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

SOUTHERN CALIFORNIA EDISON COMPANY AND

SAN DIEGO GAS AND ELECTRIC COMPANY

DOCKET NO. 50-206

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO PROVISIONAL OPERATING LICENSE

Amendment No. 72
License No. DPR-13

1. The Nuclear Regulatory Commission (the Commission) has found that:

A. The application for amendment by Southern California Edison Company and San Diego Gas and Electric Company (the licensees) dated August 10, 1983 complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public; and (ii) that such activities will be conducted in compliance with the Commission's regulations;

D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 3.B of Provisional Operating License No. DPR-13 is hereby amended to read as follows:

   B. Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 72 , are hereby incorporated in the license. Southern California Edison Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Dennis M. Crutchfield
Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 17, 1984

ATTACHMENT TO LICENSE AMENDMENT NO. 72

PROVISIONAL OPERATING LICENSE NO. DPR-13

DOCKET NO. 50-206

Revise Appendix A Technical Specifications and Bases by removing the following pages and by inserting the enclosed pages. The revised pages contain the captioned amendment number and marginal lines indicating the area of change.

| Remove Pages | Insert Pages |
|---|---|
| 33m | 33m |
| 61 | 61 |
| 62 | 62 |
| 63 | 63 |
| 64 | 64 |
| 65 | 65 |
| 65a | -- |
| 66 | 66 |
| 66a | 66a* |
| -- | 66b |

* This page is included for pagination purposes.

## TABLE 3.5.5-2

## CONTAINMENT ISOLATION INSTRUMENTATION TRIP SET POINTS

| FUNCTIONAL UNIT | TRIP SETPOINT | ALLOWABLE VALUES |
|---|---|---|
| **Containment Isolation** | | |
| a) Manual | Not Applicable | Not Applicable |
| b) Containment Pressure-High | ≤1.4 psig | ≤2.0 psig |
| c) Sequencer Subchannels | Not Applicable | Not Applicable |
| d) Safety Injection | | |
| 1) Containment Pressure-High | ≤1.4 psig | ≤2.0 psig |
| 2) Pressurizer Pressure-Low | ≥1735 psig | ≥1675 psig |
| **Purge and Exhaust Isolation** | | |
| a) Manual | Not Applicable | Not Applicable |
| b) Containment Radioactivity-High | ≤2 x Background | ≤2.5 x Background |

## 5.1 SITE DESCRIPTION

The San Onofre Nuclear Generating Station is located on the West Coast of Southern California in San Diego County, about 62 miles southeast of Los Angeles and about 51 miles northwest of San Diego. The site is located within the U.S. Marine Corps Base, Camp Pendleton, California. The minimum distance to the boundary of the exclusion area as defined in 10 CFR 100.3 shall be 283.5 meters from the outer edge of the Unit 1 containment sphere. For the purpose of dose assessment, a slightly reduced distance of 282 meters defined by the discontinuous line in Figure 5.1.1 is assumed.

Basis: Leasing arrangements with the U.S. Marine Corps provide that a minimum distance to the exclusion boundary will be 283.5 meters. All dose assessments are calculated assuming 282 meters.

## 5.2 CONTAINMENT

The containment vessel shall be a steel sphere having a free internal volume of approximately $1.2 \times 10^6$ cubic feet. Above grade, the sphere shall not be insulated and shall be protected from the environment with suitable paint. (The facility was later modified by adding a Sphere Enclosure Building around the containment. For details of this modification, see Reference (1).) The containment vessel is capable of withstanding a maximum internal pressure of 53.3 psig, a temperature of 391.5°F, and an internal vacuum of 2.0 psig.

The materials used in the containment sphere and its penetrations shall have a maximum NDT of -20°F.

Penetrations added to the containment shall be designed in accordance with Section 5.3.6 of the Final Engineering Report and Safety Analysis for the appropriate class of penetration. Piping passing through such penetrations shall have isolation valves as follows:

A. Lines which penetrate the containment sphere and normally carry radioactive fluids shall have two valves in series, one of which will be located within the containment and the other outside the containment shell. These valves shall be remotely operated whenever necessary to prevent outward flow in the event of an accident. Incoming lines will be provided with a check valve inside the vapor container and will be either backed up with a closed piping system outside the vapor container or by a remotely operated valve, if necessary.

B. Lines which penetrate the sphere and open to the free volume of the sphere have two valves in series to prevent outward flow in the event of an accident. One valve closes automatically, the other can be closed from the main control room.

C. Lines which penetrate the sphere and open to the turbine cycle are equipped with one isolation valve. In the main steam lines, the turbine stop valves serve this purpose.

D. Lines which penetrate to the free volume of the sphere but which are normally closed during operation of the reactor are equipped with a single isolation valve. Depending on the service, a lock, interlock, or operating procedures ensure that these valves are closed whenever containment is required. The ventilation penetrations are included in this category.

Note 1: Lines which enter and leave the containment sphere but are not open to the containment sphere free volume or the outside atmosphere are not provided with isolation valves. These lines are either part of separate, closed systems or are not subject to damage as a result of a reactor system rupture.

Note 2: Safety injection lines must remain open in the event of an accident.

Electrical penetrations added to the containment vessel shall be designed in accordance with Section 5.3.6 of the Final Engineering Report and Safety Analysis.

The containment vessel shall have a spray system which provides a uniformly distributed borated water spray of at least 1000 gpm upon proper actuation. The system shall be automatically actuated within five minutes upon actuation of the Safety Injection System or it shall be capable of being manually actuated from the control room. All active components (i.e., actuating instruments, pumps, and actuated valves) shall be redundant and arranged such that a single failure of such component to respond to a demand signal will not impair the ability of the system to deliver 1000 gpm.

The automatically actuated containment isolation valves shall be designed to close upon high pressure in the containment (setpoint no higher than 1.4 psig), high radiation in the containment sphere (ventilation valves only), or safety injection actuation. The actuation system shall be designed such that no single component failure will prevent containment isolation if required.

Basis: The containment vessel is designed to contain the atmosphere within the vessel in the event of a rupture of the primary Reactor Coolant System. With a free volume of $1.2 \times 10^6$ cubic feet, the containment vessel pressure resulting from a complete loss of water from the Primary Reactor System is 46.0 psig and the corresponding temperature is 271.2F. The containment vessel is designed to withstand these pressure-temperature conditions simultaneously with an earthquake having a maximum ground acceleration of 0.25 g. The design vacuum rating of the containment vessel is 2.0 psig. No vacuum relief valves are provided for the containment vessel since no credible mechanism for creating a vacuum in excess of 2.0 psig has been identified. The materials used in construction of the containment vessel have an NDT of -20F or less. The lowest recorded temperature at San Onofre was +25F, hence meeting an NDT of -20F assures that the vessel will always be operated in the ductile region and will meet NDT +30 with an adequate margin.

All plant piping penetrations have been designed in accordance with the above criteria. The basic design philosophy used to develop these criteria is recognition of the importance of isolation valves and their associated apparatus in assuring containment integrity. They must be redundant such that the failure of a single valve will not result in a release of fission products to the atmosphere. The redundant valves and their associated controls must be independent of each other.

Electrical penetrations which may have paths for leakage, such as coaxial cables, are installed in canisters which are amenable to leak rate testing during reactor operation. This design allows meaningful leak rate testing of these penetrations.

Accident evaluations indicate that a containment spray system capable of supplying 1,000 gpm will provide adequate cooling to prevent post-accident pressure from exceeding the containment vessel design pressure, taking into consideration credible metal water reactions, stored energy in the Reactor Coolant System, and fission product decay heat. Calculations have shown that after spraying into the containment vessel (using the stored water in the refueling storage tank) no further credit for active heat removal systems is required since the bare steel containment vessel is capable of dissipating energy at a rate sufficient to preclude pressurization above the design limit.[2]

References: (1) Amendment 52 to the Final Safety Analysis, Sphere Enclosure Project, submitted December 3, 1975; Supplement to the Sphere Enclosure Project Report, submitted March 1, 1976; Second Supplement to the Sphere Enclosure Report, submitted March 25, 1978; additional information submitted by letter dated March 25, 1976 (withheld from public disclosure pursuant to 10 CFR Part 2, Section 2.790(d)).

(2) Supplement No. 1 to Final Engineering Report and Safety Analysis, Section 5, Question 3.

5.3 REACTOR

The design of all components in the Reactor Coolant System shall comply with the code requirements listed in Subsection 3.5, Table 3.12 of the Final Engineering Report and Safety Analysis. Any modifications to the system shall be in accordance with these requirements and other standards imposed at the time of initial fabrication. The materials of construction shall be as indicated in this Table.

The Reactor Coolant System shall be designed for a pressure of 2485 psig and a temperature of 650°F. The maximum liquid volume of the primary system at rated conditions shall be 6800 cubic feet. Auxiliary systems which connect with the Reactor Coolant System and are exposed to the same conditions of temperature and pressure shall be designed to the same specifications as the Reactor Coolant System. Two self-actuated, spring loaded safety valves, having a combined capability of 480,000 pounds/hour, shall be provided, and shall be in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code.

A redundant Safety Injection System shall be designed so that each injection train can deliver at least 7000 gpm at 715 psig. The system shall be designed to be automatically actuated upon low pressurizer pressure ($\geq$ 1735 psig) or high containment pressure ($\leq$ 1.4 psig). The system shall be capable of being manually actuated in the control room. The system shall be designed to inject into all three coolant loops and shall be provided with flow indicators to indicate the safety injection flow rate to each of the three coolant loops. The system shall be designed such that no single failure of an active component to respond to a demand signal will impair the systems capability to deliver 7000 gpm at 715 psig.

The initial reactor core shall consist of 157 fuel assemblies containing enriched uranium dioxide pellets clad in stainless steel with the physical arrangement and dimensions of the assemblies and components as shown in Figure 3.10 of the Final Engineering Report and Safety Analysis. Fuel rods shall be held in place by spring-clip grids and 16 of the fuel rod positions shall have guide tubes which may be used to contain the absorber rods used for rod cluster control. The assemblies shall form an essentially cylindrical lattice with a height of 10 feet and an equivalent diameter of 9.2 feet. The initial core shall be divided into three concentric regions with the two outermost regions containing 52 fuel assemblies each, and the innermost regions containing 53 fuel assemblies. The initial core shall contain approximately 22,000 lbs. of Type 304 stainless steel and 143,600 lbs. of $UO_2$.

Subsequent cores shall contain 157 fuel assemblies with each fuel assembly containing 180 fuel rods clad with type 304 stainless steel. Reload cores will contain a mixture of fresh fuel assemblies and irradiated assemblies from previous cycles. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.10 weight percent U-235.*

As many as four fuel assemblies containing mixed oxide ($PuO_2$-UO2) pellets clad in zircaloy may be placed in the core in lieu of an equal number of assemblies containing uranium dioxide pellets clad in stainless steel. The mixed oxide assemblies may remain in the reactor core through up to three normal reactor core cycles. The initial composition of the mixed oxide assemblies will not exceed a nominal value of 3.53 weight percent plutonium.

Initial fuel enrichments of 3.15, 3.40, and 3.85 weight percent shall be used in the center, intermediate, and the outer core regions, respectively. The maximum value of the temperature coefficient of reactivity shall be $+1.0\times10^{-4}$ delta k/k per $^{o}F$ and the maximum coolant void coefficient of reactivity shall be $+1.0\times10^{-3}$ delta k/k per % void.

Core excess reactivity shall be controlled by rod cluster control assemblies and by boron dissolved in the primary coolant. Forty-five rod cluster control assemblies shall be distributed throughout the core as shown in Figure 3.27 of the Final Engineering Report and Safety Analysis. Each assembly shall consist of sixteen silver-indium-cadmium absorber rods which shall be inserted in the guide tubes provided in the fuel assemblies. The guide tubes shall be designed such that absorber rods remain in the guide tubes when the assembly is at its upper limit of travel.

Neutron monitoring instrumentation shall be provided to continuously monitor neutron flux intensities from the fully shutdown condition to 200% of full power. Monitors in each range shall be fully redundant and shall be in continuous operation until at least one decade of reliable indication is verified on the next range of instrumentation.

The reactor protection system shall be designed and constructed such that no single failure in any of the instrument systems will prevent the desired safety action if an applicable parameter exceeds a safety setpoint.

* For Cycle 4, two Region 1 and two Region 2 assemblies have been placed in the outer region of the core (Location A-8, R-8, H-1, H-15). Four non-depleted assemblies have been placed in the inner region. (Location B-8, P-8, H-2, H-14).

Basis: Design requirements of the Reactor Coolant System and the Safety Injection System are specified to ensure that these systems adequately and reliably perform their intended functions. The maximum liquid volume of the primary system limits the containment pressure following a double-ended rupture of a main coolant line to that upon which containment design is based. Design requirements regarding the actuating mechanisms of the Safety Injection System provide assurance that action of this vital engineered safeguard will be initiated so as to protect the fuel.

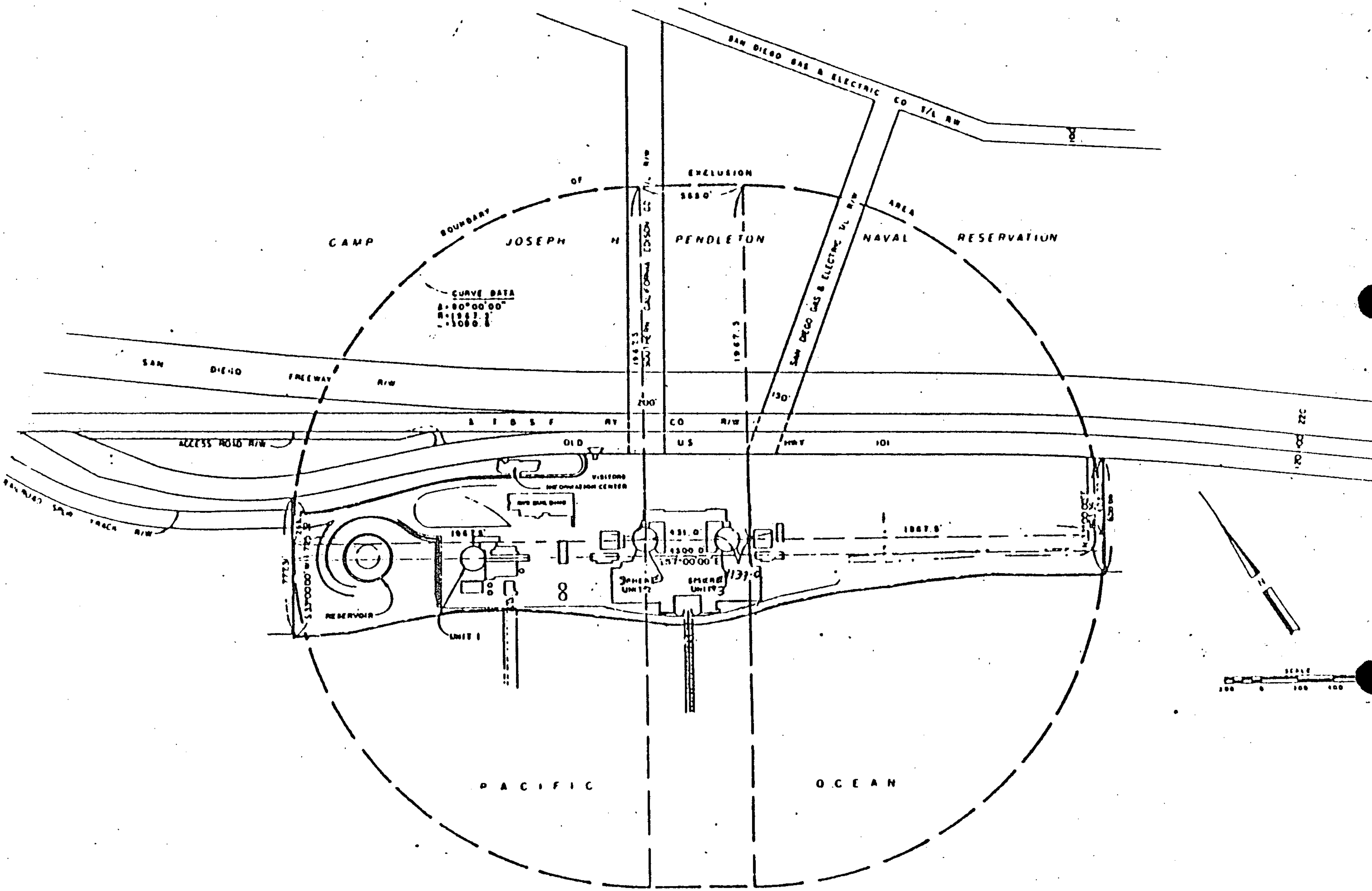


FIGURE 5.1.1
EXCLUSION AREA