EGG-NTA-7368

TECHNICAL EVALUATION REPORT

CONFORMANCE TO REGULATORY GUIDE 1.97
ZION NUCLEAR POWER STATION, UNIT NOS. 1 AND 2

Docket Nos. 50-295 and 50-304

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Published January 1987

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Prepared for the
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Under DOE Contract No. DE-AC07-76ID01570
FIN No. A6483

ABSTRACT

This EG&G Idaho, Inc., report reviews the submittal for Revision 2 of Regulatory Guide 1.97 for Unit Nos. 1 and 2 of the Zion Nuclear Power Station and identifies areas of nonconformance to the regulatory guide. Exceptions to Regulatory Guide 1.97 are evaluated and those areas where sufficient basis for acceptability is not provided are identified.

Docket Nos. 50-295 and 50-304
TAC Nos. 51367 and 51368

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.

The U.S. Nuclear Regulatory Commission Funded the work under authorization B&R 20-19-10-11-3.

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CONFORMANCE TO REGULATORY GUIDE 1.97
ZION NUCLEAR POWER STATION, UNIT NOS. 1 AND 2

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).

Commonwealth Edison Company, the licensee for Unit Nos. 1 and 2 of the Zion Nuclear Power Station, responded to Section 6.2 of the generic letter with a letter dated August 1, 1986 (Reference 4). This provides a review of the instrumentation provided for Revision 2 of Regulatory Guide 1.97.

This report provides an evaluation of that submittal.

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 any deviations from the recommendations of Regulatory Guide 1.97 and provide supporting justification or alternatives for the deviations identified.

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 their 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 submittal based on the review policy described in the NRC regional meetings.

3. EVALUATION

This evaluation is based on the licensee's August 1, 1986 response to Generic Letter 82-33.

3.1 Adherence to Regulatory Guide 1.97

The licensee's submittal for Unit Nos. 1 and 2 of the Zion Nuclear Power Station, compares their post-accident monitoring instrumentation with that recommended by Regulatory Guide 1.97, Revision 2. The licensee states that a final Regulatory Guide 1.97 report and implementation schedule will be submitted by February 1, 1987. Therefore, we conclude that the licensee has provided an explicit commitment on conformance to Regulatory Guide 1.97. Exceptions to and deviations from the regulatory guide are 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 (wide range)

2. RCS cold leg water temperature (wide range)

3. RCS pressure

4. Steam generator level (wide range)

5. Steam generator level (narrow range)

6. Pressurizer level

7. Steam line pressure

8. Containment pressure

9. Refueling water storage tank level

10. Containment water level (wide range)

11. Auxiliary feedwater flow

12. Containment radiation level

13. Core exit temperature

14. RCS subcooling

15. Condensate storage tank level

This instrumentation meets the Category 1 recommendations consistent with the requirements for Type A variables, except as noted in Section 3.3.

3.3 Exceptions to Regulatory Guide 1.97

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

3.3.1 Neutron Flux

Regulatory Guide 1.97 recommends Category 1 instrumentation to monitor this variable. The licensee has provided instrumentation that does not meet Category 1 requirements for environmental and seismic qualification. The licensee states that they have reclassified this instrumentation to Category 3 since the primary indication of reactivity and control and

reactor shutdown is provided by the control rod position (short term) and the post accident sampling system for boron concentration (long term).

The measurement of neutron flux is the key variable, defined in Regulatory Guide 1.97, for detecting an uncontrolled approach to criticality and for determination that an accident has been successfully mitigated. Control rod position and RCS soluble boron concentration are the backup variables (Category 3) as defined in Regulatory Guide 1.97. Because of this, the licensee's justification is not acceptable.

The licensee should therefore provide instrumentation for this variable that is environmentally qualified in accordance with the provisions of 10 CFR 50.49 and Regulatory Guide 1.97.

Regulatory Guide 1.97 recommends seismic qualification for all Category 1 instrumentations. The licensee's justification is not acceptable. The licensee should provide the recommended seismic qualification for this variable in accordance with the plants' seismic design criteria.

3.3.2 RCS Cold Leg Water Temperature
RCS Hot Leg Water Temperature

Regulatory Guide 1.97, Revision 2, recommends instrumentation with a range of 50 to 750°F for these variables. The licensee has provided a range of 0 to 700°F. The licensee states that the existing range is adequate to monitor RCS design temperatures and pressure and in addition the core exit thermocouple indication provides an alternate temperature indication.

The licensee indicates that the range supplied exceeds all expected design basis conditions. Based on this statement, we find this deviation acceptable. Further, Revision 3 of Regulatory Guide 1.97 (Reference 5) recommends a range of 50 to 700°F. This range is met by the licensee.

3.3.3 Core Exit Temperature

The licensee has identified this variable as Type A which requires Category 1 instrumentation. The licensee has not provided Category 1 instrumentation stating that further modification is required since only part of the system is environmentally qualified and safety-related.

The NRC is reviewing the acceptability of this variable as part of their review of NUREG-0737, Item II.F.2.

3.3.4 Degrees of Subcooling

Regulatory Guide 1.97 recommends environmentally qualified instrumentation for this variable. The licensee states that further modification is needed for this instrumentation since only part of the system is environmentally qualified and safety related.

The NRC is reviewing the acceptability of this variable as part of their review of NUREG-0737, Item II.F.2.

3.3.5 Containment Isolation Valve Position

Regulatory Guide 1.97 recommends Category 1 valve position indication for the purpose of verifying the accomplishment of isolation. The licensee has provided a list of containment isolation valves and justification for exceptions (note 26) from the regulatory guide recommendations.

Based on the information provided we are unable to determine that the recommendations for (a) redundancy, (b) single-failure criterion and (c) environmental qualification have been met.

a. The licensee has listed a group of valves that do not have position indication for series pairs. The licensee states that backup indication is provided by various plant system variables. The licensee should provide additional information for the valves

listed i.e., why is there no indication of individual valves of the series pair?. Why is a plant system variable adequate to determine the proper valve position?

b. The licensee states that all air operated and solenoid operated valves fail in the safe direction (closed) on loss of power, thus, position status for these valves need only meet Category 3 criteria.

The fact that these valves are supposed to fail shut is not sufficient justification for not meeting the single failure criterion. In an accident situation, the operator should be able to ascertain that the valves are in fact shut from the position indication. The licensee should meet this single failure criterion.

c. We are unable to determine from the licensee's submittal which valve position switches are located in a mild environment and which ones are not. The licensee should provide information that verifies that all valve position switches requiring environmental qualification do in fact have the proper switch.

3.3.6 Radioactivity Concentration or Radiation Level in Circulating Primary Coolant

Regulatory Guide 1.97 recommends Category 1 instrumentation for this variable. The licensee has provided Category 3 instrumentation stating that containment radiation and containment hydrogen concentration are the primary short-term indications of fuel-cladding integrity. The licensee further states that the post accident sampling system provides additional, long term indication.

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

3.3.7 Containment Effluent Radioactivity - Noble Gasses (from Identified Release Points)

Regulatory Guide 1.97 recommends Category 2 instrumentation with a range of 10^{-6} to 10^{-2} µCi/cc for this variable. The licensee indicates that an instrument is installed to monitor this variable and has a range of 10 to 10^{6} cpm. The licensee states that this effluent path is not required for post-accident service and therefore, meeting the regulatory guide recommendations for this variable is not applicable.

This is insufficient justification for this deviation. The licensee should provide an explanation as to why this flow path is not required post-accident and show the correlation between cpm and µCi/cc so a determination can be made that the provided range meets the Regulatory Guide 1.97 recommendation.

3.3.8 Effluent Radioactivity-Noble Gases (from buildings--)

Regulatory Guide 1.97 recommends Category 2 instrumentation with a range of 10^{-6} to 10^{3} µCi/cc for this variable. The licensee indicates that an instrument is installed to monitor this variable and has a range of 10 to 10^{6} cpm. The licensee states that this effluent path is not required for post-accident service and therefore, meeting the regulatory guide recommendations for this variable is not applicable.

This is insufficient justification for this deviation. The licensee should provide an explanation as to why this flow path is not required post-accident and show the correlation between cpm and µCi/cc so a determination can be made that the provided range meets the Regulatory Guide 1.97 recommendation.

3.3.9 Residual Heat Removal (RHR) Flow

Regulatory Guide 1.97 recommends environmentally qualified instrumentation with a range of 0 to 110 percent of design flow for this

variable. The licensee states that the sensors are located in a mild environment and the range is 0 to 59.5 inches of water and 0 to 800 inches of water.

Non environmentally qualified instrumentation is acceptable since the instrumentation is located in a mild environment. However, we are unable to determine, from the information provided, that the recommended range has been provided. The licensee should provide the information that shows that 0 to 110 percent of the design flow is monitored.

3.3.10 RHR Heat Exchanger Outlet Temperature

Regulatory Guide 1.97 recommends environmentally qualified instrumentation with a range of 32°F to 350°F for this variable. The licensee states that the sensors are located in a mild environment and that the range of 50°F to 350°F is adequate for the intended monitoring functions.

Non-environmentally qualified instrumentation is acceptable since the instrumentation is located in a mild environment. The range recommended for this variable in Regulatory Guide 1.97, Revision 2, is 40°F to 350°F. This deviation is less than 3 percent of the maximum recommended range. Considering instrument accuracy, and overall range, we consider this deviation minor and, therefore, acceptable.

3.3.11 Accumulator Tank Level and Pressure

Regulatory Guide 1.97 recommends environmentally qualified instrumentation for this variable with a range of 10 to 90 percent volume (for level) and 0 to 750 psig (pressure). The licensee has supplied instrumentation with no environmental qualification. The provided ranges are approximately 20 to 95 percent of the tank volume and 0 to 700 psig.

The licensee states that the primary function of both level and pressure instrumentation is to monitor the pre-accident status of the

accumulator tanks to assure that this passive safety system is prepared to serve its safety function.

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 ranges of the instrumentation supplied for this variable are adequate to determine that the accumulators have discharged. Therefore, the ranges of this instrumentation are acceptable for this variable.

The existing non-qualified instrumentation is not acceptable. An environmentally qualified instrument is necessary to monitor the status of these tanks. The licensee should designate either level or pressure as the key variable to directly indicate accumulator discharge and provide instrumentation for that variable that meets the requirements of 10 CFR 50.49 and Regulatory Guide 1.97.

3.3.12 Accumulator Isolation Valve Position

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee states that this requirement is not applicable at this station since these valves are de-energized in the open position.

Based on the licensee's justification that these valves are open and can not change position during or following an accident, we consider the instrumentation provided for this variable acceptable.

3.3.13 Boric Acid Charging Flow

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737. The information provided pertains to the boric acid transfer pump flow.

The licensee should provide the required information, identify any deviation from Regulatory Guide 1.97 and provide supporting justification or alternatives for those deviations.

3.3.14 Flow in High Pressure Injection (HPI) System

Regulatory Guide 1.97 recommends Category 2 instrumentation with a range of 0 to 110 percent of design flow for this variable. The licensee has instrumentation that is not environmentally qualified and has a range of 0 - 3200 inches of water and 0 - 25 psi. The licensee states that environmental qualification is not necessary since the instrumentation is located in a mild environment. The licensee further states that this instrumentation is not safety-related and is adequate for the intended use.

We find the licensee's justification unacceptable. The licensee should provide information on the following.

1. What basis is used to consider the HPI system to be non-safety-related?

2. Is the entire flow instrumentation system located in a mild environment?

3. What is the correlation between design flow, inches of water and psi?

4. Is 0 to 110 percent of design flow being monitored with the existing range?

3.3.15 Flow in Low Pressure Injection (LPI) System

Regulatory Guide 1.97 recommends Category 2 instrumentation with a range of 0 to 110 percent of design flow for this variable. The licensee has instrumentation that is not environmentally qualified and has a range of 0 - 59.5 inches of water and 0 - 800 inches of water. The licensee

states that environmental qualification is not necessary since the instrumentation is located in a mild environment. The licensee further states that this instrumentation is not safety-related and is adequate for the intended use.

We find the licensee's justification unacceptable. The licensee should provide information on the following.

1. What basis is used to consider the LPI system to be non-safety-related?

2. Is the entire flow instrumentation system located in a mild environment?

3. What is the correlation between design flow and inches of water?

4. Is 0 to 110 percent of design flow being monitored with the existing range?

3.3.16 Refueling Water Storage Tank Level

Regulatory Guide 1.97 recommends environmentally qualified instrumentation for this variable. The licensee has instrumentation that is not environmentally qualified and states that a modification is required.

The licensee should commit to upgrading this instrumentation in accordance with the Environmental Qualification Rule, 10 CFR 50.49 and Regulatory Guide 1.97.

3.3.17 Primary System Safety-Relief Valve Position

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee has provided Category 3 instrumentation for the safety relief valve position indication. The licensee states that existing instrumentation is adequate since the relief valves are totally enclosed

and self actuated at 2500 psia. In addition a backup indication of valve position is provided by thermowell temperature indications in each downstream discharge line which includes a high temperature alarm.

We find the licensee's justification unacceptable. Besides the recommendation of Regulatory Guide 1.97 for Category 2 instrumentation, Item II.D.3 of NUREG-0737 also addresses this variable.

Three clarifications from the position of NUREG-0737 are (a) if the position indication is not safety grade, a reliable single channel of direct indication powered from a vital instrument bus may be provided if backup methods of determining valve position are available and are discussed in the emergency procedures, (b) the valve position indication should be seismically qualified consistent with the component of the system to which it is attached and (c) the position indication should be qualified for its appropriate environment (any transient or accident which could cause the relief or safety valve to lift).

As a minimum the criteria of Regulatory Guide 1.97 for Category 2 instrumentation should be complied with.

3.3.18 Quench Tank (Pressurizer Relief Tank) Temperature

Regulatory Guide 1.97 recommends a temperature range of 50 to 750°F for this variable. The licensee has provided a range of 50 to 400°F and states that the instruments are adequate for the intended use.

The licensee has not provided adequate justificaton for this deviation. The licensee should show that the temperature indication will remain on scale, including the maximum saturation temperature, during any accident that lifts the pressurizer relief valves.

3.3.19 Safety/Relief Valve Position or Main Steam Flow

Regulatory Guide 1.97 recommends closed-not closed indication or steam flow indication to monitor this variable. The licensee indicates that the range is 0 to 300 inches of water.

This is insufficient information to determine that the range recommendation has been met for this variable. The licensee should provide the correlation between inches of water and flow.

3.3.20 Main Feedwater Flow

Regulatory Guide 1.97 recommends instrumentation with a range of 0 to 110 percent of design flow to monitor this variable. The licensee indicates that the range monitored is 0 to 600 and 0 to 300 inches of water.

This is insufficient information to determine that the range recommendation has been met for this variable. The licensee should provide the correlation between inches of water and flow.

3.3.21 Auxiliary Feedwater Flow

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of 0 to 110 percent of design flow. Since the licensee has designated this instrumentation as Type A, this instrumentation should be Category 1. The licensee indicates the range is 200 inches of water and there is no redundant channel to meet the single failure criteria.

The licensee states that the lack of redundancy is resolved by use of redundant instrument power supplies, redundant auxiliary feedwater pumps and the ability to isolate flow through a damaged steam generator line. The licensee further states that steam generator narrow range level is available as backup indication.

This is insufficient information to determine that the range recommendation has been met for this variable. The licensee should provide the correlation between inches of water and flow.

We find the redundancy deviation unacceptable for Type A variables. Neither NUREG-0737, nor Regulatory Guide 1.97 require this instrumentation to be Type A. The licensee has determined that this instrumentation is Type A. Therefore, the licensee should provide Category 1 instrument channels for this variable.

3.3.22 Condensate Storage Tank Water Level

Regulatory Guide 1.97 recommends Category 1 instrumentation for this variable. The licensee has instrumentation that is not Category 1 and states that a modification is required.

The licensee should commit to upgrading this instrumentation to meet the Category 1 requirements.

3.3.23 Containment Atmosphere Temperature

Regulatory Guide 1.97 recommends Category 2 instrumentation with a range of 40 to 400°F for this variable. The licensee has supplied Category 3 instrumentation with a range of 0 to 150°F. The licensee states that the containment atmosphere temperature is not a key variable for accident monitoring; that the key variable for monitoring containment cooling is containment pressure indication, which is monitored by Category 1 instrumentation; and that the containment atmosphere temperature is a backup variable for reactor building accident monitoring.

We find that the licensee's application of Category 3 backup instrumentation is in accordance with the regulatory guide. However, the licensee should justify the range and show that it will remain on scale for post-accident conditions, or provide the recommended range.

3.3.24 Component Cooling Water Flow to Engineered Safety Features (ESF) System

Regulatory Guide 1.97 recommends a flow range from 0 to 110 percent of design flow for this variable. The licensee has provided a range of 1500 to 7000 gpm. The licensee states that the instruments are adequate for the intended purpose.

Based on the licensee's justification and statement of compliance, we conclude that 1500 gpm is the minimum flow that would be seen with the system in operation. Therefore, we find this deviation acceptable.

3.3.25 Emergency Ventilation Damper Position

Regulatory Guide 1.97 recommends Category 2, open-closed status instrumentation for this variable. The licensee states that the instrumentation provided is not environmentally qualified and that radiation monitors provide indication of damper actuation and position verification.

Based on the information provided we are unable to determine if the recommendations of Regulatory Guide 1.97 have been met. The licensee should submit additional information that will clarify what instrumentation exists for this variable and that it is environmentally qualified.

3.3.26 Noble Gases and Vent Flow Rate

Regulatory Guide 1.97 recommends instrumentation for this variable with ranges monitored in μCi/cc and flow monitored from 0 to 110 percent flow. The licensee provides the existing ranges monitored in counts per minute (cpm) and mR/hr and states that no flow instrumentation exists.

Based on the information provided we are unable to determine that the instrumentation provided is adequate. The licensee should show the

correlation between μCi/cc and cpm and mR/hr and commit to the installation of flow instrumentation or further justify how releases can be assessed without it.

3.3.27 Particulates and Halogens

Regulatory Guide 1.97 recommends instrumentation for this variable with ranges monitored in μCi/cc and flow monitored from 0 to 110 percent flow. The licensee provides the existing ranges monitored in counts per minute (cpm) and states that no flow instrumentation exists.

Based on the information provided we are unable to determine that the instrumentation provided is adequate. The licensee should show the correlation between μCi/cc and cpm and commit to the installation of flow instrumentation or further justify how releases can be assessed without it.

3.3.28 Airborne Radiohalogens and Particulates

Regulatory Guide 1.97 recommends that the instrumentation to monitor airborne radiohalogens and particulates have a range of 10^{-9} to 10^{-3} Ci/cc. The licensee states that this range is N/A.

The licensee has not provided the range as required by Section 6.2 of Supplement No. 1 of NUREG-0737. The licensee should provide the range of their laboratory instrumentation, identify any deviation from Regulatory Guide 1.97 and provide supporting justification for those deviations.

3.3.29 Plant and Environs Radiation

Regulatory Guide 1.97 recommends that the plant and environs radiation monitors have a range of 10^{-3} to 10^{4} R/hr. The licensee states that the existing range is 0 to 10^{3} R/hr.

We find this deviation acceptable as the instrumentation is portable and would not be used to assess levels of radiation greater than the range provided.

3.3.30 Estimation of Atmoshperic Stability

The licensee has not provided the information required by Section 6.2 of Supplement No. 1 of NUREG-0737.

The licensee should provide the required information, identify any deviation from Regulatory Guide 1.97 and provide supporting justification or alternatives for those deviations.

4. CONCLUSIONS

Based on our review, we find that the licensee either conforms to or is justified in deviating from Regulatory Guide 1.97, with the following exceptions:

1. Neutron flux--environmental qualification should be addressed in accordance with 10 CFR 50.49 and seismic qualification should be provided in accordance with the plants' seismic design criteria (Section 3.3.1).

2. Containment isolation valve position--the licensee should provide additional information to resolve the questions on redundancy, single failure criterion and environmental qualification (Section 3.3.5).

3. Containment effluent radioactivity - noble gases--the licensee should provide an explanation for not using this flow path post-accident and show the relationship of μCi/cc and cpm (Section 3.3.7).

4. Effluent radioactivity - noble gases (from buildings--)--the licensee should provide an explanation for not using this flow path post-accident and show the relationship of μCi/cc and cpm (Section 3.3.8).

5. RHR flow--the licensee should show the correlation between inches of water and design flow (Section 3.3.9).

6. Accumulator tank level and pressure--environmentally qualified instrumentation should be provided for this variable (Section 3.3.11).

7. Boric acid charging flow--the licensee should provide the information on the instrumentation for this variable, identify any deviations and justify any deviations identified (Section 3.3.13).

8. Flow in HPI system--the licensee should provide additional information to resolve the questions asked (Section 3.3.14).

9. Flow in LPI System--the licensee should provide additional information to resolve the questions asked (Section 3.3.15).

10. Refueling water storage tank level--the licensee should make a commitment to upgrade this instrumentation in accordance with 10 CFR 50.49 (Section 3.3.16).

11. Primary system safety relief valve position--the licensee should provide Category 2 instrumentation to monitor this variable (Section 3.3.17).

12. Quench tank temperature--the licensee should provide analysis that shows the existing range will remain on scale during accident conditions (Section 3.3.18).

13. Safety/relief valve position or main steam flow--the licensee should provide additional information on the instrumentation used to monitor this variable (Section 3.3.19).

14. Main feedwater flow--the licensee should provide additional information on the instrumentation used to monitor this variable (Section 3.3.20).

15. Auxiliary feedwater flow--the licensee should provide Category 1 instrumentation for this Type A variable and provide additional range information (Section 3.3.21).

16. Containment storage tank water level--the licensee should commit to the changes necessary to upgrade this instrumentation to Category 1 (Section 3.3.22).

17. Containment atmosphere temperature--the licensee should either increase the range of this instrument or show that the existing range will remain on scale during accident conditions (Section 3.3.23).

18. Emergency ventilation damper position--the licensee should provide additional information on the instrumentation used to monitor this variable (Section 3.3.25).

19. Noble gases and vent flow rate--the licensee should provide additional information on the instrumentation used to monitor this variable (Section 3.3.26).

20. Particulates and halogens--the licensee should provide additional information on the instrumentation used to monitor this variable (Section 3.3.27).

21. Airborne radiohalogens and particulates--the licensee should provide the range of the instrumentation used to monitor airborne radichalogens and particulates, identify any deviations from the regulatory guide and justify those deviations (Section 3.3.28).

22. Estimation of atmospheric stability--the licensee should provide information on the instrumentation for this variable, identify any deviations and justify any deviations identified (Section 3.3.30).

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. Commonwealth Edison Company letter, P. C. LeBlond to H. R. Denton Director of Nuclear Reactor Regulation, NRC, "NUREG-0737, Supplement 1 - Confirmatory order - Regulatory Guide 1.97," August 1, 1986.

5. 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.

NRC FORM 335 (2.84) NRCM 1102, 3201, 3202

U.S. NUCLEAR REGULATORY COMMISSION

SEE INSTRUCTIONS ON THE REVERSE

BIBLIOGRAPHIC DATA SHEET

1 REPORT NUMBER (Assigned by TIDC and Vol. No. if any)

EGG-NTA-7368
Revision 1

2 TITLE AND SUBTITLE

CONFORMANCE TO REGULATORY GUIDE 1.97
ZION NUCLEAR POWER STATION, UNIT NOS. 1 AND 2

3 LEAVE BLANK

4 DATE REPORT COMPLETED

MONTH	YEAR
February	1987

5 AUTHOR(S)

J. W. Stoffel

6 DATE REPORT ISSUED

MONTH	YEAR
February	1987

7 PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)

NRR and I&E
EG&G Idaho, Inc.
P. O. Box 1625
Idaho Falls, ID 83415

8 PROJECT/TASK/WORK UNIT NUMBER

9 FIN OR GRANT NUMBER

A6493

10 SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)

Division of Systems Integration
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

11a TYPE OF REPORT

Preliminary Technical Evaluation Report

b PERIOD COVERED (Inclusive dates)

12 SUPPLEMENTARY NOTES

13 ABSTRACT (200 words or less)

This EG&G Idaho, Inc. report reviews the submittal for the Zion Nuclear Power Station, Unit Nos. 1 and 2, and identifies areas of nonconformance to Regulatory Guide 1.97. Exceptions to these guidelines are evaluated and those areas where sufficient basis for acceptability is not provided are identified.

14 DOCUMENT ANALYSIS - a KEYWORDS/DESCRIPTORS

b IDENTIFIERS/OPEN-ENDED TERMS

15 AVAILABILITY STATEMENT

Limited Distribution

16 SECURITY CLASSIFICATION

(This page)
Unclassified

(This report)
Unclassified

17 NUMBER OF PAGES

18 PRICE