

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-315/85037(DRSS); 50-316/85037(DRSS)

Docket Nos. 50-315; 50-316

Licenses No. DPR-58; DPR-74

Licensee: American Electric Power  
Service Corporation  
Indiana and Michigan Power  
Company  
1 Riverside Plaza  
Columbus, OH 43216

Facility Name: Donald C. Cook Nuclear Plant, Units 1 and 2

Inspection At: Donald C. Cook Site, Bridgman, MI

Inspection Conducted: November 18-21, 1985

Inspectors: *R. B. Holtzman*  
R. B. Holtzman  
*M. J. Oestmann*  
M. J. Oestmann

12/6/85  
Date  
12/9/85  
Date

Approved By: *W.D. Schaefer for*  
M. C. Schumacher, Chief  
Radiological Effluents and  
Chemistry Section

12-9-85  
Date

Inspection Summary

Inspection on November 18-21, 1985 (Reports No. 50-315/85037(DRSS);  
50-316/85037(DRSS))

Areas Inspected: Routine, announced inspection of: (1) confirmatory measurements, including sampling, quality control of analytical measurements, and comparison of licensee analyses with those of the Region III Mobile Laboratory and the NRC Reference Laboratory; (2) chemistry and radiochemistry, including laboratory facilities and counting room; (3) radiological environmental monitoring program results; and (4) review of corrective actions taken on previous inspection findings. The Region III Mobile Laboratory was onsite to analyze samples split with the licensee for comparison. The inspection involved 52 inspector-hours onsite by two NRC inspectors.

Results: No violations or deviations were identified during this inspection.

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Q PDR

## DETAILS

### 1. Persons Contacted

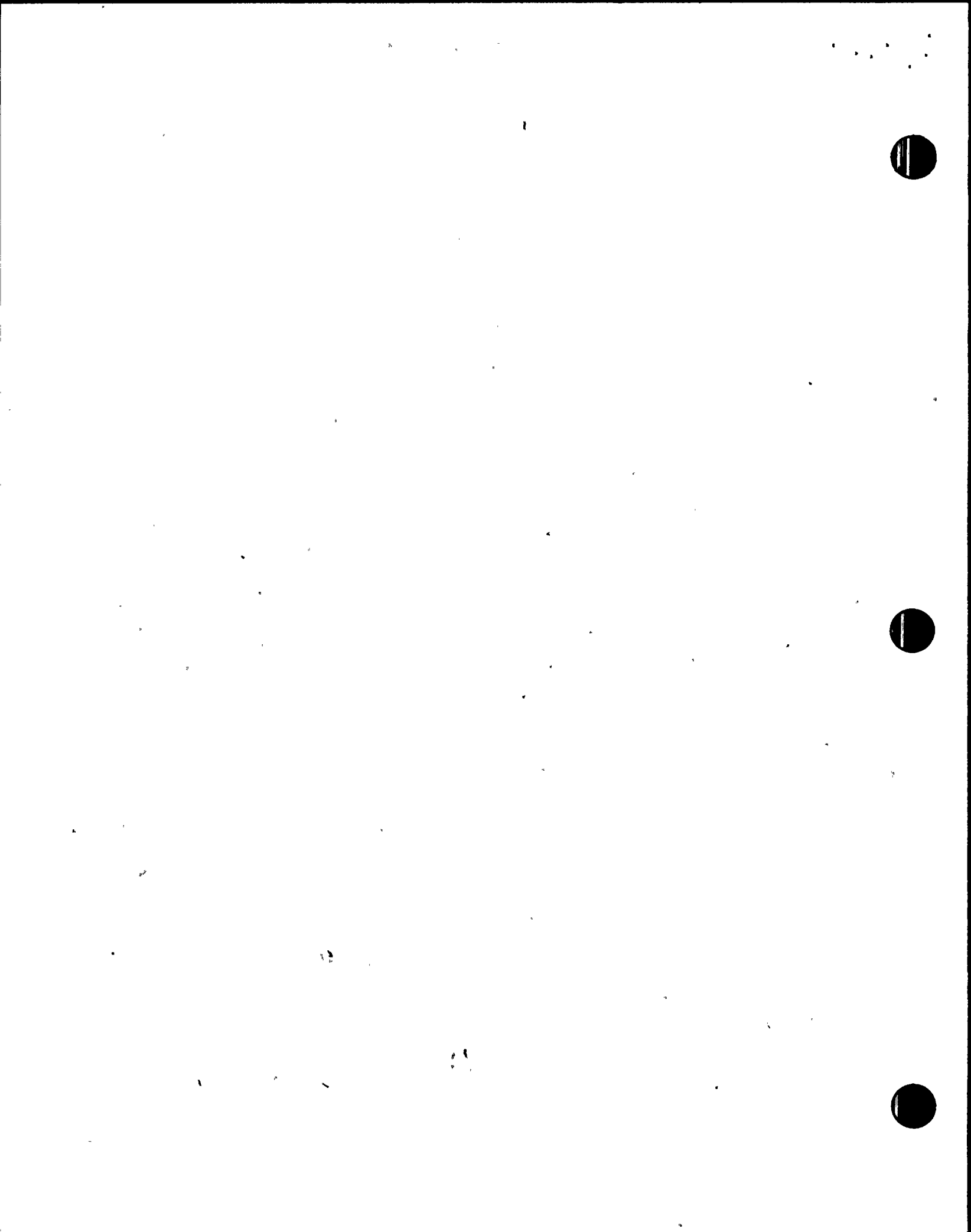
- \*W. G. Smith, Jr., Plant Manager
- \*B. A. Svensson, Assistant Plant Manager, Operations
- \*J. F. Stietzel, Quality Control Superintendent
- G. H. Caple, Engineer, Quality Control
- \*J. Wojcik, Plant Chemistry Superintendent
- \*J. Fryer, Environmental Coordinator
- \*L. G. Holmes, Administrative Compliance Coordinator
- \*N. A. Baker, Department Assistant
- W. E. Hart, Radiation Protection Specialist
- S. W. McLea, Chemistry Laboratory Supervisor
- K. Vogel, Senior Chemistry Technician
- K. Haglund, Chemistry Supervisor
- S. Rose, Chemistry Technician
- \*C. L. Wolfsen, NRC Resident Inspector
- \*R. L. Hague, NRC Resident Inspector (Acting)

The inspectors also contacted several other licensee employees during the course of the inspection, including chemistry and radiation protection personnel.

\*Denotes those present at the exit interview on November 21, 1985.

### 2. Licensee Action on Previous Inspection Findings

- a. (Closed) Open Item (50-315/82021-03; 50-316/82021-03): Recalibrate gas geometry. The licensee did recalibrate the gas Marinelli geometry in early 1985 and obtained agreement of results with Analytix, Incorporated for an unknown gas sample and also had agreement of results with the NRC on a split gas sample for this confirmatory measurements inspection. This item is considered closed.
- b. (Closed) Violation Severity Level V (50-315/84021-01; 50-316/84023-01); The licensee failed to report the 1983 results of land use census, gamma isotopic analyses of monthly composite water samples from three locations (L1, L2, L3) at the plant site and gross beta and gamma isotopic analyses of composite samples from three locations from public water intakes. The licensee provided the 1983 and the 1984 data for the land use census, and the gamma isotopic results on samples from the three plant and three public water intake locations and gross beta results on samples from the public water intake locations in the 1984 Annual Environmental Operating Report. The licensee collects broad leafy vegetation at the site boundary in the direction sector with the highest D/Q in lieu of garden census. This closes this item.
- c. (Closed) Open Item (50-315/84021-02; 50-316/84023-02): Licensee to determine whether water samples from wells 4, 5, and 6, which are contaminated with fuel oil, had been distilled prior to tritium analysis. The licensee determined that all water samples from the

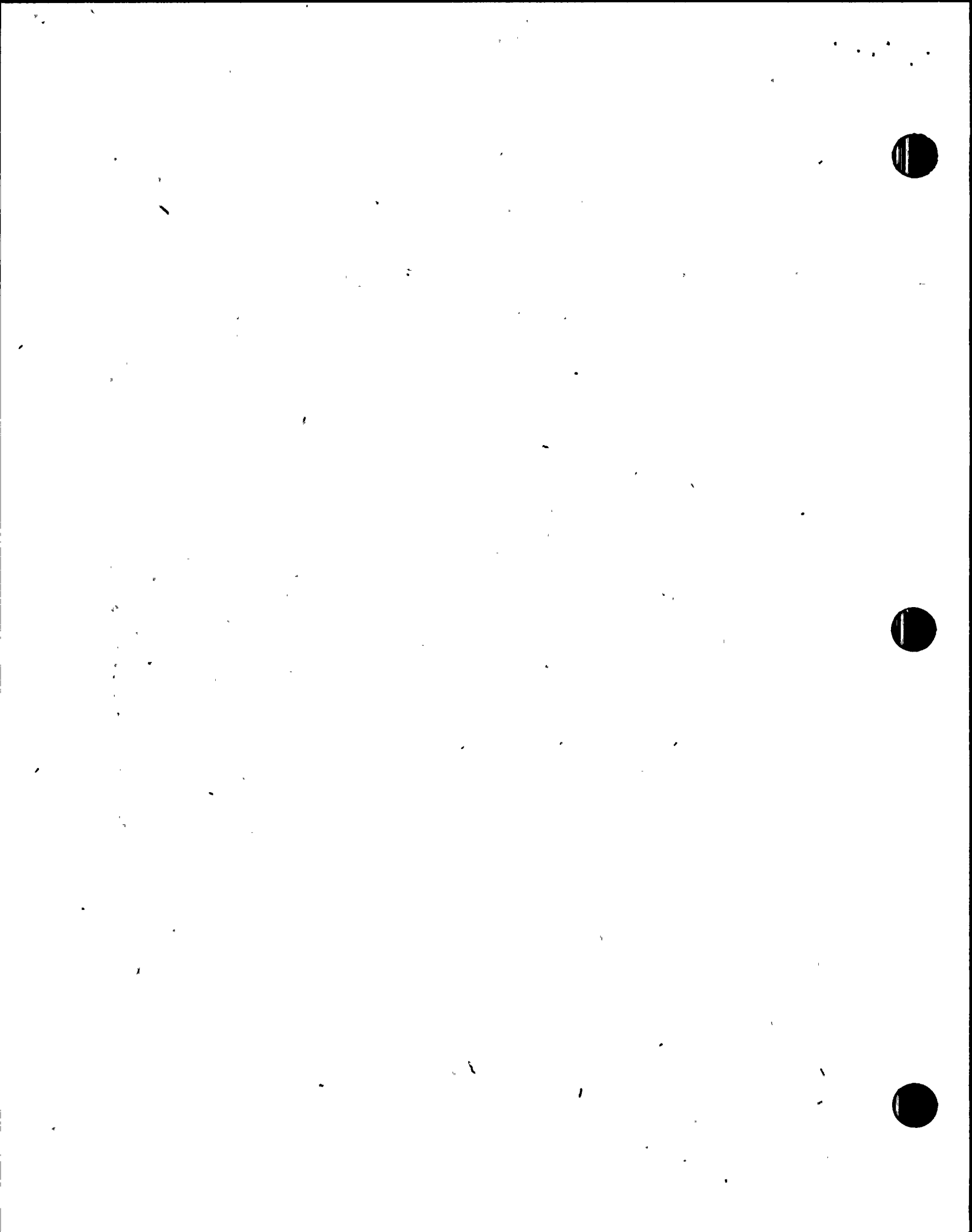


wells were distilled prior to tritium analysis. This item is considered closed.

- d. (Closed) Open Item (50-315/84021-03; 50-316/84023-03): Review of the licensee's Nuclear Safety and Design Review Committee (NSDRC) Audit Report No. 111 on the REMP QA Program. The inspector reviewed the results of Audit No. 111 conducted October 29 through November 1, 1984. No deficiencies were found. This item is considered closed.
- e. (Closed) Violation Severity Level V (50-315/84021-04; 50-316/84023-04): Licensee failed to prepare a procedure for PC-55 gas flow counter and implement procedure 12 THP 6020. LAB.088, "Quality Control of Counting Equipment". The licensee revised procedure 12 THP 6020 LAB.073 "Calibration of Gas Proportional Counter PC-5/PC-55," dated August 17, 1985 to include operation of the PC-55. Procedure 12 THP 6020 LAB.088 was also revised on June 20, 1985 to include a description of response actions for unacceptable calibrations and requirements for calibration checks of counting equipment. Observation of control charts for each detector involving daily source checks and background revealed no problems. This item is considered closed.
- f. (Closed) Violation Severity Level IV (50-315/84021-06; 50-316/84023-06): The licensee failed to accurately quantify radioactive releases. The licensee prepared Procedure 12 THP 6020 LAB.135 "Collection of Samples from Continuous Stack Monitor," dated March 12, 1985, which addresses the correct orientation of charcoal adsorbers in the SPING holder and the adsorber relative to the Ge(Li) detector. No problems were noted during counting of a spiked charcoal adsorber used in the NRC confirmatory measurements program. This item is considered closed.
- g. (Closed) Open Item (50-315/84021-07; 50-316/84023-07): The licensee committed to reanalyze silver zeolite cartridges or correct derived radioactive concentrations for release to environment. A licensee representative stated that no cartridges had been available for reanalysis after the previous inspection. However, appropriate corrections were made when reporting radioactive releases in the semi-annual effluent report for July 1 through December 31, 1984. This item is considered closed.

### 3. Management Controls, Organization, Training and Qualifications

The Plant Chemistry Supervisor has the responsibility for the sampling and analyses of plant chemical and radiochemical samples. Four chemistry supervisors, a chemist (currently vacant), a performance engineer, seven senior technicians, ten technicians and two junior technicians report to the Plant Chemistry Supervisor. The inspectors dealt primarily with the counting room supervisor and one senior technician in performing the confirmatory measurements program. The licensee also has about six contract technicians available so as to permit the licensee's chemistry personnel to undergo training on specific topics, such as the operation of the Canberra gamma-ray spectrometry system. The licensee's senior technicians are in the process of taking requalification training which extends over a two-year period. Instrumentation, plant system topics, and laboratory test performance are being presented to the technicians in



greater depth than was done originally. The technicians and junior technicians are completing a formal 28-week three-phase program designed to upgrade the knowledge of the chemistry technicians in chemistry laboratory practices and chemistry fundamentals. The formal training program and hands-on experience gained by the chemistry staff since the previous inspection<sup>1</sup> were very effective, as evidenced by the good performance of the licensee in the confirmatory measurements program. The licensee's chemistry staffing and training program appeared to be satisfactory.

With regard to the radiological environmental monitoring program (REMP), the licensee changed contractors as of October 1, 1985, from Teledyne Isotopes, Inc. to Controls for Environmental Pollution, to perform the sampling and analyses of environmental media in accordance with Technical Specifications 3/4 12.1. No problems were noted in this change.

No violations or deviations were identified.

4. Quality Control of Analytical Measurements in the Chemistry and Radiochemistry Program

The inspectors reviewed Procedure 12 THP 6020 LAB.044 "Laboratory Quality Assurance," dated September 12, 1985, and Procedure 12 THP 6020 LAB.088 "Quality Control of Counting Equipment," dated June 20, 1985 and their implementation. Procedure LAB.044 was revised in response to a deficiency identified in the Quality Assurance Department Audit QA 84-20. The procedure now includes a description of personnel responsibilities for the program and of a program outlining the traceability of standards and instruments, and calibration of laboratory instrumentation. Procedure LAB.088 was revised to encompass individual responsibilities for implementation of the QA program, a description of response actions for unacceptable calibrations and calibration checks, and an update on split sample analysis. The revised procedures provide improvements over their earlier versions.

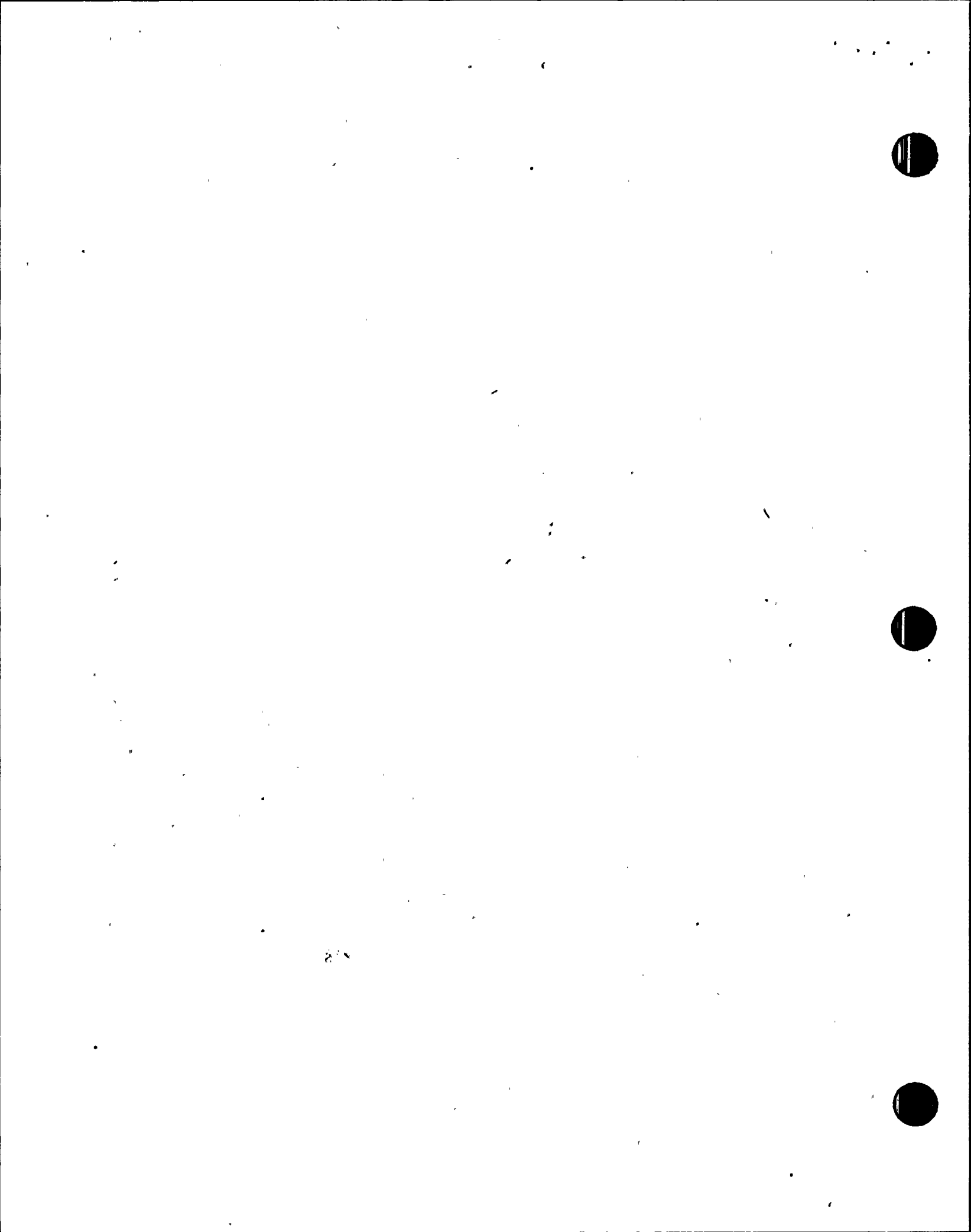
During a tour of the cold and hot laboratories, all reagents were found to have current labels of preparation and all instruments were found with current calibrations stickers. The licensee improved the housekeeping of the laboratory in response to an inspector's comments.

No problems were noted during the collection of gas samples from the gas decay tanks and the dirty waste holdup tank liquid sample. The technicians appeared to be knowledgeable in laboratory practices and adequately followed the appropriate procedures. No problems were noted during the filtering of the dirty waste tank sample to prepare a sample for counting.

Implementation of Procedure LAB.088 on quality control of counting room equipment has improved since the previous inspection.<sup>2</sup> No problems were noted with documentation of the daily check source and background counts

<sup>1</sup>Inspection Report Nos. 50-315/84021; 50-316/84023.

<sup>2</sup>Ibid



on control charts for the appropriate dates. All equipment was found operational and properly calibrated. Procedures for each counter were available.

A licensee representative reported that recently a program for split and unknown spiked samples for quality control of analytical measurements was initiated with Science Applications, Incorporated (SAI). Results to date have been in agreement with those from SAI.

No violations or deviations were identified.

#### 5. Confirmatory Measurements

Three samples from a waste-holdup tank, a gas-decay tank and reactor coolant, were split and counted by the licensee and in the Region III Mobile Laboratory. Because the radioactive content of the plant air particulate filters and charcoal adsorber cartridges were too low to obtain effective intercomparisons, the licensee was asked to count a spiked filter and a spiked charcoal cartridge supplied by the inspectors. A liquid radwaste sample was filtered through paper and membrane filters, split and sent to the NRC Reference Laboratory, the Radiological and Environmental Sciences Laboratory (RESL), in Idaho Falls, Idaho, for analyses of tritium, Sr-89, Sr-90, Fe-55, and gross beta. The licensee agreed to analyze the sample and report the results to Region III (Open Item 50-315/85037-01; 50-316/85037-01).

The results of comparisons made during this inspection are presented in Table 1 and the comparison criteria in Attachment 1. All of the 31 comparisons were agreements. The "L WASTE" sample was a split sample from a "dirty" source (floor drains, etc.) that had been filtered prior to the split. The data for "L WASTE2" were those of the licensee's results for the above sample taken prior to filtration and compared with those of the NRC on the filtered sample. The good agreements show that the solids contained little or no activity. While one result, that for Cd-109 in the spiked filter, was 20% low, a large majority of the licensee's results were essentially identical to those of the NRC.

The inspectors noted that for a sample with a complex gamma-ray spectrum (reactor coolant), the licensee report showed the presence of lines, which on further analysis were found to be absent. This indicates the need for the licensee to perform a more careful review of the gamma-ray data.

No basic problems were observed in the gamma-ray measurements. The good results with the SAI (Section 5) and NRC intercomparisons indicate that the quality control/quality assurance program has improved since the last inspection.<sup>3</sup> Overall, the radiological measurements were very good and the licensee's system appears to be operating well.

No violations or deviations were identified.

<sup>3</sup>Ibid



6. Radiological Environmental Monitoring Program (REMP)

The inspectors reviewed the REMP section of the 1984 Annual Environmental Operating Report to ensure compliance with the T/S Section 3/4.12 and 6.9.1.7 (Amendment 69, effective date April 13, 1983). The inspectors noted that the licensee is having difficulty in obtaining regularly the required daily collections of water samples from the public water supply intakes from Lake Michigan at St. Joseph, Lake Township and New Buffalo for the preparation of monthly composite samples. While daily telephone calls are made to the personnel at these stations to remind them to collect the daily grab samples, nevertheless, according to the licensee's condition reports in the 1984 Annual Report, this problem continues, especially at New Buffalo. This item was discussed at the exit meeting and the licensee agreed to take positive steps to resolve the problem within the next month. This item will be examined in a subsequent inspection (Open Item 50-315/85037-02; 50-316/85037-02).

All other samples have been accounted for. No unusual trends or anomalies were identified, except for tritium results. Water samples taken from the seven wells onsite, (including wells 4, 5, and 6) showed elevated tritium levels (up to 7890 pCi/L). The licensee agreed to investigate the cause of the elevated levels in the wells and provide results of the investigation within six months of this inspection (Open Item 50-315/85037-03; 50-316/85037-03).

The licensee's NSDRC reviewed the REMP, Audit No. 120, conducted on September 9-12, 1985, in which three findings were identified. These findings noted the lack of written, approved, and implemented procedures regarding sampling and analyses of surface water (at locations L1, L2, and L3) and drinking water at the above public water supply intakes. This sampling and analysis are performed by the Chemistry Department. The licensee has prepared or revised the appropriate procedures (12 THP 6020 LAB.037, dated September 26, 1985 and 12 THP 6020 LAB.157, dated October 25, 1985) in response to the findings. The NSDRC plans to perform a followup audit in the next six months to assure that all findings have been resolved.

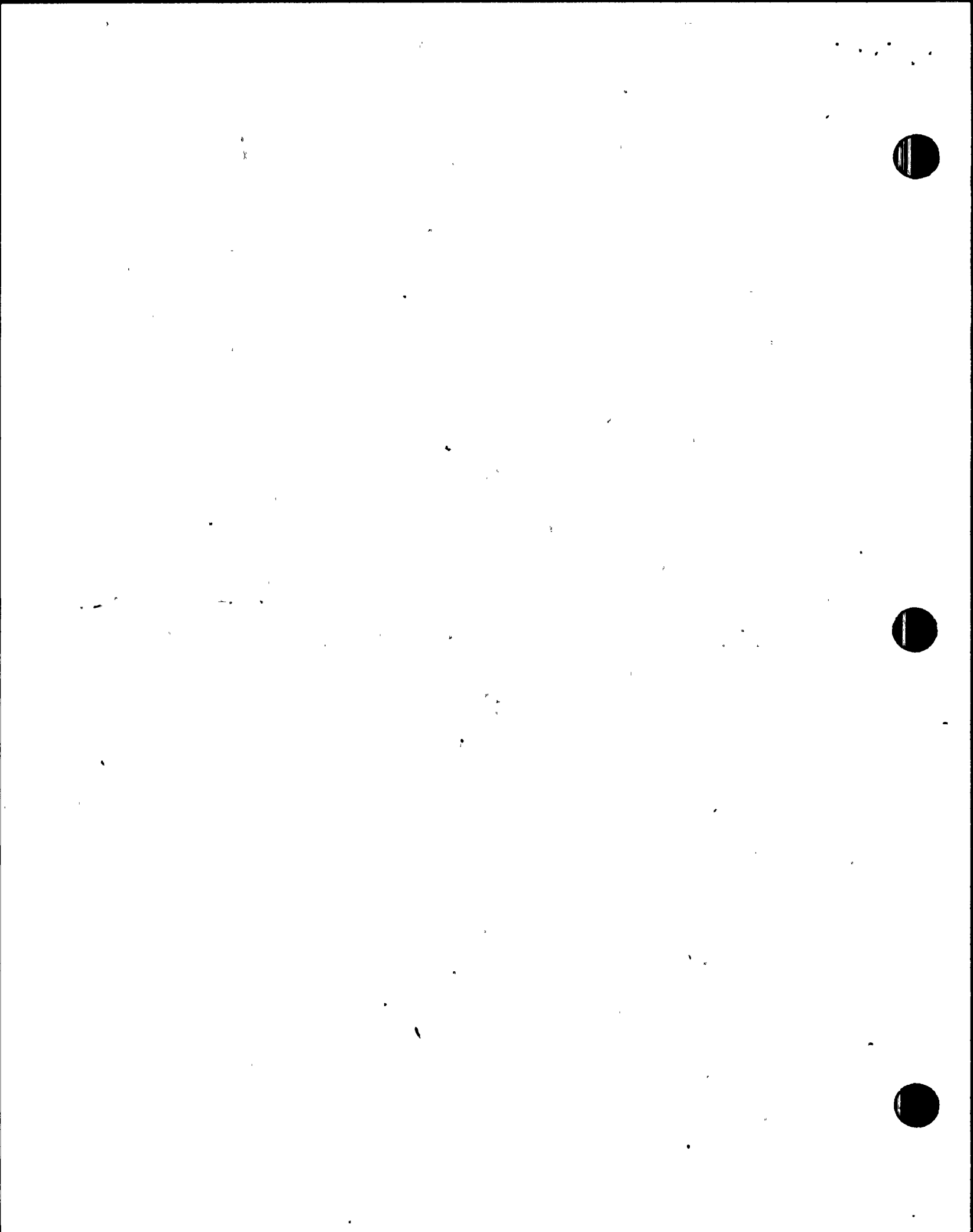
No violations or deviations were identified.

7. Open Items

Open items are matters that have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action on the part of the NRC or licensee or both. Three open items disclosed during the inspection are discussed in Sections 5 and 6.

8. Exit Meeting

The inspectors reviewed the scope and conclusions of the inspection with the licensee representatives denoted in Section 1 at the conclusion of the inspection on November 21, 1985. The inspectors presented the results of the confirmatory measurements and discussed their probable



findings. On environmental matters the licensee acknowledged the inspectors concerns with problems of sample collection and tritium in the well waters, noted in Section 5 and 6, and agreed to resolve the problems in a timely manner.

During the inspection the inspector's discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. Licensee representatives did not identify any such documents or procedures as proprietary.

Attachments:

1. Table 1, Confirmatory Measurements Program
2. Criteria for Comparing Analytical Measurements

TABLE 1

U S NUCLEAR REGULATORY COMMISSION  
 OFFICE OF INSPECTION AND ENFORCEMENT  
 CONFIRMATORY MEASUREMENTS PROGRAM  
 FACILITY: D. C. COOK  
 FOR THE 4 QUARTER OF 1985

SAMPLE	ISOTOPE	-----NRC-----		----LICENSEE----		---LICENSEE:NRC----		
		RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
F SPIKED	CO-57	4.5E-04	3.3E-05	4.5E-04	3.8E-05	9.8E-01	1.4E 01	A
	CO-60	1.6E-02	2.7E-04	1.5E-02	4.3E-04	9.7E-01	5.9E 01	A
	CD-109	6.6E-02	1.2E-03	5.3E-02	1.8E-03	8.0E-01	5.5E 01	A
	CS-137	2.0E-02	3.0E-04	1.8E-02	3.6E-04	9.0E-01	6.6E 01	A
C SPIKED	CO-57	2.2E-04	3.6E-05	2.2E-04	3.1E-05	9.9E-01	6.1E 00	A
	CO-60	6.6E-03	2.4E-04	6.6E-03	3.2E-05	1.0E 00	2.8E 01	A
	CD-109	2.9E-02	1.4E-03	2.7E-02	1.4E-03	9.5E-01	2.1E 01	A
	CS-137	7.9E-03	2.1E-04	7.6E-03	2.6E-04	9.7E-01	3.7E 01	A
GAS	KR-85	4.1E-03	1.2E-04	4.0E-03	6.4E-05	9.9E-01	3.3E 01	A
	XE-133	9.4E-04	3.5E-06	9.2E-04	1.3E-05	9.8E-01	2.7E 02	A
	XE-133M	2.3E-05	2.6E-06	1.9E-05	6.3E-07	8.4E-01	6.8E 00	A
	XE-135	4.2E-05	7.4E-07	3.7E-05	3.1E-07	8.9E-01	5.7E 01	A
L WASTE	MN-54	1.3E-05	1.3E-06	1.3E-05	8.0E-07	1.0E 00	9.8E 00	A
	CO-57	1.7E-05	1.2E-06	1.8E-05	8.0E-07	1.0E 00	1.4E 01	A
	CO-58	2.6E-03	6.9E-06	2.6E-03	3.0E-05	1.0E 00	3.8E 02	A
	CO-60	1.2E-04	2.3E-06	1.2E-04	2.0E-06	1.0E 00	5.3E 01	A
	AG-110M	3.5E-04	3.2E-06	3.2E-04	4.0E-06	9.2E-01	1.1E 02	A
	CS-134	6.4E-05	3.6E-06	6.7E-05	4.0E-06	1.0E 00	1.8E 01	A
	CS-137	7.4E-05	2.8E-06	7.3E-05	1.6E-06	9.9E-01	2.7E 01	A
PRIMARY	CO-58	7.4E-04	7.4E-05	6.8E-04	8.4E-05	9.1E-01	1.0E 01	A
	I-131	1.1E-03	7.7E-05	1.1E-03	7.6E-05	9.6E-01	1.4E 01	A
	I-132	1.6E-02	5.1E-04	1.5E-02	3.1E-04	9.3E-01	3.1E 01	A
	I-133	1.2E-02	1.4E-04	1.3E-02	2.0E-04	1.0E 00	8.9E 01	A
	I-135	2.4E-02	7.4E-04	2.4E-02	7.2E-04	9.9E-01	3.3E 01	A
	NA-24	5.1E-03	1.6E-04	5.4E-03	1.8E-04	1.0E 00	3.3E 01	A
L WASTE2	MN-54	1.3E-05	1.3E-06	1.3E-05	1.2E-06	1.0E 00	9.8E 00	A
	CO-57	1.7E-05	1.2E-06	1.8E-05	1.0E-06	1.0E 00	1.4E 01	A

T TEST RESULTS:

A AGREEMENT

S DISAGREEMENT

N CRITERIA RELAXED

= NO COMPARISON

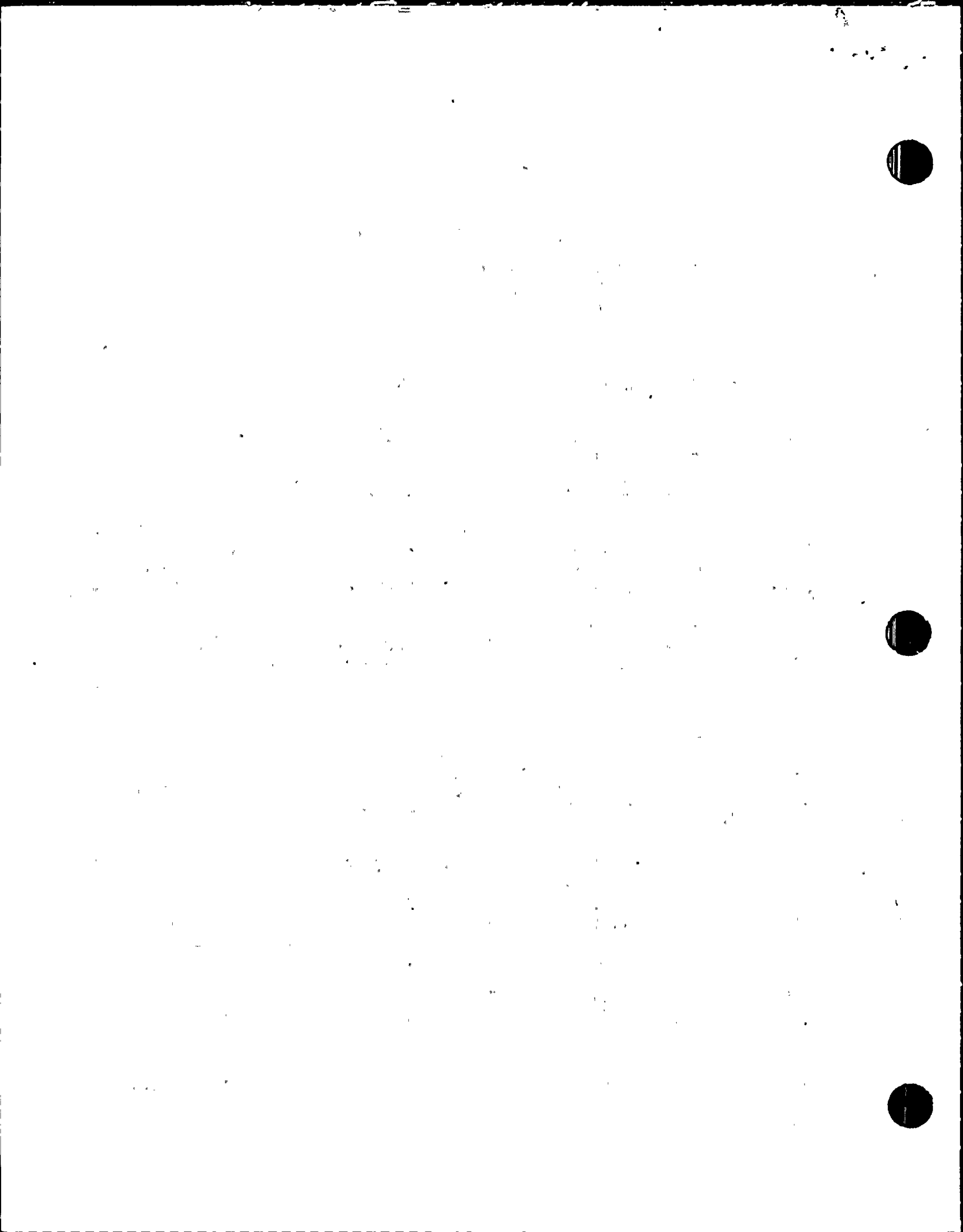


TABLE 1

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 OFFICE OF INSPECTION AND ENFORCEMENT  
 CONFIRMATORY MEASUREMENTS PROGRAM  
 FACILITY: D. C. COOK  
 FOR THE 4 QUARTER OF 1985

SAMPLE	ISOTOPE	-----NRC-----		----LICENSEE----		---LICENSEE:NRC---		
		RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
L WASTE2	CO-58	2.6E-03	6.9E-06	2.6E-03	6.9E-06	1.0E 00	3.8E 02	A
	CO-60	1.2E-04	2.3E-06	1.2E-04	2.0E-06	1.0E 00	5.3E 01	A
	AG-110M	3.5E-04	3.2E-06	3.4E-04	5.0E-06	9.8E-01	1.1E 02	A
	CS-134	6.4E-05	3.6E-06	6.1E-05	2.4E-06	9.5E-01	1.8E 01	A
	CS-137	7.4E-05	2.8E-06	7.3E-05	2.1E-06	9.9E-01	2.7E 01	A

T TEST RESULTS:

A=AGREEMENT

D=DISAGREEMENT

R=CRITERIA RELAXED

C=COMPARISON



T  
C

ATTACHMENT 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgment limits are variable in relation to the comparison of the NRC's value to its associated one sigma uncertainty. As that ratio, referred to in this program as "Resolution", increases, the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement should be considered acceptable as the resolution decreases. The values in the ratio criteria may be rounded to fewer significant figures to maintain statistical consistency with the number of significant figures reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance.

RESOLUTION

RATIO = LICENSEE VALUE/NRC REFERENCE VALUE

Agreement

<3		No Comparison
≥3 and <4		0.4 - 2.5
≥4 and <8		0.5 - 2.0
≥8 and <16		0.6 - 1.67
≥16 and <51		0.75 - 1.33
≥51 and <200		0.80 - 1.25
≥200		0.85 - 1.18

Some discrepancies may result from the use of different equipment, techniques, and for some specific nuclides. These may be factored into the acceptance criteria and identified on the data sheet.



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