

APPENDIX B
ENVIRONMENTAL TECHNICAL SPECIFICATIONS
FOR
DONALD C. COOK NUCLEAR PLANT
UNITS 1 AND 2
BERRIEN COUNTY, MICHIGAN
DOCKET NUMBERS 50-315 AND 50-316

PART I - RADIOLOGICAL

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DEFINITIONS

Abnormal Environmental Occurrence (AEO) is one that:

- a. Results in noncompliance with, or is in violation of, the specifications section of a limiting condition for operation (section 2).
- b. Results in uncontrolled or unplanned release of _____ radioactive discharges from the Donald C. Cook Nuclear Plant in excess of the applicable regulations of _____ governing agencies, or _____
- c. Results in a significant adverse Radiological environmental impact.

Accuracy: Refers to the deviation of a result obtained by a particular method from the value accepted as true.

Annually: Annually is once per calendar year at intervals of twelve calendar months.

Batch Release: A batch release is the discharge of fluid wastes of a discrete volume.

Calibration: An instrument or device calibration shall be the adjustment, as necessary, of the output such that it responds with the necessary range and accuracy to known values of the parameter(s) which the instrument sensor or device monitors. The calibration shall encompass the entire circuit including the sensor, indicatory control feature, alarm and/or trip function(s), and shall include the functional test. The calibration may be performed by any series of sequential, overlapping or total circuit steps such that the entire circuit is calibrated as specified.

Composite Sample: A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged.

Continuous Monitors: As applied to in place monitors and flow indicators does not prevent the devices from being periodically taken out of service for calibration or maintenance.

Continuous Release: A continuous release is the discharge of fluid waste of a non-discrete volume, e.g., from a volume or system that has an input flow during the continuous release.

Functional Check: A functional check shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter.

Functional Test: A functional test shall be the injection of a simulated signal into the channel as close to the primary sensor as practicable to verify OPERABILITY including alarm and/or trip functions.

Grab Sample: A grab sample is a single sample taken at neither a set time nor a flow.

Monthly: Monthly is once every 30 days.

Normal Operation: Operation of the station at greater than 5% of rated thermal power in other than a emergency situation.

Precision: Relates to the reproducibility of measurements within a set, that is, to the scatter or dispersion of a set about its central value.

Quarterly: Quarterly is once during each successive three month period of the calendar year, counting from January 1, at intervals of 13 weeks.

Semi-Monthly: Semi-monthly is once every 15 days.

Spectral Band: A width, generally expressed in wavelength or frequency of a particular portion of the electromagnetic spectrum. A given sensor (e.g., radiometer detector or camera film) is designed to measure or be sensitive to energy received from that part of the spectrum.

Plant and Unit: Plant refers to D. C. Cook Nuclear Plant, Units Nos. 1 and 2. Unit refers only to Unit No. 1 or Unit No. 2.

Weekly: Weekly is once during each calendar week at intervals of 7 days.

2.0 LIMITING CONDITIONS FOR OPERATION

2.1 RADIOACTIVE EFFLUENTS

Objective: To define the limits and conditions for the controlled release of radioactive materials in liquid and gaseous effluents to the environs to ensure that these releases are as low as practicable. These releases should not result in radiation exposures in unrestricted areas greater than a few percent of natural background exposures. The release rate for all effluent discharges shall be within the limits specified in 10 CFR Part 20.

To assure that the releases of radioactive material above background to unrestricted areas be as low as practicable as defined in Appendix I to 10 CFR Part 50; the following design objectives apply:

For liquid wastes:

- a. The annual dose above background to the total body or any organ of an individual from all reactors at a site should not exceed 5 mrem in an unrestricted area.
- b. The annual total quantity of radioactive materials in liquid waste, excluding tritium and dissolved gases, discharged from each reactor should not exceed 5 Ci.

For gaseous wastes:

- c. The annual total quantity of noble gases above background discharged from the plant should result in an air dose due to gamma radiation of less than 10 mrad, and an air dose due to beta radiation of less than 20 mrad, at any location near ground level which could be occupied by individuals at or beyond the boundary of the site.
- d. The annual total quantity of all radioiodines and radioactive material in particulate forms above background from all reactors at a site should not result in an annual dose to any organ of an individual in an unrestricted area from all pathways of exposure in excess of 15 mrem.
- e. The annual total quantity of iodine-131 discharged from each reactor at a site should not exceed 1 Ci.

2.1.1 Specifications for Liquid Waste Effluents

- a. The concentration of radioactive materials released in liquid waste effluents from all reactors at the site shall not exceed the

values specified in 10 CFR Part 20, Appendix B, Table II, Column 2, for unrestricted areas.

- b. The cumulative release of radioactive materials in liquid waste effluents, excluding tritium and dissolved gases, shall not exceed 10 Ci/reactor/calendar quarter.
- c. The cumulative release of radioactive materials in liquid waste effluents, excluding tritium and dissolved gases, shall not exceed 20 Ci/reactor in any 12 consecutive months.
- d. During release of radioactive wastes, the effluent control monitor shall be set to alarm and to initiate the automatic closure of each waste isolation valve prior to exceeding the limits specified in 2.1.1.a above.
- e. The operability of the automatic isolation valves in the liquid radwaste discharge lines shall be demonstrated quarterly.
- f. The equipment installed in the liquid radioactive waste system shall be maintained and shall be operated to process radioactive liquid wastes prior to their discharge when the projected cumulative release rate could exceed 1.25 Ci/reactor/calendar quarter, excluding tritium and dissolved gases.
- g. The maximum radioactivity to be contained in any liquid radwaste tank that can be discharged directly to the environs shall not exceed 10 Ci, excluding tritium and dissolved gases.
- h. If the cumulative release of radioactive materials in liquid effluents, excluding tritium and dissolved gases, exceeds 2.5 Ci/reactor/calendar quarter, the licensee shall make an investigation to identify the causes for such releases, define and initiate a program of action to reduce such release rates to the design objective levels listed in Section 2.1, and report these actions to the Commission within 30 days from the end of the quarter during which the release occurred.

2.1.2 Specifications for Liquid Waste Sampling and Monitoring

- a. Plant records shall be maintained of the radioactive concentration and volume before dilution of liquid waste intended for discharge and the average dilution flow and length of time over which each discharge occurred. Sample analysis results and other reports shall be submitted in accordance with

Section 5.4 of these specifications. Estimates of the sampling and analytical errors associated with each reported value shall be included.

- b. Prior to release of each batch of liquid waste, a representative sample shall be taken from that batch and analyzed for the concentration of each significant gamma energy peak in accordance with Table 2.1-1 to demonstrate compliance with Specification 2.1.1 using the flow rate of the stream into which the waste is discharged during the period of discharge.
- c. Sampling and analysis of liquid radioactive waste shall be performed in accordance with Table 2.1-1. Prior to taking samples from a monitoring tank, at least two tank volumes shall be recirculated.
- d. The radioactivity in liquid wastes shall be continuously monitored during release. Whenever these monitors are inoperable for a period not to exceed 72 hours, two independent samples of each tank to be discharged shall be analyzed and two plant personnel shall independently check valving prior to the discharge. If these monitors are inoperable for a period exceeding 72 hours, no liquid waste tank shall be released and any release in progress shall be terminated.
- e. The flow rate of liquid radioactive waste shall be measured during release.
- f. All liquid effluent radiation monitors shall be calibrated at least quarterly by means of a radioactive source which has been calibrated to a National Bureau of Standards source. Each monitor shall also have a functional test monthly and an instrument check prior to making a release.
- g. The radioactivity in steam generator blowdown shall be continuously monitored and recorded. Whenever these monitors are inoperable, the blowdown flow shall be diverted to the waste management system and the direct release to the environment terminated.

Bases: The release of radioactive materials in liquid waste effluents to unrestricted areas shall not exceed the concentration limits specified in 10 CFR Part 20 and should be as low as practicable in accordance with the requirements of 10 CFR Part 50.36a.

Bases (Continued)

These specifications provide reasonable assurance that the resulting annual dose to the total body or any organ of an individual in an unrestricted area will not exceed 5 mrem. At the same time, these specifications permit the flexibility of operation, compatible with considerations of health and safety, to assure that the public is provided a dependable source of power under unusual operating conditions which may temporarily result in releases higher than the design objective levels but still within the concentration limits specified in 10 CFR Part 20. It is expected that by using this operational flexibility under unusual operation conditions, and exerting every effort to keep levels of radioactive material in liquid wastes as low as practicable, the annual releases will not exceed a small fraction of the concentration limits specified in 10 CFR Part 20.

The design objectives have been developed based on operating experience taking into account a combination of variables including defective fuel, primary system leakage, primary to secondary system leakage and the performance of the various waste treatment systems, and are consistent with Appendix I to 10 CFR Part 50.

Specification 2.1.1.a requires the licensee to limit the concentration of radioactive materials in liquid waste effluents from the site to levels specified in 10 CFR Part 20, Appendix B, Table II, Column 2, for unrestricted areas. This specification provides assurance that no member of the general public will be exposed to liquid containing radioactive materials in excess of limits considered permissible under the Commission's Rules and Regulations.

Specifications 2.1.1.c establish the upper limits for the release of radioactive materials in liquid effluents. The intent of these Specifications is to permit the licensee the flexibility of operation to assure that the public is provided a dependable source of power under unusual operating conditions which may temporarily result in releases higher than the levels normally achievable when the plant and the liquid waste treatment systems are functioning as designed. Releases of up to these limits will result in concentrations of radioactive material in liquid wastes at small percentages of the limits specified in 10 CFR Part 20.

Specifications 2.1.1.d and 2.1.1.e require that suitable equipment to control and monitor the releases of radioactive materials in liquid wastes are operating during any period

these releases are taking place consistent with the requirements of 10 CFR Part 50, Appendix A, Design Criterion 64.

Specification 2.1.1.f requires that the licensee maintain and operate the equipment installed in the liquid waste systems to reduce the release of radioactive materials in liquid effluents to as low as practicable consistent with the requirements of 10 CFR Part 50.36a. Normal use and maintenance of installed equipment in the liquid waste system provides reasonable assurance that the quantity released will not exceed the design objective. In order to keep releases of radioactive materials as low as practicable, the specification requires operation of equipment whenever it appears that the projected cumulative discharge rate will exceed one-fourth of this design objective annual quantity during any calendar quarter.

Specification 2.1.1.g. limits the amount of radioactive material that may be inadvertently released to the environment to an amount that will not exceed the Technical Specification limit.

In addition to limiting conditions for operation listed under Specification 2.1.1.b and 2.1.1.c the reporting requirements of Specification 2.1.1.h delineate that the licensee shall identify the cause whenever the release rate of radioactive materials in liquid waste effluents exceeds one-half the design objective annual quantity during any calendar quarter and describe the proposed program of action to reduce such releases to design objective levels on a timely basis. This report must be filed within 30 days following the calendar quarter in which the release occurred.

The sampling and monitoring requirements given under Specification 2.1.2 provide assurance that radioactive materials in liquid wastes are properly controlled and monitored in conformance with the requirements of Design Criteria 60 and 64. These requirements provide the data for the licensee and the Commission to evaluate the plant's performance relative to radioactive liquid wastes released to the environment. Reports on the quantities of radioactive materials released in liquid waste effluents are furnished to the Commission according to Section 5.4 of these Technical Specifications in conformance with Regulatory Guide 1.21. On the basis of such reports and any additional information the Commission may from time to time require the licensee to take such action as the Commission deems appropriate.

The points of release to be monitored in Section 2.1.2 include all the monitored release points as provided for in Table 2.1-3.

2.1.3 Specifications for Gaseous Waste Effluents

- a. (1) The release rate limit of noble gases from the site shall be:

$$\sum_i Q_{iv} [37 \bar{E}_{i\gamma} + 112 \bar{E}_{i\beta}] \leq 1$$

where \dot{Q}_v = release rate (sum of the unit vents and the turbine condenser steam air ejector exhaust for Unit 1 and Unit 2)

Q_{iv} = release rate from vents in Ci/sec (ground release) for the i th individual nuclide.

i = the i th individual nuclide

$\bar{E}_{i\gamma}$ = the average gamma energy per disintegration for nuclide i

$\bar{E}_{i\beta}$ = the average beta energy per disintegration for nuclide i

Refer to Table 2.1-5 for \bar{E}_γ and \bar{E}_β values to be used.

- a. (2) The release rate limit of all radioiodines and radioactive materials in particulate form with half-lives greater than eight days, released to the environs as part of the gaseous waste from the site shall be:

$$1.5 \times 10^5 Q_v \leq 1$$

where Q_v is defined above

- b. (1) The average release rate of noble gases from the site during any calendar quarter shall be:

$$\sum_i \bar{E}_{i\beta} [350 Q_{iv}] \leq 1$$

and,

$$\sum_i \bar{E}_{i\gamma} [120 Q_{iv}] \leq 1$$

- b. (2) The average release rate of noble gases from the site during any 12 consecutive months shall be:

$$\sum_i \bar{E}_{i_B} [700 Q_{i_V}] \leq 1$$

and,

$$\sum_i \bar{E}_{i_Y} [230 Q_{i_V}] \leq 1$$

- b. (3) The average release rate of all iodines and radioactive materials in particulate form per site with half-lives greater than eight days during any calendar quarter shall be:

$$1.8 \times 10^6 Q_V \leq 1$$

- b. (4) The average release rate of all iodines and radioactive materials per site in particulate form with half-lives greater than eight days during any period of 12 consecutive months shall be:

$$3.6 \times 10^6 Q_V \leq 1$$

- b. (5) The amount of iodine-131 released during any calendar quarter shall not exceed 2 Ci/reactor.

- b. (6) The amount of iodine-131 released during any period of 12 consecutive months shall not exceed 4 Ci/reactor.

- c. Should the conditions of 2.1.3.c(1), (2), or (3) listed below exist, the licensee shall make an investigation to identify the causes of the release rates, define and initiate a program of action to reduce the release rates to design objective levels, listed in Section 2.1, and report these actions to the Commission within 30 days from the end of the quarter during which the releases occurred.

- c. (1) If the average release rate of noble gases during any calendar quarter is:

$$\sum_i \bar{E}_{i_B} [1400 Q_{i_V}] > 1$$

or,

$$\sum_i \bar{E}_{i_Y} [470 Q_{i_V}] > 1$$

- c. (2) If the average release rate of all iodines and radioactive materials in particulate form per site with half-lives greater than 8 days during any calendar quarter is:

$$7.3 \times 10^6 Q_v > 1$$

- c. (3) If the amount of iodine-131 released during any calendar quarter is greater than 0.5 Ci/reactor.
- d. During the release of gaseous wastes from the primary system waste gas holdup system the effluent monitors listed in Table 2.1-4 shall be operating and set to alarm and to initiate the automatic closure of the waste gas discharge valve prior to exceeding the limits specified in 2.1.3a, above. The operability of each automatic isolation valve shall be demonstrated quarterly.
- e. The maximum activity to be contained in one waste gas storage tank shall not exceed 438,000 curies (considered as Xe-133).

2.1.4 Specifications for Gaseous Waste Sampling and Monitoring

- a. Plant records shall be maintained and reports of the sampling and analyses results shall be submitted in accordance with Section 5.4 of these Specifications. Estimates of the sampling and analytical error associated with each reported value should be included.
- b. Gaseous releases to the environment, except from the turbine building ventilation exhaust and as noted in Specification 2.1.4.c, shall be continuously monitored for gross radioactivity and the flow continuously measured and recorded. Whenever these monitors are inoperable, grab samples shall be taken and analyzed daily for gross radioactivity. If these monitors are inoperable for more than 7 days, these releases shall be terminated.
- c. During the release of gaseous wastes from the primary system waste gas holdup system, the gross activity monitor, the iodine collection device, and the particulate collection device shall be operating.
- d. All waste gas effluent monitors shall be calibrated at least quarterly by means of a known radioactive source which has been calibrated to a National Bureau of Standards source. Each monitor shall have a functional test at least monthly and instrument check at least daily.
- e. Sampling and analysis of radioactive material in gaseous waste, particulate form, and radioiodine shall be performed in accordance with Table 2.1-2.

Bases: The release of radioactive materials in gaseous waste effluents to unrestricted areas shall not exceed the concentration limits specified in 10 CFR Part 20, and in accordance with the requirements of 10 CFR Part 50.36a.

These specifications provide reasonable assurance that the resulting annual air dose due to gamma radiation will not exceed 10 mrad, and an annual air dose due to beta radiation will not exceed 20 mrad from noble gases, and that the annual dose to any organ of an individual from iodines and particulates will not exceed 15 mrem per site. At the same time these specifications permit the flexibility of operation, compatible with considerations of health and safety, to assure that the public is provided with a dependable source of power under unusual operating conditions which may temporarily result in releases higher than the design objective levels but still within the concentration limits specified in 10 CFR Part 20. It is expected that using this operational flexibility under unusual operating conditions, and by exerting every effort to keep levels of radioactive material in gaseous wastes as low as practicable, the annual releases will not exceed a small fraction of the concentration limits specified in 10 CFR Part 20. These efforts should include consideration of meteorological conditions during releases.

There is a reduction factor of 243 by which the maximum permissible concentration of radioactive iodine in air should be reduced to allow for the grass-cow-milk pathway. (The factor is 1220 for the grass-goat-milk pathway). This factor has been derived for radioactive iodine, taking into account the milk pathway. It has been applied to radionuclides of iodine and to all radionuclides in particulate form with a half-life greater than eight days. The factor is not appropriate for iodine where milk is not a pathway of exposure or for the other radionuclides.

The design objectives have been developed based on operating experience taking into account a combination of system variables including defective fuel, primary system leakage, primary to secondary system leakage, steam generator blowdown and the performance of the various waste treatment systems.

For Specification 2.1.3.a (1) dose calculations have been made for the critical sector. These calculations consider site meteorology, buoyancy characteristics, and radionuclide content of the effluent of each unit. Meteorological calculations for offsite locations were performed, and the most critical one was selected to set the release rate. The controlling distance is 610 meters to the north.

The gamma dose contribution was determined using the equation 7.63 in Section 7-5.2.5 of Meteorology and Atomic Energy - 1968. The releases from vents are considered to be ground level releases which could result in a beta dose from cloud submersion. The beta

dose contribution was determined using Equation 7.21, as described in Section 7-4.1 of Meteorology and Atomic Energy - 1968. The beta dose contribution was determined on the basis of an infinite cloud passage with semi-infinite geometry for a ground level release (submersion dose). The beta and gamma components of the gross radioactivity in gaseous effluents were combined to determine the allowable continuous release rate. Based on these calculations, a continuous release rate of gross radioactivity in the amount specified in 2.1.3.a(1) will not result in offsite annual doses above background in excess of the limits specified in 10 CFR Part 20.

The average gamma and beta energy per disintegration used in the equation of Specification 2.1.3.a(1) will be based on the average composition of gases determined from the plant vent and ventilation exhausts. The average energy per beta or gamma disintegration for those radioisotopes determined to be present from the isotopic analyses are given in Table 2.1-5. Where isotopes are identified that are not listed in Table 2.1-5, the average gamma and beta energies are determined from ORNL/NUREG-70 (NUREG/CR-1413), A Radionuclide Decay Data Base - Index and Summary Table, D. C. Kocher, May 1980.

For Specification 2.1.3.a(2), dose calculations have been made for the critical sectors and critical pathways for all radioiodines and radioactive material in particulate form, with half-lives greater than eight days. The calculations consider site meteorology for these releases.

For radioiodines and radioactive materials in particulate form, the controlling sector for unit vent releases is the $3N$ sector at a distance of 610 meters ($X/Q = 7.7 \times 10^{-6} \text{ sec/m}^3$) for the dose due to inhalation. The nearest milk cow is located in the ENE sector at a distance of 2900 meters. The applicable X/Q at the nearest milk cow is $1.5 \times 10^{-7} \text{ sec/m}^3$. The grass-cow-milk-child thyroid chain is controlling.

The assumptions used for these calculations are: (1) onsite meteorological data for the most critical 22.5 degree sector; (2) credit for building wake; and (3) a reconcentration factor 243 and a grazing factor of 0.4 was applied for possible ecological chain effects from radioactive iodine and particulate releases.

Specification 2.1.3.b establishes upper limits for the releases of noble gases, iodines and particulates with half-lives greater than eight days, and iodine-131 at twice the design objective annual

quantity during any calendar quarter, or four times the design objective annual quantity during any period of 12 consecutive months. The intent of this specification is to permit the licensee the flexibility of operation to assure that the public is provided a dependable source of power under unusual operating conditions which may temporarily result in higher releases than the objectives.

In addition to the limiting conditions for operation of Specifications 2.1.3.a and 2.1.3.b, the reporting requirements of 2.1.3.c delineate that the cause be identified whenever the release of gaseous effluents exceeds one-half the design objective annual quantity during any calendar quarter and describe the proposed program of action to reduce such release rates to the design objectives.

Specification 2.1.3.d requires that suitable equipment to monitor and control the radioactive gaseous releases are operating during any period these releases are taking place.

Specification 2.1.3.d limits the maximum offsite dose above background to below the limits of 10 CFR Part 20, postulating that the rupture of a waste gas storage tank holding the maximum activity releases all of the contents to the atmosphere.

The sampling and monitoring requirements given under Specification 2.1.4 provide assurance that radioactive materials released in gaseous waste effluents are properly controlled and monitored in conformance with the requirements of Design Criteria 60 and 64. These requirements provide the data for the licensee and the Commission to evaluate the plant's performance relative to radioactive wastes released to the environment. Reports on the quantities of radioactive materials released in gaseous effluents are furnished to the Commission on the basis of Section 5.4 of these Technical Specifications and in conformance with Regulatory Guide 1.21. On the basis of such reports and any additional information the Commission may obtain from the licensee or others; the Commission may from time to time require the licensee to take such action as the Commission deems appropriate.

The points of release to the environment to be monitored in Section 2.1.4 include all the monitored release points as provided for in the Table 2.1-4.

Specification 2.1.4.b excludes monitoring the turbine building ventilation exhaust since this release is expected to be a negligible release point. Many PWR reactors do not have turbine

building enclosures. To be consistent in this requirement for all PWR reactors, the monitoring of gaseous releases from turbine buildings is not required.

2.1.5 Specifications for Solid Waste Handling and Disposal

- a. Measurements shall be made to determine or estimate the total curie quantity and principle radionuclide composition of all radioactive solid waste shipped offsite.
- b. Solid wastes in storage and preparatory to shipment shall be monitored and packaged to assure compliance with 10 CFR Part 20, 10 CFR Part 71, and 49 CFR Parts 171-178.
- c. Reports of the radioactive solid waste shipments, volumes, principle radionuclides, and total curie quantity, shall be submitted in accordance with Section 5.4.

Bases: The requirements for solid radioactive waste handling and disposal given under Specification 2.1.5 provide assurance that solid radioactive materials stored at the plant and shipped offsite are packaged in conformance with 10 CFR Part 20, 10 CFR Part 71, and 49 CFR Parts 171-178. These requirements provide the data for the licensee and the Commission to evaluate the handling and storage facilities for solid radwaste, and to evaluate the environmental impact of offsite shipment and storage. Reports on the quantities, principle isotopes and volumes of the shipments, are furnished to the Commission according to Section 5.4 of these Technical Specifications. On the basis of such reports and any additional information the Commission may obtain from the licensee or others, the Commission may from time to time require the licensee to take such action as the Commission deems appropriate.

Table 2.1-1

RADIOACTIVE LIQUID SAMPLING AND ANALYSIS

Liquid Source	Sampling Frequency	Type of Activity Analysis	Detectable Concentrations (pCi/ml) (2)
A. Monitor Tank Releases	Each Batch	Principal Gamma Emitters	5×10^{-7} (1)
	One Batch/Month	Dissolved Gases	10^{-5}
	Weekly Composite	Ba-La-140, I-131	10^{-6}
		Sr-89	5×10^{-8}
	Monthly Composite	H-3	10^{-5}
		Gross α	10^{-7}
	Quarterly Composite	Sr-90	5×10^{-8}
B. Primary Coolant	Weekly (3)	I-131, I-133	10^{-6}
C. Steam Generator Blowdown	Weekly (4)	Principal Gamma Emitters	5×10^{-7} (1)
		Ba-La-140, I-131	10^{-6}
	One Sample/Month	Dissolved Gases	10^{-5}
		Sr-89	5×10^{-8}
	Monthly Composite (4)	H-3	10^{-6}
		Gross α	10^{-7}
	Quarterly Composite (4)	Sr-90	5×10^{-8}

Table 2.1-1 (Continued)

NOTES:

- (1) For certain mixtures of gamma emitters, it may not be possible to measure radionuclides in concentrations near their sensitivity limits when other nuclides are present in the sample in much greater concentrations. Under these circumstances, it will be more appropriate to calculate the concentrations of such radionuclides using measured ratios with those radionuclides which are routinely identified and measured.
- (2) The detectability limits for activity analysis are based on the technical feasibility and on the potential significance in the environment of the quantities released. For some nuclides, lower detection limits may be readily achievable and when nuclides are measured below the stated limits, they should also be reported.
- (3) The power level and cleanup or purification flow rate at the sample time shall also be reported.
- (4) To be representative of the average quantities and concentrations of radioactive materials in liquid effluents, samples should be collected in proportion to the rate of flow of the effluent stream. Prior to analyses, all samples taken for the composite should be thoroughly mixed in order for the composite sample to be representative of the average effluent release.

Table 2.1-2

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS

Gaseous Source	Sampling Frequency	Type of Activity Analysis	Detectable Concentrations ($\mu\text{Ci}/\text{ml}$) (1)
A. Waste Gas Decay Tank Releases	Each Tank	Principal Gamma Emitters	10^{-4} (3)
		H-3	10^{-6}
B. Containment Purge Releases	Each Purge	Principal Gamma Emitters	10^{-4} (2)
		H-3	10^{-6}
C. Condenser Air Ejector	Monthly	Principal Gamma Emitters	10^{-4} (2) (3)
		H-3	10^{-6}
D. Environmental Release Points	Monthly (Gas Samples)	Principal Gamma Emitters	10^{-4} (2) (3)
		H-3	10^{-6}
	Weekly (Charcoal Sample)	I-131	10^{-12}
	Monthly (Charcoal Sample)	I-133, I-135	10^{-10}
	Weekly (Particulates)	Principal Gamma Emitters (at least for Ba-La-140, I-131)	10^{-11}
	Monthly Composite ⁽⁴⁾ (Particulates)	Sr-89	10^{-11}
		Gross α	10^{-11}
	Quarterly Composite ⁽⁴⁾ (Particulates)	Sr-90	10^{-11}

Table 2.1-2 (Continued)

NOTES:

- (1) The above detectability limits for activity analysis are based on technical feasibility and on the potential significance in the environment of the quantities released. For some nuclides, lower detection limits may be readily achievable and when nuclides are measured below the stated limits, they should also be reported.
- (2) Analyses shall also be performed following each refueling, startup or similar operational occurrence which could alter the mixture of radionuclides.
- (3) For certain mixtures of gamma emitters, it may not be possible to measure radionuclides at levels near their sensitivity limits when other nuclides are present in the sample at much higher levels. Under these circumstances, it will be more appropriate to calculate the levels of such radionuclides using observed ratios with those radionuclides which are measurable.
- (4) To be representative of the average quantities and concentrations of radioactive materials in particulate form released in gaseous effluents, samples should be collected in proportion to the rate of flow of the effluent stream.

Table 2.1-3.

PW-1 LIQUID WASTE SYSTEM
LOCATION OF PROCESS AND EFFLUENT MONITORS AND SAMPLERS REQUIRED BY TECHNICAL SPECIFICATIONS

<u>Process Stream or Release Point</u>	<u>Alarm</u>	<u>Auto Control to Isolation Valve</u>	<u>Continuous Monitor</u>	<u>Grab Sample Station</u>	<u>Gross Activity</u>	<u>I</u>	<u>Dissolved Gases</u>	<u>Alpha</u>	<u>H-1</u>	<u>Isotopic Analysis</u>
Clean & Station Drainage	xa			X		X	X	X	X	X
Waste Hold-up Tank										
Chemical Drain Tank	xa			X		X	X	X	X	X
Laundry/Hot Shower Tank	xa			X		X	X	X	X	X
Primary Coolant System	X			X		X				
Liquid Effluent Discharge Pipe	X	X	X		X					
Steam Generator Blowdown System ^{aa}	X		X	X	X	X	X	X	X	X
Service Water Discharge Pipe				X ^b	X ^b					
Outdoor Storage Tanks -	xa			X	X					
Nuclear Closed Cooling System	X		X		X					
Turbine Building Sumps (Floor Drains)	xa			X	X					X

a - liquid level high

b - when activity in the Component Cooling Water System (CCWS) exceeds 10^{-5} microcuries/ml and a leak in the CCWS is observed, gross activity in the service water discharge will be determined (by grab sample analysis) daily.

Table 2.1-4

PWR-Gaseous Waste SystemLOCATION OF PROCESS AND EFFLUENT MONITORS AND SAMPLES REQUIRED BY TECHNICAL SPECIFICATIONS

<u>Process Steam or Release Point</u>	<u>Alarm</u>	<u>Auto Control to Isolation Valve</u>	<u>Continuous Monitor</u>	<u>Grab Sample Station</u>	<u>NG</u>	<u>Measurement</u>			<u>Alpha</u>
						<u>I</u>	<u>Part</u>	<u>H-3</u>	
Waste Gas Storage Tanks***	x		x	x	x	x	x	x	x
Condenser Air Ejector	x		x	x	x	x	x	x	x
Vent. Header System*	x		x	x	x	x	x	x	x
Building Ventilation Systems	x								
Reactor Containment Building (whenever there is flow)	x	x	x	x	x	x	x	x	x
Auxiliary Building*	x	x***	x	x	x	x	x	x	x
Fuel Handling & Storage Building*	x		x	x	x	x	x	x	x
Radwaste Building*	x		x	x	x	x	x	x	x
Steam Generator Blowdown Tank Vent or Condenser Vent**	x		x	x	x	x	x	x	x
Turbine Gland Seal Condenser	x		x	x	x	x	x	x	x
Waste Evaporator Condenser Vent	x		x	x	x	x	x	x	x

*If any or all of the process streams or building ventilation systems are routed to a single release point, the need for a continuous monitor at the individual discharge point to the main exhaust duct is eliminated. One continuous monitor at the final release point is sufficient.

**In some PWR's the steam generator blowdown tank vent is routed to the main turbine condenser and the need for a continuous monitor at this release point is eliminated.

***The auxiliary Building ventilation monitor will isolate the Waste Gas Storage Tanks.

TABLE 2.1-5
AVERAGE ENERGY PER DISTINTEGRATION (1)

ISOTOPE	\bar{E}_β , Mev/dis	\bar{E}_B , Mev/dis ⁽²⁾
Kr-83m	0.0026	0.0382
Kr-85	0.0022	0.2505
Kr-85m	0.1577	0.2553
Kr-87	0.7931	1.3235
Kr-88	1.9545	0.3648
Kr-89	1.8344	1.3620
Kr-90	1.2715	1.3151
Xe-131m	0.0201	0.1422
Xe-133	0.0453	0.1355
Xe-133m	0.0415	0.1902
Xe-135	0.2479	0.3182
Xe-135m	0.4307	0.0958
Xe-137	0.1877	1.7687
Xe-138	1.1258	0.6315

(1) ORNL/NUREG-70 (NUREG/CR-1413), A Radionuclide Decay Data Base - Index and Summary Table, D. C. Kocher, May, 1980.

(2) The average B energy is taken from "all electrons" column of the reference indicated in (1) above.

3. ENVIRONMENTAL SURVEILLANCE

3.1 RADIOLOGICAL ENVIRONMENTAL MONITORING

Objective

1. To establish a sampling schedule which will assure recognition of changes in radioactivity in the environment surrounding the plant.
2. To verify that offsite concentrations of radioactive materials and doses due to plant operation are within allowable limits.

Specification

1. Samples shall be collected and analyzed according to the schedule established by Table 3.1-1.
2. This program shall be continued until four years after licensing of Unit 2,* at which time the licensee will evaluate the extent to which the program has met its objectives, and may request from the NRC permission to implement changes in the program.
3. Suitable analytical procedures shall be used to determine the radioiodine content of milk to a sensitivity of 0.5 picocuries per liter of milk at the time of sampling. Overall error (one sigma confidence level) of this analytical procedure will be within $\pm 25\%$.
4. Milk samples shall be obtained from those milk-producing cows actually in the area of highest dose potential. An annual survey shall be made during the grazing season to confirm that no milk producing cows are closer than the closest cow now sampled.
5. Deviations are permitted from the required sampling schedule if biological specimens are not obtained or if due to the malfunction of an automatic sampler. If the latter, corrective actions shall be completed prior to the end of the next sampling period. All deviations from the sampling schedule shall be described in the annual reports.

Reporting Requirements

A. Routine Reports

1. The annual report, specified in Section 5, shall contain:
 - a. A narrative summary of the results of offsite airborne environmental surveys performed during the report period.

* Unit 2 Low Power License dated December 23, 1977.

- b. For each medium sampled during the year, a list of the sampling locations, the total number of samples, and the highest, lowest, and the average concentrations for the highest location.
 - c. Figures showing locations of offsite and onsite sampling locations.
 - 2. In the event that some results are not available within the 60 day period, the report should be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.
 - 3. If statistically significant variations of offsite environmental radionuclide concentrations with time are observed, a comparison of these results with effluent releases shall be provided.
 - 4. Individual samples which show higher than normal levels (25% above background for external dose, or twice background for radionuclide content) will be noted in the report.
3. Non-Routine Reports (See Non-Routine Reports, Section 5.4.2)
- 1. Prompt Report
If a measured level of radioactivity in critical pathway environmental media samples indicates that the resultant annual dose to an individual from these levels could equal or exceed 4 times the design objective, a determination will be made as to whether or not such levels of radioactivity are attributable to plant operation. If attributable to plant operation, a report will be made to the Region III Office of Inspection and Enforcement within 24 hours and a plan will be submitted within 10 days advising the NRC of the proposed action to ensure the plant related annual doses will be within the design objective. If not attributable to plant operation, the rationale for this conclusion shall be included in the annual report.
 - 2. 30-Day Report
If samples of critical pathway environmental media collected over a calendar quarter show total levels of radioactivity that could result in accumulated plant related doses to an individual for that quarter of $1/2$ the annual design objective or for any 2 consecutive quarters of $3/4$ the annual design objective a determination will be made as to whether or not such levels of radioactivity are attributable to plant operation. If attributable to plant operation, the results shall be reported within 30 days and a plan submitted and implemented within 30 days to limit conditions so that the annual dose to an individual will not exceed the design objective. If not attributable to plant operation, the rationale for this conclusion shall be included in the annual report.

Basis

The survey program is designed to allow the licensee to:

1. Assure compliance with Technical Specifications and Federal Regulations by measurement of radiation levels in samples of selected media.
2. Differentiate releases of plant origin from natural or other sources of radiation in the environment. This is accomplished by using a reference (background) ring of sampling stations and an indicator (site vicinity) ring of sampling stations. Calculations are then made which show whether or not a statistical difference exists between the levels of radioactivity detected in the site vicinity and those detected remotely from the site.

Also, analysis for specific radionuclides are made in the sampled media which can be related to known plant releases of the same radionuclide.

3. Make dose estimates if significant increase in radiation levels are detected by the survey. This is accomplished by sampling significant media and using sufficient sensitivity in sample analysis to detect concentrations far below maximum permissible concentrations.

The reporting requirements assure that the NRC will be informed of the results of the survey on a regular basis, and will be informed promptly of any results that indicate that annual design objectives may be exceeded. They require the licensee to take steps to assure that annual doses will be within design objectives, and to inform the NRC of such steps, should monitoring indicate that the annual design objective may be exceeded.

TABLE 3.1-1

RADIOLOGICAL
ENVIRONMENTAL MONITORING PROGRAM
DONALD C. COOK NUCLEAR PLANT

<u>Sample Type</u>	<u>No. Stations</u> <u>Ind. - Bkg.</u>		<u>Collection</u> <u>Frequency</u>	<u>Analysis</u> <u>Frequency</u>	<u>Type</u> <u>Analysis</u>	<u>Remarks</u>
Air Particulate	6	4	Weekly	Weekly	Gross Beta	By indicator and background samples
				Monthly	Gamma Spectral Composite of Weekly Samples	
				Quarterly	Sr-89, Sr-90 (Composite)	
Airborne I-131	6	4	Weekly	Weekly	Gamma Spectral	By indicator and background samples
Precipitation 3 - 4	6	4	Monthly *	Monthly	Gamma Spectral Composite	By indicator and background samples
				Semi-annually	Sr-89, Sr-90 (Composite)	
Lake Water	3	2	Monthly or 24 hours after a batch release *	Quarterly	Tritium Sr-89,90 (Composite of collected samples)	By indicator and background samples Two indicator stations will include the nearest public water intakes on the lake north and south of the plant
				Monthly	Gamma Spectral (Composite of collected samples)	
Well Water	4	3	Every 18 wks.	Every 18 wks.	Tritium	
					Gamma Spectral	
Fish	2	2	2/year	2/year	Gamma Spectral Sr-89, 90	Edible portion only

* weather permitting

TABLE 3.1-1 (Continued)

RADIOLOGICAL
ENVIRONMENTAL MONITORING PROGRAM
DONALD C. COOK NUCLEAR PLANT

<u>Sample Type</u>	<u>No. Stations</u> <u>Ind. - Bkg.</u>		<u>Collection</u> <u>Frequency</u>	<u>Analysis</u> <u>Frequency</u>	<u>Type</u> <u>Analysis</u>	<u>Remarks</u>
Aquatic Organisms or Vegetation (as available)	2	2	2/year	2/year	Gama Spectral Sr-87, Sr-90	
Milk	3*	2**	Monthly	Monthly	I-131	
				Monthly	Gama Spectral Sr-89, Sr-90	
Sediment	2	2	2/year	2/year	Gama Spectral Sr-89, Sr-90	
TLD	19	4	Quarterly	Quarterly	Total Dose	
Human Food Crops	1	1	Annually	Annually	Gamma Spectral	

* The three indicator stations shall be within 5 miles of the Plant. If fewer than four locations meeting this requirement are available, the number of indicator stations may be reduced.

**The two background stations shall be between 5 and 20 miles of the Plant. If fewer than three locations meeting this requirement are available, the number of background stations may be reduced. At least one background station shall be established within 50 miles of the Plant, if available.

4.0 SPECIAL SURVEILLANCE AND STUDY ACTIVITIES

None

5.0 ADMINISTRATIVE CONTROLS

5.1 ORGANIZATION, REVIEW AND AUDIT

Organization, review and audit shall be in accordance with Section 6, Appendix A.

5.2 ACTION TO BE TAKEN IF A LIMITING CONDITION FOR OPERATION IS EXCEEDED

1. Remedial action permitted by the Environmental Technical Specifications will be performed until the condition can be met. The occurrence of exceeding a limiting condition will be investigated by the Plant staff as directed by the Plant Manager.
2. A separate report for each occurrence will be prepared as specified in Section 5.4.2.1. This report shall include an evaluation of the cause of the occurrence, and recommendations for appropriate action to prevent or reduce the probability of recurrence.

5.3 PROCEDURES

1. Detailed written procedures, including applicable check lists and instructions, shall be prepared and adhered to for all activities involved in carrying out the requirements of the Part I Appendix B Technical Specifications. Procedures shall include sampling, instrument calibration, analysis, and actions to be taken when limits are approached or exceeded. Testing frequency of any alarms shall be included. These frequencies will be determined from experience with similar instruments in similar environments and from manufacturer's technical manuals.
2. In addition to the procedures specified above, the Plant operating procedures shall include provisions to ensure that the Plant's systems and components are operated in compliance with the limiting conditions for operations established as part of the Environmental Technical Specifications.
3. The Plant procedures described above, and all changes thereto, will be reviewed and approved prior to implementation. Temporary changes to Plant procedures which do not change the intent or capability of the original procedure may be made, provided such changes are approved in writing by two members of the Plant management staff. Such changes will be documented and reported to the Regulatory staff. Any such changes which affect data required in the annual Operating Report shall be described in those Reports.

5.4 PLANT REPORTING REQUIREMENTS

5.4.1 ROUTINE REPORTS

A. Radioactive Effluent Release Report

A report on the radioactive discharges released from the site during the previous 6 months of operation shall be submitted to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation) within 60 days after January 1 and July 1 of each year. The report shall include a summary of the quantities of radioactive effluents released as outlined in Regulatory Guide 1.21, with data summarized on a quarterly basis following the format of Appendix B thereof.

The report shall include a summary of the meteorological conditions concurrent with the release of gaseous effluents during each quarter as outlined in Regulatory Guide 1.21, with data summarized on a quarterly basis following the format of Appendix B thereof. Calculated offsite dose to humans resulting from the release of effluents and their subsequent dispersion in the atmosphere shall be reported in accordance with Regulatory Guide 1.21.

a. Gases

1. Quarterly sums of total curies of fission and activation gases released.
2. Average release rates (uCi/sec) of fission and activation gases for the quarterly periods covered by the report.
3. Percent of technical specification limit for release of fission and activation gases. This should be calculated in accordance with technical specification limits.
4. Quarterly sums of total curies for each of the radionuclides determined to be released based on analyses of fission and activation gases. The data should be categorized by (1) elevated releases, batch and continuous modes, and (2) ground level releases, batch and continuous modes.

b. Iodines

1. Quarterly sums of total curies of iodine-131 released.
2. Average release rate ($\mu\text{Ci/sec}$) of iodine-131.
3. Percent of technical specification limit for iodine-131.
4. Quarterly sums of total curies of each of the isotopes, iodine-131, iodine-133, and iodine-135 determined to be released.

c. Particulates

1. Quarterly sums of total curies of radioactive material in particulate form with half-lives greater than 8 days determined to be released.
2. Average release rate ($\mu\text{Ci/Sec}$) of radioactive material in particulate form with half-lives greater than 8 days.
3. Percent of technical specification limit for radioactive material in particulate-form with half-lives greater than 8 days.
4. Quarterly sums of total curies for each of the radionuclides in particulate form determined to be released based on analyses performed.
5. Quarterly sums of total curies of gross alpha radioactivity determined to be released.

d. Tritium

1. Quarterly sums of total curies of tritium determined to be released in gaseous effluents.
2. Average release rate ($\mu\text{Ci/sec}$) of tritium.
3. Percent of appropriate technical specification or MPC limits for tritium.

e. Mixed Fission and Activation Products

1. Quarterly sums of total curies of radioactive material determined to be released in liquid effluents (not including tritium, dissolved and entrained gases, and alpha-emitting material).

2. Average concentrations ($\mu\text{Ci/ml}$) of mixed fission and activation products released to unrestricted areas, averaged over the quarterly periods covered by the report.
3. Percent of applicable limit of average concentrations released to unrestricted areas. Include the limit used and the bases in the supplemental report information.
4. Quarterly sums of total curies for each of the radionuclides determined to be released in liquid effluents, based on analyses performed. Data should be separated by type of release mode, i.e., continuous or batch.

f. Tritium

1. Quarterly sums of total curies of tritium determined to be released in liquid effluents.
2. Average concentrations ($\mu\text{Ci/ml}$) of tritium released in liquid effluents to unrestricted areas, averaged over the quarterly periods covered by the report.
3. Percent of applicable limit of average concentrations released to unrestricted areas, i.e., percent of $3 \times 10^{-3} \mu\text{Ci/ml}$. Include the limit and the bases in the supplemental report information.

g. Dissolved and Entrained Gases

1. Quarterly sums of total curies of gaseous radioactive material determined to be released in liquid effluents.
2. Average concentrations ($\mu\text{Ci/ml}$) of dissolved and entrained gaseous radioactive material released to unrestricted areas, averaged over the quarterly periods covered by the report.
3. Percent of technical specification limit of average concentrations released to unrestricted areas. Include the limit used and the bases in the supplemental report information.
4. Quarterly sums of total curies for each of the radionuclides determined to be released as dissolved and entrained gases in liquid effluents.

h. Alpha Radioactivity

Quarterly sums of total curies of gross alpha-emitting material determined to be released in liquid effluents.

i. Volumes

1. Quarterly sums, in liters, of total measured volume, prior, to dilution, of liquid effluent released.
2. Quarterly sums of total determined volume, in liters, of dilution water used during the period of the report.

j. Solid Waste

The following information should be reported for shipments of solid waste and irradiated fuel transported from the site during the report period:

1. The semiannual total quantity in cubic meters and the semiannual total radioactivity in curies for the categories or types of waste.
 - a) Spent resins, filter sludges, evaporator bottoms;
 - b) Dry compressible waste, contaminated equipment, etc.;
 - c) Irradiated components, control rods, etc.;
 - d) Other (furnish description).
2. An estimate of the major nuclide composition in the categories of waste above.
3. The disposition of solid waste shipments. (Identify the number of shipments, the mode of transport, and the destination.)
4. The disposition of irradiated fuel shipments. (Identify the number of shipments, the mode of transport, and the destination.)

k. Radiological Impact on Man

Potential doses to individuals and populations should be calculated using measured effluent and meteorological data. A semiannual summary report should be submitted containing the following information:

1. Total body and significant organ doses to individuals in unrestricted areas from receiving-water-related exposure pathways.
2. Total body and skin doses to individuals exposed at the point of maximum offsite ground-level concentrations of radioactive materials in gaseous effluents.
3. Organ doses to individuals in unrestricted areas from radioactive iodine and radioactive material in particulate form from all pathways of exposure.

4. Total body doses to individuals and populations in unrestricted areas from direct radiation from the facility.
5. Total body doses to the population and average doses to individuals in the population from all receiving-water-related pathways.
6. Total body doses to the population and average doses to individuals in the population gaseous effluents to a distance of 50 miles from the site. If a significantly large population area is located just beyond 50 miles from the site, the dose to this population group should be considered.

1. Meteorological Data

The report should include the cumulative joint frequency distribution of wind speed, wind direction, and atmospheric stability for the stability for the quarterly periods. Similar data should be reported separately for the meteorological conditions during batch releases.

5.4.2 NONROUTINE REPORTS

5.4.2.1 Abnormal Environmental Occurrence (AEO)

In the event of an AEO as defined in Section 1.0 a report shall be submitted under one of the report schedules described below.

1. Prompt Report. Those events requiring prompt reports shall be reported within 24 hours by telephone, telegraph, or facsimile transmission to the Director of the NRC Regional Office and within 10 days by a written report to the Director of the Regional NRC Office (with a copy to the Director, Office of Nuclear Reactor Regulation).
2. 30-Day Report. Those events not requiring prompt reports shall be reported within 30 days by a written report to the Director of the NRC Regional Office (with a copy to the Director, Office of Nuclear Reactor Regulation).

The reporting schedule for reports concerning limiting conditions for operation and report levels are specified in the technical specifications. Reports concerning unusual or important AEO's shall be reported on the prompt schedule. The significance of an unusual or apparently important event with regard to environmental impact may not be obvious or fully appreciated at the time of occurrence. In such cases, the NRC shall be informed promptly of changes in the licensee's assessment of the significance of the event and a corrected report shall be submitted as expeditiously as possible.

The written report, and to the extent possible the preliminary telephone and telegraph report, shall: (a) describe, analyze and evaluate the AEO, including extent and magnitude of the impact, (b) describe the cause of the AEO, and (c) indicate the corrective action (including any significant changes made in procedures) taken to preclude repetition of the AEO and to prevent similar AEO's involving similar components or systems.

5.4.2.2 Changes

When a change to the Plant design, to the Plant operation, or to the procedures described in Section 5.3 is planned which involves an environmental matter or question not previously reviewed and evaluated by the NRC, a report on the change shall be made to the Office of Nuclear Reactor Regulation prior to implementation. The report shall include a description and evaluation of the change.

Changes or additions to permits and certificates required by Federal, state, local and regional authorities for the protection of the environment shall be reported. When the required changes are submitted to the

concerned agency for approval, they shall also be submitted to the Director, Office of Nuclear Reactor Regulation, USNRC, for information. The submittal shall include an evaluation of the environmental impact of the change.

Request for changes in environmental technical specifications shall be submitted to the Director, Office of Nuclear Reactor Regulation, USNRC, for prior review and authorization. The request shall include an evaluation of the impact of the change, including a supporting benefit-cost analysis.

5.4.2.3 Radioactive Discharges

The reporting requirements for radioactive discharges are specified in Section 2.1 of the Environmental Technical Specifications.

5.4.2.4 Radiological Environmental Monitoring

Reporting involving radiological environmental monitoring is discussed in Section 3.1 of the Environmental Technical Specifications.

5.5 RECORDS RETENTION

5.5.1 RECORDS RETAINED FOR LIFE OF PLANT

Records and logs relative to the following areas will be retained for the life of the Plant:

- a. Records and drawing changes reflecting Plant design modifications made to systems and equipment as described in Section 5.4.2.2.
- b. Records of radiological environmental surveillance data.
- c. Records to demonstrate compliance with the limiting conditions for operation in Section 2.

5.5.2 RECORDS RETAINED FOR FIVE YEARS

All other records and logs relating to the Environmental Technical Specifications Part 1 shall be retained for five years.

APPENDIX B
ENVIRONMENTAL TECHNICAL SPECIFICATIONS
FOR
DONALD C. COOK NUCLEAR PLANT
UNITS 1 AND 2
BERRIEN COUNTY, MICHIGAN

PART II - NONRADIOLOGICAL
ENVIRONMENTAL PROTECTION PLAN

DONALD C. COOK NUCLEAR PLANT

UNITS 1 and 2

ENVIRONMENTAL PROTECTION PLAN

(NON-RADIOLOGICAL)

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1.0 Objectives of the Environmental Protection Plan

The Environmental Protection Plan (EPP) is to provide for protection of environmental values during construction and operation of the nuclear facility. The principal objectives of the EPP are as follows:

- (1) Verify that the station ~~is~~ operated in an environmentally acceptable manner, as established by the FES* and other NRC environmental impact assessments.
- (2) Coordinate NRC requirements and maintain consistency with other Federal, State and local requirements for environmental protection.
- (3) Keep NRC informed of the environmental effects of facility construction and operation, and of actions taken to control those effects.

Environmental concerns identified in the FES which relate to water quality matters are regulated by way of the licensee's NPDES permit.

* Final Environmental Statement

2.0 Environmental Protection Issues

In the FES-OL dated August 1973, the staff considered the environmental impacts associated with the operation of the Donald C. Cook Nuclear Plant. Certain environmental issues were identified which required study or license conditions to resolve and to assure adequate protection of the environment. The Appendix B Environmental Technical Specifications accompanying the license included monitoring programs and other requirements to permit resolution of the issues. Prior to issuance of this EPP, the requirements remaining in the ETS were:

2.1 Aquatic Issues

1. Protection of the aquatic environment by limiting the thermal stress to which aquatic organisms will be subjected during transit through the plant.
2. The avoidance of possible adverse effects on lake biota due to deicing operations.
3. Protection of aquatic life by limiting the release of chlorine from plant operation.
4. Monitoring of the movement of chemicals introduced into the groundwater from the onsite absorption field.

5. Limit the plant discharge of corrosion and deposit inhibitors used in the plant systems.
6. The need for aquatic monitoring programs to confirm that effects on phytoplankton, periphyton, zooplankton, benthic invertebrates, and fish due to plant operation are no greater than predicted.
7. The need for special studies to document levels of intake entrainment and impingement in relation to the densities of important species in the plant vicinity.
8. The need for visual underwater observations in the intake and discharge area to observe the physical and ecological conditions.

These Aquatic Issues are addressed by the effluent limitations, monitoring requirements and the Section 316(b) demonstration requirement contained in the effective NPDES permit issued by the State of Michigan, Department of Natural Resources. The NRC will rely on this agency for regulation of matters involving water quality and aquatic biota.

2.2 Terrestrial Issues

The remaining terrestrial issue is the need for controlled use of herbicides if such are used for maintenance of transmission rights-of-way. NRC requirements with regard to this terrestrial issue are specified in Subsection 4.2.

3.0 Consistency Requirements

3.1 Plant Design and Operation

The licensee may make changes in station design or operation or perform tests or experiments affecting the environment provided such changes, tests or experiments do not involve an unreviewed environmental question, and do not involve a change in the Environmental Protection Plan.* Changes in plant design or operation or performance of tests or experiments which do not affect the environment are not subject to the requirements of this EPP. Activities governed by Section 3.3 are not subject to the requirements of this section.

Before engaging in unauthorized construction or operational activities which may affect the environment, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity involves an unreviewed environmental question, the licensee shall provide a written evaluation of such activities and obtain prior approval from the NRC. When such activity involves a change in the Environmental Protection Plan, such activity and change to the Environmental Protection Plan may be implemented only in accordance with an appropriate license amendment as set forth in Section 5.3.

A proposed change, test or experiment shall be deemed to involve an unreviewed environmental question if it concerns (1) a matter which may result in a significant increase in any adverse environmental impact previously evaluated

*This provision does not relieve the licensee of the requirements of 10 CFR 50.59.

in the final environmental statement (FES) as modified by staff's testimony to the Atomic Safety and Licensing Board, supplements to the FES, environmental impact appraisals, or in any decisions of the Atomic Safety and Licensing Board; or (2) a significant change in effluents or power level [in accordance with 10 CFR Part 51.5(b)(2)] or (3) a matter not previously reviewed and evaluated in the documents specified in (1) of this Subsection, which may have a significant adverse environmental impact.

The licensee shall maintain records of changes in facility design or operation and of tests and experiments carried out pursuant to this Subsection. These records shall include a written evaluation which provide bases for the determination that the change, test, or experiment does not involve an unreviewed environmental question nor constitute a decrease in the effectiveness of this EPP to meet the objectives specified in Section 1.0. The licensee shall include as part of his Annual Environmental Operating Report (per Subsection 5.4.1) brief descriptions, analyses, interpretations, and evaluations of such changes, tests and experiments.

3.2 Reporting Related to the NPDES Permits and State Certifications

Violations of the NPDES Permit or the State certification (pursuant to Section 401 of the Clean Water Act) shall be reported to the NRC by submittal of copies of the reports required by the NPDES Permit or certification.

Changes and additions to the NPDES Permit or the State certification shall be reported to the NRC within 30 days following the date the change is approved. If a permit or certification, in part or in its entirety, is appealed and stayed, the NRC shall be notified within 30 days following the date the stay is granted.

The NRC shall be notified of changes to the effective NPDES Permit proposed by the licensee by providing ~~NRC~~ with a copy of the proposed change at the same time it is submitted to the permitting agency. The licensee shall provide the NRC a copy of the application for renewal of the NPDES permit at the same time the application is submitted to the permitting agency.

3.3 Changes Required for Compliance with Other Environmental Regulations

Changes in plant design or operation and performance of tests or experiments which are required to achieve compliance with other Federal, State, or local environmental regulations are not subject to the requirements of Section 3.1.

4.0 Environmental Conditions

4.1 Unusual or Important Environmental Events

Any occurrence of an unusual or important event that indicates or could result in significant environmental impact related to plant operation shall be recorded and promptly reported to the NRC within 24 hours by telephone, telegraph, or facsimile transmissions followed by a written report per Subsection 5.4.2.

No routine monitoring programs are required to implement this condition.

4.2 Environmental Monitoring

4.2.1 Herbicide Application

The use of herbicides within rights-of-way within the Plant site shall conform to the approved use of selected herbicides as registered by the Environmental Protection Agency and approved by State authorities and applied as directed by said authorities.

5.0 Administrative Procedures

5.1 Review and Audit

The licensee shall provide for review and audit of compliance with the Environmental Protection Plan. The audits shall be conducted independently of the individual or groups responsible for performing the specific activity. A description of the organization structure utilized to achieve the independent review and audit function and results of the audit activities shall be maintained and made available for inspection.

5.2 Records Retention

Records and logs relative to the environmental aspects of plant operation shall be made and retained in a manner convenient for review and inspection. These records and logs shall be made available to NRC on request.

Records of modifications to plant structures, systems and components determined to potentially affect the continued protection of the environment shall be retained for the life of the plant. All other records, data and logs relating to this EPP shall be retained for five years or, where applicable, in accordance with the requirements of other agencies.

5.3 Changes in Environmental Protection Plan

Request for change in the Environmental Protection Plan shall include an assessment of the environmental impact of the proposed change and a supporting justification. Implementation of such changes in the EPP shall not commence

prior to NRC approval of the proposed changes in the form of a license amendment incorporating the appropriate revision to the Environmental Protection Plan.

5.4 Plant Reporting Requirements

5.4.1 Routine Reports

An Annual Environmental Operating Report describing implementation of this EPP for the previous year shall be submitted to the NRC prior to May 1 of each year. The initial report shall be submitted prior to May 1 of the year following issuance of the EPP.

The report shall include summaries and analyses of the results of the environmental protection activities required by Subsection 4.2 of this Environmental Protection Plan for the report period, including a comparison with preoperational studies, operational controls (as appropriate), and previous nonradiological environmental monitoring reports, and an assessment of the observed impacts of the plant operation on the environment. If harmful effects or evidence of trends towards irreversible damage to the environment are observed, the licensee shall provide a detailed analysis of the data and a proposed course of action to alleviate the problem.

The Annual Environmental Operating Report shall also include:

- (a) A list of EPP noncompliances and the corrective actions taken to remedy them.

(b) A list of all changes in station design or operation, tests, and experiments made in accordance with Subsection 3.1 which involved a potentially significant unreviewed environmental issue.

(c) A list of nonroutine reports submitted in accordance with Subsection 5.4.2.

In the event that some results are not available by the report due date, the report shall be submitted ~~noting~~ and explaining the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

5.4.2 Nonroutine Reports

A written report shall be submitted to the NRC within 30 days of occurrence of nonroutine event. The report shall (a) describe, analyze, and evaluate the event, including extent and magnitude of the impact and plant operating characteristics, (b) describe the probable cause of the event, (c) indicate the action taken to correct the reported event, (d) indicate the corrective action taken to preclude repetition of the event and to prevent similar occurrences involving similar components or systems, and (e) indicate the agencies notified and their preliminary responses.

Events reportable under this subsection which also require reports to other Federal, State or local agencies shall be reported in accordance with those reporting requirements in lieu of the requirements of this subsection. The NRC shall be provided a copy of such report at the same time it is submitted to the other agency.

