

**DESCRIPTION AND SAFETY ANALYSIS
OF PROPOSED CHANGE NPF-10/15-446, SUPPLEMENT 1**

This is a request to revise Technical Specification 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," Table 3.3-3, for San Onofre Units 2 and 3.

Units 2 and 3 Technical Specifications

Existing Specifications:

Unit 2: See Attachment "A"
Unit 3: See Attachment "B"

Proposed Specifications:

Unit 2: See Attachment "C"
Unit 3: See Attachment "D"

1.0 DESCRIPTION OF CHANGES:

This amendment request is to make a change to Technical Specification (TS) 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," Table 3.3-3. TS 3/4.3.2 includes the requirements for the minimum number of Toxic Gas Isolation System (TGIS) channels operable. This TS change request is to extend the allowed TGIS outage times during replacement of TGIS instrumentation. Replacement of TGIS instrumentation is governed by Design Change Package 6933 (DCP 2/3-6933.00SJ).

This change adds a note to TS Table 3.3-3. This note states:

"During construction for DCP 2/3-6933.00SJ Actions 14 and 15 will not be in effect. Compensatory actions for the TGIS channels will be conducted in accordance with the October 18, 1995, Edison letter to the U.S. Nuclear Regulatory Commission."

PCN-446 required that either one channel of TGIS be available or the Units 2 and 3 control room be isolated during the construction period for TGIS instrumentation replacement. In the event a TGIS channel cannot be restored ~~or the Control Room Emergency Air Clean Up System (CREACUS) cannot be initiated or maintained in the isolation mode of operation due to equipment malfunction,~~ it is acceptable to return the control room to the normal mode of ventilation for a limited time to restore control room air quality ~~or repair the associated CREACUS equipment.~~ These periods when the control room will be in the normal mode of ventilation with TGIS unavailable ~~will not exceed a cumulative 54 hours for all construction periods associated with TGIS instrumentation replacement~~ will be for contingency use only. During these periods a "gas watch" will be provided to monitor for toxic gas

provided to monitor for toxic gas events and alert control room personnel, via hand held radio or telephone, to immediately place the control room in the isolation mode of operation should any potential toxic gas event be observed.

2.0 BACKGROUND:

2.1 TGIS

The TGIS provides protective action for control room personnel from a toxic chemical release at or in the vicinity of San Onofre. Two independent channels (Channels A and B) of instrumentation are shared by both Units 2 and 3 as a common system and are required for all modes of operation. TGIS analyzers monitor for high concentrations of Butane/Propane (hydrocarbons), Ammonia, and Chlorine gases. Upon reaching the TS limit the TGIS isolates the common Units 2 and 3 control room and starts the Control Room Emergency Air Cleanup System (CREACUS). Manual TGIS actuation is also available in the control room if plant conditions require, or for testing. The toxic gas sources evaluated for San Onofre are (1) onsite releases due to equipment failure/transfer accidents and (2) offsite releases due to transportation accidents. Each of these potential release sources is described below.

(1) Onsite Sources

Ammonia is the only onsite toxic gas that the TGIS system is credited for in toxic gas events. The principal ammonia gas source onsite is the 9000 gallon ammonia tank. Evaluated accidents include seismic ammonia tank failure, random ammonia tank failure (unanticipated tank failure), and ammonia tank accidents during ammonia transfer, including operator error.

(2) Offsite Sources

These include transportation accidents on Interstate 5 or the adjacent rail lines which result in releases of ammonia, chlorine, and Butane/Propane (hydrocarbon) gases.

2.2 Technical Specification

TS 3/4.3.2, "Engineered Safety Features Actuation System Instrumentation," provides the requirements for the number of operable channels, trip setpoints, and response times for the Engineered Safety Features Actuation Systems, including TGIS. TS 3/4.3.2, Table 3.3-3, requires two operable channels of TGIS gas analyzers, manual trip buttons, and automatic actuation logic. Action 14 of Table 3.3-3 requires that with only one operable channel the inoperable channel be restored to operable status within seven days or isolate the control room and initiate and maintain CREACUS in the isolation mode of operation within six hours. Action 15 of Table 3.3-3 requires that with no operable

channel initiate and maintain operation of CREACUS in the isolation mode of operation within one hour. If CREACUS cannot be maintained in the isolation mode or a channel of TGIS restored to operable status within the specified intervals, then both San Onofre Units 2 and 3 must be shutdown.

3.0 DISCUSSION:

3.1 Reason for the Proposed Change

TGIS instrumentation replacement involves substantial modifications in the cabinet which houses both channels of TGIS instrumentation. It is expected that one channel of TGIS will be inoperable for approximately 22 days for replacement of the ammonia and butane analyzers. Both channels of TGIS will then be maintained operable for approximately 7 to 30 days to allow for testing of the new instrumentation. Then the other channel of TGIS will be inoperable for approximately 22 days for replacement of its ammonia and butane analyzers. The need for replacement of the TGIS instrumentation is described below:

A. Obsolete Equipment

The TGIS panel was designed and fabricated with instruments procured in the early 1980s. Over the years, progress has been made in the field of analytical instrumentation, thus making the current TGIS ammonia and butane analyzers obsolete. The original vendor of the ammonia and butane analyzers, Beckman Instruments, sold their analyzer division to Rosemount Analytical Inc. Rosemount has subsequently discontinued manufacturing both the Model 400 Hydrocarbon Analyzer and the 865 Ammonia Analyzer currently used in the San Onofre TGIS, and spare parts for these analyzers are no longer readily available. In some cases, spare parts are only available as substitutes requiring system modification.

B. High Maintenance

The ammonia analyzers are developing a poor maintenance record and have experienced several spurious trips. The existing ammonia analyzers have experienced problems of drifting low and bringing in the channel failure alarm. The analyzer drift has been increasing and the maintenance costs associated with frequent calibration are significant. The drift has exceeded the 5% drift accounted for in the TGIS setpoint calculation several times in the last 3 years. (In these cases the TGIS was evaluated by the San Onofre instrument out-of-tolerance program and addressed as necessary.)

The hydrocarbon analyzers, although not experiencing a drift problem, have also recently experienced more frequent maintenance activities.

The existing TGIS chlorine analyzers are operating properly and are still supported by the manufacturer, Wallace & Tiernan. These components have not become obsolete, and spare parts are available. Therefore, the chlorine analyzers are considered acceptable and are not expected to require upgrade in the near term.

3.2 Basis for the Duration of the Proposed Change

The TGIS is common to both units and is required for all modes of operation. The construction schedule for the ammonia and butane analyzer replacement is planned to consist of 43 shifts per channel, which is about 22 days of two 10-to 12-hour shifts per day, 7 days a week. Replacement activities will be performed on one channel of TGIS at a time, with an approximate 7-to 30-day period following replacement of the first channel of instrumentation when both channels of TGIS will be operable to assure proper operation of the new instrumentation prior to replacement of the second channel of instrumentation. During construction activities the entire TGIS channel being worked on, including the chlorine, ammonia, and butane/propane detectors, will be inoperable. Construction activities required to replace a channel of TGIS are not expected to affect or result in physical damage to any components in the remaining operable channel of TGIS except as described below.

Some periods of construction involve extensive cutting and welding work within the cabinet, which contains both channels of TGIS. During these periods it is expected that the operable channel of TGIS may experience spurious actuations. During these periods the control room will generally be isolated with CREACUS initiated and maintained in the isolation mode and the operable TGIS channel will be in bypass. Control room isolation may be accomplished via either manual actuation of the TGIS system (pressing the trip button) or by manual operator actuation of the individual components actuated by TGIS. (All TGIS actuated components can be operated from the control room area which is in the CREACUS boundary.)

Some of these periods of potential spurious actuation ~~are expected to~~ may be of a lengthy duration (i.e., longer than 24 hours). The San Onofre control room is not designed to be operated for extended periods while isolated with CREACUS operating. (Toxic gas releases which the TGIS is designed to mitigate are expected to dissipate to acceptable levels in less than 24 hours.) Over extended periods the control room air quality will degrade slowly and may become uncomfortable and, if prolonged long enough, uninhabitable. Therefore, the control room cannot be placed in the isolation mode continuously for the entire construction period.

The instrumentation replacement construction schedule provides for 6 shifts for which the control room ventilation will be operating in the isolation mode during the first week of construction for each channel. Operations will coordinate with Construction to

place control room ventilation in the isolation mode when required. After approximately 24 hours in the isolation mode, Operations and Construction will coordinate to return one TGIS channel to operable status. The 24-hour period is based on previous operational experience. Control room ventilation will then be returned to normal (unisolated) operation until Construction requires another period of isolation.

Should Construction be unable to return one TGIS channel to operable status after the control room has been in the isolation mode or if the CREACUS cannot be initiated or maintained in the isolation mode of operation due to equipment malfunction, it is permissible as a contingency to return control room ventilation to normal operation to allow the control room air quality to return to normal or to repair associated CREACUS equipment. During these periods a "gas watch" will be provided to monitor for toxic gas events and alert control room personnel, via hand held radio or telephone, to immediately place the control room in the isolation mode of operation should any potential toxic gas event be observed. These contingency "gas watch" periods when no channel of automatic actuation will be available have been found acceptable based on a risk analysis described below and will not exceed 54 hours over the entire TGIS instrumentation replacement. The 54 hour period is for contingency use only. Based on previous maintenance history, 54 hours is believed to be a reasonable length of time to allow for restoration of an inoperable TGIS channel.

Operation with the control room ventilation in the normal (unisolated) mode of operation when no channel of TGIS is available is not part of the planned construction schedule and will be used on a contingency basis only. During these periods a "gas watch" will be provided to monitor for toxic gas events and alert control room personnel. The "gas watch" will consist of two dedicated individuals each equipped with a hand held radio. One individual will continuously monitor the onsite ammonia tank for accidents, tank leaks, and failures. The second individual will continuously monitor Interstate 5, the rail lines, and the natural gas line for transportation accidents (i.e., truck and train accidents) and natural gas line ruptures. Should any of these events occur, the individual will immediately contact control room personnel who will immediately isolate the control room.

The CREACUS charcoal and HEPA filters were assessed to determine whether they would mitigate toxic gas events and were found ineffective. Therefore, the charcoal and HEPA filters cannot be credited for mitigating toxic gas events.

To improve reliability of TGIS operation, preventive maintenance will be performed on the operable channel of TGIS instrumentation prior to the start of TGIS instrumentation replacement.

3.3 Risk Assessment of the Proposed Change

The San Onofre Nuclear Safety Group (NSG) has evaluated the risk associated with this amendment request based on the risk models used in the 1993 San Onofre Offsite Hazards Update and the NSG Probabilistic Risk Assessment Evaluation of Liquefied Petroleum Gas (LPG) Railcar Transportation (References 1 and 2). As noted above, TGIS instrumentation replacement will consist of two approximately 22-day periods when a single channel of TGIS is available with an approximate 7 to 30-day period between the approximately 22-day periods when two channels of TGIS will be available. As noted above, there may also be brief periods where no channel of TGIS is available and the control room ventilation must be restored to normal (unisolated) operation to provide fresh air or repair the associated CREACUS equipment.

The likelihood of control room habitability loss from toxic gas hazards with one channel of TGIS available is estimated to be $1E-8$ per day. Therefore, the total control room habitability loss risk for two 22-day TGIS instrumentation replacement periods is $4.4E-7$. The control room habitability loss risk from toxic gas hazards with both channels of TGIS unavailable is estimated to be $2.5E-7$ per day. On the basis that $1E-6$ represents an acceptable increase for the entire instrumentation replacement period, it is considered acceptable to operate the control room ventilation system in the normal mode (i.e., unisolated) without an operable TGIS channel for up to a total of 54 hours during the instrumentation replacement periods. The 54 hours result from $1E-6$ minus $4.4E-7$ equals the product of 2.25 days (54 hours) times $2.5E-7$ per day. The cumulative TGIS replacement construction period including contingency is not expected to exceed 44 days plus 54 hours or 46.25 days. The approximate 7 to 30-day period between construction intervals is not part of the 46.25 days since the existing TSs will be in effect. If, due to unanticipated circumstances, the 46.25-day construction period may be exceeded, Edison will immediately notify the NRC.

It is expected that the 54-hour period where both channels of TGIS are unavailable with the control room ventilation in the normal mode will be for contingency use only.

4.0 DISCUSSION OF CHANGES TO PCN-299:

PCN-299 implements the Technical Specification Improvement Project which incorporates the recommendations of NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants." PCN-299 was submitted to the NRC for review on December 30, 1993. This proposed change (PCN-446) does not require any changes to PCN-299 because this change is not expected to be in effect when PCN-299 is implemented.

5.0 SAFETY ANALYSIS:

The proposed Technical Specification change described above shall be deemed to involve a significant hazards consideration if there is a positive finding in any one of the following areas:

1. Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of any accident previously evaluated?

Response: No

The Toxic Gas Isolation System (TGIS) is designed to monitor and mitigate the effects of toxic gas releases on control room habitability. TGIS unavailability is not a precursor to any accident previously evaluated in Chapter 15 of the San Onofre Updated Final Safety Analysis Report (UFSAR). ~~A risk assessment of the TGIS instrumentation replacement activity was performed and found that the likelihood of a loss of control room habitability beyond that permitted by the Technical Specifications (TS) will not exceed 1E-6 over the duration of this TS change. In addition, a loss of control room habitability does not necessarily lead to an accident or core damage event. However, if a loss of control room habitability was conservatively assumed to lead to a core damage event, this increase in risk would still not constitute a significant increase in the consequences or probability of any accident previously evaluated since the increase is less than 3% of the average annual core damage risk from internal events as reported in the San Onofre Individual Plant Examination.~~ Therefore, operation of the facility in accordance with this proposed change does not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. Will operation of the facility in accordance with this proposed change create the possibility of a new or different kind of accident from any previously evaluated?

Response: No

This change extends the allowed outage times of the TGIS system. The change does not affect the design or operation of any other plant systems. An increase in TGIS unavailability is not a precursor to any accident previously evaluated in Chapter 15 of the San Onofre UFSAR. Therefore, operation of the facility in accordance with this proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?

Response: No

During replacement of TGIS instrumentation a single channel of TGIS will be maintained operable except during periods when construction activity may result in spurious TGIS alarms. During these periods the control room will normally be isolated except for brief contingency periods when the control room will be open to allow for air exchange or to allow for CREACUS equipment repair. These periods, when the control room is open without a TGIS channel available, will not exceed 54 hours during the entire period when this change is in effect. During these contingency periods a "gas watch" will be provided to monitor for potential toxic gas events and alert control room personnel, via hand held radio or telephone, to immediately place the control room in the isolation mode of operation should any potential toxic gas event be observed. The "gas watch" will continuously visually observe the potential sources of toxic gases and thus be able to alert personnel to conservatively isolate the control room before toxic gases reach the control room air intake. This, in conjunction with the limited duration of the equipment replacement, results in a level of safety that is equivalent to that experienced in normal plant operation with the TGIS available. Operation with control room ventilation in the normal mode with a single channel of TGIS operable for 44 days and no TGIS channel available for up to 54 hours has been analyzed, and results in an increase in the probability of a loss of control room habitability which does not exceed $1E-6$ over the duration of this TS change. Therefore, this proposed change does not involve a significant reduction in a margin of safety.

6.0 SAFETY AND SIGNIFICANT HAZARDS DETERMINATION:

Based on the above Safety Analysis, it is concluded that: (1) the proposed change does not constitute a significant hazards consideration as defined by 10 CFR 50.92; and (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change. Moreover, because this action does not involve a significant hazards consideration, it will also not result in a condition which significantly alters the impact of the station on the environment as described in the NRC Final Environmental Statement.

7.0 REFERENCES

1. ~~Southern California Edison San Onofre Nuclear Generating Station 1993 Offsite Hazards Update, NSG/PRA Report PRA 2/3 93-008, December 1993~~

2. ~~Nuclear Safety Group Probabilistic Risk Assessment Evaluation of
LPG Railcar Transp ion, Southern California Edison Company, San
Onofre Nuclear Gene ng Station, NSG/PRA Report PRA 2/3-92-007,
November 16, 1992~~

ATTACHMENT A
EXISTING TECHNICAL SPECIFICATIONS
UNIT 2

Table 3.3-3 (Continued)

TABLE NOTATION

- ACTION 13 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency air cleanup system in the emergency (except as required by ACTIONS 14, 15) mode of operation.
- ACTION 14 - With the number of channels OPERABLE one less than the total number of channels, restore the inoperable channel to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room emergency air cleanup system in the isolation mode of operation.
- ACTION 15 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency air cleanup system in the isolation mode of operation.
- ACTION 16 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.12.
- ACTION 17 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, operation may continue provided that the purge valves are maintained closed.
- ACTION 17a - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.5.1. (Mode 1, 2, 3, 4 only)
- ACTION 17b - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, close each of the containment purge penetrations providing direct access from the containment atmosphere to the outside atmosphere.

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ATTACHMENT B

EXISTING TECHNICAL SPECIFICATIONS
UNIT 3

Table 3.3-3 (Continued)

TABLE NOTATION

- ACTION 13 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency air cleanup system in the emergency (except as required by ACTIONS 14, 15) mode of operation.
- ACTION 14 - With the number of channels OPERABLE one less than the total number of channels, restore the inoperable channel to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room emergency air cleanup system in the isolation mode of operation.
- ACTION 15 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency air cleanup system in the isolation mode of operation.
- ACTION 16 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.12.
- ACTION 17 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, operation may continue provided that the purge valves are maintained closed.
- ACTION 17a - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.5.1. (MODE 1, 2, 3,4 only)
- ACTION 17b - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, close each of the containment purge penetrations providing direct access from the containment atmosphere to the outside atmosphere.

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ATTACHMENT C

PROPOSED TECHNICAL SPECIFICATIONS
UNIT 2

Table 3.3-3 (Continued)

TABLE NOTATION

- ACTION 13 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency air cleanup system in the emergency (except as required by ACTIONS 14, 15) mode of operation.
- ACTION 14 - With the number of channels OPERABLE one less than the total number of channels, restore the inoperable channel to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room emergency air cleanup system in the isolation mode of operation. (See Note 1)
- ACTION 15 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency air cleanup system in the isolation mode of operation. (See Note 1)
- ACTION 16 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.12.
- ACTION 17 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, operation may continue provided that the purge valves are maintained closed.
- ACTION 17a - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.5.1. (Mode 1, 2, 3, 4 only)
- ACTION 17b - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, close each of the containment purge penetrations providing direct access from the containment atmosphere to the outside atmosphere.
- NOTE 1 - During construction for DCP 2/3-6933.00SJ Actions 14 and 15 will not be in effect. Compensatory actions for the TGIS channels will be conducted in accordance with the October 18, 1995, Edison letter to the U.S. Nuclear Regulatory Commission.

ATTACHMENT D

PROPOSED TECHNICAL SPECIFICATIONS
UNIT 3

Table 3.3-3 (Continued)

TABLE NOTATION

- ACTION 13 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency air cleanup system in the emergency (except as required by ACTIONS 14, 15) mode of operation.
- ACTION 14 - With the number of channels OPERABLE one less than the total number of channels, restore the inoperable channel to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room emergency air cleanup system in the isolation mode of operation. (See Note 1)
- ACTION 15 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency air cleanup system in the isolation mode of operation. (See Note 1)
- ACTION 16 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.12.
- ACTION 17 - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, operation may continue provided that the purge valves are maintained closed.
- ACTION 17a - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.5.1. (MODE 1, 2, 3, 4 only)
- ACTION 17b - With the number of channels OPERABLE less than required by the minimum channels OPERABLE requirement, close each of the containment purge penetrations providing direct access from the containment atmosphere to the outside atmosphere.
- NOTE 1 - During construction for DCP 2/3-6933.00SJ Actions 14 and 15 will not be in effect. Compensatory actions for the TGIS channels will be conducted in accordance with the October 18, 1995, Edison letter to the U.S. Nuclear Regulatory Commission.