

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/84-21(DRSS)

Docket No. 50-346

License No. NPF-3

Licensee: Toledo Edison Company
Edison Plaza
300 Madison Avenue
Toledo, OH 43652

Facility Name: Davis-Besse Nuclear Power Plant, Unit 1

Inspection At: Davis-Besse Site
Oak Harbor, OH

Inspection Conducted: September 10-14, 1984

Inspectors: *M. Schumacher*
S. Rozak *for* 10/1/84
Date

A. G. Januska
A. G. Januska 10/1/84
Date

Approved By: *M. Schumacher*
M. C. Schumacher, Chief 10/1/84
Date
Independent Measurements and
Environmental Protection Section

Inspection Summary

Inspection on September 10-14, 1984 (Report No. 50-346/84-21(DRSS))
Areas Inspected: Routine announced inspection of: (1) Confirmatory Measurements including collection of samples, analysis onsite with the Region III Measurements Laboratory and discussion of results; (2) Radiological Environmental Monitoring Program (REMP) implementation and results; and (3) review of an open item identified during a previous inspection. The inspection involved 68 inspector-hours onsite by two NRC inspectors.
Results: No apparent items of noncompliance were identified.

DETAILS

1. Persons Contacted

- D. Briden, Head, Chemistry and Health Physics Department
- *R. Scott, Chemistry and Radiochemistry Supervisor
- *J. Ferguson, Chemistry and Health Physics Specialist
- *J. Scott-Wasilk, Environmental Monitoring Supervisor
- *G. Downing, Senior Technician
- *J. Faris, Administrative Coordinator
- C. Rider, Senior Technician
- B. Geddes, Associate Auditor

*Denotes those present at the exit interview on September 14, 1984.

2. Licensee Action on Previous Inspection Findings

(Closed) Open Item (345/83-02-02): Failure to meet detection limit of 5×10^{-7} $\mu\text{Ci/ml}$ for liquid release samples as specified in Table 2.4-1 Appendix B Technical Specifications. Licensee minimum detectable activity (MDA) values for Ce-144 and Mo-99 were slightly above the value of 5×10^{-7} $\mu\text{Ci/ml}$ required by Technical Specifications. Since then the licensee has purchased a detector with a larger active volume and correspondingly higher efficiency and the sample container has been changed from a 500 ml bottle to a 1 liter Marinelli beaker. These changes allow the licensee to lower the MDAs well below the required sensitivity. In addition, the licensee in the process of changing to Standard Radiological Effluent Tech. Specs. (RETS) has successfully negotiated for an MDA of 2×10^{-6} $\mu\text{Ci/ml}$ for Ce-144, the most restrictive of the ten principal gamma emitters specified in NUREG-0472, "Standard Radiological Effluent Technical Specifications for Pressurized Water Reactors" for which LLD (MDA) values apply.

3. Radiological Environmental Monitoring Program (REMP)

The radiological environmental monitoring program implemented by the licensee's environmental contractor (Teledyne Isotopes Midwest Laboratory) was reviewed for accuracy against the required program in the Technical Specifications. One discrepancy noted was discussed with the licensee and was brought to the attention of the contractor prior to the conclusion of the inspection.

The annual REMP report for 1983 and selected monthly reports from the licensee's contractor were examined for compliance with Technical Specifications. No unusual trends were noted and no station effect on the environment was indicated in any of the sampling media collected and analyzed. The contractor has participated in interlaboratory comparisons (crosscheck) programs since the formation of its quality control program in December 1971 and has participated in International Intercomparisons of Environmental Dosimeters from 1976 through 1981. EPA Intercomparison results for 1980-1983 and TLD results presented in the annual report were examined with no problems being noted.

The inspector verified that the required annual census of animals producing milk for human consumption was conducted in accordance with Technical Specifications, Appendix B, Sections 3.2.D.1 and 3.2.D.2.

In addition to the required milch animals the licensee also located residences, private gardens and cattle within 5 miles and listed the nearest in each of sixteen sectors around the site. Monthly checklists examined, which include the sample collection schedule, verification of implementation and the environmental air sample pump maintenance schedule, were complete and had been properly reviewed. Four environmental monitoring stations were visited. Air sampling systems were operating properly and TLDs were in place.

No items of noncompliance or deviations were identified.

4. Audits

The following QA Audits were reviewed: TED-QA Audit 1115, Technical Specifications, Appendix B, conducted November 14-22, 1983; TED-QA Audit 1086, Chemistry and Health Physics requirements, conducted September 1-12, 1983; TED-QA 1153, Adequacy and implementation of Station Procedures in Chemistry and Health Physics area for requirements of 10 CFR 20 and appropriate criteria of 10 CFR 50 Appendix B, conducted February 27 - March 6, 1984; TED-QA Audit 1200, Adequacy and implementation of requirements of 10 CFR 50, Appendix B, Criteria II, V, VII and XVI, conducted June 18-22, 1984; and TED-QA Audit 1191, Teledyne compliance with their Quality Assurance Program for radiological environmental monitoring, conducted May 29, 30, 1984. No substantial findings in the Chemistry or Environmental areas were noted.

No items of noncompliance or deviations were identified.

5. Measurements and Observations

While touring the licensee's laboratories, the inspectors made face velocity measurements of all laboratory fume hoods. All three hoods had face velocities in the working area of less than 50 fpm. In addition the sash on the hood in the hot lab area was stuck in the nearly full open position. Acceptable air flows are on the order of 100-150 fpm. This matter was discussed with licensee representatives at the exit interview on September 14, 1984. No specific corrective actions were requested of the licensee at that time due to an imminent outage which would constrain the licensee's resources. The licensee did agree to forward a schedule for corrective actions in the near future. The repair and maintenance of air flow in the fume hoods will be examined in a future inspection (Open Item 50-346/84-21-01).

Analytical instruments, in general, were found to be operable with current calibration stickers. Chemical solutions were labeled with preparation and expiration dates listed. The only out-of-date solutions

seen had been segregated in an area designated for solutions to be restandardized.

No items of noncompliance or deviations were identified.

6. Quality Control of Analytical Measurements

During a tour of the licensee's laboratories the inspectors examined daily quality control logs of several counting room instruments. Instances when detector performance was outside of limits were appropriately flagged and supervisors were informed of instruments with suspect behavior.

Supervisor attention and control in the laboratories was evident. Duties in the laboratories were adequately designated. Staff turnover did not appear to be a problem; the majority had several years of experience in their areas of responsibility. Analysts are periodically required to perform chemical analysis of blind samples as a check of their own performance and procedural adequacy. Quarterly, the licensee participates in a radiochemical crosscheck program with Analytics, Inc. The inspectors reviewed program results since September 1982. The comparisons were generally acceptable. The licensee has a chemistry and radiochemistry training program that had been instituted relatively recently. This program is still being developed and expanded.

The licensee's equipment appears adequate for the licensee's current needs; however, some of the equipment is aging. The licensee does not have a backup for the counting room computer used for gamma analyses; however, licensee representatives stated that they have practiced relocating this computer in the case that the counting room is unuseable, and that manufacturer servicing is available within hours.

No items of noncompliance or deviation were identified.

7. Sample Analyses

Seven inplant samples (gas decay tank, vent charcoal and particulate filters, containment charcoal and particulate filters, primary coolant, and detergent waste tank) were collected and analyzed onsite with the Region III Mobile Laboratory for gamma isotopic activity. Comparative results are presented in Table I. Comparison criteria are outlined in Attachment 1. In addition, a sample from a lake discharge tank was collected and will be analyzed for tritium, strontium-89 and -90 by the licensee and by the NRC Reference Laboratory. Licensee representatives agreed to submit these additional results to Region III for comparison, to be reported in an addendum to this report (Open Item 50-346/84-21-02).

Of twenty-three comparisons presented in Table I, all are classified as agreements. No comparisons were made for the vent particulate filter because very little activity had been deposited on the filter.

No items of noncompliance or deviations were identified.

8. Exit Interview

The inspectors met with licensee representatives denoted in Section 1, at the conclusion of the inspection on September 14, 1984. The scope and findings of the inspection were discussed. In response to inspector comments licensee representatives agreed to the following actions:

- (a) Correct problems identified with laboratory fume hoods (Open Item 50-346/84-21-01) (Section 5);
- (b) Analyze liquid sample for H-3, Sr-89, Sr-90 and report results to Region III (Open Item 50-346/84-21-02) (Section 7).

Attachments:

- 1. Confirmatory Measurements Program
Results, 3rd Quarter 1984
- 2. Criteria for Comparing Analytical
Measurements

TABLE I

U S NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
CONFIRMATORY MEASUREMENTS PROGRAM
FACILITY: DAVIS BESSE
FOR THE 3 QUARTER OF 1984

SAMPLE	ISOTOPE	-----NRC-----		----LICENSEE----		---LICENSEE:NRC---		
		RESULT	ERROR	RESULT	ERROR	RATIO	RES	T
GAS	XE-133	2.2E-01	2.0E-04	2.3E-01	0.0E-01	1.1E 00	1.1E 03	A
	XE-135	1.8E-02	5.3E-05	1.9E-02	0.0E-01	1.0E 00	3.4E 02	A
	XE-133M	3.6E-03	8.8E-05	3.7E-03	0.0E-01	1.0E 00	4.1E 01	A
	KR-85M	5.2E-04	2.0E-05	5.1E-04	0.0E-01	9.9E-01	2.6E 01	A
C FILTER	I-131	2.0E-13	2.1E-14	2.2E-13	0.0E-01	1.1E 00	9.6E 00	A
P FILTER	I-131	2.9E-10	1.1E-11	2.3E-10	0.0E-01	8.0E-01	2.6E 01	A
	I-133	1.5E-10	1.0E-11	1.1E-10	0.0E-01	7.6E-01	1.5E 01	A
	CS-134	1.6E-10	1.0E-11	1.6E-10	0.0E-01	9.8E-01	1.6E 01	A
	CS-137	2.9E-10	1.5E-11	2.5E-10	0.0E-01	8.5E-01	1.9E 01	A
C FILTER	I-131	1.4E-08	1.6E-10	1.4E-08	0.0E-01	1.1E 00	8.7E 01	A
	I-133	4.0E-09	1.1E-10	4.3E-09	0.0E-01	1.1E 00	3.6E 01	A
PRIMARY	I-131	1.1E-02	2.3E-04	9.7E-03	0.0E-01	9.0E-01	4.7E 01	A
	I-132	2.7E-02	5.8E-04	3.2E-02	0.0E-01	1.2E 00	4.6E 01	A
	I-133	2.1E-02	3.1E-04	2.1E-02	0.0E-01	9.7E-01	6.8E 01	A
	I-134	4.2E-02	1.6E-03	4.7E-02	0.0E-01	1.1E 00	2.7E 01	A
	I-135	3.2E-02	1.1E-03	3.3E-02	0.0E-01	1.0E 00	2.8E 01	A
L WASTE	I-131	1.9E-05	2.4E-07	1.9E-05	0.0E-01	1.0E 00	7.8E 01	A
	CS-136	4.9E-07	5.7E-08	3.6E-07	0.0E-01	7.4E-01	8.6E 00	A
	I-133	6.2E-06	1.7E-07	6.2E-06	0.0E-01	1.0E 00	3.6E 01	A
	CS-134	3.7E-06	1.3E-07	3.9E-06	0.0E-01	1.1E 00	2.8E 01	A
	CS-137	7.5E-06	1.9E-07	7.7E-06	0.0E-01	1.0E 00	4.0E 01	A
	CO-58	1.5E-06	8.6E-08	1.5E-06	0.0E-01	9.7E-01	1.8E 01	A
	MN-54	2.1E-07	8.1E-08	2.6E-07	0.0E-01	1.3E 00	2.6E 00	N
	CO-60	1.4E-06	1.0E-07	1.2E-06	0.0E-01	8.4E-01	1.4E 01	A

T TEST RESULTS:
A=AGREEMENT
D=DISAGREEMENT
N=NO COMPARISON

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.

<u>RESOLUTION</u>	<u>RATIO = LICENSEE VALUE/NRC REFERENCE VALUE</u>
	<u>Agreement</u>
<3	No Comparison
<u>≥</u> 3 and <4	0.4 - 2.5
<u>≥</u> 4 and <8	0.5 - 2.0
<u>≥</u> 8 and <16	0.6 - 1.67
<u>≥</u> 16 and <51	0.75 - 1.33
<u>≥</u> 51 and <200	0.80 - 1.25
<u>≥</u> 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.