ENCLOSURE I

PROPOSED CHANGE NO. 117

EXISTING TECHNICAL SPECIFICATIONS

TABLE 3.5.5-2

CONTAINMENT ISOLATION INSTRUMENTATION TRIP SET POINTS

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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	≥ 1685 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 10CFR100.3 shall be 283 meters from the outer edge of the Unit 1 containment sphere.

Basis: Leasing arrangements with the U.S. Marine Corps provide that a minimum distance to the exclusion boundary will be 283 meters and, hence, all accident consequences are calculated assuming this distance. 34 4/1/77

5.2 CONTAINMENT

The containment vessel shall be a steel sphere having a free internal volume of approximately 1.2 x 10^6 cubic feet. Above grade, the sphere shall not be insulated and shall be protected from the environment with suitable paint. The design of the sphere shall conform to ASME Boiler and Pressure Vessel Code, Section III, Subsection B, for an internal pressure of 46.4 psig at 271.2°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 soap valves serve this purpose. 1 7/21/70

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. 1 7/21/70

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 will provide 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 5 psig) or high radiation in the containment sphere. The actuation system shall be designed such that no single component failure will prevent containment if required.

Basis:

The containment vessel is designed to contain the atmosphere within the vessle in the event of a rupture of the Primary Reactor Coolant System. With a free volume of 1.2 x 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 271.2°F. 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 vessle 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 -20°F or less. The lowest recorded temperature at San Onofre was +25°F, hence meeting an NDT of -20°F 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 1 7/21/70 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. 1 7/21/70

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 1000 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.(1)

<u>Reference</u>:

(1) 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 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 accord 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 simultaneous low pressurizer pressure (no less than 1600 psig) and low pressurizer level (no less than 6 feet). 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 automatic flow monitors to automatically stop flow to the loop which has abnormally high flow indicative of a loop rupture. 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 @ 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 positions shall be replaced with 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.

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Subsequent cores shall contain 157 fuel assemblies with each fuel assembly containing 180 fuel rods clad with type 304 Stainless Steel. Reload core 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.* 44 10/31/78

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 w/o plutonium. 2 11/31/70

Initial fuel enrichmens 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 $+1.0 \times 10^{-4}$ delta k/k per ^{o}F and the maximum coolant void coefficient of reactivity shall be $+1.0 \times 10^{-3}$ 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-cadium 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 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 of 150% 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 present the desired safety action if an applicable parameter exceeds a safety setpoint.

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* 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.) 44 10/31/78

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 requiremens 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.

5.4 AUXILIARY EQUIPMENT

The spent fuel storage facility shall be designed to maintain fuel element geometry such that k is < 0.9. For purposes of design, new fuel elements in unborated water shall be considered.

Basis: The spent fuel storage facility is designed to preclude the occurrence of inadvertent criticality. Normally, this facility will contain irradiated fuel and borated water. However, since this facility is located outside the containment sphere, a substantial margin to criticality is provided.

ENCLOSURE II

PROPOSED CHANGE NO. 117

PROPOSED TECHNICAL SPECIFICATIONS

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	$\leq$ 1.4 psig	$\leq$ 2.0 psig
c) Sequencer Subchannels	Not Applicable	Not Applicable
d) Safety Injection		
1) Containment Pressure-High	$\leq$ 1.4 psig	$\leq$ 2.0 psig
2) Pressurizer Pressure-Low	$\geq$ 1735 psig	$\geq$ 1675 psig
Purge and Exhaust Isolation		
a) Manual	Not Applicable	Not Applicable
b) Containment Radioactivity-High	$\leq$ 2 x Background	$\leq$ 2.5 x Background

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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 1.2×10^6 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 designed for and shall be maintained within 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 upon actuation of the Safety Injection System and high containment pressure 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 Coolant System or the Secondary Coolant System. With a free volume of $1.2x10^6$ cubic feet, the containment vessel pressure and temperature resulting from a rupture of the Primary Coolant System are 49.4 psig and 291^oF respectively. The corresponding values for a rupture of the Secondary Coolant System are 53.3 psig and 391.5^oF respectively. The containment vessel is designed to withstand these pressure-temperature conditions simultaneously with an earthquake having a maximum ground acceleration of 0.67g. This conclusion is based on a structural integrity evaluation, the details of which are provided below.

1. The peak calculated containment internal pressure of 49.4 psig following a rupture of the Primary Coolant System results in stresses within Code allowable stresses based on as-built minimum ultimate tensile strength of the containment material (the maximum internal pressure without exceeding Code allowable stresses is 51 psig).

2. The peak calculated containment internal pressure of 53.3 psig following a rupture of the Secondary Coolant System is less than the maximum pressure capability of the containment sphere based on minimum specification yield strength of the sphere material. The stress intensity allowables for the containment sphere are based on minimum specification yield strength or ultimate tensile

strength at temperature (5/8 yield strength or 110% ultimate tensile strength divided by four, whichever is less). The yield strength criterion does not govern for the sphere material with respect to Code evaluations, but it is an indication of the maximum sphere strength capability and margin available prior to localized yielding which could lead to loss of containment sphere integrity. In order to achieve the minimum specification yield strength of the sphere material (38,000 psi) an internal sphere pressure of 92 psig would be required. The as-built material strength exceeds minimum specification; thus, it is evident that from a structural integrity perspective, a rupture of the Secondary Coolant System inside containment can be accommodated with the current design. Additional assurance of containment integrity was demonstrated by an initial pneumatic integrity test which was conducted for the sphere following construction. The sphere was held at 53.4 psig for one hour.

Thermal effects were considered as secondary stresses per ASME Code Section III Subsection NE-3222.2 and as primary loads for the analysis of piping loads on penetrations. The stress analysis was performed for a temperature differential of 200°F, based upon a maximum temperature of 271.8°F and an ambient temperature of 72°F. Allowable stresses were in accordance with the applicable sections of the ASME Code. An additional analysis for secondary stresses was performed based upon a maximum sphere temperature of 300°F. The penetration analysis included loads due to thermal growth. In general, stresses in the vicinity of the penetration are less than those in the region of the shell to foundation juncture because the penetration area is reinforced with a doubler plate. Thermal effects on this thickened portion were investigated in the analysis of the penetration. The results indicated that stresses were within allowable limits. The results of the analysis for the effects of a postulated rupture of the Secondary Coolant System indicate an expected maximum temperature of the steel sphere of less than 268°F. Since this is less than the values 271.8°F and 300°F discussed above, temperature effects due to a rupture of the Secondary Coolant System are within allowable limits.

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 -20°F or less. The lowest recorded temperature at San Onofre was +25°F, hence meeting an NDT of -20°F 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 core 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-U02) 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.

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* 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 Coolant 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.

5.4 AUXILIARY EQUIPMENT

The spent fuel storage facility shall be designed to maintain fuel element geometry such that k_∞ is < 0.9. For purposes of design, new fuel elements in unborated water shall be considered.

Basis: The spent fuel storage facility is designed to preclude the occurrence of inadvertent criticality. Normally, this facility will contain irradiated fuel and borated water. However, since this facility is located outside the containment sphere, a substantial margin to criticality is provided.

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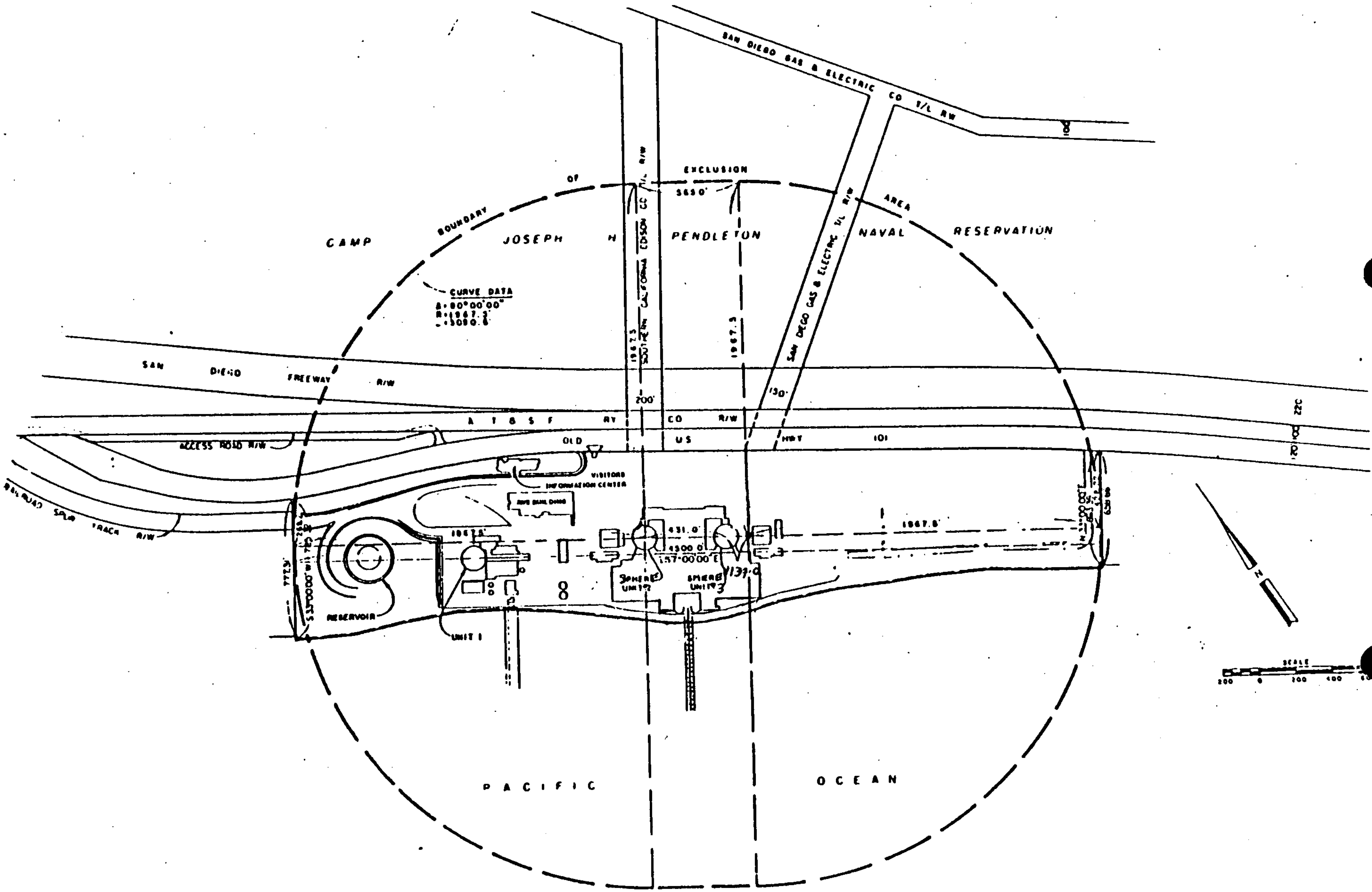

FIGURE 5.1.1
EXCLUSION AREA