U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/91007(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 Station, Unit 1

Inspection At: Davis Besse Nuclear Power Station, Oak Harbor, Ohio

Inspection Conducted: April 1 - 5, 1991

Inspector: A. G. Januska — Date: 4/24/91

Accompanied By: B. L. Hamrick

Approved By: M. C. Schumacher, Chief
Radiological Controls and
Chemistry Section — Date: 4/24/91

Inspection Summary

Inspection on April 1 - 5, 1991 (Report No. 50-346/91007(DRSS))
Areas Inspected: Routine unannounced inspection of the licensee's confirmatory measurements program (IP 84750) including: audits, quality assurance, confirmatory measurements of in-plant radiochemical analyses, primary coolant radiochemistry, post accident sampling, implementation of the radiological environmental monitoring program (REMP) and followup on items identified during previous inspections (IP 92701).
Results: The licensee's continues to demonstrate high quality radiochemical measurements capability as demonstrated by very good comparative results with the NRC and excellent comparative results with an independent laboratory contractor. The implementation of the REMP satisfies the Technical Specifications (T/S) requirements, is well managed and personnel have an indepth knowledge of the details of the program. There is no evidence of any impact on the environment due to the operation of the plant.

DETAILS

1. Persons Contacted

*L. Bonker, Supervisor Rad Health
*R. Edwards, Chemistry Analyst
*B. Geddes, Radiological Environmental Supervisor
*G. Honma, Compliance Supervisor-Licensing
*R. Gaston, Licensing Technologist
J. Lochotzki, Asst. Environmental Compliance Technologist
*A. Mason, Radiological Controls-Associate HP
*R. Scott, Chemistry Superintendent

*R. Walton, Resident Inspector, NRC

The inspectors also contacted other licensee employees.

* Denotes those present at the Exit Meeting on April 5, 1991

2. Licensee Action on Previous Inspection Findings (IP 92701)

a. (Closed) NC4(50-346/90008-01: Licensee failed to place the results of all analyses of environmental radiological samples in the REMP annual report. The licensee submitted supplemental information to the 1985, 1986, 1987 and 1988 Annual Environmental Operating Reports on May 31, 1990 and submitted required sample results as Attachment 1 to the 1989 Annual Environmental Operating Report.

b. (Open) Open Item (50-346/91003-03): The licensee is reviewing the options of excavating the soil for offsite disposal and of evaluating the consequences of letting it remain in-place pursuant to 10 CFR 20.302. A difficultly with the first option is the determination of the appropriate background for comparison. The licensee has analyzed soil samples collected 10 - 20 miles from the station which show low levels of fallout cesium-137 in the range of 1 pCi/g. However, these were surface samples and probably not representative of subsurface soil backgrounds. These matters were discussed in telecoms between the licensee, Region III and NRR representatives following the inspection.

3. Management Controls and Organization (IP 84750)

The Chemistry Section is headed by a Chemistry Superintendent (CS) who answers to the Operations Superintendent. Answering to the CS are five Chemistry Staff, a General Supervisor (Chemistry) and a Clerk. The five supervisors who direct 20 Chemistry Testers answer to the General Supervisor. Staffing is stable.

The REMP group is headed by a Radiological Environmental Supervisor who answers to the Radiological Controls Manager. Since the transfer of this group to the Radiological Controls Section in early 1990, the group lost the services of two experienced technologists and four

trained students. The technologists' positions have been filled by one promotion and a transfer within TECo. Three student positions have been filled. Slots for two more students currently remain unfilled.

No violations or deviations were identified.

4. Radiological Confirmatory Measurements (IP 84750)

Five samples (air particulate, charcoal, gas, reactor coolant and a simulated liquid waste) were analyzed for gamma emitting isotopes by the licensee and in the Region III Mobile Laboratory on site. Comparisons were made on combinations of the licensee's three detectors in chemistry and radiological controls. Results of the sample comparisons are given in Table 1; the comparison criteria are given in Attachment 1. The licensee achieved 56 agreements out of 57 comparisons.

Agreements were achieved for containment air particulate, charcoal, and reactor coolant samples. A Borated Water Storage Tank (BWST) sample was used to simulate a liquid radwaste sample. Initial analyses on this sample for all three detectors yielded agreements except for Mn-54 and Cs-136 on chemistry detector #2. Because of poor counting statistics, the sample was reanalyzed by both the licensee and the inspectors and resulted in all agreements. A portion of the BWST sample will be sent to the licensee's contractor and analyzed for H-3, Sr-89, Sr-90 and Fe-55 and the results reported to Region III for comparison with an analysis by the NRC Reference Laboratory on a split of the same sample. (Open Item 50-346/91007-01)

The analyses of a sample of gas stripped from a reactor coolant sample (RCS) resulted in one disagreement, Xe-131m where the licensee failed to accurately quantify this nuclide. No reason was identified for the disagreement; the amount of the nuclide's activity accounted for less than 1.0% of the total sample.

No violations or deviations were identified.

5. Audits (IP 84750)

The inspectors reviewed quality assurance audit AR-89-CHEMC-01. The audit covered, in part, aspects related to this inspection. No observations or findings made pertained to the content of this inspection.

No violations or deviations were identified.

6. Quality Assurance/Quality Control of Radiological Measurements (IP 84750)

The inspectors reviewed the counting room Quality Control (QC). The licensee performs required QC checks on various counting room instruments, and plots the results. The inspector noted that supervisory reviews for the Scintillation Alpha Counter (SAC-4) were not performed because of confusion on the data sheet. The QC results in all cases were in specification.

The inspectors also reviewed both the radiochemistry laboratory and count room operations, including physical facilities. Housekeeping was generally good; the radiochemistry laboratory is a section of the general chemistry laboratory and is small. Counting room work space is adequate. The Chemistry Tester observed during sample acquisition and preparation used very good laboratory techniques.

The inspectors examined the 1990 results of the confirmatory measurements program the licensee participates in with an independent vendor. The licensee achieved all agreements (180) for alpha, beta and gamma emitters. All three detectors were involved for the gamma analyses.

No violations or deviations were identified.

7. Primary Coolant Radiochemisty (IP 84750)

Technical Specification (T/S) 3.4.8 requires that the specific activity of the primary coolant not exceed one microcurie per gram of dose equivalent I-131 (DEI-131) with exceptions stated in that section's Action Statements. The inspectors selectively reviewed the licensee's primary coolant radiochemistry results for 1990 to determine compliance with the T/S requirements for the DEI-131 concentration. The inspector noted that the licensee performs this analysis more frequently than either the T/S or an Administrative requirement. The selective review indicated that the DEI-131 concentration for the primary system remained less than the applicable T/S limit throughout the review period.

No violations or deviations were identified.

8. Radiological Environmental Monitoring Program (IP 84750)

The inspectors examined the adherence of the REMP to the T/S, its implementation, Annual Environmental Operating Reports and also toured some selected air sampling stations. The program as implemented complies with the requirements of Table 3.12-1 of the T/S. In addition to the requirements, the licensee conducts an enhanced program which results in more samples than required. The program is being implemented properly. Missed samples are documented along with the reason. A review of the 1989 and draft of the 1990 Annual Reports did not indicate any significant contribution to the environment due to the operation of the plant. The inspectors toured several onsite air sampling stations with the licensee and noted that equipment was well maintained and under current calibration. During the tour and during subsequent discussions, the licensee's representative demonstrated in depth knowledge of the program. Quality assurance audit AR-90-ENVGM-01 conducted in the Fall of 1990, which dealt in part with the REMP, was examined. One minor observation was made which received prompt attention. Loss of staff in the REMP group was identified and is discussed in Section 3.

No violations or deviations were identified.

9. Post Accident Sampling System (IP 84750)

The inspectors examined the licensee's Post Accident Sampling System (PASS) program and toured two sampling stations (RCS and containment air). They were easily accessible and sample collection appeared to be relatively straight forward. Samples are collected periodically using this system. Samples from the PASS are compared with results of like routine samples with good results. A revision to the governing procedure was in review and will add the requirement of a gamma scan on the stripped gas sample.

No violations or deviations were identified.

10. Open Items

Open items are matters which 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, to both. An open item disclosed during the inspection is discussed in Section 4.

11. Exit Interview

The scope and findings of the inspection were discussed with licensee representatives (Section 1) at the conclusion of the inspection on April 5, 1990. Licensee representatives did not identify any documents or processes reviewed during the inspection as proprietary.

Attachments:
1. Table 1, Radiological Confirmatory Measurements Program Results 2rd Quarter 1991
2. Attachment 1, Criteria for Comparing Radiological Measurements

TABLE 1

U.S NUCLEAR REGULATORY COMMISSION

REGION III

FACILITY: DAVIS-BESSE

FOR THE 2ND QUARTER OF 1991

SAMPLE	NUCLIDE	NRC VAL.	NRC ERR.	LIC.VAL.	LIC.ERR.	RATIO	RESOL.	RESULT
AIR PART	I-131	1.91E-02	1.76E-04	2.05E-02	0.00E+00	1.07	108.9	A
CONTNMT	I-132	1.37E-03	1.16E-04	1.37E-03	0.00E+00	1.00	11.8	A
CHEM 2	I-133	7.65E-03	1.34E-04	8.74E-03	0.00E+00	1.14	57.3	A
	I-135	2.19E-03	2.61E-04	3.08E-03	0.00E+00	1.41	8.4	A
	SB-122	9.97E-05	6.11E-05	0.00E+00	0.00E+00		1.6	N
	CS-134	2.25E-03	8.12E-05	2.73E-03	0.00E+00	1.21	27.7	A
	CS-137	3.03E-03	9.94E-05	3.69E-03	0.00E+00	1.22	30.5	A
CHARC	I-131	6.43E-01	3.02E-03	6.93E-01	0.00E+00	1.08	212.7	A
CONTNMT	I-133	1.47E-01	1.82E-03	1.75E-01	0.00E+00	1.19	80.9	A
CHEM 2								
STRIPPED	KR-85M	5.05E-02	8.34E-04	5.71E-02	0.00E+00	1.13	60.6	A
GAS	KR-87	6.66E-02	2.22E-03	7.28E-02	0.00E+00	1.09	29.9	A
CHEM 2	KR-88	1.02E-01	2.47E-03	1.29E-01	0.00E+00	1.26	41.5	A
	XE-131M	3.81E-02	8.69E-03	5.20E-03	0.00E+00	0.14	4.4	D
	XE-133	5.18E+00	9.21E-03	5.29E+00	0.00E+00	1.02	562.2	A
	XE-133M	9.08E-02	3.88E-03	1.08E-01	0.00E+00	1.19	23.4	A
	XE-135	4.06E-01	1.80E-03	4.49E-01	0.00E+00	1.10	225.5	A
	XE-135M	5.35E-02	1.05E-02	6.20E-02	0.00E+00	1.16	5.1	A
	AR-41	1.73E-03	6.86E-04	4.23E-03	0.00E+00	2.45	2.5	N
CONTMMNT	I-131	6.43E-01	3.02E-03	6.65E-01	0.00E+00	1.03	212.7	A
CHAR.	I-133	1.47E-01	1.82E-03	1.53E-01	0.00E+00	1.04	80.9	A
RC DET.								
CONTNMNT	I-131	1.91E-02	1.76E-04	1.97E-02	0.00E+00	1.03	108.9	A
AIR PART	I-132	1.37E-03	1.16E-04	1.11E-03	0.00E+00	0.81	11.8	A
RC DET.	I-133	7.65E-03	1.34E-04	8.00E-03	0.00E+00	1.05	57.3	A
	I-135	2.19E-03	2.61E-04	2.55E-03	0.00E+00	1.17	8.4	A
	SB-122	9.40E-05	6.11E-05	0.00E+00	0.00E+00		1.5	N
	CS-134	2.25E-03	8.12E-05	2.29E-03	0.00E+00	1.02	27.7	A
	CS-137	3.03E-03	9.94E-05	3.35E-03	0.00E+00	1.10	30.5	A
SIMUL	MN-54	2.92E-07	7.87E-08	3.23E-07	0.00E+00	1.11	3.7	N
L WASTE	CO-57	3.63E-07	7.36E-08	4.21E-07	0.00E+00	1.16	4.9	A
CHEM 2	CO-58	2.22E-04	7.65E-07	2.40E-04	0.00E+00	1.08	290.2	A
	CO-60	3.06E-06	1.00E-07	3.20E-06	0.00E+00	1.05	30.6	A

SAMPLE	NUCLIDE	NRC VAL.	NRC ERR.	LIC.VAL.	LIC.ERR.	RATIO	RESOL.	RESULT
SIMUL	SB-125	5.00E-06	5.23E-07	5.07E-06	0.00E+00	1.01	9.6	A
L WASTE	CS-134	4.23E-05	2.83E-07	4.97E-05	0.00E+00	1.17	149.5	A
CON'T	CS-136	8.30E-07	1.07E-07	1.19E-06	0.00E+00	1.43	7.8	A
	CS-137	5.85E-05	3.57E-07	6.54E-05	0.00E+00	1.12	163.9	A
	BA-139	5.96E-06	1.64E-06	7.94E-06	0.00E+00	1.33	3.6	N
	BA-140	4.97E-06	6.32E-07	4.36E-06	0.00E+00	0.88	7.9	A
	CE-144	1.76E-06	5.14E-07	0.00E+00	0.00E+00		3.4	N
RCS	I-131	1.17E-01	8.18E-04	9.91E-02	0.00E+00	0.85	143.0	A
CHEM 2	I-132	9.48E-02	7.08E-04	9.09E-02	0.00E+00	0.96	133.9	A
	I-133	1.27E-01	7.61E-04	1.13E-01	0.00E+00	0.89	166.9	A
	I-134	5.69E-02	1.03E-03	5.36E-02	0.00E+00	0.94	55.2	A
	I-135	1.39E-01	2.64E-03	1.20E-01	0.00E+00	0.86	52.7	A
	CS-134	3.04E-03	3.50E-04	2.84E-03	0.00E+00	0.93	8.7	A
	CS-137	3.29E-03	4.54E-04	3.56E-03	0.00E+00	1.08	7.2	A
	CS-138	7.53E-02	1.83E-03	6.46E-02	0.00E+00	0.86	41.1	A
SIMUL	MN-54	3.48E-07	7.35E-08	2.75E-07	0.00E+00	0.79	4.7	A
L WASTE	CO-57	3.87E-07	7.28E-08	3.65E-07	0.00E+00	0.94	5.3	A
RC DET	CO-58	2.22E-04	5.69E-07	2.21E-04	0.00E+00	1.00	390.2	A
	CO-60	2.74E-06	1.15E-07	2.94E-06	0.00E+00	1.07	23.8	A
	SB-125	4.90E-06	4.81E-07	4.66E-06	0.00E+00	0.95	10.2	A
	CS-134	4.30E-05	2.82E-07	4.69E-05	0.00E+00	1.09	152.5	A
	CS-136	8.53E-07	9.88E-08	1.12E-06	0.00E+00	1.31	8.6	A
	CS-137	5.93E-05	3.67E-07	6.10E-05	0.00E+00	1.03	161.6	A
	BA-140	4.86E-06	6.64E-07	4.13E-06	0.00E+00	0.85	7.3	A
SIMUL	MN-54	3.48E-07	7.35E-08	2.07E-07	0.00E+00	0.59	4.7	A
L WASTE	CO-57	3.87E-07	7.28E-08	4.04E-07	0.00E+00	1.04	5.3	A
CHEM 1	CO-58	2.22E-04	5.69E-07	2.17E-04	0.00E+00	0.98	390.2	A
	CO-60	2.74E-06	1.15E-07	2.87E-06	0.00E+00	1.05	23.8	A
	SB-125	4.90E-06	4.81E-07	4.34E-06	0.00E+00	0.89	10.2	A
	CS-134	4.30E-05	2.82E-07	4.57E-05	0.00E+00	1.06	152.5	A
	CS-136	8.53E-07	9.88E-08	1.09E-06	0.00E+00	1.28	8.6	A
	BA-140	4.86E-06	6.64E-07	4.12E-06	0.00E+00	0.85	7.3	A

T TEST RESULTS
A=AGREEMENT
D=DISAGREEMENT
*=CRITERIA RELAXED
N=NOCOMPARISON

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 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
<4	NO COMPARISON
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 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.