TECHNICAL EVALUATION REPORT

RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATION IMPLEMENTATION (A-2)

INDIANA AND MICHIGAN ELECTRIC COMPANY

DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2

NRC DOCKET NO. 50-315, 50-316

NRC TAC NO. 8138, 8139

NRC CONTRACT NO. NRC-03-81-130

FRC PROJECT C5506

FRC ASSIGNMENT 4

FRC TASKS 89, 90

Prepared by

Franklin Research Center
20th and Race Street
Philadelphia, PA 19103

Author: S. Chen

FRC Group Leader: S. Pandey

Prepared for

Nuclear Regulatory Commission
Washington, D.C. 20555

Lead NRC Engineer: F. Congel
C. Willis

October 8, 1982
Revised October 22, 1982

Prepared by:	Reviewed by:	Approved by:
S. L. Yaw Chen	S. Pandey	Robert P. Gruen
Principal Author:	Group Leader	Department Director
Date: 10/7/82	Date: 10/7/82	Date: 10-8-82

XA Copy Has Been Sent to PDR

XA

8210260044

Franklin Research Center
A Division of The Franklin Institute
The Benjamin Franklin Parkway, Phila., Pa. 19103 (215) 448-1000

CONTENTS

FIGURES

TABLE

FOREWORD

This Technical Evaluation Report was prepared by Franklin Research Center under a contract with the U.S. Nuclear Regulatory Commission (Office of Nuclear Reactor Regulation, Division of Operating Reactors) for technical assistance in support of NRC operating reactor licensing actions. The technical evaluation was conducted in accordance with criteria established by the NRC.

1. INTRODUCTION

1.1 PURPOSE OF REVIEW

The purpose of this technical evaluation report (TER) is to review and evaluate the proposed changes in the Technical Specifications of Donald C. Cook Nuclear Plant Units 1 and 2 with regard to Radiological Effluent Technical Specifications (RETS) and the Offsite Dose Calculation Manual (ODCM).

The evaluation uses criteria proposed by the NRC staff in the Model Technical Specifications for pressurized water reactors (PWRs), NUREG-0472 [1]. This effort is directed toward the NRC objective of implementing RETS which comply principally with the regulatory requirements of the Code of Federal Regulations, Title 10, Part 50 (10CFR50), "Domestic Licensing of Production and Utilization Facilities," Appendix I [2]. Other regulations pertinent to the control of effluent releases are also included within the scope of compliance.

1.2 GENERIC BACKGROUND

Since 1970, 10CFR50, Section 50.36a, "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 reasonably achievable (ALARA). In 1975, numerical guidance for the ALARA requirement was issued in 10CFR50, Appendix I. The licensees of all operating reactors were required [3] to submit, no later than June 4, 1976, their proposed ALARA Technical Specifications and information for evaluation in accordance with 10CFR50, 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 deals with radioactive waste management systems and environmental monitoring. Although the model RETS closely parallels 10CFR50, Appendix I requirements, it also includes provisions for addressing other issues.

These other issues are specifically stipulated by the following regulations:

- 10CFR20 [4], "Standards for Protection Against Radiation," Paragraphs 20.105(c), 20.106(g), and 20.405(c) require that nuclear power plants and other licensees comply with 40CFR190 [5], "Environmental Radiation Protection Standards for Nuclear Power Operations," and submit reports to the NRC when the 40CFR190 limits have been or may be exceeded.

- 10CFR50, Appendix A [6], "General Design Criteria for Nuclear Power Plants," contains Criterion 60 - Control of releases of radioactive materials to the environment; Criterion 63 - Monitoring fuel and waste storage; and Criterion 64 - Monitoring radioactivity releases.

- 10CFR50, Appendix B [7], establishes the quality assurance required for nuclear power plants.

The current 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 [1] and NUREG-0473 [8] for boiling water reactors (BWRs). Copies were sent to licensees in July 1978 with a request to submit proposed site-specific RETS on a staggered schedule over a 6-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 was subsequently revised 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 ODCM.

The revised 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 6-month period.

Four regional seminars on the RETS were conducted by the NRC staff during November and December 1978. Subsequently, 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. In response to the NRC's request, operation reactor licensees have subsequently submitted initial proposals on plant RETS and the ODCM. Review leading to ultimate implementation of these documents was initiated by the NRC in 1981 using subcontracted independent teams as reviewers.

As the RETS review process has progressed since September 1981, feedback from the licensees has led the NRC to believe that modification to some of the requirements in the current version of Revision 2 is needed to better clarify specific concerns of the licensees and thus expedite the entire review process. Starting in April 1982, 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 the AIF meeting on May 19, 1982 [10]. Some interim changes regarding the Radiological Environmental Monitoring Section were issued in August 1982 [11]. With the incorporation of these new changes, NRC issued, in September 1982, a draft version of NUREG-0472, Revision 3 [12], to serve as new guidance for the review teams.

1.3 PLANT-SPECIFIC BACKGROUND

In response to the NRC's request, the Licensee, Indiana and Michigan Electric Company (IMEC), submitted a RETS proposal dated March 27, 1978 [13] on behalf of Donald C. Cook Nuclear Plant Units 1 and 2. This proposal also included the ODCM [14]. In the RETS submittal, the Licensee closely followed the model RETS format (NUREG-0472) for PWRs. In an initial evaluation by the Franklin Reseach Center (FRC), an independent review team, the Licensee's RETS and ODCM submittals were compared with the model RETS (NUREG-0472, Revision 2) and assessed for compliance with the stipulated requirements. Copies of the draft review, dated March 30, 1982 [15, 16], were delivered to the NRC and the Licensee prior to a site visit by the reviewers.

The site visit was conducted on April 27-28, 1982 by representatives of the NRC, the reviewers, and the Licensee. Discussions focused on the initial review of the proposed changes to the RETS and on the technical requirements for an ODCM. The deficiencies in the Licensee's proposed RETS were considered, deviations from NRC requirements were pointed out, many differences were clarified, and only a few items remained unresolved, pending justification by the Licensee. These issues are summarized in Reference 17.

On July 30, 1982, the Licensee's revised RETS proposal [18] and ODCM [19] were received for review. On August 9, 1982, a telephone conference took place involving NRC, IMEC, and independent reviewers of FRC to discuss the

response to IMEC's resubmittal. A summary of that telephone conference was forwarded to the NRC and IMEC on August 12, 1982.

The final versions of the Donald C. Cook Nuclear Plant RETS [20] and ODCM [21] were submitted to the NRC on September 17, 1982. Copies of the submittal were transmitted to the FRC reviewers on September 23, 1982. Final evaluation of both documents was detailed in the comparison copies [22, 23] which used the draft version of NUREG-0472, Revision 3 [12] to evaluate the Licensee's submittal.

2. REVIEW CRITERIA

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

NUREG-0472, RETS for PWRs

NUREG-0473, RETS for BWRs

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 10CFR20, Appendix B, Table II limits.

3. Offsite doses of radioactivity 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 will not cause offsite doses exceeding 10CFR20 limits.

6. Waste gas concentrations 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.

Subsequent to the publication of NUREG-0472 and NUREG-0473, the NRC staff issued guidelines [24, 25], clarifications [26, 27], and branch positions [28, 29, 30] 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 implementation for operating reactors.

The review of the ODCM was based on the following NRC guidelines: Branch Technical Position, "General Content of the Offsite Dose Calculation Manual" [31]; NUREG-0133 [9]; and Regulatory Guide 1.109 [32]. The ODCM format 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 radwaste liquid and gaseous effluent treatment systems, release paths, and control systems installed at Donald C. Cook Units 1 and 2.

3.1.1 Radioactive Liquid Effluent

The liquid waste treatment system for the Donald C. Cook plant is common to both Units 1 and 2 (see Figure 1). The liquid waste is collected primarily in the clean waste holdup tank (CWHT) and the station drainage waste holdup tank (SDWHT) before being processed by the waste evaporator, which has a capacity of 30 gpm. The processed liquid is stored in two monitor tanks which are sampled before release. The release line, i.e., the radwaste effluent line, has a radiation monitor (R-18) with alarm and automatic isolation capability.

Each unit has a separate steam generator blowdown line (monitored by R-19), steam generator blowdown treatment line (monitored by R-24), and service water line (monitored by R-20 and R-28). Both R-19 and R-24 have the capability of automatic isolation.

All the effluent lines described above share a common discharge through the tunnels leading to Lake Michigan.

Effluent from the turbine building sump is discharged separately to an absorption pond in the dune area near the site. This effluent line is monitored by a composite sampler.

3.1.2 Radioactive Gaseous Effluent

The gaseous waste treatment system for the Donald C. Cook plant is also common to both units (see Figure 2). The waste gas is collected in waste decay tanks (four tanks per unit) before being discharged to the atmosphere through the auxiliary building vent system. The containment purge, fuel

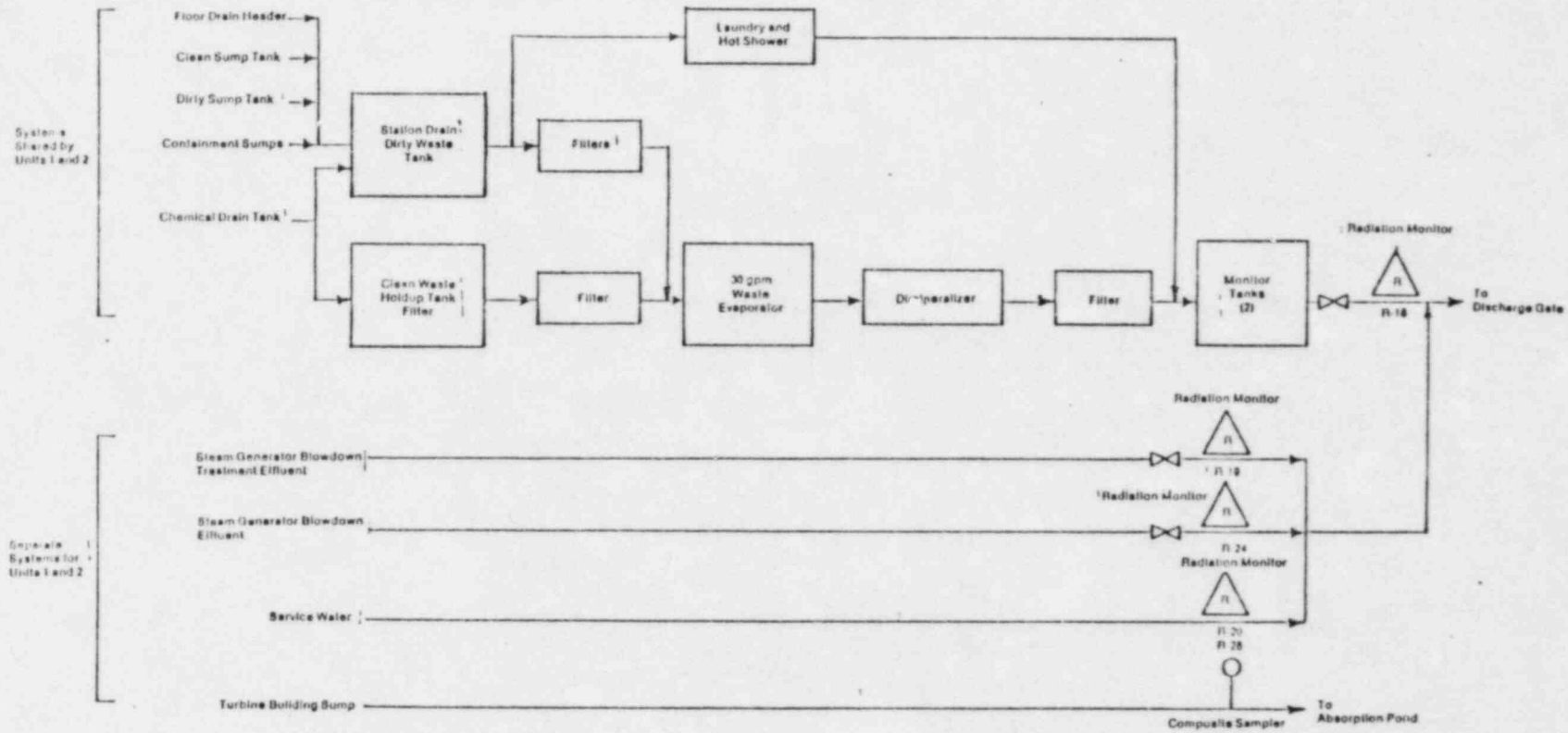

Figure 1. Liquid Radwaste Treatment Systems, Effluent Paths, and Controls for Donald C. Cook Units 1 and 2

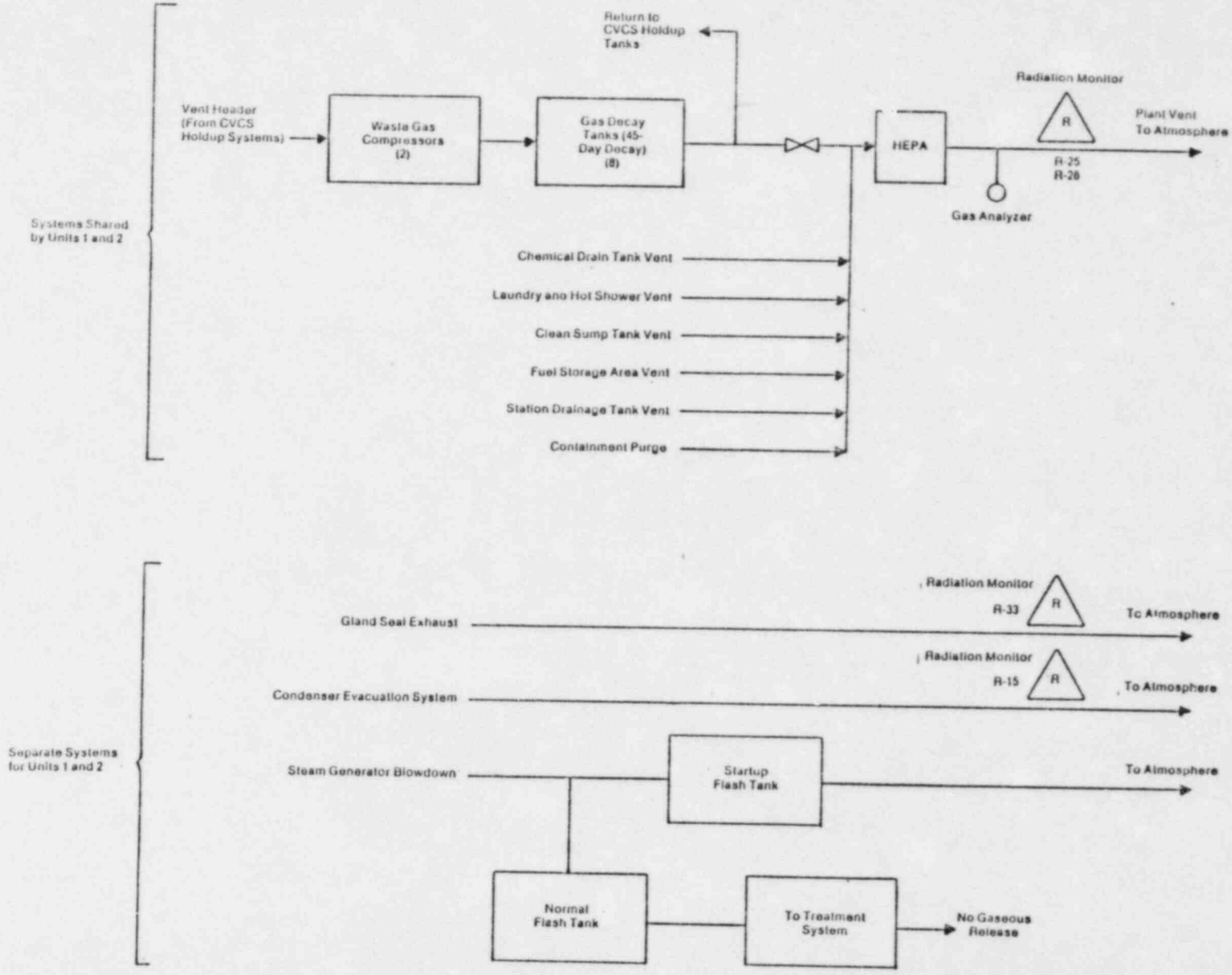

Figure 2. Gaseous Radwaste Treatment Systems, Effluent Paths, and Controls for Donald C. Cook Units 1 and 2

storage vent, and various tank vents also use this vent system. This effluent line has radiation monitors (R-25 and R-26) capable of automatically isolating the releases from the gas decay tanks. Each unit has a separate condenser evacuation effluent line and gland seal exhaust with radiation monitors R-15 and R-33, respectively.

3.2 RADIOLOGICAL EFFLUENT TECHNICAL SPECIFICATIONS

The evaluation of the Licensee's proposed RETS against the requirements of NUREG-0472 included the following: (1) a review of information provided in the Licensee's 1978 submittal [13, 14], (2) the resolution of problem areas in that submittal by means of a site visit [15], (3) a review of the Licensee's July 21, 1982 submittal [18, 19], (4) a telephone conference of August 9, 1982 to discuss the review, and (5) a review of the Licensee's September 17, 1982 revised submittal [20, 21].

3.2.1 Effluent Instrumentation

The objective of the RETS with regard to effluent instrumentation is to ensure that all significant releases of radioactivity are monitored. The RETS require that all effluent monitors be operable and alarm/trip setpoints be determined to ensure that radioactivity levels do not exceed the maximum permissible concentration (MPC) set by 10CFR20. To further ensure that the instrumentation functions properly, surveillance requirements are needed in the specifications. Although the Licensee does not have a monitor for the discharge from the steam generator flash tank (Figure 2), the Licensee has made a commitment to determine the release of iodine-131 via the flash tank vent in accordance with the ODCM, which is considered an acceptable alternative under NUREG-0133 [9]. The Licensee's proposed RETS submittal thus met all these requirements and thus satisfies the intent of NUREG-0472.

3.2.2 Concentration and Dose Rates of Effluents

The objective of the RETS with regard to effluent concentrations and dose rates is to ensure that offsite effluent concentrations do not exceed the MPC established by 10CFR20, Appendix B, Table II, Columns 1 and 2. The Licensee

has stated that the concentration of radioactive material will be monitored "at all times," and if the concentration of liquid effluents exceeds the 10CFR20 values, it will be reduced without delay to a value equal to or less than the MPC specified in 10CFR20.

The monitoring systems are equipped to automatically terminate effluents. Should concentrations be found to exceed the MPC specified in 10CFR20, based on monitoring setpoint values, release rates will be decreased without delay. To demonstrate compliance with gaseous dose-rate limits, the Licensee is using the inhalation pathway for radioiodine and for particulate radioactive material and radionuclides other than noble gases with half-lives greater than 8 days. These provisions satisfy the intent of NUREG-0472.

3.2.3 Offsite Doses from Effluents

The objective of the RETS with regard to offsite doses from effluents is to ensure that offsite doses are kept ALARA, comply with the dose requirements of NUREG-0472, and are in accordance with 10CFR50, Appendix I, and 40CFR190. The Licensee has made a commitment to (1) meet the quarterly and yearly dose limitations for liquid effluents, per Section 3.11.1.2 [1]; (2) restrict the air doses for beta and gamma radiation in unrestricted areas as specified in 10CFR50, Appendix I, Section II.B; and (3) maintain the dose level to an individual from release of radioiodine and radioactive particulates within the design objectives of 10CFR50, Appendix I, Section II.C. This satisfies the intent of NUREG-0472.

3.2.4 Effluent Treatment

The objectives of the RETS with regard to effluent treatment are to ensure that wastes are treated to keep releases ALARA and to satisfy the requirement for Technical Specifications governing the maintenance and use of radwaste treatment equipment. The Licensee has made a commitment to use the liquid and gaseous radwaste treatment system when the projected doses averaged over 31 days exceed 25% of the annual dose design objectives, prorated monthly. This meets the intent of 10CFR50, Appendix I, Section II.D. The Licensee has also

made a commitment to project the monthly dose in accordance with the surveillance requirements of NUREG-0472. This meets the intent of NUREG-0472.

3.2.5 Tank Inventory Limits

The objective of the RETS with regard to tank inventory limits is to ensure that the rupture of a radwaste tank would not cause offsite doses greater than the limits set in 10CFR20 for non-occupational exposure. The Licensee has put a curie limit on all outside liquid tanks and has made a commitment to perform surveillance. For liquid holdup tanks, this limit excludes tritium and dissolved or entrained noble gases. For gas storage tanks, a curie limit has been set for noble gases. The Licensee's commitment to comply with tank inventory limits has satisfied the intent of NUREG-0472.

3.2.6 Explosive Gas Mixtures

The objective of the RETS with regard to explosive gas mixtures is to prevent hydrogen explosions in waste gas systems. The Licensee has made a commitment to maintain a safe concentration of oxygen in the waste gas holdup system by a constant O_2 monitoring using a minimum of two channels. However, the plant has only one instead of the two hydrogen monitors required in NUREG-0472, Table 3-3.13, Section 2B, for systems not designed to withstand a hydrogen explosion. In accordance with the Branch Position, the present monitoring system is acceptable on an interim basis, as discussed with the Licensee at the site visit of April 27-28, 1982.

3.2.7 Solid Radwaste System

The objective of the RETS with regard to the solid radwaste system is to ensure that radwaste will be properly processed and packaged before it is shipped to the burial site. Specification 3.11.3 of NUREG-0472 requires the Licensee to establish a Process Control Program (PCP), or the equivalent, to show compliance with this objective. The Licensee has made a commitment to implement such a program, thus providing assurance that the requirements of 10CFR20 and 10CFR71 would be met.

3.2.8 Radiological Environmental Monitoring Program

The objectives of the RETS with regard to environmental monitoring are to ensure that an adequate and full-area-coverage environmental monitoring program exists and that the 10CFR50, Appendix I requirements for technical specifications on environmental monitoring are satisfied. The Licensee has followed NUREG-0472 requirements, including the Branch Technical Position dated November 1979. Since the Licensee's land sectors cover only about one half the entire meteorological sectors at the site, the proposed 23 TLD locations satisfy the intent of the Branch Technical Position, which calls for a total of 40 TLD locations if the entire sectors are covered by land. The Licensee's methods of analysis and maintenance of yearly records satisfy the requirements and meet the intent of 10CFR50, Appendix I. The specification for the land use census satisfies the requirements of Section 3.12.2 of NUREG-0472 by providing for an annual census in the specified areas. The Licensee participates in an interlaboratory comparison program approved by the NRC and reports the results in the Annual Radiological Environmental Operating Report, which also meets the requirements of NUREG-0472.

3.2.9 Audits and Reviews

The objective of the 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 designates the Plant Nuclear Safety Review Committee (PNSRC) and Nuclear Safety and Design Review Committee (NSDRC) as the two groups responsible for the review and audit of the radiological environmental monitoring program, the ODCM, and the PCP. The proposed quality assurance (QA) program has met the criteria of 10CFR50, Appendix B, and, specifically, the requirements of Regulatory Guides 1.21 and 4.1. The PNSRC is responsible for auditing those four programs as often as or more often than required under NUREG-0472. The NSDRC is responsible for a review of every unplanned release of radioactive material, to include an event description, remedial action to prevent recurrence, and corrective action. The NSDRC also reviews any changes to the ODCM and the PCP.

3.2.10 Procedures

The objective of the RETS with regard to procedures is to establish a requirement for implementing the ODCM, the PCP, and the QA program. The Licensee has committed to establish, implement, and maintain written procedures for the PCP, ODCM, and QA program.

3.2.11 Reports

The objective of the RETS with regard to reports is to ensure that appropriate periodic and special reports are submitted to the NRC, and that these reports meet the requirements of 10CFR50.36a. The Licensee has made a commitment to issue annual, semiannual, and monthly reports as required under Sections 6.9.1.7, 6.9.1.9, and 6.9.1.10, respectively, of NUREG-0472, Rev. 2 [1], as well as special reports (Prompt Notification) under Section 6.9.1.12 when (1) offsite releases exceed the limits specified under paragraphs 3.11.1.1 and 3.11.2.1 of NUREG-0472 and (2) inventory limits for the storage tanks have exceeded those listed under Sections 3.11.1.4 and 3.11.2.6 of NUREG-0472, Rev. 2 [1]. The Licensee has also made a commitment to submit a special report in Section 6.9.2 for pertinent sections referenced in the Technical Specifications, which satisfies the requirements of the Model RETS.

3.3 OFFSITE DOSE CALCULATION MANUAL (ODCM)

As required by 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, it is required that the ODCM provide equations and methodology for the following topics:

- o alarm and trip setpoint on effluent instrumentation
- o liquid effluent concentration in unrestricted areas
- o gaseous effluent dose rate at or beyond the site boundary
- o liquid and gaseous effluent dose contributions
- o liquid and gaseous effluent dose projections.

In addition, flow diagrams defining the treatment paths and the components of the radioactive liquid, gaseous, and solid waste management systems are required and reviewed for consistency against the system being used at the station. A description and location of samples in support of the environmental monitoring program are also required in the ODCM.

3.3.1 Evaluation

The Licensee has followed the methodology of NUREG-0133 to determine the alarm and trip setpoints for the liquid and gaseous effluent monitors. A conservative factor is used for the setpoints, which ensures that the maximum permissible concentration (MPC) will not be exceeded even in the case of simultaneous effluent releases. The Licensee demonstrated the methodology of calculating the liquid concentration by describing in the ODCM the means of collecting and analyzing representative samples. To waive the requirement of a radiation monitor at the steam generator blowdown flash tank vent, the Licensee has adopted methodology suggested by NUREG-0133 to estimate the release of iodine-131 during the discharge.

The dose rate at or beyond the site boundary due to gaseous effluent release is in compliance with 10CFR20. Gaseous effluents are released from three release points for which the Licensee uses conservative values of relative concentration (X/Q) and relative deposition (D/Q) for average atmospheric dispersion conditions. For each of the three release points, as described in the Donald C. Cook ODCM, the highest site boundary X/Q values for each release point are used in conjunction with the radionuclide mix and release rate to determine the controlling location. The Licensee has identified the receptor age, location, and critical organ for dose-rate determination. The Licensee has also considered inhalation, ground-plane, and cow- and goat-milk pathways in the calculations, although only the inhalation pathway is necessary. It has been demonstrated by the Licensee that conservative values were used in the calculations.

The dose evaluation for pathways associated with the release of radioactive material in liquid effluents is based on the maximally exposed

individual. Dose contributions are calculated once per 31 days. The Licensee has taken a conservative approach to the methodology for dose factors by incorporating a far-field dilution factor well below the total dilution factor.

Evaluation of noble gases released to the atmosphere includes both beta and gamma air doses at the site boundary and total body and skin doses at the residence receiving the highest dose.

For radioiodine and radioactive particulates, the Licensee has demonstrated that the method used in the ODCM for calculating releases to unrestricted areas meets the design objective of maintaining an annual dose or dose commitment not to exceed 15 mrem to any organ of the maximally exposed individual. The Licensee has demonstrated the method of calculating the dose using X/Q values for the inhalation pathway and has included D/Q values for the food and ground-plane pathways. In determining the tritium dose, the parameter for dispersion was based on the food pathway using the same X/Q values. The ground-plane pathway is not appropriate for tritium.

The Licensee has made a commitment to perform dose projections for both liquid and gaseous effluent releases once every 31 days to determine the use of appropriate portions of the radwaste system.

The flow diagrams defining the treatment paths and components of the radioactive liquid, gaseous, and solid waste management systems are adequately provided by the Licensee in the submitted RETS.

The Licensee has provided a complete description of sampling locations in the ODCM in Figures IV-1 through IV-3. This description is consistent with the sampling locations specified in the Licensee's RETS Table 3.12-1 on environmental monitoring. Table IV-1 in the Licensee's ODCM tabulates the site number identification, sector location, distance from station center, and sample type description, and covers all of the committed sampling exposure pathways in accordance with the Licensee's Table 3.12-1, RETS Environmental Monitoring Program.

4. CONCLUSIONS

Table 1 summarizes the results of the final review and evaluation of the Donald C. Cook Nuclear Plant Units 1 and 2 proposed Radiological Effluent Technical Specifications (RETS). The following conclusions have been reached:

1. The Licensee's proposed RETS meets the intent of the NRC staff's current standard, "Radiological Effluent Technical Specifications," NUREG-0472.

2. The Licensee's Offsite Dose Calculation Manual (ODCM) uses documented and approved methods that are consistent with the criteria of NUREG-0133.

Table 1. Evaluation of Proposed Radiological Effluent Specifications (RETS), Donald C. Cook Units 1 and 2

RETS Requirement	Technical Specifications: NRC Staff Model RETS NUREG-0472 (Section)*	Technical Specifications: Licensee Proposal (Section)	Replaces or Updates Existing Tech. Spec. (Section)	Evaluation
Effluent Instrumentation	3/4.3.3.9, 3/4.3.3.10	3/4.3.3.9, 3/4.3.3.10	2.1.1, 2.1.3 (Appendix B) 2.1.2, 2.1.4	Meets the intent of NRC criteria
Radioactive Effluents	3/4.11.1.1, 3/4.11.2.1	3/4.11.1.1, 3/4.11.2.1	2.1.1, 2.1.3 (Appendix B)	Meets the intent of NRC criteria
Offsite Doses	3/4.11.1.2, 3/4.11.2.2, 3/4.11.2.3, 3/4.11.4	3/4.11.1.2, 3/4.11.2.2, 3/4.11.2.3, 3/4.11.4	2.1 (Appendix B)	Meets the intent of NRC criteria
Effluent Treatment	3/4.11.1.3, 3/4.11.2.4	3/4.11.1.3, 3/4.11.2.4	2.1.1, 2.1.3 (Appendix B)	Meets the intent of NRC criteria
Tank Inventory Limits	3/4.11.1.4, 3/4.11.2.6	3/4.11.1.4, 3/4.11.2.6	2.1.1, 2.1.3 (Appendix B)	Meets the intent of NRC criteria
Explosive Gas Mixtures	3/4.11.2.5	3/4.11.2.5	3/4.6.4	Meets the intent of NRC criteria in the interim
Solid Radioactive Waste	3/4.11.3	3/4.11.3	2.1.5 (Appendix B)	Meets the intent of NRC criteria
Environmental Monitoring	3/4.12.1	3/4.12.1	3.1 (Appendix B)	Meets the intent of NRC criteria
Audit and Review	6.5.1, 6.5.2	6.5.4.7, 6.5.4.8	6.5.1, 6.5.2	Meets the intent of NRC criteria
Procedures	6.8	6.8	6.8	Meets the intent of NRC criteria
Reports and Records	6.9.1.6 - 6.9.1.9 6.9.1.12, 6.9.1.13 6.9.2, 6.10.2	6.9.1.6 - 6.9.1.9 6.9.1.12, 6.9.1.13 6.9.2, 6.10.2	3.1.A, 3.1.B, (Appendix B) 6.9.1.8, 6.9 1.9, 6.9.2, 6.10.2	Meets the intent of NRC criteria

*Section numbering sequence is according to NUREG-0472, Rev. 2 [1].

5. REFERENCES

1. "Radiological Effluent Technical Specifications for Pressurized Water Reactors," Rev. 2
   NRC, July 1979
   NUREG-0472

2. 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"

3. Title 10, Code of Federal Regulations, Part 50, Appendix I, Section V, "Effective Dates"

4. Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation"

5. Title 40, Code of Federal Regulations, Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations"

6. Title 10, Code of Federal Regulations, Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants"

7. Title 10, Code of Federal Regulations, Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants"

8. "Radiological Effluent Technical Specifications for Boiling Water Reactors," Rev. 2
   NRC, July 1979
   NUREG-0473

9. "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants, A Guidance Manual for Users of Standard Technical Specifications"
   NRC, October 1978
   NUREG-0133

10. C. Willis and F. Congel (NRC)
    "Summary of Draft Contractor Guidance of RETS"
    Presented at the AIF Environmental Subcommittee Meeting, Washington, DC
    May 19, 1982

11. F. Congel (NRC)
    Memo to RAB Staff (NRC)
    Subject: Interim Changes in the Model Radiological Effluent Technical Specifications (RETS)
    August 9, 1982

12. "Radiological Effluent Technical Specifications for Pressurized Water Reactors," Rev. 3, Draft 7, intended for contractor guidance in reviewing RETS proposal for operating reactors
NRC, September 1979
NUREG-0472

13. Radiological Effluent Technical Specifications
Donald C. Cook Nuclear Plant Units 1 and 2
Indiana and Michigan Power Company, March 27, 1978
NRC Docket Nos. 50-315, 50-316

14. Offsite Dose Calculation Manual
Donald C. Cook Nuclear Plant Units 1 and 2
Indiana and Michigan Power Company, March 27, 1978
NRC Docket Nos. 50-315, 50-316

15. Comparison of Specification NUREG-0472, Radiological Effluent Technical Specifications for PWRs, vs. Licensee Submittal of Radiological Effluent Technical Specifications for Donald C. Cook Nuclear Plant Units 1 and 2" (Draft)
Franklin Research Center, March 30, 1982

16. Technical Review of Offsite Dose Calculation Manual for Donald C. Cook Units 1 and 2 (Draft)
Franklin Research Center, March 30, 1982

17. Franklin Research Center
Letter of Transmittal to NRC
Subject: Trip report on site visit to Donald C. Cook Nuclear Plant
April 27, 1982

18. Radiological Effluent Technical Specifications (RETS)
Donald C. Cook Nuclear Plant Units 1 and 2
July 21, 1982
NRC Docket Nos. 50-315, 50-316

19. Offsite Dose Calculation Manual (ODCM)
Donald C. Cook Nuclear Plant Units 1 and 2
July 21, 1982
NRC Docket Nos. 50-315, 50-316

20. Radiological Effluent Technical Specifications (RETS)
Donald C. Cook Nuclear Plant Units 1 and 2
September 17, 1982
NRC Docket Nos. 50-315, 50-316

21. Offsite Dose Calculation Manual (ODCM)
Donald C. Cook Nuclear Plant Units 1 and 2
September 17, 1982
NRC Docket Nos. 50-315, 50-316

22. "Comparison of Specification NUREG-0472, Radiological Effluent Technical Specifications for PWRs, vs. Licensee Submittal of Radiological Effluent Technical Specifications for Donald C. Cook Nuclear Plant Units 1 and 2"
Franklin Research Center, September 27, 1982

23. "Technical Review of Plant Offsite Dose Calculation Manual for Donald C. Cook Nuclear Plant Units 1 and 2"
Franklin Research Center, September 27, 1982

24. C. Willis (NRC)
Letter to Dr. S. Pandey (FRC)
Subject: Changes to RETS requirements following meeting with Atomic Industrial Forum (AIF)
November 20, 1981

25. C. Willis (NRC)
Letter to Dr. S. Pandey (FRC)
Subject: Control of explosive gas mixture in PWRs
December 18, 1981

26. C. Willis and F. Congel (NRC)
"Status of NRC Radiological Effluent Technical Specification Activities"
Presented at the AIF Conference on NEPA and Nuclear Regulations, Washington, D.C.
October 4-7, 1981

27. C. Willis (NRC)
Memo to P. C. Wagner (NRC)
"Plan for Implementation of RETS for Operating Reactors"
November 4, 1981

28. 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

29. "An Acceptable Radiological Environmental Monitoring Program"
Branch Technical Position
November 1979

30. Methods for Demonstrating LWR Compliance with the EPA Uranium Fuel Cycle Standard (40CFR190)
NRC, February 1980
NUREG-0543

31. "General Contents of the Offsite Dose Calculation Manual," Revision 1
Branch Technical Position, Radiological Assessment Branch
February 8, 1979

32. Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I
NRC, October 1977
Regulatory Guide 1.109