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INFORMAL REPORT

CONFORMANCE TO REGULATORY GUIDE 1.97, RANCHO SECO

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EG&G Idaho

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TECHNICAL EVALUATION REPORT

CONFORMANCE TO REGULATORY GUIDE 1.97
RANCHO SECO

Docket No. 50-312

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ABSTRACT

This EG&G Idaho, Inc., report reviews the submittals for Regulatory Guide 1.97, Revision 3, for the Rancho Seco Nuclear Generating Station. Exceptions to Regulatory Guide 1.97 are evaluated and those areas where sufficient basis for acceptability is not provided are identified.

FOREWORD

This report is supplied as part of the "Program for Evaluating Licensee/Applicant Conformance to RG 1.97," being conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of PWR Licensing-A, by EG&G Idaho, Inc., NRR and I&E Support Branch.

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CONFORMANCE TO REGULATORY GUIDE 1.97

RANCHO SECO

1. INTRODUCTION

On December 17, 1982, Generic Letter No. 82-33 (Reference 1) was issued by D. G. Eisenhut, Director of the Division of Licensing, Nuclear Reactor Regulation, to all licensees of operating reactors, applicants for operating licenses and holders of construction permits. This letter included additional clarification regarding Regulatory Guide 1.97, Revision 2 (Reference 2), relating to the requirements for emergency response capability. These requirements have been published as Supplement No. 1 to NUREG-0737, "TMI Action Plan Requirements" (Reference 3).

The Sacramento Municipal Utility District, licensee for the Rancho Seco Nuclear Generating Station, provided a response to the generic letter on April 15, 1983 (Reference 4). The response to Section 6.2 of the generic letter was submitted on September 14, 1983 (Reference 5), and revised on July 13, 1984 (Reference 6). This last response provides a comparison of the licensee's instrumentation to the recommendations of Revision 3 of Regulatory Guide 1.97 (Reference 7). Additional information was submitted on September 30, 1985 (Reference 8), October 31, 1985, (Reference 9), January 13, 1986 (Reference 10) and March 7, 1986 (Reference 11).

This report provides an evaluation of this material.

2. REVIEW REQUIREMENTS

Section 6.2 of NUREG-0737, Supplement No. 1, sets forth the documentation to be submitted in a report to the NRC describing how the licensee complies with Regulatory Guide 1.97 as applied to emergency response facilities. The submittal should include documentation that provides the following information for each variable shown in the applicable table of Regulatory Guide 1.97.

1. Instrument range

2. Environmental qualification

3. Seismic qualification

4. Quality assurance

5. Redundance and sensor location

6. Power supply

7. Location of display

8. Schedule of installation or upgrade

The submittal should identify deviations from the regulatory guide and provide supporting justification or alternatives.

Subsequent to the issuance of the generic letter, the NRC held regional meetings in February and March 1983, to answer licensee and applicant questions and concerns regarding the NRC policy on this subject. At these meetings, it was noted that the NRC review would only address exceptions taken to Regulatory Guide 1.97. Where licensees or applicants explicitly state that instrument systems conform to the regulatory guide, it was noted that no further staff review would be necessary. Therefore,

this report only addresses exceptions to Regulatory Guide 1.97. The following evaluation is an audit of the licensee's submittals based on the review policy described in the NRC regional meetings.

3. EVALUATION

The licensee provided responses to Item 6.2 of NRC Generic Letter 82-33 on September 14, 1983 and July 13, 1984. These responses describe the licensee's position on post-accident monitoring instrumentation. Additional information was provided on September 30, 1985, October 31, 1985, January 13, 1986 and March 7, 1986. This evaluation is based on this material.

3.1 Adherence to Regulatory Guide 1.97

The licensee has provided a review of their post-accident monitoring instrumentation that compares the instrumentation characteristics against Regulatory Guide 1.97, Revision 3. Their report lists the regulatory guide variables, showing compliance, deviations and references to justification for any deviations. Modifications identified to provide compliance with Regulatory Guide 1.97 are scheduled for completion prior to the cycle 9 startup. Therefore, we conclude that the licensee has provided an explicit commitment on conformance to Regulatory Guide 1.97, except for those deviations that were justified by the licensee as noted in Section 3.3.

3.2 Type A Variables

Regulatory Guide 1.97 does not specifically identify Type A variables, i.e., those variables that provide the information required to permit the control room operator to take specific manually controlled safety actions. The licensee classifies the following instrumentation as Type A.

1. Reactor coolant system (RCS) hot leg water temperature

2. RCS pressure

3. Containment sump water level

4. Steam generator level

5. Steam generator pressure

This instrumentation meets the Category 1 recommendations for Type A variables.

3.3 Exceptions to Regulatory Guide 1.97

The licensee identified the following deviations and exceptions to Regulatory Guide 1.97. These are discussed in the following paragraphs.

3.3.1 NUREG-0737 Instrumentation

The licensee has installed instrumentation for several variables in accordance with the requirements of NUREG-0737. For some, the range differs from tnat recommended by the regulatory guide, others deviate from the regulatory guide in the instrument category. These variables are listed below. The licensee states that this instrumentation has been reviewed and approved by the NRC. The licensee has referred to this approval in addition to his justification for any deviation.

- Degrees of subcooling
- Analysis of primary coolant
- Containment sump water level, wide range
- Containment hydrogen concentration
- Primary system safety relief valve position
- Pressurizer safety/relief valve position
- Noble gas and vent flow rate--auxiliary building

- o Noble gas release from steam generator safety relief valves or atmospheric dump valves, including duration of release and mass of steam per unit time.

We find these instances to be good faith attempts, as defined in NUREG-0737, Supplement No. 1, Section 3.7 (Reference 3), to meet NRC requirements and are, therefore, acceptable.

3.3.2 Neutron Flux

Regulatory Guide 1.97 recommends Category 1 instrumentation for this variable. The licensee indicates, in Reference 6, that the installed instrumentation is Category 3. In Reference 9, the licensee commits to install Category 1 instrumentation for this variable prior to the startup of Cycle 9. Thus, the instrumentation will be in conformance with the regulatory guide.

3.3.3 Reactor Coolant System (RCS) Cold Leg Water Temperature

Regulatory Guide 1.97 recommends Category 1 instrumentation with a range of 50 to 700°F for this variable. The licensee has supplied Category 3 instrumentation with a range of 50 to 650°F. There is a deviation in both category and range.

The licensee states that the temperature sensors must have either forced or natural circulation flow through the steam generators for their indications to be representative of actual core conditions. Also, due to the proximity of the cold leg RTD's to the high pressure injection (HPI) nozzles, the licensee states that HPI flow may significantly affect the cold leg temperature indication, particularly in the absence of forced RCS flow. The licensee states that incore temperature monitors provide a more direct indication of core cooling independent of whether or not coolant flow exists through the loops.

As the licensee has supplied Category 1 core exit thermocouples, we find this justification for Category 3 RCS cold leg water temperature instrumentation acceptable.

The licensee justifies the upper limit of the range based on the highest possible temperature of 560°. This takes into account the highest main steam safety relief valve setting of 1102.5 psig. As the instrumentation will remain on scale in the post-accident situation, we find this range acceptable.

3.3.4 RCS Hot Leg Water Temperature

Regulatory Guide 1.97 recommends instrumentation with a range of 50 to 700°F for this variable. The licensee has supplied instrumentation with a range of 120 to 920°F. The licensee states that the low end of the range for RCS hot leg temperature is not important to post-accident monitoring because cold shutdown is defined in the Technical Specifications as less than 200°F. With the RCS temperature between 50 and 120°F, it is cold enough for refueling, therefore, it is in a safe condition.

Additionally, heat removal at these temperatures would be by the residual heat removal (RHR) system rather than the steam generators. This system has instrumentation to monitor the temperature of the RCS in this temperature range. We therefore find this deviation acceptable.

3.3.5 Radiation Level in Circulating Primary Coolant

The licensee indicates that radiation level measurements to indicate fuel cladding failure are provided by the following:

1. Letdown line radiation monitor

2. Radiochemistry analysis

3. Post-accident sampling system.

The post-accident sampling system is being reviewed by the NRC as part of its review of NUREG-0737, Item II.B.3.

Based on the alternate instrumentation provided by the licensee, we conclude that the instrumentation supplied for this variable is adequate and, therefore, acceptable.

3.3.6 Containment Effluent Radioactivity - Noble Gases from Identified Release Points

The licensee provides the following justification for not having this instrumentation: (a) the containment effluent radiation monitors are of benefit only if there is a pathway to the environment through the containment purge valves or equalizing valves, (b) these valves are normally closed (per Technical Specification), and opened only during cold shutdown and (c) they would not be opened in a post-accident situation.

We note that these valves are verified closed monthly as a technical specification requirement. Based on the licensee's justification, we find the lack of instrumentation for this variable acceptable.

3.3.7 Residual Heat Removal (RHR) System Heat Exchanger Outlet Temperature

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee currently has Category 3 instrumentation for this variable. In Reference 9, the licensee commits to upgrade this instrumentation to Category 2, prior to the startup from Cycle 9. Thus, this instrumentation will be in conformance with the regulatory guide.

3.3.8 Accumulator Tank Level and Pressure

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable with a range of 10 to 90 percent volume and 0 to 750 psig pressure. The licensee has identified deviations in that (a) the level instrumentation has a range of 3 to 169 inches (2 to 81 percent volume); (b) the pressure instrumentation is Category 3.

The licensee notes that the normal water level in these tanks is 13.0 feet (156 inches), a high level alarm is set at 159.6 inches and the tank would not be filled above this level. Because the water level is maintained at less than the upper limit of the range (169 inches), and the lower limit of the range is less than the recommended limit, we find that the range is acceptable.

The licensee states that the core flood tank pressure instruments are used as backup instrumentation, and that the key variable to indicate proper operation of the core flood tanks is the level instruments.

The accumulators are passive devices. Their discharge into the reactor coolant system (RCS) is actuated solely by a decrease in RCS pressure. We find that the instrumentation supplied for this variable is adequate to determine that the accumulators have discharged. Therefore, this instrumentation is acceptable.

3.3.9 Accumulator Tank Isolation Valve Position

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee states that these valves are opened during normal plant heatup. Prior to criticality, the valves are verified to be in the operating position, and they do not change position during the course of an accident. Furthermore, the licensee observes that the position indication for these valves is diagnostic in purpose. Therefore, the licensee has supplied Category 3 instrumentation for this variable.

We find that Category 3 instrumentation for this variable is acceptable.

3.3.10 Boric Acid Charging Flow

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee has Category 3 instrumentation. The licensee states that two independent sources and multiple paths exist for

introduction of boron into the RCS for reactivity control. The boric acid charging flow to the makeup tank is the boration pathway for normal operation. Additionally, the licensee states that the borated water storage tank provides storage for borated water fed to the suction of the high pressure injection (HPI) and the low pressure injection (LPI) pumps. It is this boron source which is the assured post-accident boration source. Thus, the boric acid charging pump flow is not considered a safety system by the licensee since the charging flow to the makeup tank is only assumed to be operational during normal operation. The licensee states that the boric acid charging pumps are not a source of boron for RCS reactivity control following any design basis accident.

Based on the analysis given by the licensee, we find the deviation from Category 2 to Category 3 for this variable acceptable.

3.3.11 Refueling Water Storage Tank Level

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee has Category 3 level instrumentation for the borated water storage tank. As an accident progresses, the volume of water in this tank is depleted, accumulating in the reactor building sumps (which have Type A, Category 1 level instrumentation). The licensee states that the decision to switch the emergency cooling system pump suction from this tank to the sump is based solely on the key variable, sump level.

Based on the analysis given by the licensee, we find the deviation from Category 2 to Category 3 for this variable acceptable.

3.3.12 Pressurizer Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the top to the bottom of the pressurizer vessel. The licensee's instrumentation has a range that is limited by the location of the upper and lower pressure taps to 320 inches (or 72 percent of the straight side height). The licensee states that the RCS can experience a reactor trip from full power without uncovering the level sensors in the

lower shell and will maintain steam pressure above the high pressure injection (HPI) system actuation setpoint. Additionally, the licensee states that the RCS can experience a turbine trip without covering the level sensors in the upper shell. Thus, the range allows level monitoring to ensure proper operation of pressurizer heaters. The licensee states that it is adequate for the purpose of determining RCS leakage and voiding.

In Reference 10, the licensee states that the existing range is sufficient to remain on scale for anticipated transients. For severe accidents or transients, the pressurizer will either void or go solid. This would cause the pressurizer level indication to go off-scale low or high depending on the accident or transient, regardless of the span of the range. In these cases of off-scale pressurizer instrumentation, action to be taken must be determined by subcooling margin, reactor coolant system pressure, power operated relief valve status and pressurizer safety valve status. These indications are all available in the control room.

Based on the licensee's justification and the alternate instrumentation available, we conclude that indication of the pressurizer level outside of the supplied range will provide no significant additional information. Therefore, we find this to be an acceptable deviation from Regulatory Guide 1.97.

3.3.13 Pressurizer Heater Status

Regulatory Guide 1.97 recommends instrumentation to monitor the current drawn by the pressurizer heaters. The licensee's instrumentation consists of on/off indication of the redundant emergency pressurizer heaters. In Reference 10, the licensee commits to provide current instrumentation for the emergency pressurizer heaters, prior to Cycle 9 startup. We find this commitment acceptable in meeting the recommendations of Regulatory Guide 1.97.

3.3.14 Quench Tank Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the top to the bottom of the tank. The overall height of

this tank is 23 feet 5 inches. The straight cylindrical shell height (without the hemispherical ends) is 17 feet 7 inches. The range supplied by the licensee indicates the top 10 feet of the straight cylindrical shell height.

The licensee indicates that the normal water level is maintained at greater than 50 percent of the indicated level (66 percent of total tank height). Any pressurizer discharge to the quench tank would increase the level. Any level above the indicated range would be in a hemispherical end, where the level/volume ratio is not linear. The tank is essentially full with the level this high.

Based on this analysis, we find that the range of the instrumentation for the quench tank level is acceptable.

3.3.15 Quench Tank Temperature

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 50 to 750°F. The installed instrumentation has a range of 100 to 600°F, with the temperature on the suction side of the pressurizer relief tank recirculation pump being monitored. The licensee states that the saturated temperature at the rupture disk relief pressure of 180 psig is 373°F. The temperature in the quench tank cannot exceed the saturation temperature unless the liquid in the tank is depleted to below the level of the header discharge. Depletion is unlikely since the effect of condensing steam is to add liquid to the tank.

We consider the deviation in the upper limit of the range acceptable. The licensee states, in Reference 9, that the lower limit of the range will be extended to include 50°F during the Cycle 8 refueling outage. Thus, the lower limit of this instrumentation will be in conformance with the regulatory guide.

3.3.16 Quench Tank Pressure

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 0 to design pressure. The design pressure of this tank

is 235 psig. The instrumentation for this variable has a range of 0 to 200 psig. The licensee states that this is adequate since the tank rupture disk set pressure is 180 psig.

Based on the rupture disk set pressure, we find that the range of 0 to 200 psig is acceptable and adequate.

3.3.17 Steam Generator Pressure

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 0 to 20 percent above the lowest safety valve setting. The lowest safety valve setting is 1050 psig; therefore the range should be from 0 to 1260 psig. The instrumentation for this variable has a range of 0 to 1200 psig, 9 percent above the highest safety valve setting.

The licensee states that the upper limit of the range of the instrumentation is 9 percent above the highest setting of the safety relief valves and that the pressure-relief capacity is 20 percent greater than required to relieve the steam flow at maximum power.

Based on this statement, and the maximum range being nearly 100 psi above the highest safety valve setting, we find that the range of 0 to 1200 psig is acceptable.

3.3.18 Containment Spray Flow

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. In Reference 9, the licensee describes the instrumentation for this variable. The safety-grade containment spray system is actuated automatically by high containment pressure. Thus, the licensee considers the Category 1 reactor building pressure instrumentation the key variable to indicate operation of this containment cooling system. Reactor building pressure and reactor building temperature (Category 2) show the effects of the spray. Pump and valve position are monitored to indicate system operation. Finally, Category 3 flow transmitters are indicated in the control room as a backup variable.

The alternate instrumentation provided by the licensee is adequate to monitor this variable. Therefore, we find this deviation acceptable.

3.3.19 Heat Removal by the Containment Fan Heat Removal System

Regulatory Guide 1.97 recommends plant specific instrumentation for this variable. The licensee, in Reference 5, indicates that this is monitored by air flow instrumentation with a range of 0 to 40,000 SCFM. Reference 6 indicates a deviation, measuring this variable indirectly by fan on/off indication. As this is an engineered safety feature (ESF) system, cooling water flow to this system is monitored. We find this combination of instrumentation acceptable for this variable.

3.3.20 Containment Atmosphere Temperature

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee currently has Category 3 instrumentation for this variable. The licensee states, in Reference 9, that this instrumentation will be upgraded to Category 2 prior to the startup from Cycle 9. Thus, this instrumentation will be in conformance with the regulatory guide.

3.3.21 Containment Sump Water Temperature

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable with a range of 50 to 250°F. The licensee does not have instrumentation for this variable. The licensee states that adequate net positive suction head exists for all pumps that use the sump as a water source regardless of the sump temperature.

The Rancho Seco station has temperature indication for the decay heat removal (DHR) heat exchanger outlet and DHR/reactor building spray suction line. The suction line temperature (range of 0 to 300°F) will be the same as the sump temperature when the sump is the water source for the DHR system or reactor building spray system. We find this alternate instrumentation acceptable.

3.3.22 Letdown Flow-Out

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee has Category 3 instrumentation. The licensee states that maintaining letdown flow is not essential to the mitigation of any design basis accident. Furthermore, in the event that the Safety Features Actuation System (SFAS) is initiated, letdown flow is isolated.

As this flow is isolated as a result of an accident signal, Category 3 instrumentation for this variable is acceptable.

3.3.23 Volume Control Tank Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the top to the bottom of the tank. The licensee does not consider this as post-accident instrumentation; however, the range of this instrumentation covers from 29 to 129 inches of the 153 inch tank height The level is maintained within this range.

The range supplied essentially covers the straight cylindrical shell, not monitoring the hemispherical ends of the tank where the level to volume ratio is not linear. Approximately 78 percent of the tank volume, inclusive of the hemispherical ends is measured for level. Based on this, and the licensee's justification for not requiring this instrumentation in a post-accident situation, we find this deviation in range acceptable.

3.3.24 Component Cooling Water Temperature to Engineered Safety Feature (ESF) System Components

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee has Category 3 instrumentation installed. Cooling water for the ESF components is provided by the Nuclear Service Raw Water (NSRW) system. The heat from this system is transferred to the atmosphere by spray ponds. The Nuclear Service Cooling Water (NSCW) system is cooled by the NSRW system. The spray ponds provide a source of low temperature coolant for the NSCW and NSRW systems.

The NSCW provides cooling for the decay heat removal (DHR) coolers and the reactor building emergency cooling units. It consists of two independent closed loop systems, cooled by the NSRW/NSCW service cooling water heat exchangers. In Reference 9, the licensee committed to provide Category 2 instrumentation to monitor the NSCW temperature during the Cycle 9 refueling outage. Thus, this instrumentation will be in conformance with the regulatory guide.

The NSRW provides cooling for the NSCW, the diesel generators, the emergency pump room air coolers, the HPI pump lube oil coolers, the DHR pump bearing oil coolers, and the reactor building spray pump bearing oil coolers. It consists of two independent open loop systems, cooled by the mentioned spray ponds. The licensee states that the upper limit of the temperature of this water is 95°F. With flow, and thus the pond spray operating, the temperature will be lower than this. Based on this description, we find the Category 3 temperature instrumentation for the NSRW system acceptable.

3.3.25 Component Cooling Water Flow to Engineered Safety Feature (ESF) System

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee measures the flow to individual components using Category 3 instrumentation. The licensee indicates that the component flow is complementary to their Class 1 pump status and valve position indications. We find that this combination of instrumentation is adequate for this variable.

3.3.26 Radioactive Gas Holdup Tank Pressure

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of 0 to 150 percent of design pressure. The tank design pressure is 150 psig; the instrumentation range is 0 to 160 psig. Thus the range deviates from that recommended.

There is a safety relief valve on this tank, set to relieve any pressure above 145 psig. As the tank pressure will not exceed 160 psig, we find this range acceptable.

3.3.27 Estimation of Atmospheric Stability

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of -9 to +18°F or an analogous range for alternative stability analysis. The licensee has supplied instrumentation with a range of -10 to +10°F. The licensee justifies this, indicating that the range is based on RG 1.23, Rev. 1, Table 1, 'Classification of Atmospheric Stability by Temperature Change with Height'.

Table 1 of Regulatory Guide 1.23 provides seven atmospheric stability classifications based on the difference in temperature per 100 meters elevation change. These classifications range from extremely unstable to extremely stable. Any temperature difference greater than +4°C or less than -2°C does nothing to the stability classification. The licensee's instrumentation encompasses this range. Therefore, we find that the instrumentation is acceptable to determine the atmospheric stability.

3.3.28 Accident Sampling (Primary Coolant, Containment Air and Sump)

The licensee's post-accident sampling system provides sampling and analysis as recommended by the regulatory guide, except that

1. It does not have the capability to analyze for dissolved oxygen, using total gas instead, and

2. It does not have containment air oxygen content analysis on-site, as no action is planned based on this parameter.

The licensee deviates from Regulatory Guide 1.97 with respect to post-accident sampling capability. This deviation goes beyond the scope of this review and is being addressed by the NRC as part of their review of NUREG-0737, Item II.B.3.

3.3.29 Category 1 Indicators

Regulatory Guide 1.97 recommends continuous real-time display of Category 1 variables. When direct and immediate trend or transient information is essential for operator information or action, a recording should be continuously available on redundant dedicated recorders.

The Category 1 instrumentation will be displayed on the Safety Parameter Display System (SPDS). The licensee has committed to provide SPDS hardware and software that will meet Category 1 requirements. The NRC is separately and independently reviewing the hardware and software for the SPDS. This technical evaluation report does not evaluate the adequacy of the SPDS.

Based on the licensee's commitment to provide Category 1 hardware and software for the SPDS, we find the use of this system for indication and recording of Regulatory Guide 1.97 variables acceptable.

4. CONCLUSIONS

Based on our review, we find that the licensee either conforms to or is justified in deviating from Regulatory Guide 1.97. This report does not address the adequacy of the SPDS.

5. REFERENCES

1. NRC letter, D. G. Eisenhut to All Licensees of Operating Reactors, Applicants for Operating Licenses, and Holders of Construction Permits, "Supplement No. 1 to NUREG-0737--Requirements for Emergency Response Capability (Generic Letter No. 82-33)," December 17, 1982.

2. Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident, Regulatory Guide 1.97, Revision 2, NRC, Office of Standards Development, December 1980.

3. Clarification of TMI Action Plan Requirements, Requirements for Emergency Response Capability, NUREG-0737, Supplement No. 1, NRC, Office of Nuclear Reactor Regulation' January 1983.

4. Sacramento Municipal Utility District (SMUD) letter, R. J. Rodriguez to Director of Nuclear Reactor Regulation, NRC, "Generic Letter No. 82-33, Supplement 1 to NUREG-0737," April 15, 1983.

5. SMUD letter, J. J. Mattimoe to Director of Nuclear Reactor Regulation, NRC, "Regulatory Guide 1.97 Comparison Report," September 14, 1983.

6. SMUD letter, R. J. Rodriguez to Director of Nuclear Reactor Regulation, NRC, "NUREG-0737 Supplement 1--Regulatory Guide 1.97," July 13, 1984.

7. Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident, Regulatory Guide 1.97, Revision 3, NRC, Office of Nuclear Regulatory Research, May 1983.

8. SMUD letter, R. J. Rodriguez to Director of Nuclear Reactor Regulation, NRC, "NUREG 0737, Supplement 1 - Status of Open Items for Implementation," September 30, 1985, RJR 85-470.

9. SMUD letter, R. J. Rodriguez to Director of Nuclear Reactor Regulation, NRC, "Regulatory Guide 1.97, Request for Additional Information," October 31, 1985, RJR 85-521.

10. SMUD letter, R. J. Rodriguez to Director of Nuclear Reactor Regulation, NRC, "Regulatory Guide 1.97 Request for Additional Information," January 13, 1986, RJR 86-11.

11. SMUD letter, R. J. Rodriguez to Director of Nuclear Reactor Regulation, NRC, "Regulatory Guide 1.97 Implementation Schedule," March 7, 1986, RJR 86-93.

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13 ABSTRACT (200 words or less)

This EG&G Idaho, Inc. report reviews the submittals for the Rancho Seco Nuclear Generating Station, and identifies areas of nonconformance to Regulatory Guide 1.97.

14 DOCUMENT ANALYSIS - a KEYWORDS/DESCRIPTORS

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