DESCRIPTION OF PROPOSED CHANGE AND SAFETY ANALYSIS OF
PROPOSED CHANGE NO. 115 TO THE TECHNICAL SPECIFICATIONS
PROVISIONAL OPERATING LICENSE DPR-13

This is a request to revise Section 4.5, "Radioactive Liquid Waste Release," and 4.6, "Radioactive Gaseous Waste Release," of the Appendix A Technical Specifications for San Onofre Nuclear Generating Station Unit 1.

REASON FOR PROPOSED CHANGE

The existing Technical Specifications 4.5.A and 4.6.A have led to several discussions between SCE, NRR and Region V. The result of these discussions has led to agreement that the intent of these Technical Specifications is to require compliance with 10 CFR 20, Appendix B. This intent limits concentration in unrestricted areas for both liquid and gaseous effluents. At present, these technical specifications do not adequately establish concentration limits of these effluents in unrestricted area. For this reason, SCE has developed revised Technical Specifications 4.5.A and 4.6.A. The purpose for this revision is to update our calculation methods so that we may more accurately comply with the requirements of 10 CFR 20, Appendix B.

Revision of Technical Specification 4.6.C has been included in this proposed change in order to implement requirements for sampling of iodine and particulate discharge through the stack.

Existing Specification

Technical Specifications 4.5 and 4.6 currently read as shown in Enclosure 1.

Proposed Specification

Technical Specifications 4.5 and 4.6 would be revised to read as shown in Enclosure 2.

Safety Analysis

Proposed Change No. 115 revises the San Onofre Nuclear Generating Station Unit 1 Technical Specifications in order to be in compliance with 10 CFR 20, Appendix B. This revision will provide equations which more accurately establish limits of liquid and gaseous effluents in unrestricted areas than the existing specifications and, additionally, provide requirements to sample for iodine and particulate activity in order to maintain a more accurate account of these types of radioactivity released to the environs, in accordance with 10 CFR 20, Appendix B.

Accordingly, it is concluded that (1) the proposed change does not involve an unreviewed safety question as defined in 10 CFR 50.59, nor does it present significant hazards consideration not described or implicit in the Final Safety Analysis, and (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change.

MJT:5167

ENCLOSURE 1

Existing Technical Specifications

4.5 and 4.6

4.5 RADIOACTIVE LIQUID WASTE RELEASE

Applicability: Applies to release of radioactive liquid waste to the Circulating Water System.

Objective: To verify that discharge of radioactive waste to the Circulating Water System is maintained below the limits set forth in 10CFR20.

Specification:

A. Averaged over a year, the release rates of liquid wastes shall not result in concentrations in the circulating water discharge in excess of Part 20 limits for unrestricted areas, except that the maximum release rate over the period of one hour shall not exceed 10 times the yearly averaged limit.

B. At least one circulating water pump shall be in operation whenever radioactive liquid wastes are released.

C. Prior to release of waste, gross activity shall be sampled and determination made of the maximum permissible release rate.

D. All radioactive wastes entering the Circulating Water System shall be monitored for isotopic or gross activity during discharge. Such monitoring may be accomplished by either of the following methods:

(1) Continuous monitoring with the in-stream liquid waste monitor channel; or, if the liquid waste monitor channel is inoperable,

(2) Analyses of a minimum of three samples of effluent stream taken approximately towards the beginning, mid-point, and end of each release period.

E. The liquid waste monitor and the flow rate meter shall be calibrated at a minimum frequency of once every six months, and normal response of the monitor shall be tested weekly.

F. A record of all liquid waste releases shall be kept in accordance with Specification 6.10.

Basis: Liquid wastes from the Radioactive Waste Disposal System are diluted in the Circulating Water System discharge prior to release to the ocean.[1] With two pumps operating, the rated capacity of the Circulating Water System is 350,000 gpm. Operation of a single circulating water pump reduces the nominal flow rate by about 50%. The actual circulating water flow under various operating conditions will be calculated from the head differential across the pumps and the manufacturer's head-capacity curves. To ensure operation of at least one pump during liquid waste release, an interlock exists

which automatically halts liquid release to the Circulating Water System if there is no circulating water flow.

Specification A provides a simple mechanism for confirming that 10 CFR 20 has not been exceeded, and further ensures that the intent of 10 CFR 20 has not been exceeded by the transient release of high levels of radioactivity averaged together with long periods of low activity release. Specification B provides further protection against high levels of radioactivity release by ensuring that substantial dilution flow is available at the time of release. Specification C provides reasonable assurance that the release rate limitations by Specification A are met. Specification D provides backup to Specification C.[2] Specification E provides assurance that the determination made in accordance with Specifications A and D are accurate. Specification F provides the record which demonstrates that liquid releases are within the limits prescribed by 10 CFR Part 20 and are as low as practicable. It is intended that the monitoring provisions of Specification D.2 be utilized during periods that the in-stream liquid waste monitoring channel may be out of service.

References:

(1) Final Engineering Report and Safety Analysis, Paragraph 3.10.

(2) Final Engineering Report and Safety Analysis, Paragraph 6.7.

4.6 RADIOACTIVE GASEOUS WASTE RELEASE

Applicability: Applies to the release of radioactive gaseous waste from the plant stack.

Objective: To verify discharge of radioactive gaseous waste to the atmosphere will not result in ground level radioactivity concentrations outside the plant boundaries in excess of limits established in 10 CFR 20.

Specification:

A. Averaged over a year, release rates of gaseous wastes in curies/sec shall not result in a value exceeding that calculated from the following formula:

$$1.8 \times 10^5 \left(\frac{m^3}{sec}\right) \times \Sigma \; C_x \left(\frac{\mu c}{cc}\right)$$

Where C_x is the concentration of any radioisotope X, the values of the concentrations of all isotopes discharged shall be such that $\Sigma \frac{C_x}{(MPC)_x}$ is less than 1.0.

$(MPC)_x$ as defined above shall be that stated in Column 1, Table II of 10 CFR 20. The maximum release rate over any one hour shall not exceed 10 times the yearly averaged limit as stated above.

B. At least one stack fan shall be in operation delivering normal flow whenever radioactive gaseous wastes are released to the vent stack.

C. All radioactive wastes discharged through the stack shall be monitored continuously for gross activity.

D. A record of the above releases shall be kept in accordance with Specification 6.10.

E. The stack gas and particulate monitors shall be calibrated at a minimum frequency of once every six months, and normal response of each monitor shall be tested weekly.

Basis: Prior to release to the atmosphere, gaseous wastes from the radioactive waste disposal system are mixed in the stack flow of two 20,000 cfm fans.(1) Dilution then occurs in the atmosphere.

The formula prescribed in Specification A takes atmospheric dilution into account and ensures that at the point of maximum ground concentration the requirements of 10 CFR 20 will not be

exceeded. The constant 1.8×10^5 m^3/sec is derived from Gifford's long term dilution equation, with the following conditions:

(1) Ground level release.

(2) Meteorological conditions - Giffords condition C and a wind speed of 8 mph.[3]

(3) Wind frequency in the direction of interest (SE, ESE, SSE,) 32%.

Specification A further ensures that the intent of 10 CFR 20 has not been exceeded by the transient release of high levels of radioactivity averaged together with long periods of low activity release.

Specification B ensures that there will be no local high concentrations in the vicinity of the release, and provides the representative gas flow required by Specification C. Specifications C and D ensure that appropriate information is available to demonstrate compliance with Specification A.[2] Specification E provides assurance that the determinations made in accordance with Specification A are accurate.

References:

(1) Final Engineering Report and Safety Analysis, Paragraph 3.10.

(2) Final Engineering Report and Safety Analysis, Paragraph 6.7.

(3) Final Engineering Report and Safety Analysis, Paragraph 2.2.

ENCLOSURE 2

Revised Technical Specifications

4.5 and 4.6

4.5 RADIOACTIVE LIQUID WASTE RELEASE

Applicability: Applies to release of radioactive liquid waste to the Circulating Water System.

Objective: To verify that discharge of radioactive waste to the Circulating Water System is maintained below the limits set forth in 10 CFR 20.

Specification: A. Averaged over a year, radioactivity released shall not result in concentrations at the point of discharge such that the following condition is exceeded.

$$\sum_i C_i/MPC_i \leq 1$$

where: C_i = concentration of radionuclide i in the circulating water discharge at the point of release to unrestricted areas; in μCi/ml.

MPC_i = maximum permissible concentration of radionuclide i, as defined in 10 CFR 20, Appendix B, Table II, Column 2; in μCi/ml.

The percent of Technical Specification Limit averaged over a year shall be determined by calculation of the following parameter:

$$\frac{1\times10^6}{V_T}\sum_i \frac{A_i}{MPC_i} \times 100\%$$

where: A_i = activity of radionuclide i released over a year; in Curies

V_T = total volume of liquid effluent released to the unrestricted area during the year; in ml.

$V_T = V_{DW} + V_{LW}$

T = subscript to indicate total volume of both dilution water and liquid waste prior to dilution.

DW = subscript to indicate dilution water.

LW = subscript to indicate liquid waste prior to dilution.

V_{DW} = total volume of dilution water used to dilute liquid waste during the year; in ml.

V_{LW} = total volume of liquid waste released prior to dilution; in ml.

MPC_i = as defined above.

The licensee shall be provided the flexibility of averaging over the semi-annual period of interest rather than averaging over a year if the licensee desires.

Averaged over an hour, radioactivity released shall not result in concentrations in circulating water discharge such that the following condition is exceeded:

$$\sum_i C_i/MPC_i \leq 10$$

where: 10 = maximum value of the summation of the ratios of C_i/MPC_i averaged over hourly time periods; dimensionless.

C_i = as defined above.

MPC_i = as defined above.

The percent of Technical Specification Limit averaged over an hour shall be determined by calculation of the following parameter for the hourly period when maximum releases and/or concentrations occurred:

$$\frac{1\text{x}10^6}{10\ V_{T,h}} \sum_i \frac{A_{i,h}}{MPC_i} \times 100\%$$

where: 10 = as defined above.

h = subscript used to indicate the hourly period when maximum releases occurred.

$A_{i,h}$ = activity of radionuclide i released during the hour when maximum releases occurred; in Curies

$V_{T,h}$ = total volume of both liquid waste and dilution water released to the unrestricted area during the hour when maximum releases occurred; in ml.

MPC_i = as defined above.

For purposes of reporting the percent of Technical Specification Limit in the Semi-Annual Effluent Report, the licensee will report the percent of the limit as determined from averaging over the year.

B. At least one circulating water pump shall be in operation whenever radioactive liquid wastes are released.

C. Prior to release of waste, gross activity shall be sampled and determination made of the maximum permissible release rate.

D. All radioactive wastes entering the Circulating Water System shall be monitored for isotopic or gross activity during discharge. Such monitoring may be accomplished by either of the following methods:

(1) Continuous monitoring with the in-stream liquid waste monitor channel; or, if the liquid waste monitor channel is inoperable,

(2) Analyses of a minimum of three samples of effluent stream taken approximately towards the beginning, mid-point, and end of each release period.

E. The liquid waste monitor and the flow rate meter shall be calibrated at a minimum frequency of once every six months, and normal response of the monitor shall be tested weekly.

F. A record of all liquid waste releases shall be kept in accordance with Specification 6.10.

Basis: Liquid wastes from the Radioactive Waste Disposal System are diluted in the Circulating Water System discharge prior to release to the ocean.(1) With two pumps operating, the rated capacity of the Circulating Water System is 350,000 gpm. Operating of a single circulating water pump reduces the nominal flow rate by about 50%. The actual circulating water flow under various operating conditions will be calculated from the head differential across the pumps and the manufacturer's head-capacity curves. To ensure operation of at least one pump during liquid waste release, an interlock exists which automatically halts liquid release to the Circulating Water System if there is no circulating water flow.

Specification A provides a simple mechanism for confirming that 10 CFR 20 has not been exceeded, and further ensures that the intent of 10 CFR 20 has not been exceeded by the transient release of high levels of radioactivity averaged together with long periods of low activity release. Specification B provides further protection against high levels of radioactivity release by ensuring that substantial dilution flow is available at the time of release. Specification C provides reasonable assurance that the release rate limitations by Specification A are met. Specification D provides backup to Specification C.[2] Specification E provides assurance that the determination made in accordance with Specifications A and D are accurate. Specification F provides the record which demonstrates that liquid releases are within the limits prescribed by 10 CFR Part 20 and are as low as practicable. It is intended that the sampling provisions of Specification D.2 be utilized during periods that the in-stream liquid waste monitoring channel may be out of service.

References:

(1) Final Engineering Report and Safety Analysis, Paragraph 3.10.

(2) Final Engineering Report and Safety Analysis, Paragraph 6.7.

5096

4.6 RADIOACTIVE GASEOUS WASTE RELEASE

Applicability: Applies to the release of radioactive gaseous waste from the plant stack.

Objective: To verify discharge of radioactive gaseous waste to the atmosphere will not result in ground level radioactivity concentrations outside the plant boundaries in excess of limits established in 10 CFR 20.

Specification: A. Averaged over a year, radioactivity released shall not result in concentrations of radioactivity in unrestricted areas such that the following condition is exceeded:

$$\sum_i C_i/MPC_i \leq 1$$

where: C_i = concentration of radionuclide i at the unrestricted area.

MPC_i = maximum permissible concentrations of radionuclide i as defined in 10 CFR 20, Appendix B, Table II, Column 1; in μCi/cc.

The percent of Technical Specification Limit averaged over a year shall be determined by calculation of the following parameter:

$$[6.1E\text{-}5 \sum_i Q_i/MPC_i] \times 100\%$$

where: 6.1E-5 = atmosphere dispersion factor, in $\frac{sec}{m^3}$

(Highest annual average X/Q as measured at the site boundary in the northwest sector)

Q_i = release rate of nuclide i averaged over a year; in Ci/sec.

MPC_i = as defined above.

The licensee shall be provided the flexibility of averaging over the semi-annual period of interest rather than averaging over a year if the licensee desires.

Averaged over the hour when maximum releases occur, radioactivity released shall not result in concentrations in unrestricted areas exceeding ten times the yearly averaged limit stated above. The percent of Technical Specification Limit shall be determined by calculation of the following parameter for the hourly period when maximum releases occurred:

$$[6.1E\text{-}6 \sum_i Q_{i,h}/MPC_i] \times 100\%$$

where: 6.1E-6 = Atmosphere dispersion factor divided by 10, in $\frac{sec}{m^3}$.

h = subscript used to indicate the hourly period when maximum releases occurred.

$Q_{i,h}$ = release rate of nuclide i averaged over the hour during which the highest releases occurred.

MPC_i = as defined above.

For purposes of reporting the percent of Technical Specification Limit in the Semi-Annual Effluent Report, the licensee will report the percent of the limit as determined from averaging over the year.

B. At least one stack fan shall be in operation delivering normal flow whenever radioactive gaseous wastes are released to the vent stack.

C. All radioactive wastes discharged through the stack shall be monitored continuously for gross activity and sampled for iodine and particulate activity whenever that form of radioactive material is being released via that pathway.

D. A record of the above releases shall be kept in accordance with Specification 6.10.

E. The stack gas and particulate monitors shall be calibrated at a minimum frequency of once every six months, and normal response of each monitor shall be tested weekly.

Basis: Prior to release to the atmosphere, gaseous wastes from the radioactive waste disposal system are mixed in the stack flow of two 20,000 cfm fans.(1) Dilution then occurs in the atmosphere.

The formula prescribed in Specification A takes atmospheric dilution into account and ensures that at the point of maximum ground concentration the requirements of 10 CFR 20 will not be exceeded. The constant 6.1×10^{-5} sec/m^3 is derived from the NRC computer code XUQDOQ and is based on meteorological data gathered at the site boundary during 1973 through 1976. This data was taken in 16 different sectors around the site boundary. The constant 6.1×10^{-5} sec/m^3 represents the most conservative annual averaged X/Q as determined from this data.

Specification A further ensures that the intent of 10 CFR 20 has not been exceeded by the transient release of high levels of radioactivity averaged together with long periods of low activity release.

Specification B ensures that there will be no local high concentrations in the vicinity of the release, and provides the representative gas flow required by Specification C. Specifications C and D ensure that appropriate information is available to demonstrate compliance with Specification A.(2). Specification E provides assurance that the determinations made in accordance with Specification A are accurate.

References:

(1) Final Engineering Report and Safety Analysis, Paragraph 3.10.

(2) Final Engineering Report and Safety Analysis, Paragraph 6.7.

(3) Final Engineering Report and Safety Analysis, Paragraph 2.2.

5096