

RESPONSE TO FOIA REQUEST FOIA-81-93
SUB-PART A: MONITORING OR SAMPLING OF
RADIOACTIVE EFFLUENTS FROM NUCLEAR POWER PLANTS IN ILLINOIS

Item A(1) Monitoring or sampling of radioactive effluents from nuclear power plants in Illinois.

Response: Each plant is required to submit a Semi-Annual Effluent Release Report to the NRC Regional Office. Requestor is referred to the public document rooms for the subject reports for each operating plant located in Illinois. See also general information summary below.

Item A(2) Data obtained from any such monitoring or sampling.

Response: See Semi-Annual Effluent Release Reports.

Item A(3) The location, time, and manner of any such monitoring or sampling.

Response: See Semi-Annual Effluent Release Reports and generic information in Standard Review Plan 11.5 and Regulatory Guide 1.21 (located in Public Document Rooms).

Item A(4) The basis for the agency's determination that such data should be collected in the manner and at the time and place so collected.

Response: See Regulatory Guide 1.21 and the specific references to Title 10 of the Code of Federal Regulations (located in Public Document Rooms) given in the general information summary below.

Item A(5) Evaluation or analysis of such data.

Response: The data provided by each licensee are reviewed by staff of the Regional Office of Inspection and Enforcement and by the staff of the Office of Nuclear Reactor Regulation (Bethesda, MD). The data are compared to typical plant values based on extensive operating history. Unless the data exhibits substantial deviation from the norm, no specific evaluation or analysis of the data is performed. NUREG reports are published by the NRC which summarize data from all plants contained in the semi-annual release reports. The most recent report, NUREG-0521, summarizes data for 1977.

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GENERAL INFORMATION SUMMARY ON
REGULATORY REQUIREMENT FOR
MONITORING OF RADIOACTIVE PLANT EFFLUENTS

Each nuclear power plant is required to monitor or sample releases of radioactivity to the environment which may be contained in plant liquid and gaseous effluent streams. The basic requirements are summarized below.

10 CFR 20.106(b)(2) requires licensees to demonstrate that it is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to concentrations of radioactive material in air or water exceeding the limits in Appendix B, Table II of 10 CFR 20.

10 CFR 20.106(d)(e) provides that "...the Commission may limit quantities of radioactive materials in air or water during a specified period of time if it appears that the daily intake of radioactive material from air, water or food by a suitable sample of an exposed population group, averaged over a period of one year, would otherwise exceed the daily intake resulting from continuous exposure to air or water containing one-third the concentration of radioactive materials specified in Appendix "B", Table II of 10 CFR Part 20.

10 CFR 20.201(b) requires each licensee to make or cause to be made such surveys as may be necessary for him to comply with the regulations of 10 CFR Part 20. A "survey" means evaluation of the radiation hazards incident to the ...release, (or) disposal... of radioactive materials...including...measurements of levels of radiation or concentrations of radioactive material present.

10 CFR 50.34a requires, for power plants licensed under applications filed on or after January 2, 1971, that licensees identify design objectives for keeping levels of radioactive material in effluents to unrestricted areas as low as reasonably achievable. Appendix I of 10 CFR Part 50 provides numerical guidance on design objectives to meet "ALARA" requirements.

10 CFR 50.36 requires that each plant shall operate in accordance with certain Technical Specifications, which include, among other factors, limiting conditions for operation relative to limits on radioactive materials in liquid and gaseous effluents, specifications for the monitoring and sampling of plant effluents, and periodic reporting requirements for plant radioactive effluents. In particular, Section 50.36a(a)(2) requires that each licensee submit a report to the appropriate NRC Regional Office within 60 days after January 1 and July 1 of each year specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and gaseous effluents during the previous 6 months of operation, and such other information as may be required by the Commission to estimate maximum potential annual radiation doses to the public resulting from such effluent releases (Note: For specifics on monitoring or sampling of radioactive effluents from specific plants, see the Semi-Annual Effluent Release Reports for each plant).

Appendix A to 10 CFR Part 50 -- The General Design Criteria. Appendix A to 10 CFR Part 50 contains a number of very important criteria which all plants must meet. The criteria pertaining to release of radioactive material to the

environment and to the monitoring of such releases are:

General Design Criterion 60 - Control of releases of radioactive materials to the environment.

General Design Criterion 61 - Fuel storage and handling and radioactivity control.

General Design Criterion 63 - Monitoring fuel and waste storage.

General Design Criterion 64 - Monitoring radioactivity releases.

Regulatory Guide 1.21: Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants

Regulatory Guide 1.21 provides guidance on programs acceptable to the NRC staff for measuring, evaluating and reporting releases of radioactive materials in liquid and gaseous effluents. Other than the regulations of Title 10 of the Code of Federal Regulations previously cited -- and which Regulatory Guide 1.21 implements -- Regulatory Guide 1.21 is the NRC staff's principal guide on what constitutes acceptable monitoring of plant radioactive releases.



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

FEB 20 1981

MEMORANDUM FOR: Leo Higginbotham, Chief
Radiological Safety Branch, IE:HQ

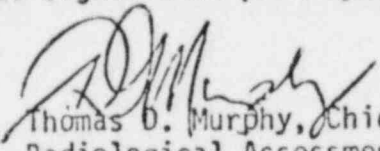
FROM: Thomas D. Murphy, Chief
Radiological Assessment Branch, DSI

SUBJECT: YOUR MEMO OF JANUARY 22, 1981 - REQUEST FOR
ACTION - GROUND WATER MONITORING

The questions raised in your memo of January 22, 1981 and the accompanying memo of A. B. Davis of Region III dated January 7, 1981 are already covered by current standard Radiological Effluent Technical Specifications (RETS) and the Radiological Assessment Branch Technical Position (BTP). There are now no "Standard Environmental Technical Specifications." All radiological environmental technical specifications are now included in the RETS.

Copies of the appropriate sections of the RETS and the BTP for waterborne environmental monitoring are attached. Note that these current regulations do require monitoring of the water sources referred to in the Davis letter i.e. where - "wells are as important as private and public water supplies" and "where all public and private water sources are ground water." This is exactly the type of ground water monitoring Duane Arnold has incorporated in their Technical Specifications(see attachment).

However, we do not require ground water monitoring when the wells are up-gradient from the facility. This position is consistent with our overall approach of monitoring real and potential significant pathways to human beings.


Thomas D. Murphy, Chief
Radiological Assessment Branch
Division of Systems Integration

Attachment:
As stated

cc: D. Ross
W. Kreger
F. Congel
~~W. Meinke~~

Dupl of 8103250205 - Add P - Change FOR

TABLE 3.12-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

PRR-STS-1

3/4 12-4

<u>Exposure Pathway and/or Sample</u>	<u>Number of Samples and Sample Locations**</u>	<u>Sampling and Collection Frequency</u>	<u>Type and Frequency of Analysis</u>
3. WATERBORNE			
a. Surface	(Locations 46 and 47)	Composite* sample collected over a period of ≤ 31 days.	Gamma isotopic analysis of each composite sample. Tritium analysis of composite sample at least once per 92 days.
b. Ground	(Locations 46 and 49)	At least once per 92 days.	Gamma isotopic and tritium analyses of each sample.
c. Drinking	(Locations 50-52)	Composite* sample collected over a period of ≤ 14 days, if I-131 analysis is performed; or Composite* sample collected over a period of ≤ 31 days.	I-131 analysis of each composite sample; and Gross beta and gamma isotopic analysis of each composite sample. Tritium analysis of composite sample at least once per 92 days.
d. Sediment from Shoreline	(Locations 53)	At least once per 184 days.	Gamma isotopic analysis of each sample.

* Composite samples shall be collected by collecting an aliquot at intervals not exceeding 2 hours.

** Sample locations are shown on the figure in the ODCM.

TABLE 1 (Continued)

Exposure Pathway and/or Sample	Number of Samples ^a and Locations	Sampling and Collection Frequency ^a	Type and Frequency of Analysis
WATERBORNE			
Surface ^g	1 sample upstream 1 sample downstream	Composite sample over one-month period ^{h,i}	Gamma isotopic analysis monthly. Composite for tritium analyses quarterly
Ground	Samples from 1 or 2 sources only if likely to be affected ^j	Quarterly	Gamma isotopic and tritium analysis quarterly
Drinking	1 sample of each of 1 to 3 of the nearest water supplies could be affected by its discharge 1 sample from a control location	Composite sample over two-week period ⁱ if I-131 analysis is performed, monthly composite otherwise	I-131 analysis on each composite when the dose calculated for the consumption of the water is greater than 1 mrem per year. ^k Composite for Gross β and gamma isotopic analyses monthly. Composite for tritium analysis quarterly
Sediment from Shoreline	1 sample from downstream area with existing or potential recreational value	Semiannually	Gamma isotopic analyses semiannually

^gThe "upstream sample" should be taken at a distance beyond significant influence of the discharge. The "downstream" sample should be taken in an area beyond but near the mixing zone. "Upstream" samples in an estuary must be taken far enough upstream to be beyond the plant influence.

^hGenerally, salt water is not sampled except when the receiving water is utilized for recreational activities.

ⁱComposite samples should be collected with equipment (or equivalent) which is capable of collecting an aliquot at time intervals which are very short (e.g., hourly) relative to the compositing period (e.g., monthly).

^jGroundwater samples should be taken when this source is tapped for drinking or irrigation purposes in areas where the hydraulic gradient or recharge properties are suitable for contamination.

TABLE 4.3-1 (Continued)

ENVIRONMENTAL RADIOACTIVITY MONITORING PROGRAM FOR THE DUANE ARNOLD ENERGY CENTER

SAMPLING DESCRIPTION		SAMPLE FREQUENCY	ANALYSIS	REMARKS
Type of Sample	Sample Point	Sampling Point Description	Operational Program	
Surface Water (Cont'd.)	49-52			^{89}Sr , ^{90}Sr Performed if gross beta activity exceeds 10 pCi/l and on a quarterly basis.
Ground Water	53	Treated Municipal Water	Monthly	Gross beta
	54	Inlet to Municipal Water Treatment Sys.		Gamma isotopic analysis
	57-60	4 off-site wells (in vicinity of site)		Gamma isotopic analysis will be performed on each sample in which the gross beta activity exceeds 10 pCi/l. Daily grab sample of untreated municipal water is composited for monthly analysis. Two hour grab sample of treated municipal water is composited for monthly analysis.
Ground Water (Cont'd.)				Tritium Monthly samples will be composited quarterly for tritium.
				^{89}Sr , ^{90}Sr Performed if gross beta activity exceeds 10 pCi/l and on a quarterly basis.

Amendment No. 22
 JUL 26 1977