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RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATIONS (RETS) IMPLEMENTATION

DRESDEN STATION UNITS 2 AND 3

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ABSTRACT

A review of the Radiological Effluent Technical Specifications (RETS) for the Dresden Station Units 2 and 3 Nuclear Generating Plants 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-0473, Revision 3, "Standard Radiological Effluent Technical Specifications for Boiling 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 and Process Control Program were reviewed and generally found to be in compliance 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 Dresden Station Units 2 and 3 Nuclear Generating Plants with regard to Radiological Effluent Technical Specifications (RETS), the proposed Offsite Dose Calculation Manual (ODCM) and the proposed 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 (BWRs), NUREG-0473,[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 50.36a,[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 to submit, no later than June 4, 1976,[4] 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 radicactive waste management systems and environmental monitoring. Although the model RETS address 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:

- 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.

- 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.

- 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 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 PCP were issued in February 1979 to each utility at individual meetings. NUREG-0473, Revision 2,[1] and NUREG-0472, 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. Reviews leading to ultimate implementation of these documents were initiated by the NRC in September 1981 using subcontracted independent teams as reviewers.

As the RETS review progressed, feedback from the licensees led the NRC to modify some of the provisions in the February 1, 1980 versions of the model RETS to clarify specific concerns of the licensees and thus expedite the reviews. Starting in April 1982, the NRC distributed revised versions of the model 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 7'' of Revision 3 of NUREG-0473[13] in September 1982 to serve as new guidance for the review teams.

1.3 Plant-Specific Background

In conformance with the 1975 directive[4] Commonwealth Edison Company (CEC), the Licensee of Dresden Station Units 2 and 3 filed with the Commission on June 4, 1975[14] and November 12, 1976,[15] the necessary information to permit evaluation of the Dresden Station Units 2 and 3 Technical Specifications with respect to the requirements of 10 CFR Part 50, Sections II.A, II.B, and II.C of Appendix I. These submittals showed that the radioactive waste treatment systems installed at Dresden Station Units 2 and 3 are capable of reducing releases of radioactive materials in liquid and gaseous effluents to ALARA levels in conformance with the requirements of 10 CFR Part 50, Section 50.34a, and of compliance with Appendix I.[16] CEC did not submit proposed RETS at that time.

EG&G Idaho, Inc. (EG&G), selected as an independent task review team, initiated a review and evaluation of existing RETS for Dresden Station. These technical specifications were 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.

Review comments and questions dated January 19, 1982[17] were mailed to the NRC prior to arranging a site visit with the Licensee. The site visit was arranged for the purpose of resolving questions identified in the January 1982 review of CEC's RETS. During the site visit on April 5 and 6 of 1982, technical discussions resolved many of the shortcomings of the Licensee's RETS.

Following the site visit, the Licensee submitted draft RETS for Dresden Station Units 2 and 3 to the NRC on January 12, 1984,[18] addressing most of the discrepancies discussed during the site visit.

The January 1984 draft RETS were reviewed by the EG&G team and review comments and questions identifying unresolved items were transmitted to NRC on February 8, 1984.[19] These issues were resolved in discussions

between the NRC staff and representatives of CEC. On May 3, 1984 [20] CEC submitted proposed RETS that incorporated the resolutions agreed upon. This submission resolved all outstanding RETS issues and these resolutions were forwarded to EG&G on May 10, 1984.[21] This allowed preparation of a TER for submittal to the NRC. The proposed RETS, submitted May 10, 1984 are evaluated in Section 3.

Review of an existing ODCM for Dresden Station, dated February 1979[22] was delayed pending completion of the review of the ODCM for CEC's lead station (Quad Cities). Subsequently, an updated general ODCM, applicable to all the Licensee's nuclear generating plants, was received by the EG&G review team on April 25, 1983.[23] This general ODCM was reviewed, and review comments and questions pertaining to all CEC nuclear generating plants plus questions specific to Quad Cities were transmitted to the NRC by letters dated May 17, 1983[24] and June 24, 1983.[25] Comments and questions specific to Dresden Station Units 2 and 3 were transmitted to the NRC on February 14, 1984.[26] The ODCM generally uses documented and approved methods that are consistent with the guidelines of NUREG-0133.

The Licensee submitted a draft Process Control Program (PCP) to the NRC on January 12, 1984.[18] The EG&G team reviewed this document and transmitted comments and questions to the NRC on February 14, 1984.[26] On May 3, 1984 CEC submitted a PCP that in general included the provisions of the NRC review guidelines identified in letter dated January 3, 1983.[27]

2. REVIEW CRITERIA

Review criteria for the RETS and ODCM 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 II limits.[28]

3. Offsite radiation doses shall be ALARA.

4. Equipment shall be maintained and used to keep offsite doses ALARA.

5. Radwaste tanks 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, as revised, the NRC staff issued guidelines,[29,30] clarifications,[31,32] branch positions,[33,34] and NUREG-0543[35] 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 is based on the following NRC guidelines: Branch Technical Position, "General Contents of the Offsite Dose Calculation Manual;[36] NUREG-0133;[9] and Regulatory Guide 1.109.[37] The format for the ODCM is left to the Licensee and may be simplified by tables and grid printouts.

3. TECHNICAL EVALUATION

3.1 General Description of Radiological Effluent System

This section briefly describes the liquid and gaseous radwaste effluent treatment systems, release paths, and control systems installed at Dresden Station Units 2 and 3, (BWRs).

3.1.1 Radioactive Liquid Effluents

There are two possible sources of radioactive liquid effluents for Dresden Station Units 2 and 3: the radwaste treatment system and the service water system.

Except for the collection sumps and reactor water cleanup systems, the two units share a common radwaste system, as shown in Figure 1. Radioactive liquids are collected in the floor drain sample tank and the decontamination solution tank. The contents of these tanks are isolated, mixed, and sampled prior to discharge to the circulating water discharge canal system at a controlled rate through the monitored radwaste effluent line.

The normally uncontaminated service water effluent is released to the circulating water discharge canal system via a monitored line.

3.1.2 Radioactive Gaseous Effluents

There are two radioactive gaseous effluent release points for Dresden Station Units 2 and 3: the reactor building vent and the main chimney. Gaseous waste treatment systems and discharge pathways are shown in Figure 2.

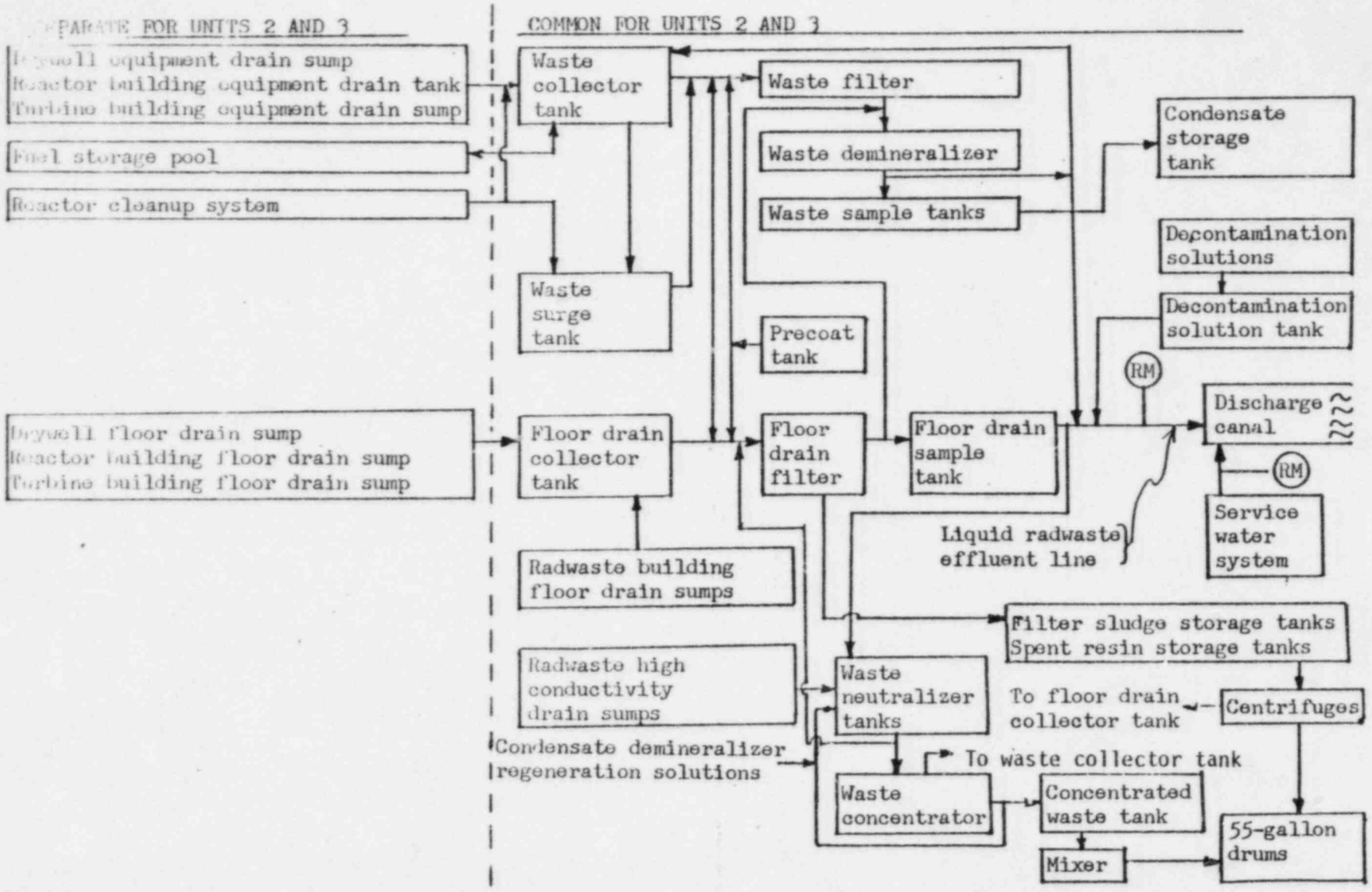

Figure 1. Dresden Station liquid radwaste system and discharge pathways.

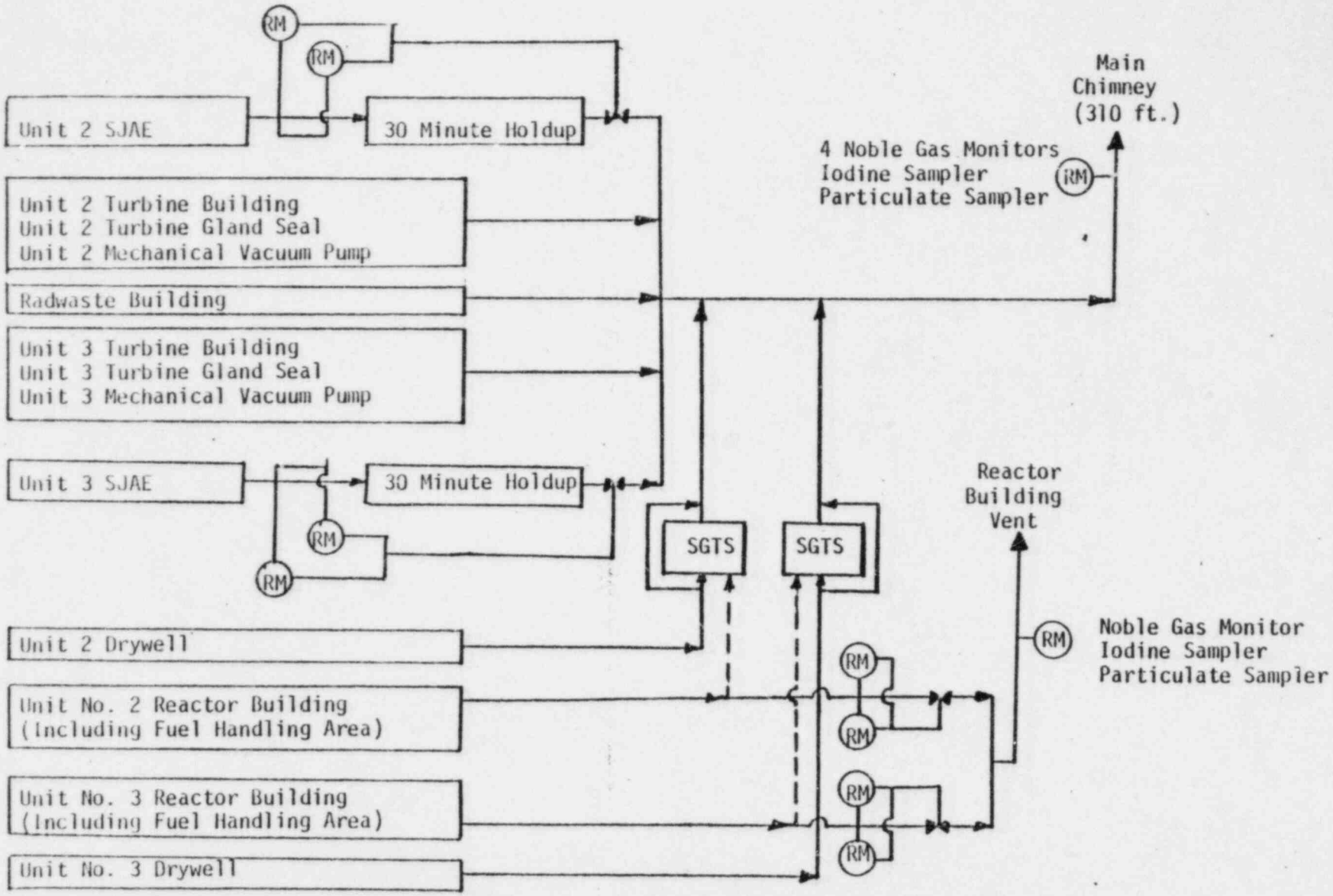

Figure 2. Dresden Station gaseous radwaste system and discharge pathways

The reactor building effluents from both units, including releases from the fuel storage areas, are collected in a common header and normally released through the reactor building vent. In the event of high radiation levels in the reactor building exhaust plenum, the plenum radiation monitors will isolate the reactor building ventilation system and divert the effluents through the standby gas treatment system for eventual release out the main chimney.

Drywell air is vented to the main chimney during purging. If radioactivity is present in any significant quantity, this purged air is automatically routed through the standby gas treatment system, before release out the main chimney. Gaseous effluents from the main condensers' off-gas treatment systems, turbine buildings, steam packing exhaust systems, mechanical vacuum pump exhausts, and the radwaste area are also released via the main chimney.

3.2 Radiological Effluent Technical Specifications

The following subsections describe the primary objectives of each section of the model RETS and summarize the commitments of the Licensee's RETS. A cross reference between 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 determined in order to ensure that offsite radioactive effluent concentrations do not exceed maximum permissible concentration (MPCs) listed in 10 CFR Part 20.

3.2.1.1 Radioactive Liquid Effluent Instrumentation

The radioactive liquid effluent lines leading to the common release point for Dresden Station Units 2 and 3 are monitored with adequate instrumentation surveillance being performed. Action statements in the RETS require appropriate sampling and analysis to be performed if releases are made with less than the minimum number of monitoring channels operable. The locations of the monitors are shown in Figure 1.

The radwaste discharge line is continuously monitored during releases although all releases are by batch mode. The monitor provides control room alarm upon high radiation, which initiates operator action. If any sudden increase of the radiation occurs during discharge, the batch release is terminated.

The service water discharge line is continuously monitored and control room alarm annunciation is provided if a high radiation level occurs. The probability of significant radioactivity release in the service water is small, since the closed component cooling water system which it cools is at a lower pressure than the service water system. The RETS contain a commitment to perform surveillance of the monitoring instrumentation that ensures they will be OPERABLE.

Therefore, the Licensee's RETS submittal on radioactive liquid effluent instrumentation meets the intent of NUREG-0473.

3.2.1.2 Radioactive Gaseous Effluent Instrumentation

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

Releases from the main chimney are monitored by four noble gas monitors which provide control room alarm annunciation upon high radiation. The major sources of radioactive gases in the main chimney are from the two units' off-gas systems.

Each unit has dual radiation monitors downstream of the steam jet air ejectors but prior to the 30 minute holdup pipe. If a high radiation condition is detected by these monitors, an interval timer is initiated that will isolate these systems from the main chimney unless the condit on is corrected.

Releases from the reactor building vent are monitored and control room alarm annunciation occurs upon high radiation. Prior to release at the common reactor building vent, gaseous effluents from each reactor building are monitored in the vent exhaust duct by dual radiation monitors that provide automatic isolation of the reactor building ventilation system and reroute effluents (at a reduced flow rate) to the standby gas treatment system (SGTS). Effluents from the SGTS are released via the main chimney.

The Licensee's RETS state that the monitoring requirements for the SJAE monitors are applicable during SJAE operation, and monitoring requirements for other instruments are applicable at all times.

Therefore, the Licensee's submittal on radioactive gaseous effluent instrumentation meets the intent of NUREG-0473.

3.2.1.3 Liquid and Gaseous Instrumentation Setpoints

The setpoints for the radioactivity monitors at each release point are established to prevent exceeding concentrations in liquid releases or corresponding dose rates for gaseous releases of 10 CFR Part 20 in unrestricted areas. The setpoints for the liquid and gaseous effluent instrumentation will be determined in accordance with the ODCM.

The Licensee's RETS submittal on liquid and gaseous effluent monitoring instrumentation satisfies the provisions and meets the intent of NUREG-0473.

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 the unrestricted areas to within 10 CFR Part 20 limits, and if the concentration of liquid effluents released to the unrestricted area exceeds these limits, it will be restored without delay to a value equal to or less than the MPC values specified in 10 CFR Part 20. Both batch and continuous 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-0473.

3.2.2.2 Gaseous Effluent Dose Rate

The Licensee's RETS include a commitment to maintain the dose rates in unrestricted areas at or beyond the site boundary due to radioactive materials released in gaseous effluents from the site to within 10 CFR Part 20 limits, and if the concentration of gaseous effluents exceeds these limits or the equivalent dose rate values, it will be restored without delay to a value equal to or less than these limits.

The radioactive gaseous waste sampling and analysis program provides for adequate sampling and analysis of the discharges. Therefore, the Licensee's 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 maintain doses due to liquids effluents to within the NUREG-0473 quarterly and annual dose criteria, (b) to maintain noble gas air doses in unrestricted areas to within the NUREG-0473 quarterly and annual dose criteria, (c) to maintain the dose level due to release of iodine-131, iodine-133, tritium and materials in particulate form with half lives greater than eight days to within the NUREG-0473 quarterly and annual dose criteria, and (d) to limit the annual dose to any member of the public due to release of radioactivity and radiation from uranium fuel cycle sources to within the requirements of 40 CFR Part 190.

Figure 4.8.1, the map defining the site boundary for radioactive gaseous and liquid effluents, is illegible and should be replaced.

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 dose exceeds 25 percent of the annual dose design objective prorated monthly for the two unit site. The projections are to be made at least once per 31 days in accordance with the ODCM. A commitment is also made to submit a special report within 30 days if use of the liquid waste treatment system is required and the waste is being discharged without treatment.

The Licensee has committed to operate the offgas treatment system at all times when processing for discharge to the environs. It was determined that use of the off-gas charcoal adsorber beds are not required below 30 percent of rated thermal power. A commitment is also made to submit a special report within 30 days if gaseous wastes are discharged for more than seven days with the charcoal beds bypassed while the reactor is operated at greater than 30 percent of rated thermal power.

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

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 RETS specifies a total limit of 3.0 curies on the Waste Sample Tanks, the Floor Drain Sample Tanks, and the Waste Surge Tank, and each tank to contain no more than 0.7 curies. The RETS do not address temporary outside tanks, since use of such tanks are not anticipated.

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

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 RETS include a commitment to monitor the hydrogen content of the offgas holdup stream (downstream of the recombiner), or to verify every 8 hours that the recombiner is operating within the allowable band of the baseline plot of recombiner outlet temperature vs. reactor power. If the recombiners are inoperable for more than 7 days in a calendar quarter while the reactor is operating at above 30 percent of rated thermal power a special report will be submitted to the NRC within 30 days.

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

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.[38]

The Licensee's RETS include a commitment to process wet radioactive wastes in accordance with a PCP to ensure the solid waste shall meet shipping and burial ground requirements prior to shipment 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 CFR Part 50, and the land use census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50. 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 for a radiological environmental monitoring program have followed in general the intent of the model RETS and the Branch Technical Position on the subject issued November 1979,[34] as applicable to the site, and have generally provided an adequate number of 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 obtaining the appropriate annual information for a BWR. 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 monitoring program meets the intent of NUREG-0473.

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 Audit Function (Manager of Quality Assurance) as the two entities comparable to the Unit Review Group (URG) and the Company Nuclear Review and Audit Group (CNRAG), respectively.

The Onsite Review and Investigative Function is responsible for reviewing any unplanned on-site release of radioactive material, changes to the ODCM and PCP, and major changes to the radwaste treatment systems.

The Manager of Quality Assurance is responsible for auditing the radiological environmental program and results thereof, the ODCM and implementing procedures, the PCP and implementing procedures, and the performance of activities required by the quality assurance (QA) program. These audits are performed at the frequency required by the model RETS except for the QA audit which is performed at least once per two years.

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 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 require the records of off-site environmental monitoring surveys to 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)

   The Licensee's RETS includes a commitment that this report will be submitted by March 31 of the next year. It will include:

   - Summaries, interpretations, and analysis of trends of the results of environmental sampling.

   - Results of the census to determine the locations of animals producing milk for human consumption.

   - Results of environmental sampling summarized on a quarterly basis following the format of Regulatory Guide 4.8 Table 1 (December 1975).[39] The report shall explain any missing results.

   - An assessment of radiation dose via the principal pathways of exposure resulting from plant emissions of radioactivity including the maximum noble gas gamma and beta air doses in the unrestricted area.

- The reason for omission if the nearest dairy to the station is not in the monitoring program.

- An annual summary of meteorological conditions concurrent with the releases of gaseous effluents.

- The results of the Interlaboratory Comparison Program.

- The results of the 40 CFR 190 uranium fuel cycle dose analysis for the calendar year.

- A summary description of the monitoring program.

- Maps showing sampling locations and tables giving distance and direction of sampling locations from the station.

2. Radioactive Effluent Release Report (Semiannual)

This report shall be submitted to the Commission within 60 days after January 1 and July 1 of each year specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and gaseous effluents during the previous 6 months. The format and content of the report shall be in accordance with Regulatory Guide 1.21 (Revision 1) dated June 1974, which contains the requirements for reporting the solid wastes shipped offsite. Any changes to the PCP shall be included in this report. Changes to the ODCM shall be included in the monthly operating report.

3. Special Reports

The Licensee's RETS include a commitment to file a special report, within 30 days of the time specified in the Technical Specifications under the following conditions:

- Exceeding the liquid effluent dose limits of Specification 3.8.B.2.a or 3.8.B.2.b.

- Exceeding the gaseous effluent dose limits of Specifications 3.8.A.2.a, 3.8.A.2.b, 3.8.A.3.a, or 3.8.A.3.b.

- Exceeding the total dose limits of Specifications 3.8.A.2.a, 3.8.A.2.b, 3.8.A.3.a, 3.8.A.3.3.b, 3.8.B.2.a, or 3.8.B.2.b.

- Exceeding the reporting levels given in Table 4.8.5 for the radioactivity measured in the environmental sampling program.

- When radioactive liquid or gaseous effluents require treatment before discharge according to Specification 3.8.B.3 and the waste treatment equipment is in operable.

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 changes to the ODCM and PCP shall become effective as reviewed by the Onsite Review Function. Changes in the ODCM shall be reported to the Commission by inclusion in the Monthly Operating Report. Changes to the PCP shall be reported to the Commission in the Radioactive Effluent Release (Semiannual) Report for the period in which the change was made. Major changes to the radioactive waste treatment systems shall be reported in the Monthly Report for the period in which the evaluation was reviewed 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.

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 locations 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-0473. The ODCM describes the noble gas monitoring system for the main chimney releases as two channels of sodium iodide detectors, which is inconsistent with Table 3.2.5 of the Technical Specifications.

The Licensee's ODCM contains the methods and calculational relationships that are used to compare the radioactivity concentrations in liquid effluents 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-0473 dose rate limits by correctly determining the setpoints for the noble gas monitors. The dose rate due to the release of I-131, I-133, and radionuclides in particulate form with half-lives greater than eight days is assured to be within the NUREG-0473 limit of 1500 mrem per year by calculating the dose rate to an adult via the inhalation pathway. (The bases statement in NUREG-0473 states the thyroid dose rate to a child via the inhalation pathway is the limiting dose rate pathway.) The dose rates are calculated using the maxima X/Q or D/Q at or beyond the unrestricted area boundary.

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 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.

Specific parameters of distance and the direction sector from the centerline of a reactor and additional information have been provided for most of the sample locations in RETS Environmental Monitoring Table 4.8-4, in ODCM Tables 8.4-1 and 8.4-3, and in ODCM Figures 8.4-1 and 8.4-2. The ODCM does not contain simplified diagrams of the liquid and gaseous release points, the liquid radwaste treatment system, or the solid radwaste system. Forty-two TLD locations are stated in the Technical Specifications, which are not all identified in the ODCM figures. Two public water samples are required whereas only one surface water location is identified in the ODCM. In addition, the fish consumption rate of 2.4×10^{-4} kg/hr on page 7.2-1 of the ODCM should be 2.4×10^{-3} kg/hr.

The Licensee's ODCM for Dresden Station Units 2 and 3 is generally in compliance with the NRC requirements and uses methods consistent with the methodology and guidance prescribed in NUREG-0133.

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,[38] 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.

3.4.1 Evaluation

The Licensee's PCP describes the types of liquid wastes to be solidified and the processes used to accomplish solidification. Waste is normally solidified using a commercially built cement solidification system. The manufacturer's tested procedures and waste-cement mixture formulations are followed. Periodically, the Quality Assurance Department destructively examines filled containers. Drums are inspected for free standing water, quality of solidification and mixture.

Periodically, Dresden will use vendor supplied equipment and services to solidify various waste forms. A vendor must meet applicable CEC quality standards as well as current NRC requirements (approved Topical Report).

A commitment is made that all wastes shipped off site are packaged and shipped in compliance with DOT, NRC, and burial ground criteria.

Therefore, the Licensee's PCP is in compliance with the intent of the NRC guidelines as presently developed.[27]

4.0 Conclusions

The Licensee's proposed RETS, ODCM, and PCP were reviewed, evaluated and it was concluded that:

- The Licensee's proposed RETS for Dresden Station Units 2 and 3 submitted May 3, 1984 meets the intent of the NRC staff's "Standard Radiological Effluent Technical Specifications for Boiling Water Reactors," NUREG-0473.

- The Licensee's ODCM received by the NRC April 19, 1983[23] generally uses documented and approved methods that are consistent with the methodology and guidelines in NUREG-0133, with the following exceptions:

  1. The outstanding issues noted in references 24 and 25 that apply to the generic Sections of the CEC ODCM. The most significant of these issues are:

     a. The dose rate to an adult (instead of a child) via the inhalation pathway is used to assure that the limit of 1500 mrem/year in Specification 3.8.A.1.b is not exceeded,

     b. The dose projections to determine when to use the liquid waste treatment system, required by Specification 4.8.B.3, are not included.

  2. The ODCM description for the main chimney's noble gas monitoring system appears to be inconsistent with Table 3.2.5 of the Technical Specifications.

  3. The listing of sampling locations in Table 8.4-1 does not include samples of public water from two locations as required by Table 4.8.4 of the proposed RETS.

  4. The 42 TLD locations are not identified in Figures 8.4-1 or 8.4-2.

  5. The maps of Figures 8.4-1 and 8.4-2 do not include the environmental sample locations 17 through 38 in Table 8.4-3.

6. Block diagrams are not included showing: the liquid and gaseous radwaste treatment systems, the liquid and gaseous radwaste release pathways, or the solid radwaste system.

7. The value for the fish consumption rate on page 7.2-1 should be reevaluated.

- The Licensee's proposed PCP submitted May 3, 1984 meets the intent of the NRC's present guidelines.

A correspondence between (a) NUREG-0473, (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-0473, THE LICENSEE'S CURRENT TECHNICAL SPECIFICATIONS AND THE LICENSEE'S PROPOSAL FOR DRESDEN STATION UNITS 2 AND 3.

RETS Requirement	NUREG-0473	Current Technical Specifications	Licensee's Proposal
Effluent (Liquid) Instrumentation (Gaseous)	3.3.3.10 3.3.3.11	3.8.C.1 3.2.D, 3.8.A.1	3.2.F 3.2.G
Concentrations in Liquids	3.11.1.1	3.8.C.2, 3.8.E	3.8.B.1
Dose Rate for Gases	3.11.2.1	3.8.A.2, 3.8.E	3.8.A.1
Offsite Doses from Liquids	3.11.1.2	- - - - -	3.8.B.2
Offsite Doses from Gases	3.11.2.2	- - - - -	3.8.A.2
Offsite Doses from Iodine-131, etc.	3.11.2.3	- - - - -	3.8.A.3
Total Offsite Dose	3.11.4	- - - - -	3.8.A.2.d, 3.8.A.3.d, 3.8.B.2.d
Liquid Radwaste Treatment	3.11.1.3	4.8.E.1	3.8.B.3-4
Gaseous Radwaste Treatment	3.11.2.4	4.8.E.1	3.8.A.4,b
Tank Inventory Limits	3.11.1.4	3.8.D	3.D.8
Explosive Gas Mixtures	3.11.2.6	- - - - -	3.8.A.5-6
Main Condenset Effluent	3.11.2.7	- - - - -	3.8.A.7
Mark I or Mark II Containment	3.11.2.8	- - - - -	- - - - -
Solid Radwaste (PCP)	3.11.3	- - - - -	3.8.F
Radiological Environmental Monitoring	3.12.1	4.8.E.1	3.8.E
Land Use Census	3.12.2	4.8.E.2	3.8.E.5-6
Interlaboratory Comparisons	3.12.3	- - - - -	3.8.E.7-8
Audits and Reviews	6.5.1 6.5.2	6.1.G.2.a 6.1.G.1.b	6.1.G.2.d 6.1.G.1.b
Procedures and Records	6.8, 6.10	---, 6.5.B	---, 6.5.B
Reports	6.9	6.6.C.1 6.6.C.2	6.6.C.1 6.6.C.2
Other Administrative Controls (PCP, ODCM, Changes to Radwaste Systems)	6.13 6.14 6.15	- - - - - - - - - - - - - - -	6.9 6.8 6.10

5.0 REFERENCES

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5. United States Office of the Federal Register, Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation."

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13. ABSTRACT (200 words or less)

A review of the Radiological Effluent Technical Specifications (RETS) for the Dresden Station Units 2 and 3 Nuclear Generating Plants 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-0473, Revision 3, "Standard Radiological Effluent Technical Specifications for Boiling 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 and Process Control Program were reviewed and generally found to be in compliance with the NRC review guidelines.

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