U. S. NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

REGION IV

IE Inspection Report No. 50-313/76-13 — Docket No. 50-313

Licensee: Arkansas Power and Light Company (AP&L) — License No. DPR-51
Sixth and Pine Streets
Pine Bluff, Arkansas 71601 — Category C

Facility: Arkansas Nuclear One (ANO-1)

Location: Russellville, Arkansas

Type of License: PWR, Power Reactor

Type of Inspection: Routine, Unannounced, Radiation Protection, and Analytical Measurements

Dates of Inspection: October 6-8, 1976

Dates of Previous Radiological Inspection: August 17-19, 1976

Inspector: Blaine Murray — 10/26/76
Blaine Murray, Radiation Specialist — Date

Accompanying Personnel: None

Reviewed by: R Brown — 10/27/76
Glen D. Brown, Chief, Fuel Facility and Material Safety — Date

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SUMMARY OF FINDINGS

I. Enforcement Action

A. Items of Noncompliance Identified by The Inspector

None.

B. Items of Noncompliance Identified by The Licensee

None.

II. Licensee Action on Previously Identified Enforcement Matters

Two items of noncompliance were noted in IE Inspection Report No. 50-313/76-10. The licensee's corrective action was reviewed and found adequate to correct the previously identified enforcement items.

These items are considered closed.

III. New Unresolved Items

None.

IV. Status of Previously Identified Unresolved Items

76/08-1, Radiochemistry QC Program

The proposed radiochemistry QC procedure has not been approved.

This item remains open. (See DETAILS, paragraph C.2.a.)

76/04-1, Stack Monitor

The status of this item was not reviewed during this inspection.

This item remains open. (See DETAILS, paragraph C.2.b.)

74/14-03, Radiation Levels in Reactor Containment

There are certain areas inside containment where radiation levels exceed design basis.

This item remains open. (See DETAILS, paragraph C.2.e.)

75/05-2, Air Sampler Flow Rates

Air sampler flow rates have been measured.

This item is considered closed. (See DETAILS, paragraph C.2.c.)

76/10-1, Whole Body Counting Results

Whole body data has been reduced into units of body burdens.

This item is considered closed. (See DETAILS, paragraph C.2.g.)

76/10-2, Operation Checks of Constant Air Monitors

A procedure has not been written that establishes an operation check frequency for Constant Air Monitors.

This item remains open. (See DETAILS, paragraph C.2.h.)

76/10-3, Health Physics Staff Training

A formal training program has not been developed for new Health Physics personnel.

This item remains open. (See DETAILS, paragraph C.2.i.)

76/10-4, Plant Housekeeping

The licensee has improved housekeeping conditions.
This item is considered closed. (See DETAILS, paragraph C.2.j.)

76/10-5, Radiological Retraining

The status of this item was not reviewed during this inspection.

This item remins open. (See DETAILS, paragraph C.2.k.)

75/09-3, Whole Body Counter Calibration Procedures

Calibration procedures have not been approved for the whole body counting system.

This item remains open. (See DETAILS, paragraph C.2.d.)

75/05-5, Laboratory Counting Equipment Calibration Procedures

Calibration procedures have not been approved for laboratory counting equipment used to analyze Health Physics air and contamination surveys.

This item remains open. (See DETAILS, paragraph C.2.f.)

V. Unusual Occurrences

None.

VI. Other Significant Findings

None.

VII. Management Interview

At the conclusion of the inspection, the inspection findings were discussed with the following AP&L personnel:

Mr. J. W. Anderson, Plant Superintendent
Mr. C. H. Halbert, Technical Support Engineer
Mr. R. G. Carrol, Health Physics Supervisor
Mr. M. M. Nichols, Health Physics Foreman
Mr. L. Alexander, QC Engineer

The items discussed and the licensee's position with respect to these items as applicable, follow:

A. Scope of Inspection

The inspector outlined the areas covered during the inspection.

B. Items of Noncompliance

The inspector stated that no items of noncompliance were identified.

C. Status of Previously Reported Unresolved Items

The licensee provided a status report on open unresolved items. (See DETAILS, paragraph C.2.)

D. Plant Housekeeping

The inspector noted that general plant housekeeping conditions had improved since the last inspection. (See DETAILS, paragraph C.2.)

E. Plant Safety Committee Meeting (PSC)

Several Health Physics matters reported to the PSC were discussed. (See DETAILS, paragraph G.)

DETAILS

A. Persons Contacted

AP&L

Mr. J. W. Anderson, Plant Superintendent
Mr. C. H. Halbert, Technical Support Engineer
Mr. R. G. Carrol, Health Physics Supervisor
Mr. M. M. Nichols, Health Physics Foreman
Mr. S. J. McWilliams, Planning and Scheduling Coordinator
Mr. J. L. Bates, Radiochemistry Supervisor
Mr. L. Alexander, QC Engineer

B. Scope of Inspection

The purpose of this inspection was to complete the Radiation Protection inspection that began on August 17, 1976.1/

C. Licensee Action on Previously Reported Items

1. Items of Noncompliance

Corrective action for the two items of noncompliance noted in IE Inspection Report No. 50-313/76-10 was reviewed. The licensee's corrective action was reviewed and found adequate to correct the items of noncompliance.

These items are considered closed.

2. Unresolved Items

a. 76/08-1, Radiochemistry QC Program

This item was reported in IE Inspection Report No. 50-313/76-08 and involved the completion of written procedures for the QC program. A draft procedure has been completed.

This item remain open pending approval of the draft procedure.

1/ IE Inspection Report No. 50-313/76-10

b. 76/04-1, Stack Monitor

This item was reported in IE Inspection Report No. 50-313/76-04 and involved designating which stack monitor system is to be used during an emergency situation. The status of this item was not examined during this inspection. This item remains open.

c. 75/05-2, Air Sampler Flow Rates

This item was reported in IE Inspection Report No. 50-313/75-05 and involved measuring the flow rates of various air samplers. The licensee has established flow rates for the air samplers.

This item is considered closed.

d. 75/05-3, Calibration Procedures for Whole Body Counter

This item was reported in IE Inspection Report No. 50-313/75-05 and involved the development of a written procedure for calibration of the whole body counting system. A draft procedure has been written.

This item remains open pending approval of the procedure.

e. 74/14-3, Radiation Levels Inside Reactor Containment

This item was reported in RO Inspection Report No. 50-313/74-14 and involved radiation levels in containment that exceed design basis. Corrective action for this item is scheduled to be completed during the first refueling outage.

f. 75/05-5, Calibration Procedures for the Laboratory Counting Equipment

This item was reported in IE Inspection Report No. 50-313/75-05 and involved the development of a written procedure for calibration of laboratory counting equipment used to analyze Health Physics air and contamination surveys. A draft procedure has been written.

This item remains open pending approval of the procedure.

g. 76/10-1, Whole Body Counting Results

This item was discussed in IE Inspection Report No. 50-313/76-10 and involved recording whole body counting results in unit of body burdens. Whole body raw data have been reduced into units of body burdens.

This item is considered closed.

h. 76/10-2, Operation Checks of Constant Air Monitors

This item was discussed in IE Inspection Report No. 50-313/76-10 and involved routine operational checks for constant air monitors. A licensee representative stated that Health Physics procedures will be modified to include routine check of constant air monitors.

This item remains open pending approval of the proposed procedure change.

i. 76/10-3, Health Physics Staff Training

This item was discussed in IE Inspection Report No. 50-313/76-10 and involved the development of a training program for new Health Physicists. A licensee representative stated that a draft program has been developed.

This item remains open pending approval of the proposed training program.

j. 76/10-4, Plant Housekeeping

This item was discussed in IE Inspection Report No. 50-313/76-10 and involved poor housekeeping conditions. It was noted that general plant housekeeping conditions have improved. A licensee representative stated that it is their intention to maintain good housekeeping conditions.

This item is considered closed.

k. 76/10-5, Radiological Retraining

This item was discussed in IE Inspection Report No. 50-313/76-10 and involved establishing a frequency for radiological retraining. This item was not reviewed during this inspection.

This item remains open.

D. Radioactive Materials Control

The licensee's radioactive materials program was reviewed to determine compliance with:

10 CFR 20.205
10 CFR 20.203.e
10 CFR 20.203.f
Technical Specification 3.12
Technical Specification 4.14

The following licensee documents and procedures were examined:

Procedure H.P. 1602.29, "Radioactive Material Accountability"
Procedure H.P. 1602.34, "Leak Test of Sealed Sources"
Unsealed Source Log
Sealed Source Log
Radioactive Materials Receipt Log

No discrepancies were noted.

E. Respiratory Program

The licensee respiratory program was reviewed to determine compliance with Technical Specification 6.8.

The respiratory program is outlined in procedure H.P. 1602.03 titled: "ANO Respiratory Protection Program."

1. Inventory

The following is an approximate respirator inventory:

Type	Quantity
Full Face Canister	130
Airline Mask	80
SCBA	20

2. Training

Respirator training is provided to those individuals whose normal job duties require frequent access into controlled areas. The Training Coordinator is responsible for identifying and scheduling those person that are to receive training. The Health Physics staff conducts the training courses. Each training course consists of a two hour classroom lecture plus another two hour fitting and demostration period.

Training courses are given about once each quarter. A licensee representative stated that all designated personnel have received training. It was noted that material from the following documents were included in the training program:

ANSI Z88.2
WASH 1287
Technical Specification 6.8

No discrepancies were noted.

F. FWP/SWP Program

The licensee's Radiation Work Permit (RWP) and Special Work Permit (SWP) program is outlined in H. P. Procedure 1602.04 titled: "SWP/RWP Procedure." A RWP is usually written to cover routine maintenance activities in areas having radiation levels of less than one Rem/hr. A RWP can cover a period up to one year. Special Work Permits are issued for a specific job and must be renewed if the job lasts longer than two weeks.

Selected RWPs and SWPs issued between June 1, 1975, and October 6, 1976, were examined.

No discrepancies were noted.

G. Plant Safety Committee Meetings (PSC)

Plant Safety Committee meetings minutes were reviewed for the period between January 1, 1976, and September 13, 1976. Particular attention was given to those meetings involving Health Physics activities.

It was noted that on August 6, 1976, the Health Physics supervisor submitted a memo to the PSC for review and comments. The memo contained several examples of unsatisfactory health physics conduct by certain plant personnel. It appeared that the PSC's September 9, 1976, reply did not clearly outline proper corrective action.

The initial memo and the PSC's response were discussed during the management interview.

H. Advanced Planning and Preparation

Health Physics involvement during the planning stages of proposed maintenance work was reviewed with the Planning and Scheduling Coordinator. The position of Planning and Scheduling Coordinator was only recently established. According to the Planning and Scheduling Coordinator, copies of planned maintenance activities will be routed through the Health Physics Department in order to allow an early radiological evaluation.

I. Reportable Occurrence Reports

The following 1976 Reportable Occurrence reports having Health Physics significance were examined:

1. 50-313/76-6, "Fuel Handling Area Ventilation System," dated May 5, 1976.

   The above report involved a wording change for Technical Specification 3.15.

2. 50-313/76-2, "Control Room Ventilation System," dated May 6, 1976.

   The above report involved the failure of the ventilation system to close in three seconds as required in FSAR IV, page 9.49.

   Corrective action completed.

3. 50-313/76-11, "Overflow of Sodium Thiosulfate Tank" dated June 12, 1976.

   The above report involved a 9500 gallon overflow containing 262 mCi.

   Corrective action completed.

4. 50-313/76-9, "Control Room Emergency Ventilation System" dated July 22, 1976.

   The above item involved a surveillance test that did not meet the requirements of Technical Specification 4.10.

   Corrective action completed.

5. 50-313/76-1, "Quarterly Liquid Release of More Than 2.5 curies," dated August 14, 1976.

   The above report was made as required by Technical Specification 2.4.1.2.

J. Analytical Measurements

Verification measurements were performed on the following samples:

1. Liquid waste
2. Gaseous waste
3. Stack particulate filter
4. Stack charcoal filler

The verification tests consist of comparing measurements made by the licensee and NRC's reference laboratory, Idaho Health Services Laboratory (IHSL). IHSL's measurements are referenced to the National Bureau of Standards by laboratory intercomparisons. Verification comparisons are only made for those nuclides identified by IHSL as being present in concentrations greater than 10% of the respactive MPC's for liquid and gas samples. Stack charcoal and particulate filter comparisons are based on total activity per sample.

Attachment No. 1 contains the criteria used to compare results.

The following table shows the comparisons.

a. Liquid (Monitor Tank T-16, Collected July 23, 1976)

Nuclide	NRC Measurement	ANO-1 Measurement	Decision
Gross Beta	3.33±0.07E-3 uCi/ml	3.07E-3 uCi/ml	Agreement
^{3}H	1.12±0.02E-2 uCi/ml	1.31E-2 uCi/ml	Agreement
^{57}Co	3.4±0.7E-6 uCi/ml	1.10E-6 uCi/ml	Disagreement
^{131}I	5.7±1E-5 uCi/ml	6.52E-5 uCi/ml	Agreement
^{134}Cs	8.2±0.2E-4 uCi/ml	7.69E-4 uCi/ml	Agreement
^{137}Cs	2.69±0.08E-3 uCi/ml	2.46E-3 uCi/ml	Agreement
^{58}Co	2.76±0.08E-4 uCi/ml	2.67E-4 uCi/ml	Agreement
^{54}Mn	5.7±0.2E-5 uCi/ml	5.39E-5 uCi/ml	Agreement
^{110m}Ag	6.7±0.2E-5 uCi/ml	6.57E-5 uCi/ml	Agreement
^{59}Fe	1.9±0.8E-6 uCi/ml	1.39E-6 uCi/ml	Agreement
^{60}Co	3.6±0.1E-5 uCi/ml	3.45E-5 uCi/ml	Agreement

b. Gas (Waste Gas Decay Tank T-18, Collected July 22, 1976)

Nuclide	NRC Measurement	ANO-1 Measurement	Decision
^{133}Xe	2.71±0.08E-1 uCi/cc	3.81E-1 uCi/cc	Agreement
^{133m}Xe	2.23±0.25E-3 uCi/cc	1.77E-3 uCi/cc	Agreement
^{85}Kr	3.5±0.2E-3 uCi/cc	3.21E-3 uCi/cc	Agreement

c. Stack Particulate Filter (Collected July 22, 1976)

Nuclide concentrations identified by IHSL were less than statistical reliability limits. No comparison made.

d. Charcoal Filters (Collected July 22, 1976)

No. 1

Nuclide	NRC Measurement	ANO-1 Measurement	Decision
^{131}I	9.24±0.4E-4 uCi/sample	1.19E-3 uCi/sample	Agreement

No. 2

Nuclide	NRC Measurement	ANO-1 Measurement	Decision
^{137}Cs	3.77±0.7E-5 uCi/sample	(Not identified)	Disagreement

ATTACHMENT NO. 1

Criteria for Comparing Analytical Measurements

The following is the criteria used in comparing the results of capability tests and verification measurements. The criteria are based on an empirical relationship established through prior experience and this program's analytical requirements.

In these criteria, the judgement limits vary in relation to the comparison of the resolution.

$$\text{Resolution} = \frac{\text{NRC Value}}{\text{NRC Uncertainly}}$$

$$\text{Ratio} = \frac{\text{Licensee Value}}{\text{NRC Value}}$$

Comparisons are made by first determining the resolution and then reading across the same line to the corresponding ratio. The following table shows the acceptance values.

RESOLUTION	RATIO		
	Agreement	Possible Agreement A	Possible Agreement B
3	0.4 - 2.5	0.3 - 3.0	No comparison
4 - 7	0.5 - 2.0	0.4 - 2.5	0.3 - 3.0
8 - 15	0.6 - 1.66	0.5 - 2.0	0.4 - 2.5
16 - 50	0.75 - 1.33	0.6 - 1.66	0.5 - 2.0
51 - 200	0.80 - 1.25	0.75 - 1.33	0.6 - 1.66
200	0.85 - 1.18	0.80 - 1.25	0.75 - 1.33

"A" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is greater than 250 Kev.

Tritium analyses of liquid samples.

Iodine on adsorbers.

"B" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is less than 250 Kev.

^{89}Sr and ^{90}Sr Determinations.

Gross Beta where samples are counted on the same date using the same reference nuclide.