

UNITED STATES NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report of Emergency Planning - Environmental Monitoring-  
Confirmatory Measurements Inspection

IE Inspection Report No. OJO-346/77-05

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

Davis-Besse Nuclear Power Station  
Unit 1  
Oak Harbor, OH

License No. CPPR-80  
Category: B

Type of Licensee: PWR (BW) 2772 MWt

Type of Inspection: Routine, Announced

Dates of Inspection: February 7-11, 1977

Principal Inspector:

*A. G. Januska*  
A. G. Januska

3/7/77  
(Date)

Accompanying Inspector:

*R. J. Greer*  
R. J. Greer

3/7/77  
(Date)

Other Accompanying Personnel: None

Reviewed By:

*J. A. Pagliaro*  
J. A. Pagliaro, Chief  
Environmental and Special  
Projects Section

3/8/77  
(Date)

8002050718

## SUMMARY OF FINDINGS

### Inspection Summary

Inspection on February 7-11 (Unit 1, 77-05): Reviewed (1) the pre-operational radiological environmental monitoring program, (2) the preoperational quality control and capability test of the confirmatory measurements program, and (3) open items identified during an emergency planning inspection.<sup>1/</sup>

### Enforcement Items

None.

### Licensee Action on Previously Identified Enforcement Items

No previously identified enforcement items within the scope of this inspection.

### Other Significant Items

#### A. Systems and Components

The licensee has not completed testing of his public address system. (Paragraph 3.c, Report Details)

#### B. Facility Items (Plans and Procedures)

Implementing procedures contained in the Emergency Plan and Implementing Procedures Manual have not been revised. (Paragraph 3.e, Report Details)

#### C. Managerial Items

None.

#### D. Deviations

None.

#### E. Status of Previously Reported Unresolved Items

None.

### Management Interview

The following items were discussed on February 11 with Mr. Evans and members of his staff:

1/ IE Inspection Report No. C50-346/76-22.

- A. The scope of the inspection. (Paragraph 2, Report Details)
- B. Open items to be completed prior to various licensing stages. (Paragraphs 3 through 5, Report Details)
- C. Preoperational radiological environmental monitoring program. (Paragraph 6, Report Details)
- D. Preoperational quality control and capability test of the confirmatory measurements program. (Paragraph 7, Report Details)

REPORT DETAILS

1. Persons Contacted

J. Evans, Station Superintendent  
W. Green, Station Technical Assistant  
D. Briden, Chemist and Health Physicist  
J. Hickey, Training Supervisor  
B. Geddes, Radiochemistry and Health Physics Specialist  
R. Smith, Senior Computer Programmer  
J. Humphreys, Senior Assistant Engineer  
D. Jazwiecki, Chem and Rad Tester  
J. Tapley, Chemistry and Health Physics Foreman  
J. Buck, Operations Quality Assurance Supervisor

2. General

The inspection included an examination of the licensee's environmental monitoring, emergency planning and analytical measurement-confirmatory measurement programs. The emergency planning portion of the inspection was an examination of the open items identified during a previous inspection.<sup>2/</sup> The environmental monitoring portion was the final preoperational inspection and included an examination of the radiological monitoring program results for the period January 1976 through June 1976 and a discussion of how the preoperational environmental monitoring program relates to the program to be defined in the technical specifications. The analytical measurement-confirmatory measurement inspection consisted of an examination of the licensee's program to control quality of analytical measurements and of a test of the licensee's measurements of a simulated liquid waste sample, a stack sampler charcoal cartridge containing "mock I-131," a simulated stack sampler particulate filter and a simulated gas standard.

3. Open Items (Fuel Loading)

The following open items, identified during a previous inspection<sup>3/</sup> and during this inspection require completion prior to fuel loading:

a. Letters of Agreement

A recently received letter of agreement shall be entered into Appendix C of the Emergency Plan and a list detailing the letters of agreement updated.

2/ Ibid.

3/ Ibid.

b. Facilities Equipment

Periodic testing procedures for supplied breathing air and those communications not related to security shall be developed and implemented.

The approved periodic testing procedure for the emergency plan supply cabinet equipment shall be implemented in order to assure that emergency related equipment complies with the inventory list contained as an appendix to this procedure.

c. Public Address System

The station public address system testing shall be completed in order to determine the adequacy of the quantity and quality of the system coverage to assure that personnel can be made aware of emergency conditions.

d. Training

Documentation of the completion of general orientation training for all station personnel, contractor personnel and consultant support groups stationed on the site shall be available for review.

e. Implementing Procedures

Revisions to Administrative Procedures, Emergency Procedures and Health Physics Procedures, discussed with <sup>4/</sup>a licensee representative during a previous inspection, <sup>4/</sup> shall be made.

f. Emergency Classification Response

Clarification of the response to a fire alarm and/or the use of an additional emergency classification for local emergencies, where limited response is required, shall be made in the emergency plan and the FSAR. Retraining of personnel for the required response shall be performed.

4. Open Items (Criticality)

The following open item discussed with licensee representatives shall be completed prior to criticality:

4/ Ibid.

## Public Address System

Six additional speakers shall be installed in containment pursuant to an issued Startup Field Report.

### 5. Open Items (Power Escalation)

The following open items shall be completed prior to power escalation:

#### a. Supplied Air Cascade System

A permanent supplied air cascade charging system shall be installed.

#### b. Isolation Procedure

An Isolation Emergency Plan Implementing Procedure to cope with weather conditions which require personnel to remain at the station for undetermined periods shall be developed. This procedure shall also address provisions for transportation of emergency personnel to the station when needed during these periods.

#### c. Implementing Procedures

Pursuant to a telephone conversation with a licensee representative on February 23, 1977, it is our understanding that the following will be studied for incorporation into the Emergency Plan Implementing Procedures. These topics relate to those areas where there is a high degree of inaccessibility:

- . Evacuation of personnel to minimize exposure to a hazard
- . Personnel accountability to assist the person in charge of emergency response actions to account for missing persons
- . Reentry into previously evacuated areas for the purposes of saving lives, and search and rescue of missing and injured persons. Safety equipment to be worn depending on areas or conditions shall be addressed.

### 6. Environmental Monitoring Program

The radiological monitoring program results for the period January 1975 through June 1976 were examined. The inspectors

noted the preoperational monitoring program' is being modified as recommended changes to the program are received from the Staff. The current program is essentially the same as will be used during the operational phase as specified in the technical specifications.

The inspectors reviewed the response to deviations reported in a previous inspection<sup>5/</sup> and have no further questions regarding the items reported.

Air sampling sites were visited and it was determined that the licensee had taken corrective action to eliminate leakage potential and that procedure ST 5099.03 incorporates a field leak test. The inspectors stressed the importance of performing the field leak test on a prescribed frequency.

A comparative study between the environmental contractor's TLD results, another contractor's TLD system results and TLD results from the system being processed onsite is continuing. The results of this study will be examined during a subsequent inspection.

The meteorological program remains under contract to the Nuclear Utility Services who maintain the tower, perform calibrations on instrumentation and are responsible for reduction of data. Surveillance Test Procedures (ST's) are being developed for daily operational operability checks and semiannual calibration as current STs do not comply with technical specifications requirements. NUS provides an annual report.

7. Confirmatory Measurements

The licensee's quality control program for analytical measurements for the confirmatory measurements program was examined. Program documentation appears to be adequate to assure accurate and consistent measurements of radioactivity in liquid and gaseous effluents.

The licensee was requested to analyze a simulated liquid waste sample, a stack sampler charcoal cartridge containing "mock I-131" a simulated stack sampler particulate filter, and a simulated gas standard. The results were compared against the NRC's referenced laboratory results (Table I) and tested against the criteria used by the Office of Inspection and Enforcement for comparing analytical measurements (attachment 1). The comparison demonstrates the licensee's capability for measuring radioactivity in liquid and gaseous effluents.

Attachments:

1. Criteria for Comparing Analytical Measurements
2. Table I
- 5/ IE Inspection Report No. 050-346/76-05.

TABLE I  
 U S NUCLEAR REGULATORY COMMISSION  
 OFFICE OF INSPECTION AND ENFORCEMENT  
 CONFIRMATORY MEASUREMENTS PROGRAM  
 FACILITY: DAVIS BESSE  
 FOR THE 3 QUARTER OF 1976

| SAMPLE   | ISOTOPE | -----HSL----- |         | ---LICENSEE--- |       | -----HSL:LICENSEE----- |         |         | I       |     |
|----------|---------|---------------|---------|----------------|-------|------------------------|---------|---------|---------|-----|
|          |         | RESULT        | ERROR   | RESULT         | ERROR | Z VALUE                | PCT     | RATIO   |         | SES |
| F SPIKED | CE 144  | 1.2E-03       | 7.0E-05 | 1.1E-03        | 0.0   | 1.1E+00                | 8.3E+00 | 9.2E-01 | 1.7E+01 | A   |
|          | CS 137  | 1.3E-03       | 3.0E-05 | 1.2E-03        | 0.0   | 2.6E+00                | 7.7E+00 | 9.2E-01 | 4.3E+01 | A   |
|          | MN 54   | 2.7E-04       | 6.0E-06 | 2.0E-04        | 0.0   | 9.6E+00                | 2.6E+01 | 7.4E-01 | 4.5E+01 | F   |
|          | ZN 65   | 4.4E-04       | 1.0E-06 | 3.8E-04        | 0.0   | 4.5E+01                | 1.4E+01 | 8.6E-01 | 4.4E+02 | A   |
|          | CO 60   | 1.1E-03       | 4.0E-05 | 9.3E-04        | 0.0   | 3.2E+00                | 1.5E+01 | 8.5E-01 | 2.8E+01 | A   |
| L SPIKED | H 3     | 3.9E-03       | 4.0E-05 | 3.5E-03        | 0.0   | 7.4E+00                | 1.0E+01 | 9.0E-01 | 9.7E+01 | A   |
|          | SR 89   | 1.3E-03       | 2.0E-04 | 1.3E-02        | 0.0   | 6.9E+00                | 3.3E+03 | 1.4E+01 | 6.5E+00 | D   |
|          | SR 90   | 2.4E-03       | 3.0E-05 | 2.7E-03        | 0.0   | 6.5E+00                | 1.2E+01 | 1.1E+01 | 8.0E+01 | A   |
|          | CE 144  | 1.9E-02       | 1.2E-03 | 1.8E-02        | 0.0   | 6.9E-01                | 5.3E+00 | 9.5E-01 | 1.6E+01 | A   |
|          | CS 134  | 1.7E-03       | 1.0E-04 | 1.7E-03        | 0.0   | 0.0                    | 0.0     | 1.0E+00 | 1.7E+01 | A   |
|          | CS 137  | 4.2E-03       | 1.2E-04 | 4.1E-03        | 0.0   | 5.5E-01                | 2.4E+00 | 9.8E-01 | 3.2E+01 | A   |
|          | CO 60   | 4.0E-03       | 1.2E-04 | 4.0E-03        | 0.0   | 0.0                    | 0.0     | 1.0E+00 | 3.3E+01 | A   |
|          | BETA    | 2.4E-03       | 5.0E-05 | 2.6E-03        | 0.0   | 2.7E+00                | 8.3E+00 | 1.1E+00 | 4.8E+01 | A   |
| C SPIKED | BA 133  | 2.2E-02       | 1.0E-03 | 2.5E-02        | 0.0   | 2.9E+00                | 1.4E+01 | 1.1E+00 | 2.2E+01 | A   |

TEST RESULTS:  
 A=AGREEMENT  
 D=DISAGREEMENT  
 P=POSSIBLE AGREEMENT  
 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 Reference Laboratory'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. The acceptance category reported will be the narrowest into which the ratio fits for the resolution being used.

| <u>RESOLUTION</u> | <u>RATIO = LICENSEE VALUE/NRC REFERENCE VALUE</u> |                               |                               |
|-------------------|---|-------------------------------|-------------------------------|
|                   | <u>Agreement</u>                                  | <u>Possible Agreement "A"</u> | <u>Possible Agreeable "B"</u> |
| <3                | No Comparison                                     | No Comparison                 | No Comparison                 |
| >3 and <4         | 0.4 - 2.5   | 0.3 - 3.0                     | No Comparison                 |
| >4 and <8         | 0.5 - 2.0   | 0.4 - 2.5                     | 0.3 - 3.0                     |
| >8 and <16        | 0.6 - 1.67  | 0.5 - 2.0                     | 0.4 - 2.5                     |
| >16 and <51       | 0.75 - 1.33                                       | 0.6 - 1.67                    | 0.5 - 2.0                     |
| >51 and <200      | 0.80 - 1.25                                       | 0.75 - 1.33                   | 0.6 - 1.67                    |
| >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.

"B" criteria are applied to the following analyses:

Gamma spectrometry, where principal gamma energy used for identification is less than 250 keV.

Sr-89 and Sr-90 determinations.

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

TABLE 1 (CONT'D)

U S NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

CONFIRMATORY MEASUREMENTS PROGRAM

FACILITY: DAVIS BESS

FOR THE 3 QUARTER OF 1976

| -----HSL:LICENSEE----- |      | -----LICENSEE----- |         | -----HSL: EPHOP RESULT (Key)----- |         | -----HSL: EPHOP RESULT----- |         | -----LICENSEE----- |         | -----HSL: EPHOP RESULT----- |      |
|------------------------|------|--------------------|---------|-----------------------------------|---------|-----------------------------|---------|--------------------|---------|-----------------------------|------|
| RES                    | PCT  | 2 VALUE            | ERRR    | RESULT                            | ERRR    | RESULT                      | ERRR    | RESULT             | ERRR    | RESULT                      | ERRR |
| 1                      | R119 | 6.4E+00            | 3.0E+01 | 7.0E-01                           | 2.1E+01 | A                           | 2.3E+05 | 1.1E+04            | 1.6E+05 | 0.0                         | 0.0  |
| A                      |      | 3.0E+00            | 2.0E+01 | 8.0E-01                           | 1.5E+01 | A                           | 1.5E+05 | 1.0E+04            | 1.2E+05 | 0.0                         | 0.0  |
| A                      |      | 1.0E+00            | 1.9E+00 | 9.3E-01                           | 1.5E+01 | A                           | 2.9E+06 | 2.0E+05            | 2.1E+06 | 0.0                         | 0.0  |
| A                      |      | 6.7E-01            | 5.0E+00 | 9.5E-01                           | 1.3E+01 | A                           | 4.0E+05 | 3.0E+04            | 3.8E+05 | 0.0                         | 0.0  |
| A                      |      | 0.0E+00            | 0.0E+00 | 1.0E+00                           | 1.6E+01 | A                           | 1.4E+06 | 9.0E+04            | 1.4E+06 | 0.0                         | 0.0  |
| A                      |      | 1.0E+00            | 6.3E+00 | 9.4E-01                           | 1.6E+01 | A                           | 1.6E+06 | 1.0E+05            | 1.5E+06 | 0.0                         | 0.0  |
| A                      |      | 0.0E+00            | 0.0E+00 | 1.0E+00                           | 1.6E+01 | A                           | 2.3E+06 | 1.4E+05            | 2.3E+06 | 0.0                         | 0.0  |

4 SPIKED

303  
346  
356  
779  
9.4  
1408

1 TEST RESULTS:  
A=AGREEMENT  
D=DISAGREEMENT  
P=POSSIBLE AGREEMENT  
N=NO COMPARISON