, Unit No. 1 can be constructed with reasonable assurance that it can be operated without undue risk to the health and safety of the public."

The construction permit sought for this facility is the first step in the Commission's regulatory process which will continue throughout the lifetime of the plant. Reviews and evaluations of certain facility design aspects as discussed in our Safety Evaluation will be performed by the regulatory staff during construction. The Directorate of Regulatory Operations will conduct periodic inspections during construction in order to determine that all of the Commission's safety requirements have been satisfied. The final design and safety analysis information to be filed by the applicant for the operating license will be thoroughly evaluated by the regulatory staff, its consultants, and the Advisory Committee on Reactor Safeguards in a manner similar to the review process at this, the

CONSTRUCTION PERMIT REVIEW

SIGNIFICANT ADDITIONS, CHANGES, AND MODIFICATIONS

1. A Reactor Building Recirculation System (RBRS) was added to assure adequate recirculation and mixing of the atmosphere in the reactor building following an accident.
2. A sealing system was added to the main steamline isolation system to preclude placing complete reliance on the low leakage characteristics of the main steamline isolation valves.
3. The portion of the main steamlines containing the main steamline isolation valves will be enclosed in a tunnel chamber connected to the reactor building so that any out-leakage after a loss-of-coolant (LOCA) accident is treated by the SGTS prior to release to the environment.
4. The entire length of the main steamline up to and including the turbine stop valve, and all branch lines 2-1/2 inches in diameter and larger up to and including the first valve, will be designed to Class I (seismic) standards.
5. The main steamlines from the outermost isolation valve to the turbine stop valve will be designed, fabricated, and inspected in accordance with the requirements for AEC quality Classification Group D plus supplemental nondestructive examination of the pipe welds.
6. An improved radwaste system for treatment of gaseous wastes will be provided to limit radioactivity releases to the environment to levels that are as low as practicable. The system

11. The high pressure core spray pumps will be selected to satisfy requirements for both the high pressure and low flow rate for small breaks, and low pressure and high flow rate for the large breaks.

12. The point of injection of water to the reactor pressure vessel by means of the low pressure coolant injection (LPCI) system will be designed to provide coolant flow to the inside of the core shroud through three separate vessel penetrations, rather than through the recirculation lines.

13. Instrument lines that penetrate the primary containment will be designed in accordance with Safety Guide 11 including the use of orifices inside containment to limit the potential off-site dose in the event a line break occurs.

14. A hydrogen concentration control system using the AEC Safety Guide 7 as a basis for design, will be added to limit the concentration of hydrogen in the primary containment following a LOCA. The applicant will make provisions for inerting the containment atmosphere during reactor operation.

15. The applicant will add design features that will make tolerable the consequences of failure of the control rods to scram the reactor during anticipated transients.

16. The applicant revised the design of the spent fuel pool and overhead crane facilities to comply with AEC Safety Guide 13. The facilities will provide for a separate and adjacent pool for

22. The applicant will analyze the movement of pipes due to postulated ruptures to determine the requirement for restraints or other motion limiting devices, placement of barriers, and/or physical separation between redundant components to prevent the breaching of the primary containment or loss of emergency core cooling capability.

23. An improved leak detection system will be added to better enable the plant operator to ascertain continuously the integrity of the reactor coolant pressure boundary within the primary containment.

24. The applicant will determine and incorporate the design changes necessary to preclude adverse effects on the primary containment and core cooling capability in the event of a recirculation pump-motor seisure.

25. The instrumentation and control system will be modified to provide annunciation in the control room so that it is immediately obvious to the reactor operator that an engineered safety feature has been bypassed or that a reduction in system redundancy has been effected.

26. Redundant instrumentation with appropriate readout will be added to permit the operator in the control room to be adequately informed concerning conditions within the primary containment in the event of an accident.

33. The applicant applied the AEC code classification groups for the reactor coolant pressure boundary and components in systems important to safety outside the reactor coolant pressure boundary.

34. Compartmentalization of the service water system pumps and core standby cooling systems pumps will be provided to minimize the potential for loss of equipment due to flooding and missiles.

35. The drywell deck was designed to minimize the probability of bypass leakage from the drywell to the suppression chamber and will provide the capability for periodic testing for this bypass leakage.