

EGG-PBS-6887

RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATIONS (RETS)
IMPLEMENTATION--ZION GENERATING STATION UNITS 1 AND 2

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Published June 1985

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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. A6459

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ABSTRACT

A review of the Radiological Effluent Technical Specifications (RETS) of the Zion Generating Station Units 1 and 2 was performed. The principal review guidelines used were NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants," and Draft 7" of NUREG-0472, Revision 3, "Radiological Effluent Technical Specifications for Pressurized Water Reactors." Draft submittals were discussed with the Licensee by both EG&G and the NRC staff until all items requiring changes to the Technical Specifications were resolved. The Licensee then submitted final proposed RETS to the NRC which were evaluated and found to be in compliance with the NRC review guidelines. The proposed Offsite Dose Calculation Manual was reviewed and generally found to be consistent with the NRC review guidelines.

FOREWORD

This Technical Evaluation Report was prepared by EG&G Idaho, Inc. under a contract with the U. S. Nuclear Regulatory Commission (Office of Nuclear Reactor Regulation, Division of Systems Integration) for technical assistance in support of NRC operating reactor licensing actions. The technical evaluation was conducted in accordance with criteria established by the NRC.

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1. INTRODUCTION

1.1 Purpose of the Technical Evaluation

The purpose of this Technical Evaluation Report (TER) is to review and evaluate the proposed changes in the Technical Specifications of the Zion Generating Station Units 1 and 2 with regard to Radiological Effluent Technical Specifications (RETS) and the proposed Offsite Dose Calculation Manual (ODCM).

The evaluation used criteria proposed by the Nuclear Regulatory Commission (NRC) staff in the model Technical Specifications for pressurized water reactors (PWRs), NUREG-0472,[1] and subsequent revisions. This effort is directed toward the NRC objective of implementing RETS which comply with the regulatory requirements, primarily those of 10 CFR Part 50, Appendix I.[2] Other regulations pertinent to the control of effluent releases are also included within the scope of compliance.

1.2 Generic Issue Background

Since 1970, 10 CFR Part 50, Section 50.36.a,[3] "Technical Specifications on Effluents from Nuclear Power Reactors," has required licensees to provide Technical Specifications which ensure that radioactive releases will be kept as low as is reasonably achievable (ALARA). In 1975, numerical guidance for the ALARA requirement was issued in 10 CFR Part 50, Appendix I. The licensees of all operating reactors were required[4] to submit, no later than June 4, 1976, their proposed ALARA Technical Specifications and information for evaluation in accordance with 10 CFR Part 50, Appendix I. However, in February 1976, the NRC staff recommended that proposals to modify Technical Specifications be deferred until the NRC completed the model RETS.

The model RETS deal with radioactive waste management systems and environmental monitoring. Although the model RETS address the 10 CFR

Part 50, Appendix I requirements, subsequent revisions include provisions for addressing issues not covered in Appendix I. These provisions are stipulated in the following regulations:

- o 10 CFR Part 20,[5] "Standards for Protection Against Radiation," Sections 20.105.c, 20.106.g and 20.405.c which require that nuclear power plants and other Licensees comply with 40 CFR Part 190,[6] "Environmental Radiation Protection Standards for Nuclear Power Operations," and submit reports to the NRC when the 40 CFR Part 190 limits have been or may be exceeded.
- o 10 CFR Part 50, Appendix A,[7]"General Design Criteria for Nuclear Power Plants," which contains Criterion 60—Control of releases of radioactive materials to the environment; Criterion 63—Monitoring fuel and waste storage; and Criterion 64—Monitoring radioactive releases.
- o 10 CFR Part 50, Appendix B,[8] which establishes the quality assurance required for nuclear power plants.

The NRC position on the model RETS was established in May 1978 when the NRC's Regulatory Requirements Review Committee approved the model RETS: NUREG-0472 for PWRs and NUREG-0473 for boiling water reactors (BWRs). Copies of the model RETS were sent to licensees in July 1978 with a request to submit proposed site-specific RETS on a staggered schedule over a six-month period. Licensees responded with requests for clarifications and extensions.

The Atomic Industrial Forum (AIF) formed a task force to comment on the model RETS. NRC staff members first met with the AIF task force on June 17, 1978. The model RETS were subsequently revised (Revision 1) to reflect comments from the AIF and others. A principal change was the transfer of much of the material concerning dose calculations from the model RETS to a separate document, the ODCM.

Revision 1 of the model RETS was sent to licensees on November 15 and 16, 1978 with guidance (NUREG-0133)[9] for preparation of the RETS and the ODCM and a new schedule for responses, again staggered over a six-month period.

Four regional seminars on the RETS were conducted by the NRC staff during November and December 1978. Subsequently, a preliminary copy of Revision 2 of the model RETS and additional guidance on the ODCM and a Process Control Program (PCP) were issued in February 1979 to each utility at individual meetings. NUREG-0472, Revision 2[1] and NUREG-0473, Revision 2[10] were published in July 1979 and updated in January 1980 and February 1980. In response to the NRC's request, operating reactor licensees subsequently submitted initial proposals on plant RETS and the ODCM. Review leading to ultimate implementation of these documents was initiated by the NRC in September 1981 using subcontracted independent teams as reviewers.

As the RETS reviews progressed, feedback from the licensees led the NRC to modify some of the provisions in the February 1, 1980 version of Revision 2 to clarify specific concerns of the licensees and thus expedite the reviews. Starting in April 1982, the NRC distributed revised versions of RETS in draft form to the licensees during the site visits. The new guidance on these changes was presented in an AIF meeting on May 19, 1982.[11] Some interim changes regarding the Radiological Environmental Monitoring Section were issued in August 1982.[12] With the incorporation of these changes, the NRC issued Draft 7th of Revision 3 of NUREG-0472[13] and NUREG-0473[14] in September 1982 to serve as new guidance for the review teams.

1.3 Plant - Specific Background

On February 16, 1979, the Commonwealth Edison Company (CECo), the Licensee of the Zion Generating Station Units 1 and 2, submitted proposed RETS and ODCM to NRC.[15] The purpose was to revise the Zion Station Technical Specifications to conform to the requirements of 10 CFR Part 50,

Appendix I. EG&G Idaho, Inc., (EG&G), selected as an independent task review team, prepared a review and evaluation of the RETS proposal. The proposal was compared to the model RETS and assessed for compliance with the requirements of 10 CFR Part 50, Appendix I, and 10 CFR Part 50, Appendix A.

Review comments and questions dated January 19, 1982^[16] were mailed to the NRC prior to arranging a site visit with the Licensee. The site visit (February 8, 1982) was arranged for the purpose of discussing and clarifying questions identified in the review of the draft submittal.

The Licensee submitted a revised draft RETS with letter dated October 2, 1984.^[17] A review of the October 1984 draft RETS was made by EG&G and review comments transmitted to NRC with letter dated October 29, 1984.^[18] The NRC transmitted a copy of the review comments to the Licensee with NRC letter dated December 12, 1984.^[19] A telephone conference was held on March 19, 1985 between representatives of the Zion Station and the NRC to discuss and resolve the comments transmitted with the December 1984 letter. The Licensee responded with another proposal enclosed with letter dated June 25, 1985.^[20] The NRC reviewed the Specifications included in this proposal and transmitted comments to EG&G.^[21] Resolution of all comments allowed the EG&G review team to complete a TER for transmittal to the NRC.

The ODCM is a generic document for the nuclear power plants within the CECO system with sections specific to each plant within the system.^[22] Generic ODCM review comments were submitted by EG&G to NRC with letter dated January 19, 1982.^[16] Review comments specific to the Zion Station were transmitted by EG&G to NRC with letter dated November 15, 1984.^[23] The NRC transmitted a copy of the ODCM review comments to the Licensee with letter dated December 12, 1984.^[24] A telephone conference was held on March 13, 1985 between representatives of CECO, the NRC, and EG&G to discuss the outstanding Zion ODCM issues. The conference call resolved all outstanding issues and it was determined the ODCM contains documented and approved methods that are generally consistent with the guidelines of NUREG-0133 and is therefore acceptable to NRC as a reference.

2. REVIEW CRITERIA

Review criteria for the RETS were provided by the NRC in three documents:

1. NUREG-0472, RETS for PWRs
2. NUREG-0473, RETS for BWRs
3. NUREG-0133, Preparation of RETS for Nuclear Power Plants.

Twelve essential criteria are given for the RETS and ODCM:

1. All significant releases of radioactivity shall be controlled and monitored.
2. Offsite concentrations of radioactivity shall not exceed the 10 CFR Part 20, Appendix B, Table 2 limits.[25]
3. Offsite radiation doses shall be ALARA.
4. Equipment shall be maintained and used to keep offsite doses ALARA.
5. Radwaste tank inventories shall be limited so that failures would not cause offsite doses exceeding 10 CFR Part 20 limits.
6. Hydrogen and/or Oxygen concentrations in the waste gas system shall be controlled to prevent explosive mixtures.
7. Wastes shall be processed to shipping and burial ground criteria under a documented program, subject to quality assurance verification.

8. An environmental monitoring program, including a land use census, shall be implemented.
9. The radwaste management program shall be subject to regular audits and reviews.
10. Procedures for control of liquid and gaseous effluents shall be maintained and followed.
11. Periodic and special reports on environmental monitoring and on releases shall be submitted.
12. Offsite dose calculations shall be performed using documented and approved methods consistent with NRC methodology.

In addition to NUREG-0472 and NUREG-0473 and their subsequent revisions, the NRC staff issued guidelines, [26,27] clarifications, [28,29] and branch positions [30,31,32] establishing a policy that requires the licensees of operating reactors to meet the intent, if not the letter, of the model RETS requirements. The NRC branch positions issued since the RETS implementation review began have clarified the model RETS for operating reactors.

Review criteria for the ODCM are based on the following NRC guidelines: Branch Technical Position, "General Content of the Offsite Dose Calculation Manual;" [33] NUREG-0133; [9] and Regulatory Guide 1.109. [34] The format for the ODCM is left to the licensee and may be simplified by tables and grid printouts.

3.0 TECHNICAL EVALUATION

3.1 General Description of Radiological Effluent Systems

This section contains a brief description of the liquid and gaseous radwaste effluent treatment systems, release paths, and control systems installed at the Zion Generating Station PWRs, Units 1 and 2.

3.1.1 Radioactive Liquid Effluents

There are two radioactive effluent release points from the two-unit Zion Station as shown in Figure 1. The first release point is from batch releases from the Lake Discharge Tanks. Liquid radwaste from either unit is pumped to one of two Lake Discharge Tanks before batch release to Lake Michigan. The second release point is from the Waste Water Treatment Facility. Low-level radioactive liquid wastes from the fire sump is pumped to the Waste Water Treatment Facility before continuous release to Lake Michigan.

3.1.2 Radioactive Gaseous Effluents

A block diagram of the radioactive gaseous release system is shown in Figure 2. As can be seen from Figure 2, effluents are collected in a common header before release from either the Unit 1 or Unit 2 exhaust duct. Consequently it is difficult to apportion the radioactivity between the two units and allocation will normally be made evenly between units.

3.2 Radiological Effluent Technical Specifications

The following subsections describe the primary objectives of each section of the model RETS and a summary of the commitments of the Licensee's RETS. A cross-reference between the numbering in the model RETS and the Licensee's RETS is contained in Table 1. The chronological sequence of the RETS review was described in the Plant-Specific Background, Section 1.3 of this report.

3.2.1 Effluent Instrumentation

The objective of the model RETS with regard to effluent instrumentation is to ensure that all significant liquid and gaseous radioactive effluents are monitored. The model RETS specify that all effluent monitors be operable with periodic surveillance and that alarm/trip setpoints be

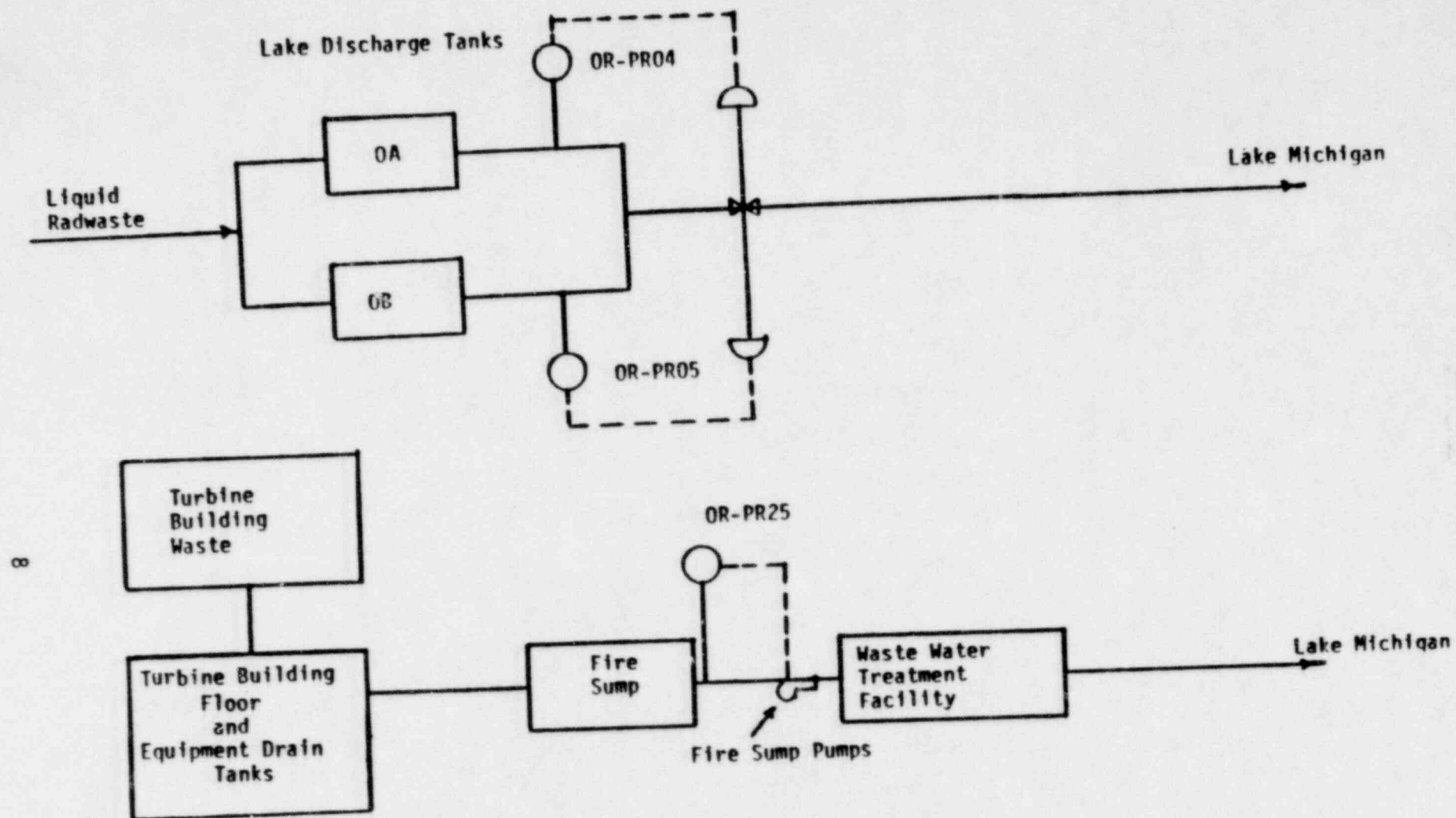


Figure 1 Zion Station liquid radwaste effluent pathway.

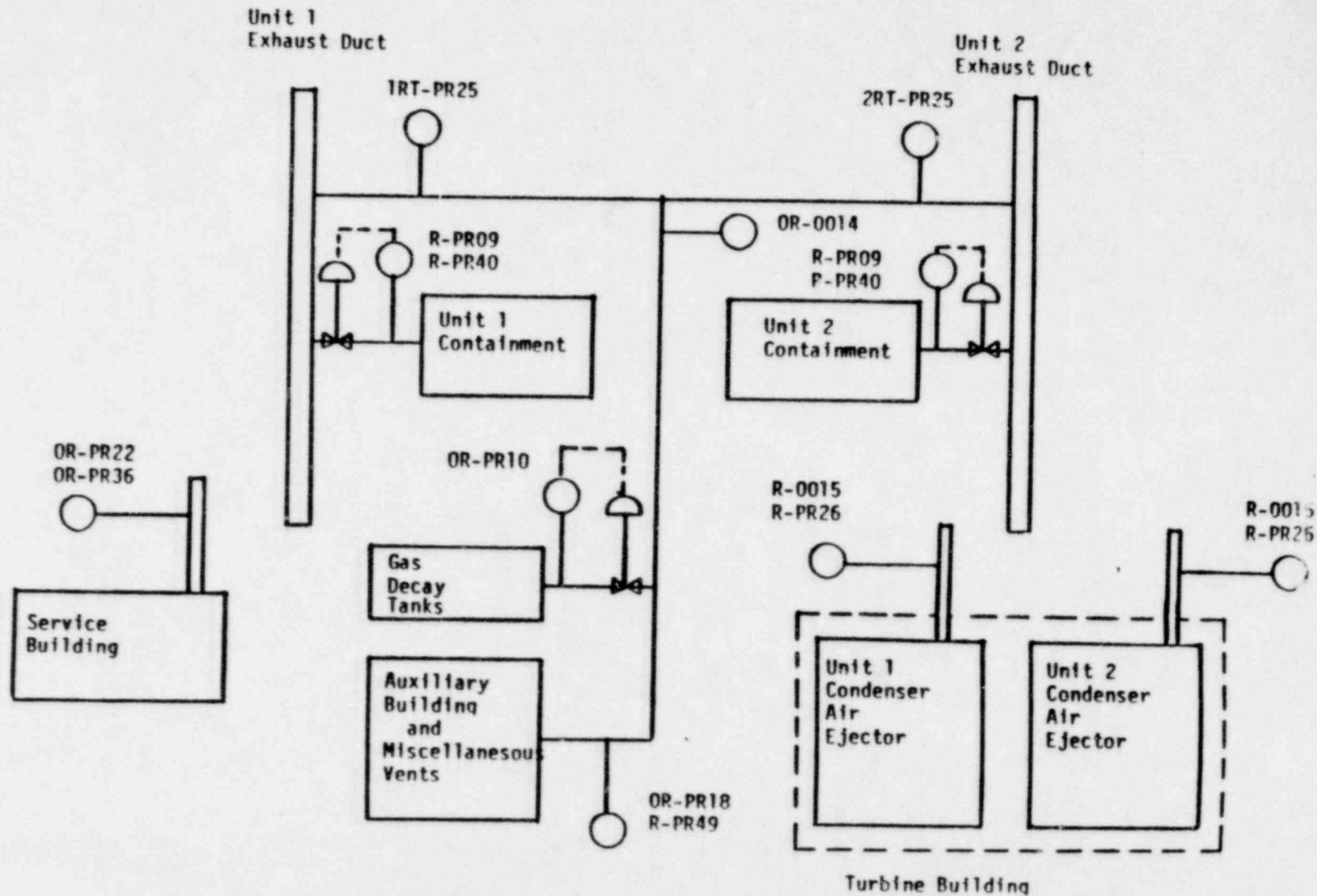


Figure 2 Zion Station gaseous radwaste effluent pathways.

determined in order to ensure that offsite radioactive effluent concentrations do not exceed maximum permissible concentrations (MPCs) listed in 10 CFR Part 20.

The Licensee has provided radiation monitors for all effluent lines with potential for release of significant amounts of radioactivity in liquid or gaseous effluents.

3.2.1.1 Radioactive Liquid Effluent Instrumentation

Instrument channels ORTPR04 and ORTPR05 are used to monitor all releases from the lake discharge tanks. On high alarm the monitor automatically initiates closure of a valve to prevent further release. The discharge valve is kept closed and tagged out of service at all times except during the discharge. The lake discharge tanks are sampled and quantified before release. The flow rate is determined from flow rate monitoring devices.

The discharge line from the fire sump pumps to the Waste Water Treatment Facility is continuously monitored by instrument channel ORTPR25. On high alarm the monitor automatically trips all of the fire sump pumps. The fire sump is sampled and quantified daily and the flow rate is determined based on pump capacity and run time.

The Licensee's RETS identifies acceptable surveillance checks to be performed on the liquid effluent instrumentation.

3.2.1.2 Radioactive Gaseous Effluent Instrumentation

The block diagram of Figure 2 shows the position of the gaseous effluent monitors. The waste gas decay tanks are monitored with noble gas monitors OR-PR10 and iodine and particulate monitors OR-PR10C. On high alarm the noble gas monitor automatically initiates termination of release. The flow rates are determined using flow rate measuring devices.

The auxiliary building ventilation and miscellaneous areas ventilation are released through the auxiliary building exhaust duct. On high alarm from the noble gas monitor the operator is alerted to take action that will reduce the release rate. The effluents are also monitored for iodine and particulate releases with OR-PR18 and R-PR49.

The air ejector effluents are monitored for noble gases with R-0015 and for iodine and particulate releases with R-PR26.

On high alarm, the containment purge noble gas monitors R-PR09A automatically initiate termination of release. The effluents are also monitored for iodine and particulate releases with instrument channels R-PR09 and R-PR40.

Service building effluents are monitored for noble gases with OR-PR22 and for iodine and particulates with OR-PR36.

Flow rate monitoring devices are included for the stack, air ejector, and waste gas releases. The sampler flow rate monitors are not specifically identified as they are a component of the radiation monitors.

Each monitoring system has acceptable surveillance checks that meet the intent of NUREG-0472.

3.2.1.3 Liquid and Gaseous Instrumentation Setpoints

The Licensee's Technical Specifications require that the instrument setpoints for the radioactive liquid effluents be set to ensure that concentrations of radioactive material released from the site be limited to within the 10 CFR Part 20 concentrations. The setpoints for the radioactive gaseous effluent instrumentation are set to ensure the dose rates of NUREG-0472 are not exceeded. The setpoints will be set in accordance with the methodology in the ODCM.

The Licensee's RETS submittal on liquid and gaseous effluent monitoring instrumentation has satisfied the provisions and meets the intent of NUREG-0472.

3.2.2 Concentration and Dose Rates of Effluents

3.2.2.1 Liquid Effluent Concentration

The Licensee's RETS include a commitment to maintain the concentration of radioactive liquid effluents released from the site to within 10 CFR Part 20 limits. Both batch and continuous radioactive liquid releases are sampled and analyzed periodically in accordance with an acceptable sampling and analysis program.

Therefore, the Licensee's RETS submittal on liquid effluent concentrations meets the intent of NUREG-0472.

3.2.2.2 Gaseous Effluent Dose Rate

The Licensee's RETS include a commitment to maintain the gaseous dose rate from the site to within NUREG-0472 limits. Both batch and continuous radioactive gaseous releases are sampled and analyzed periodically in accordance with an acceptable sampling and analysis program.

Therefore, the Licensee's RETS submittal on gaseous effluent dose rates meets the intent of NUREG-0472.

3.2.3 Offsite Doses from Effluents

The objectives of the model RETS with regard to offsite doses from effluents are to ensure that offsite doses are kept ALARA, are in compliance with dose specifications of NUREG-0472 and are in accordance with 10 CFR Part 50, Appendix I and 40 CFR Part 190.

The Licensee's RETS include a commitment to:

1. Limit the quarterly and annual dose due to liquid effluents to within the NUREG-0472 criteria allowed for the two units at the site.

2. Limit the quarterly and annual air dose from the site due to noble gas releases to within the NUREG-0472 criteria.
3. Limit the quarterly and annual dose to any organ due to release of iodine-131, tritium, and radionuclides in particulate form with half-lives greater than eight days from the site to within the NUREG-0472 criteria.
4. Limit releases such that the dose or dose commitment to a member of the public from all uranium fuel cycle sources is within the 40 CFR Part 190 limits.

Therefore, the Licensee's RETS submittal on offsite doses from radioactive effluents meets the intent of NUREG-0472.

3.2.4 Effluent Treatment

The objectives of the model RETS with regard to effluent treatment are to ensure that the radioactive waste treatment systems are used to keep releases ALARA and to satisfy the provisions for Technical Specifications governing the maintenance and use of radwaste treatment equipment.

The Licensee's RETS include a commitment to use the liquid radwaste treatment system when the projected monthly doses exceed 25 percent of the annual dose design objectives for the two-unit site. The projections are to be made at least once per 31 days in accordance with the methodology in the ODCM.

A specification requiring use of the gaseous radwaste treatment equipment is not included since the Zion gaseous radwaste treatment equipment is in continual use.

Therefore, the Licensee's RETS submittal on effluent treatment meets the intent of NUREG-0472.

3.2.5 Tank Inventory Limits

The objective of the model RETS with regard to a curie limit on liquid-containing tanks is to ensure that in the event of a tank rupture, the concentrations in the nearest potable water supply and the nearest surface water supply in an unrestricted area would not exceed the limits of 10 CFR Part 20, Appendix B Table II. The objective of the model RETS with regard to a curie limit on gas-containing tanks is to ensure that in the event of an uncontrolled release of the tank's contents the resulting total body exposure to an individual at the nearest exclusion area boundary will not exceed 0.5 rem.

The Licensee's Specifications limits the quantity to 10 curies of radioactive liquid in outdoor liquid tanks. The Licensee's Specifications limit the quantity of radioactivity in each gas decay tank to 22,000 curies (considered as Xe-133). This is less than the quantity required that would result in a 0.5 rem dose at the nearest unrestricted area boundary.

Therefore, the Licensee's RETS submittal on tank inventory limits meets the intent of NUREG-0472.

3.2.6 Explosive Gas Mixtures

The objective of the model RETS with regard to explosive gas mixtures is to prevent hydrogen explosions in the waste gas system.

The Licensee's Specification limits the concentration of hydrogen and oxygen in the waste gas system to less than or equal to 3% by volume. Appropriate actions are required in the event the concentrations exceed 3% by volume.

As in the case of other plants, the Licensee's submittal on explosive gas mixtures is accepted on an interim basis until NRC develops final guidance on monitoring and control of explosive gas mixtures.

3.2.7 Solid Radwaste System

The objective of the model RETS with regard to the solid radwaste system is to ensure that radwaste will be properly processed and packaged before it is shipped from the plant to the burial site to satisfy the requirements of 10 CFR Part 20, Section 20.301 and 10 CFR Part 71.[35]

The Licensee's RETS include a commitment to use the solid radwaste system in accordance with a Process Control Program to process wet radioactive wastes to meet shipping and burial ground requirements.

Therefore, the Licensee's RETS submittal on solid radioactive waste meets the intent of NUREG-0472.

3.2.8 Radiological Environmental Monitoring Program

The objectives of the model RETS with regard to a radiological environmental monitoring program are to ensure that (a) an adequate full-area coverage environmental monitoring program exists, (b) there is an appropriate land use census, and (c) an acceptable Interlaboratory Comparison Program exists. The monitoring program implements Section IV.B.2 of Appendix I to 10 CFR Part 50, the land use census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50, and the requirement for participation in an approved Interlaboratory Comparison Program is provided to ensure that independent checks are performed as part of the quality assurance program for environmental monitoring to demonstrate that valid results are obtained for Section IV.B.2 of Appendix I to 10 CFR Part 50.

The Licensee's RETS on a radiological environmental monitoring program have followed the model RETS and the Branch Technical Position on the subject issued November 1979,[31] as applicable to the site, and have

provided an adequate number of sample locations for pathways identified. The Licensee's method of sample analysis and maintenance of the monitoring program satisfies the requirements of Appendix I, 10 CFR Part 50. The Licensee's RETS contain a land use census specification which requires sufficient annual information for a PWR. The RETS also state that the Licensee will participate in an NRC approved Interlaboratory Comparison Program.

Thus, the Licensee's RETS submittal for a radiological environmental program meets the intent of NUREG-0472.

3.2.9 Audits and Reviews

The objective of the model RETS with regard to audits and reviews is to ensure that audits and reviews of the radwaste and environmental monitoring programs are properly conducted.

The Licensee's administrative structure identifies the Onsite Review and Investigative Function and the Offsite Review and Investigative Function as the two groups comparable to the Unit Review Group (URG) and the Company Nuclear Review and Audit Group (CNRAG), respectively.

The Onsite Review and Investigative Function has responsibility for reviewing changes to the ODCM and the PCP.

The Offsite Review and Investigative Function has responsibility for auditing the Radiological Environmental Monitoring Program at least once every 12 months, the ODCM at least once every 24 months, the Process Control Program and implementing procedures at least once per 24 months, and the performance of activities required by the Quality Assurance Program to meet the criteria of 10 CFR 50, Appendix B.

Therefore, the Licensee's requirements for audits and reviews meet the intent of NUREG-0472.

3.2.10 Procedures and Records

The objective of the model RETS with regard to procedures is to ensure that written procedures be established, implemented, and maintained for the PCP, the ODCM, and the QA program for effluent and environmental monitoring. The objective of the model RETS with regard to records is to ensure that documented records pertaining to the radiological environmental monitoring program are retained for the duration of the Operating License.

The Licensee's RETS include a requirement to establish, implement, and maintain written procedures for the radwaste solidification program (PCP) and the dose evaluation program (ODCM). Quality assurance program procedures for effluent and environmental monitoring shall be addressed in the Quality Assurance Program.

The Licensee's RETS state that records of Offsite Environmental Monitoring surveys shall be retained for the duration of the Operating License.

Therefore, the Licensee's RETS submittal on procedures and records meets the intent of NUREG-0472.

3.2.11 Reports

The objective of the model RETS with regard to reporting requirements is to ensure that appropriate annual and semiannual periodic reports and special reports are submitted to the NRC.

The Licensee's RETS include commitments to submit the following reports:

1. Annual Radiological Environmental Operating Report

This report will be submitted by April 30 of the next year. The report shall include:

- o Results of the radiological environmental sampling program.
- o An assessment of the monitoring results and radiation doses via the principal pathways of exposure.

- o Results of land use census.
- o Summary of meteorological conditions concurrent with the release of gaseous effluents.
- o A map of all sampling locations.
- o Results of participation in the Interlaboratory Comparison Program.

2. Semiannual Radioactive Effluent Release Report

The report submitted within 60 days after January 1 and July 1 of each year shall cover the radioactive content of effluents released to unrestricted areas during the previous six months of operation. The data shall be in the format of Regulatory Guide 1.21, Revision 1, June 1974.

The report shall include: a summary of solid waste shipped offsite during the reporting period; a summary of unplanned releases from the site to unrestricted areas; any changes to the Process Control Program made during the reporting period; an annual summary of hourly meteorological data collected over the previous year; an assessment of radiation doses from liquid and gaseous effluents; and an assessment to demonstrate compliance to 40 CFR 190.

It was determined that the Licensee's RETS submittal on reports meets the intent of NUREG-0472. [21]

3.2.12 Other Administrative Controls

An objective of the model RETS in the administrative controls section is to ensure that any changes to the PCP and CCOM and major changes to the radioactive waste treatment systems are reported to the NRC.

The Licensee's Specification requires that changes to the CCOM and PCP be reported to the NRC by inclusion in the Monthly Operating Report within 90 days of the effective date of the change. [21]

It was determined the Licensee's position regarding providing radwaste system changes per 10 CFR 50.59 and 10 CFR 50.71 meet the intent of NUREG-0472.

Therefore, the Licensee's RETS submittal for these administrative controls meets the intent of NUREG-0472.

3.3 Offsite Dose Calculation Manual

As specified in NUREG-0472, the ODCM is to be developed by the Licensee to document the methodology and approaches used to calculate offsite doses and maintain the operability of the effluent system. As a minimum, the ODCM should provide equations and methodology for the following topics:

- o alarm and trip setpoints for effluent instrumentation
- o liquid effluent concentration in unrestricted areas
- o gaseous effluent dose rate or concentrations at or beyond the site boundary
- o liquid and gaseous effluent dose contributions
- o total dose compliance, including direct shine
- o liquid and gaseous effluent dose projections.

In addition, the ODCM should contain flow diagrams, consistent with the systems being used at the station, defining the treatment paths and the components of the radioactive liquid, gaseous, and solid waste management systems. A description and the location of samples in support of the environmental monitoring program are also needed in the ODCM.

3.3.1 Evaluation

The Licensee's ODCM satisfies the equation in the addendum of NUREG-0133 to determine the alarm and trip setpoints for the liquid effluent monitors. This assures that the alarm and trip actions will occur prior to exceeding the 10 CFR Part 20, Appendix B, Table II values at the discharge point to the unrestricted area.

The alarm and trip setpoints for the gaseous effluent monitors are calculated to assure that alarm and trip actions will occur prior to exceeding the limits set in 10 CFR Part 20 for annual dose rates to unrestricted areas. The Licensee uses equations similar to those contained in NUREG-0133 with the dose rate values identified in NUREG-0472.

The Licensee's ODCM contains the methods and calculational relationships that are used to compare the radioactivity concentrations at the point of release to the 10 CFR Part 20 limits prior to the release and after the release.

The Licensee's ODCM states that noble gas discharges are assured to be within the NUREG-0472 dose rate limits by correctly determining the setpoints for the noble gas monitors. The dose rate due to the release of I-131, tritium, and particulates with half-lives greater than eight days is assured to be within the NUREG-0472 limit of 1500 mrem per year by calculating the dose rate to a child via the inhalation pathway due to the actual release using the highest calculated annual average relative concentration X/Q used for estimating dose to an individual.

The Licensee's ODCM demonstrates compliance with 10 CFR Part 50, Appendix I by calculating the monthly dose commitments for liquid and gaseous effluents at least once per 31 days. The calculated cumulative values are compared to the quarterly and annual limits to demonstrate compliance.

The Licensee's ODCM will contain the dose projection methodology to determine when to use the liquid radwaste treatment equipment.

Specific parameters of distance and the direction sector from the centerline of a reactor and additional information have been provided for each and every sample location in the Zion RETS Environmental Monitoring Table 3.16-1, in Tables 8.4-1 and 8.4-3, and in Figures 8.4-1 and 8.4-2 of the Zion ODCM.

The Licensee's ODCM for Zion Station Units 1 and 2 is generally in compliance with the NRC requirements and uses methods consistent with the methodology and guidance prescribed in NUREG-0133.

4.0 CONCLUSIONS

The Licensee's proposed RETS and ODCM were reviewed and evaluated and the following conclusions were reached:

- o The Licensee's proposed RETS for the Zion Station Units 1 and 2 submitted June 25, 1985 meets the intent of the NRC staff's "Standard Radiological Effluent Technical Specifications for Pressurized Water Reactors", NUREG-0472.
- o The Licensee's ODCM, Revision 8 dated March 1983, uses documented and approved methods that are applicable to the Zion Generating Station Units 1 and 2 and are generally consistent with the guidelines of NUREG-0133. Therefore, the ODCM is an acceptable continuing reference.

A correspondence between (a) NUREG-0472, (b) the Licensee's current RETS, and (c) the Licensee's proposed RETS is shown in Table 1.

TABLE 1. CORRESPONDENCE OF PROVISIONS OF NUREG-0472, THE LICENSEE'S CURRENT TECHNICAL SPECIFICATIONS AND THE LICENSEE'S PROPOSAL FOR THE ZION STATION UNITS 1 AND 2.

<u>RETS Requirements</u>	<u>NUREG-0472</u>	<u>Current Technical Specification</u>	<u>Licensee Proposal (Section)</u>
Effluent Instrumentation	3.3.3.10	3.11.3	3.11.3.A
	3.3.3.11	3.12.1.C	3.12.3.A
Concentration	3.11.1.1	3.11.1	3.11.1.A
	3.11.2.1	3.12.1	3.12.1.A
Offsite Doses	3.11.1.2	----	3.11.2.A
	3.11.2.2	----	3.12.2.A
	3.11.2.3	----	3.12.2.B
	3.11.4	----	3.11.2 3.12.2
Radwaste Treatment	3.11.1.3	----	3.11.4.A
	3.11.2.4	----	-----
Tank Inventory Limits	3.11.1.4	3.11.4.6	3.11.5
	3.11.2.6	3.12.4	3.12.4.A
Explosive Gas Mixtures	3.11.2.5.A	----	3.12.5
Solid Radwaste	3.11.3	----	3.20.1.A
Environmental Monitoring	3.12.1	3.16	3.16.1
Land Use Census	3.12.2	3.16	3.16.2
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NRC FORM 326
12-84
NRCN 1101
3201-3202

U.S. NUCLEAR REG.

BIBLIOGRAPHIC DATA SHEET

REPORT NUMBER (Assigned by NRC and Yr. No. if any)

EGG-PBS-6887

SEE INSTRUCTIONS ON THE REVERSE

2 TITLE AND SUBTITLE

RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATIONS (RETS)
IMPLEMENTATION - ZION GENERATING STATION UNITS 1 AND 2

3 LEAVE BLANK

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5 DATE REPORT COMPLETED

MONTH

YEAR

June

1985

6 DATE REPORT ISSUED

MONTH

YEAR

June

1985

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

Radiation Measurements Section
EG&G Idaho, Inc.
Idaho Falls, ID 83415

8 PROJECT/TASK/WORK UNIT NUMBER

9 FUNDING NUMBER

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

Division of Systems Integration
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

11a TYPE OF REPORT

11b PERIOD COVERED (Indicate Dates)

12 SUPPLEMENTARY NOTES

13 ABSTRACT (200 words or less)

A review of the Radiological Effluent Technical Specifications (RETS) of the Zion Generating Station Units 1 and 2 was performed. The principal review guidelines used were NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants," and Draft 7" of NUREG-0472, Revision 3, "Radiological Effluent Technical Specifications for Pressurized Water Reactors." Draft submittals were discussed with the Licensee by both EG&G and the NRC staff until all items requiring changes to the Technical Specifications were resolved. The Licensee then submitted final proposed RETS to the NRC which were evaluated and found to be in compliance with the NRC review guidelines. The proposed Offsite Dose Calculation Manual was reviewed and generally found to be consistent with the NRC review guidelines.

14 DOCUMENT ANALYSIS - KEYWORD DESCRIPTIONS

15 AVAILABILITY STATEMENT

16 SECURITY CLASSIFICATION

(This page)

(This report)

17 NUMBER OF PAGES

18 PRICE

19 IDENTIFIERS OPEN ENDED TERMS