



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NOS. 83 AND 84 TO FACILITY OPERATING
LICENSE NOS. DPR-29, and DPR-30
QUAD CITIES STATION UNITS 1 AND 2
COMMONWEALTH EDISON
DOCKET NOS. 50-254 and 50-265

1.0 INTRODUCTION

To comply with Section V c: Appendix I of 10 CFR Part 50, Commonwealth Edison has filed with the Commission plans and proposed technical specifications developed for the purpose of keeping releases of radioactive materials to unrestricted areas during normal operations, including expected operational occurrences, as low as is reasonably achievable. Commonwealth Edison filed this information with the Commission by letter dated April 14, 1983, which requested changes to the Technical Specifications appended to Facility Operating License Nos. DPR-29 and DPR-30 for Quad Cities Station Units 1 and 2. The proposed technical specifications update those portions of the technical specifications addressing radioactive waste management and make them consistent with the current staff positions as expressed in NUREG-0473. These revised technical specifications would reasonably assure compliance, in radioactive waste management, with the provisions of 10 CFR Part 50.36a, as supplemented by Appendix I to 10 CFR Part 50, with 10 CFR Parts 20.105(c), 106(g), and 405(c); with 10 CFR Part 50, Appendix A, General Design Criteria 60, 63, and 64; and with 10 CFR Part 50, Appendix B.

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2.0 BACKGROUND AND DISCUSSION

2.1 Regulations

10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities", Section 50.36a, "Technical Specifications on Effluents from Nuclear Power Reactors", provides that each license authorizing operation of a nuclear power reactor will include technical specifications that (1) require compliance with applicable provisions of Part 20.106, "Radioactivity in Effluents to Unrestricted Areas"; (2) require that operating procedures developed for the control of effluents be established and followed; (3) require that equipment installed in the radioactive waste system be maintained and used; and (4) require the periodic submission of reports to the NRC specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and gaseous effluents, any quantities of radioactive materials released that are significantly above design objectives, and such other information as may be required by the Commission to estimate maximum potential radiation dose to the public resulting from the effluent releases.

10 CFR Part 20, "Standards for Protection Against Radiation," paragraphs 20.105(c), 20.106(g), and 20.405(c), require that nuclear power plant and other licensees comply with 40 CFR Part 190, "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.

10 CFR Part 50, Appendix A - General Design Criteria for Nuclear Power Plants, contains Criterion 60, Control of releases for radioactive materials to the environment; Criterion 63, Monitoring fuel and waste storage; and Criterion 64, Monitoring radioactivity releases. Criterion 60 requires that the nuclear power unit design include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation including anticipated operational occurrences. Criterion 63 requires that appropriate systems be provided in radioactive waste systems and associated handling areas to detect conditions that may result in excessive radiation levels and to initiate appropriate safety actions. Criterion 64 requires that means be provided for monitoring effluent discharge paths and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences and postulated accidents.

10 CFR Part 50, Appendix B, establishes quality assurance requirements for nuclear power plants.

10 CFR Part 50, Appendix I, Section IV, provides guides on technical specifications for limiting conditions for operation for light-water-cooled nuclear power reactors licensed under 10 CFR Part 50.

2.2 Standard Radiological Effluent Technical Specifications

NUREG-0473 provides radiological effluent technical specifications for boiling water reactors which the staff finds to be an acceptable standard for licensing actions. Further clarification of these acceptable methods is provided in NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants." NUREG-0133 describes methods found acceptable to the staff of the NRC for the calculation of certain key values required in the preparation of proposed radiological effluent technical specifications for light-water-cooled nuclear power plants. NUREG-0133 also provides guidance to licensees in preparing requests for changes to existing radiological effluent technical specifications for operating reactors. It also describes current staff positions on the methodology for estimating radiation exposure due to the release of radioactive materials in effluents and on the administrative control of radioactive waste treatment systems.

The above NUREG documents address all of the radiological effluent technical specifications needed to assure compliance with the guidance and requirements provided by the regulations previously cited. However, alternative approaches to the preparation of radiological effluent technical specifications and alternative radiological effluent technical specifications may be acceptable if the staff determines that the alternatives are in compliance with the regulations and with the intent of the regulatory guidance.

The standard radiological effluent technical specifications can be grouped under the following categories:

- (1) Instrumentation
- (2) Radioactive effluents
- (3) Radiological environmental monitoring
- (4) Design features
- (5) Administrative controls.

Each of the specifications under the first three categories is comprised of two parts: the limiting condition for operation and the surveillance requirements. The limiting condition for operation provides a statement of the limiting condition, the times when it is applicable, and the actions to be taken in the event that the limiting condition is not met.

In general, the specifications established to assure compliance with 10 CFR Part 20 standards provide, in the event the limiting conditions of operation are exceeded, that without delay conditions are restored to within the limiting conditions. Otherwise, the facility is required to effect approved shutdown procedures. In general, the specifications established to assure compliance with 10 CFR Part 50 provide, in the event the limiting conditions of operation are exceeded, that within specified times corrective actions are to be taken, alternative means of operation are to be employed, and certain reports are to be submitted to the NRC describing these conditions and actions.

The specifications concerning design features and administrative controls contain no limiting conditions of operation or surveillance requirements.

Table 1 indicates the standard radiological effluent technical specifications that are needed to assure compliance with the particular provisions of the regulations described in Section 1.0.

3.0 EVALUATION

A technical evaluation report (EGG-PHYS-6306) was prepared for us by EG&G Idaho, Inc (EG&G) as part of our technical assistance contract program. Their report provides their technical evaluation of the compliance of the Licensee's submittal with NRC provided criteria. The staff has reviewed this TER and agrees with the evaluation. A copy of the TER, minus the detailed Appendix, is enclosed.

3.1 SAFETY CONCLUSIONS

The proposed radiological effluent technical specifications for Quad Cities Station Units 1 and 2 have been reviewed, evaluated, and found to be in compliance with the requirements of the NRC regulations and with the intent of NUREG-0133 and NUREG-0473 (the Quad Cities Station is comprised of two boiling water reactors) and thereby fulfill all the requirements of the regulations related to radiological effluent technical specifications.

Table 1. Relation Between Provisions of the Regulations and the Standard Radiological Effluent Technical Specifications for Pressurized Water Reactors and Boiling Water Reactors

● Indicate the specifications that are needed to assure compliance with the identified provision of the regulations.

Provisions of Title 10 Code of Federal Regulations	Standard Radiological Effluent Technical Specifications						
	Instrumentation	Radioactive Effluents			Rad. Envir. Monitoring	Design Features	Administrative Control
		Liquid	PWR/BWR	Gaseous			
§ 50.36a Technical specifications on effluents from nuclear power reactors Remain within limits of § 20.106 Establish and follow procedures to control effluents Maintain and use radioactive waste system equipment	●	●	●	●	●	●	●
§§ 20.105(c), 20.106(g), 20.405(c) Compliance with 40 CFR 190	●	●	●	●	●	●	●
Part 50 Appendix A - General Design Criteria							
Criterion 60 - Control of releases of radioactive materials to the environment	●	●	●	●	●	●	●
Criterion 61 - Fuel storage and handling and radioactivity control	●	●	●	●	●	●	●
Criterion 63 - Monitoring fuel and waste storage	●	●	●	●	●	●	●
Criterion 64 - Monitoring radioactivity releases	●	●	●	●	●	●	●
Part 50 Appendix B - Quality Assurance Criteria							
Part 50 Appendix I - Guides to Meet "As Low As Is Reasonably Achievable (ALARA)"	●	●	●	●	●	●	●
Maintain releases within design objectives Establish surveillance & monitoring program to provide data on: (1) quantities of rad. mats. in effluents (2) radiation & rad. mats. in the environment (3) changes in use of unrestricted areas Exert best efforts to keep releases "ALARA" Submit report if calculated doses exceed the design objective Demonstrate conform. to des. obj. by calc. proced.	●	●	●	●	●	●	●
Part 100							

*Note: needed to fully implement other specifications.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the use of a facility system located within the restricted area. The staff has determined that the amendment involves no significant increase in the amounts of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

5.0 GENERAL CONCLUSION

We have concluded, based on the considerations discussed above, that:

- (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and
- (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not

be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: W. Meinke, C. Miller

Attachment:

EG&G Technical
Evaluation Report

Dated: June 19, 1984

RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATIONS
(RETS) IMPLEMENTATION - QUAD CITIES STATION
UNITS 1 AND 2 NUCLEAR GENERATING PLANTS

William Serrano
John W. Mandler
Stephen W. Duce
Ferrol B. Simpson
Thomas E. Young

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EG&G IDAHO, INC.
Idaho Falls, Idaho 83415

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ABSTRACT

A review of the Radiological Effluent Technical Specifications (RETS) of the Quad Cities Station Units 1 and 2 Nuclear Generating Plants was performed. The principal review guidelines used were NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants," and NUREG-0473, Revision 2, "Radiological Effluent Technical Specifications for BWR's," and the applicable specifications of Draft 7' of NUREG-0472, Revision 3, "Radiological Effluent Technical Specifications for PWR's." 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 requirements of the NRC review guidelines. The proposed Offsite Dose Calculation Manual was reviewed and generally found to be in compliance with the requirements of the NRC review guidelines. However, there are outstanding items that were identified and will be resolved at a future date. A Process Control Program will be submitted to the NRC for review.

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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1.0 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 Quad Cities Station Unit 1 and 2 Nuclear Generating Plants with regard to Radiological Effluent Technical Specifications (RETS), the proposed Offsite Dose Calculation Manual (ODCM), and the Process Control Program (PCP).

The evaluation used criteria proposed by the Nuclear Regulatory Commission (NRC) staff in the model Technical Specifications for boiling water reactors (BWR's), NUREG-0473,^[1] and subsequent revisions to NUREG-0472,^[2] a comparable document for pressurized water reactors (PWR's). 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.^[3] 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 50.36a,^[4] "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^[5] 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 initial NRC position on the model RETS was established in May 1978 when the NRC's Regulatory Requirements Review Committee approved the first model RETS (NUREG-0473 for BWR's and NUREG-0472 for PWR's).

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 PCP were issued in February 1979 to each utility at individual meetings. NUREG-0473, Revision 2^[1] and NUREG-0472, Revision 2^[2] were published in July 1979 and updated in January 1980 and again in 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 a draft Revision 3 of NUREG-0472^[13] in September 1982 to serve as new guidance for the review teams. The applicable specifications from this document supplanted the comparable specifications in NUREG-0473 for reviewing the BWR's.

1.3 Plant-Specific Background

In 1979 the Commonwealth Edison Company (CECo) submitted RETS and an ODCM to the NRC^[14] to conform to the requirements of 10 CFR 50, Appendix I. EG&G Idaho, Inc., (EG&G), selected as an independent task review team, initiated a review and evaluation of this draft submittal. The submittal was compared with the model RETS and assessed for compliance with the requirements of 10 CFR Part 50, Appendix I, and 10 CFR 50, Appendix A.

The Licensee has not submitted a PCP. The Licensee has committed to having a PCP in the Technical Specifications. Therefore, a PCP will be submitted to the NRC for review and approval.

2.0 REVIEW CRITERIA

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

1. NUREG-0472, RETS for PWR's
2. NUREG-0473, RETS for BWR's
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 II 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.

3.1.1 Radioactive Liquid Effluents

There are two radioactive liquid effluent sources for the two-unit site: the radwaste treatment system and service water effluents.

The two units share a common radwaste system. Radioactive liquid wastes are collected in a common header which is connected to the river discharge tank (RDT) as shown in Figure 1. The RDT is normally valved closed except during batch release discharge and the keys to the valving and flow control valves are under the administrative control of the radwaste foreman. The tank's liquids are recirculated for thorough mixing before sampling prior to discharge.

The contents of the RDT can be discharged directly to the Mississippi River by releasing either to the diffuser pipe or to the spray canal blowdown line.

Service water effluents from each unit are collected in a common header before release to the discharge bay which in turn can also be released to the river by discharge to the spray canal blowdown line or the diffuser pipe.

3.1.2 Radioactive Gaseous Effluents

There are two radioactive gaseous effluent release points for the two-unit site. The reactor building effluents from each unit are collected in a common header before release and the two units share a common main chimney release. Effluents from the reactor building release point consist of releases from the reactor building and the fuel storage area. Effluents from the main chimney release point consist of radioactive gases from the main condenser off-gas treatment system, turbine building system, radwaste area, turbine gland seal condenser vent, and mechanical vacuum pump exhaust. A block diagram description of the radioactive gaseous effluent discharge pathway is shown in Figure 2.

IMAGE EVALUATION
TEST TARGET (MT-3)

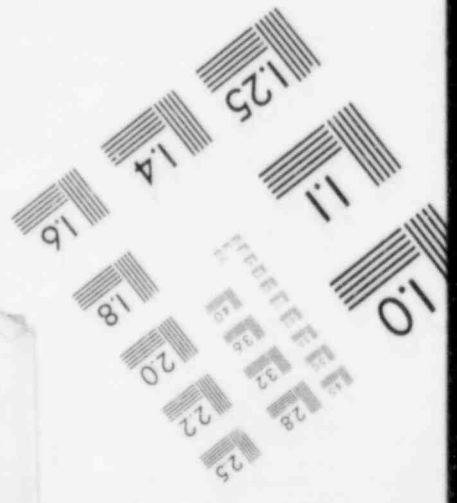
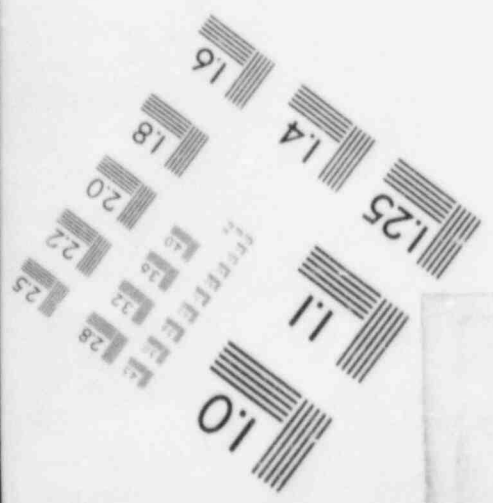
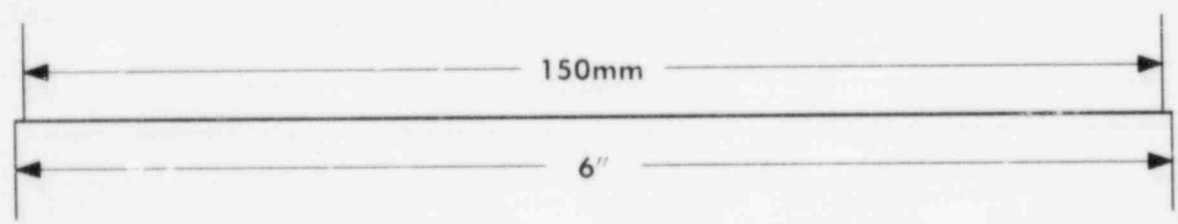
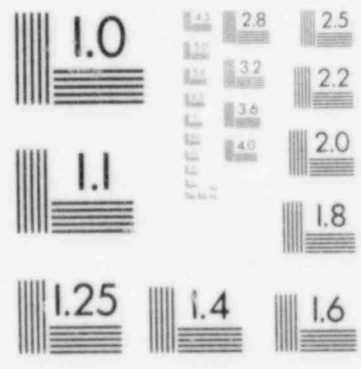
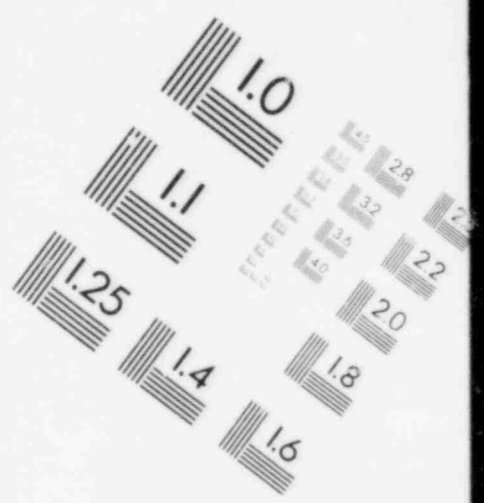
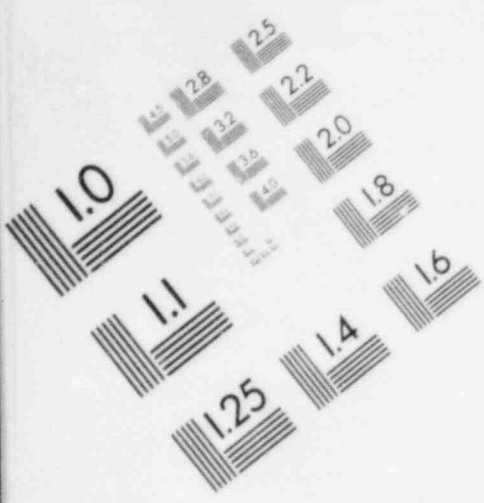


IMAGE EVALUATION
TEST TARGET (MT-3)

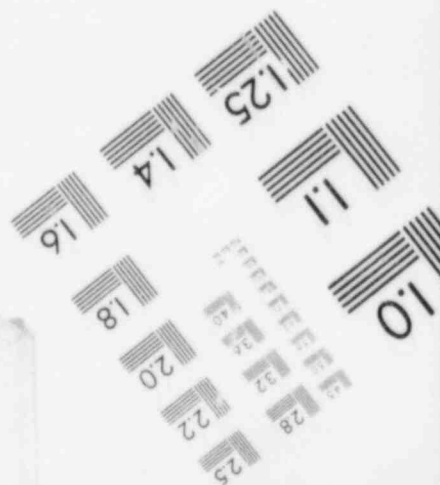
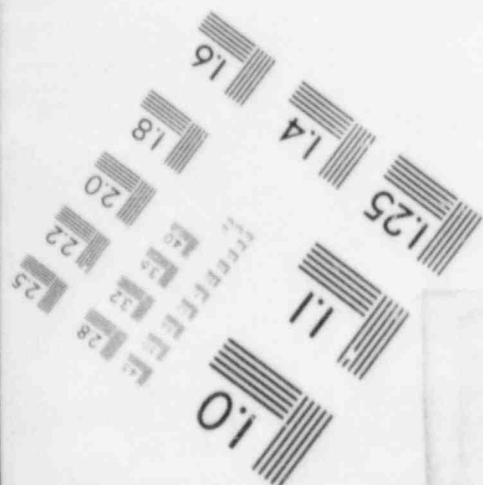
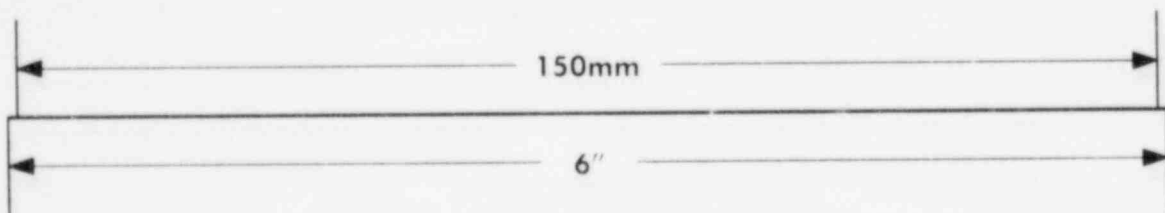
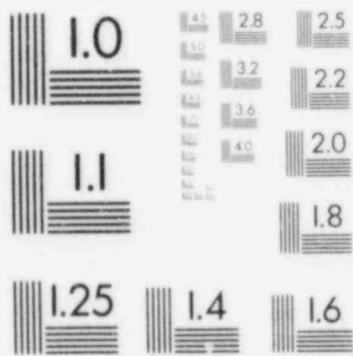
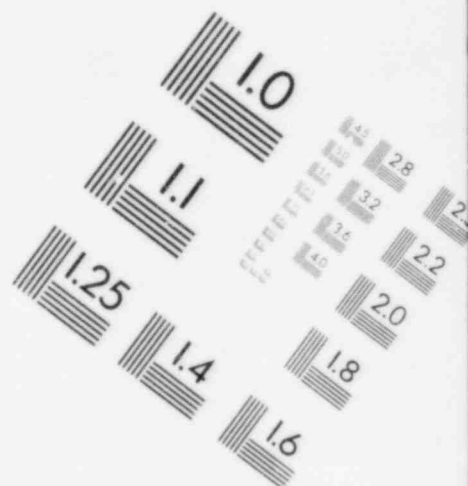
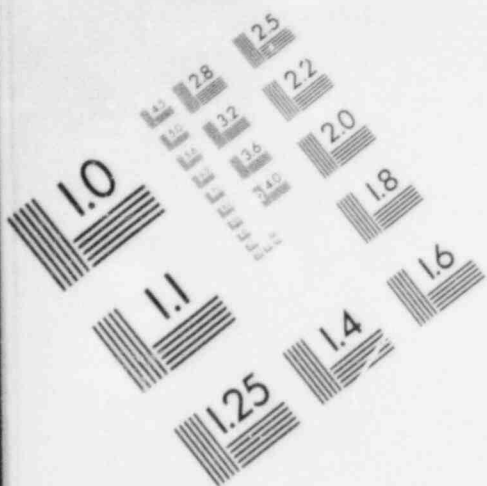
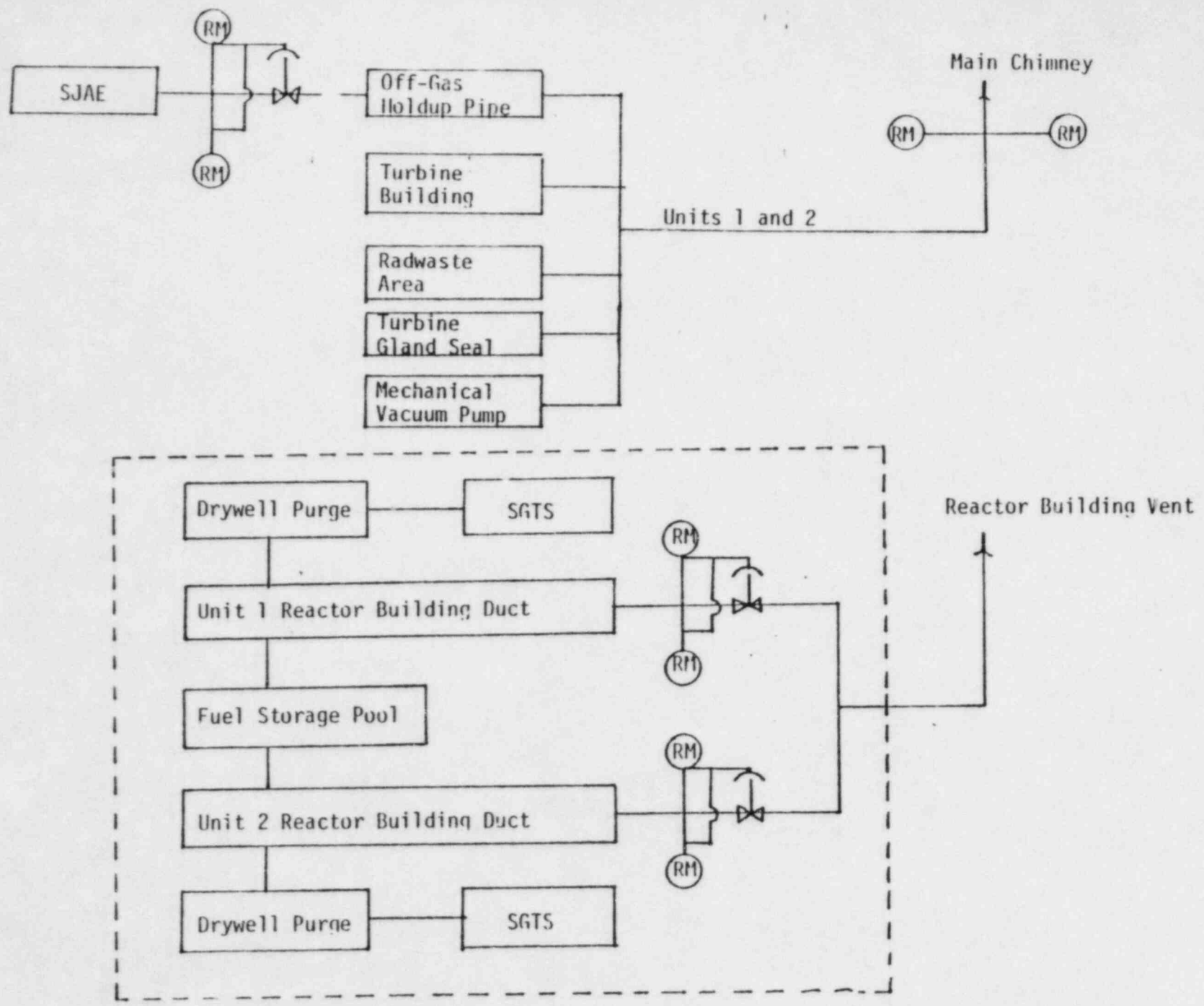


Figure 2. Gaseous Effluent Discharge Pathways.



3.2.1.2 Radioactive Gaseous Effluent Instrumentation

The two radioactive gaseous effluent release points are monitored with adequate instrument surveillance being performed.

Releases from the main chimney are monitored with two radiation monitors and control room alarm annunciation occurs upon high radiation. The major source of radioactive noble gases in the main chimney is from each unit's off-gas system. Each unit's off-gas system has its own radiation monitor capable of isolating the off-gas release pathway. Off gases from the main condenser are monitored for gross gamma activity downstream of the steam jet air ejectors but prior to release to the main chimney. The detectors are located prior to the holdup pipe. A high radiation condition in the holdup pipe will initiate an interval timer which will isolate the off-gas system from the main chimney.

Releases of radioactive noble gases from each reactor building's ventilation duct are monitored prior to collection and release via the common ventilation stack. Each reactor building's exhaust duct has two monitors. A high radiation condition will initiate an alarm in the control room. Upon high-high radiation, the detectors will initiate alarm, automatic isolation of the reactor building ventilation system and initiate the standby gas treatment system (SGTS). Effluents from the SGTS are released via the main chimney.

The Licensee has provided radiation monitors for potential liquid or gaseous effluent lines. In addition, automatic isolation is provided for each reactor building's ventilation duct and for isolation of the main condenser's off-gases from the main chimney. The Licensee's RETS states that the concentration of radioactive material will be monitored "at all times," or "during releases" for batch releases.

3.2.1.3 Liquid and Gaseous Instrumentation Setpoints

The setpoints at each release point are established to prevent exceeding

Therefore, the Licensee's RETS submittal on gaseous effluent dose rates meets the intent of NUREG-0473.

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 the dose specifications of NUREG-0473, and are in accordance with 10 CFR Part 50, Appendix I and 40 CFR Part 190.

The Licensee's RETS include commitments (a) to meet the quarterly and yearly dose criteria for liquid effluents and to use the ODCM methodology for determining the cumulative dose to individuals, (b) to maintain the air doses for noble gases in unrestricted areas to those specified in 10 CFR Part 50, Appendix I, Section II.B., (c) to maintain the dose level to an individual from release of Iodine-131 and particulates with half-lives greater than eight days to meet the design objectives of 10 CFR Part 50, Appendix I, Section II.C, and (d) to limit the annual dose to a real individual due to releases of radioactivity and radiation from uranium fuel cycle sources to within the requirements of 40 CFR Part 190.

Therefore, the Licensee's RETS submittal on offsite doses from radioactive effluents meets the intent of NUREG-0473.

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. The projections are to be made at least once per 31 days. The Licensee's RETS include a commitment to prepare a special report if radwaste treatment is required before release and the radwaste

of hydrogen in the off-gas holdup system, downstream of the recombiner. The hydrogen concentration shall be limited by ensuring the recombiners are operable within the allowable range of the recombiner outlet temperature versus reactor power. This has been accepted on an interim basis until the NRC establishes a final position on the explosive gas monitoring.

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.^[36]

The Licensee has committed to use the methods prescribed in a Process Control Program (PCP) to ensure that the requirements of shipping and burial ground requirements are met prior to shipment of radwaste from the site.

Therefore, the Licensee's RETS submittal on solid radioactive waste meets the intent of NUREG-0473.

3.2.8 Radiological Environmental Monitoring Program

The objectives of the model RETS with regard to radiological environmental monitoring 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 Onsite Review and Investigative Function and the Manager of Quality Assurance encompass the total responsibility for reviews and audits specified in NUREG-0473.

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 the documented records pertaining to the radiological environmental monitoring program are retained.

The Licensee's RETS include a commitment to establish, implement, and maintain written procedures for the PCP, ODCM, and QA programs. The Licensee's existing technical specifications state that the records of the radiological environmental monitoring program will be retained for the life of the plant which meets the intent of the model RETS.

Therefore, the Licensee's RETS submittal on procedures and records meets the intent of NUREG-0473.

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. Environmental Program Data (Annual Report)

This report includes summaries, interpretations and analysis of trends of the results of the radiological environmental surveillance program. The report also includes the results of the land use

discharge and the waste treatment equipment is inoperable as specified in 3.8.B.4.

Therefore, the Licensee's RETS submittal on reports meets the intent of NUREG-0473.

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 ODCM and major changes to the radioactive waste treatment systems are reported to the NRC. Such changes shall be reviewed and accepted by the URG before implementation.

The Licensee's RETS state that the aforementioned changes will be reported to the NRC after review and acceptance by the Onsite Review Function.

Therefore, the Licensee's RETS submittal for these administrative controls meets the intent of NUREG-0473.

3.3 Offsite Dose Calculation Manual

As specified in NUREG-0473, 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:

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

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 dose calculation pathways are shown in Figure 3 which was obtained from the ODCM.

The Licensee's RETS commits to projecting doses to determine if the liquid radwaste treatment system must be operated. The ODCM does not include the dose projection methodology. This is an outstanding item that will be resolved at a future date between the NRC and the Licensee.

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 RETS Environmental Monitoring Table 4.8-4, in Tables 8.4-1 and 8.4-3, and in Figures 8.4-1 and 8.4-2 of the ODCM. The ODCM does not contain simplified diagrams of the liquid and gaseous release points, the liquid radwaste treatment system, or the solid radwaste system. This is an outstanding item that will be resolved at a future date between the NRC and the Licensee.

The Licensee's ODCM for Quad Cities 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. Outstanding items will be resolved at a future date.

3.4 Process Control Program

NUREG-0473 specifies that the Licensee develop a PCP to ensure that the processing and packaging of solid radioactive wastes will be accomplished in compliance with 10 CFR Part 20, 10 CFR Part 71, and other Federal and State regulations or requirements governing the offsite disposal of the low-level radioactive waste.

The PCP is not intended to contain a set of detailed procedures; rather, it is the source of basic criteria for the detailed procedures to be developed

by the Licensee. The criteria used for the PCP are to address only today's requirements. The uncertainty about PCP requirements results from the recent promulgation of 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste." The NRC staff's technical positions are presently being developed by the Division of Waste Management.^[35]

3.4.1 Evaluation

The Licensee did not submit a PCP for review. Section 8.3 of the ODCM appears to be the intended location for the PCP. However, Section 8.3 does not contain the PCP requirements. This is an outstanding item that will be resolved at a future date between the NRC and the Licensee.

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 Quad Cities Units 1 and 2 Nuclear Generating Plants, submitted April 14, 1983, meets the intent of the NRC staff's "Standard Radiological Effluent Technical Specifications," NUREG-0473.
- o The Licensee's ODCM, submitted April 4, 1983 uses documented and approved methods that are applicable to Quad Cities Units 1 and 2 and are consistent with the criteria of NUREG-0133. Outstanding issues will be resolved at a future date.
- o The Licensee did not submit a PCP for review. A PCP will be submitted to the NRC for review and approval.

A correspondence between (a) NUREG-0473, (b) the Licensee's current RETS, and (c) the Licensee's proposed RETS is shown in Table 1. A more detailed explanation of how each Specification in the Licensee's RETS meets the intent of NUREG-0473 is contained in Appendix A.

5.0 REFERENCES

1. United States Nuclear Regulatory Commission, Standard Radiological Effluent Technical Specifications for Boiling Water Reactors, NUREG-0473, Revision 2, July 1979.
2. United States Nuclear Regulatory Commission, Standard Radiological Effluent Technical Specifications for Pressurized Water Reactors, NUREG-0472, Revision 2, July 1979.
3. United States Office of The Federal Register, Title 10, Code of Federal Regulations, Part 50, Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low as is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents."
4. United States Office of the Federal Register, Title 10, Code of Federal Regulations, Part 50, Section 50.36a, "Technical Specifications on Effluents from Nuclear Power Reactors."
5. United States Office of the Federal Register, Title 10, Code of Federal Regulations, Part 50, Appendix I, Section V.B., "Effective Dates."
6. United States Office of the Federal Register, Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation."
7. United States Office of the Federal Register, Title 40, Code of Federal Regulations, Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations."
8. United States Office of the Federal Register, Title 10, Code of Federal Regulations, Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants."
9. United States Office of the Federal Register, Title 10, Code of Federal Regulations, Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."
10. United States Nuclear Regulatory Commission, Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants, NUREG-0133, October 1978.
11. C. A. Willis and F. J. Congel, "Summary of Draft Contractor Guidance of RETS," AIF Environmental Subcommittee Meeting, Washington, D.C., May 19, 1982.
12. F. J. Congel, memo to RAB Staff (NRC), Interim Changes in the Model RETS, August 9, 1982.
13. United States Nuclear Regulatory Commission, Standard Radiological Effluent Technical Specifications for Pressurized Water Reactors, NUREG-0472, Revision 3, Draft 7', September 1982.

29. C. A. Willis, memo to P. C. Wagner, Plans for Implementing Radiological Effluent Technical Specifications for Operating Reactors, November 4, 1981.
30. W. P. Gammill (NRC), memo to P. C. Wagner (NRC), Current Position on Radiological Effluent Technical Specifications (RETS) including Explosive Gas Controls, October 7, 1981.
31. United States Nuclear Regulatory Commission, Radiological Assessment Branch Technical Position, An Acceptable Radiological Environmental Monitoring Program, November 1979.
32. United States Nuclear Regulatory Commission, Methods for Demonstrating LWR Compliance with the EPA Uranium Fuel Cycle Standard (40 CFR Part 190), NUREG-0543, February 1980.
33. United States Nuclear Regulatory Commission, Branch Technical Position, General Contents of the Offsite Dose Calculation Manual, Revision 1, February 8, 1979.
34. Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, October 1977.
35. C. A. Willis, letter of transmittal, Guidance on the Review of the Process Control Programs (PCP), January 3, 1983.
36. United States Office of the Federal Register, Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material For Transport and Transportation of Radioactive Material Under Certain Conditions."