

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Performance appraisal for the NRC/State of Colorado Environmental Monitoring Cooperative Agreement NRC-31-83-668

Facility: State of Colorado Department of Health

Appraisal At: Denver, Colorado

Appraisal Conducted: January 8-10, 1986

Appraisal Period: January 1 through December 31, 1984

Appraiser:

Russell Wise  
Russell Wise, Radiation Specialist

2/11/86  
Date

Approved By:

Blaine Murray  
Blaine Murray, Chief, Facilities Radiological  
Protection Section

2/11/86  
Date

Appraisal Summary

Appraisal Conducted on January 8-10, 1986 (Report: 99990004/86-01)

Areas Appraised: Adherence to requirements of the cooperative agreement including: organization and management support, sample collection and analytical procedures, facilities, counting instrumentation, technical staff, laboratory quality assurance, and followup corrective action taken on previously identified deficiencies. The appraisal involved 16 appraiser-hours onsite by one NRC appraiser.

Results: The state's overall performance satisfies the general requirements of the cooperative agreement regarding sample collection and analyses. Several minor deficiencies are discussed in paragraph 3. Based on the state's performance, it is recommended that the cooperative agreement be continued.

B602240406 B60218  
IE GA999 ESQCO  
99990004 PDR

## DETAILS

### 1. Persons Contacted

#### Colorado Department of Health

\*A. Hazle, Director, Radiation and Hazardous Wastes Control Division

\*M. Hanrahan, Sr. Health Physicist

R. Terry, Health Physicist

\*Denotes those present during the exit briefing on January 10, 1986.

### 2. General

The purpose of this appraisal was to evaluate the State of Colorado's compliance with the agreement conditions and review corrective action on the deficiencies reported in the appraisal conducted on May 30-31, 1984.

### 3. Summary and Conclusions

The state's effort, since the previous appraisal conducted in May 1984, has shown improvement. However, several deficiencies still exist. These include:

- a. Written procedures have not been completed and approved for: sample collection and control, response tests, calibration, operation and quality control of all radiation counting facility instrumentation, and preparation methods and documentation for radioactive calibration standards. See paragraph 9 for details.
- b. Airborne data for some samples in 1984 were not available. See paragraph 11.a.(1) for details.
- c. Waterborne data for some samples collected in 1984 were not available. See paragraph 11.b.(1) for details.
- d. Milk data for some samples collected in 1984 were not available. See paragraph 11.c.(1) for details.
- e. Fish sample was not collected and analyzed in 1984. See paragraph 11.d.(1) for details.
- f. The lower limits of detection (LLD) for  $^{131}\text{I}$  in surface water and milk were not met. See paragraph 11.b.(3) and 11.c.(2) for details.

Even though several minor deficiencies still need to be corrected, it is recommended that the cooperative agreement be continued.

4. Management Support

The state has a comprehensive environmental monitoring program in addition to the samples and analyses required by the cooperative agreement. The environmental monitoring program is conducted by the Division of Radiation Control with the support of the Division of Laboratories within the Colorado State Department of Health. The program is administered by qualified personnel who have experience in environmental monitoring and take a concerned interest in the performance of the program. The program is funded with a limited budget to accomplish the present workload and to adequately maintain present laboratory equipment and supplies.

5. Organizational Structure

The NRC appraiser reviewed the State of Colorado's Division of Radiation Control staff assignments and responsibilities. The organizational structure is the same as reported in NRC Appraisal Report 99990004/82-07 conducted in November 1982.

6. Staffing

The NRC appraiser reviewed the staff responsible for the requirements of the cooperative agreement. There have been no changes in the technical staff since the appraisal conducted in November 1982.

7. Facilities and Equipment

The NRC appraiser reviewed the facilities and equipment utilized in the performance of the cooperative agreement. There have been no changes in the facilities and equipment since the appraisal conducted in May 1984.

8. Training

The NRC appraiser noted that staff training primarily consists of on-the-job activities. State personnel have attended NRC sponsored offsite training courses in the past, but none of the staff had attended any during the appraisal period.

9. Procedures

The NRC appraiser reviewed the state's progress in developing program procedures for sample collection and control, instrumentation response tests, calibration and operation of counting instrumentation, preparation methods and documentation for radioactive calibration standards.

The NRC appraiser noted that calibration and operation procedures had been drafted for the gamma spectroscopy system, the low background counting system and an analytical procedure had been drafted for <sup>131</sup>I analysis in surface water utilizing the ion exchange method.

The NRC appraiser noted that progress had been made in this area, but additional work is needed to assure that written procedures are developed for various program areas.

10. Quality Assurance Program

The NRC appraiser reviewed the state's quality control program in conjunction with the laboratory counting instruments. The state participates in the Environmental Protection Agency (EPA) cross-check program. The state's performance during 1984 was reviewed. The NRC appraiser noted that in some areas, the state's cross check results were outside the EPA acceptance criteria. The technical staff was aware of problem areas and is evaluating alternate analytical procedures to improve the laboratory's performance.

11. Cooperative Agreement Required Sample Collection and Analyses

The NRC appraiser reviewed the sample analyses for the period January 1 through December 31, 1984, to determine agreement with Attachment 1 to the cooperative agreement. The licensee, Public Service Company of Colorado, by contract with an independent laboratory, conducts its own environmental sampling and analysis program in corporation with the state. State personnel performed all sample preparation and analyses for their samples in the state laboratories except for TLD direct radiation measurements.

The following cooperative agreement areas were examined and corresponding deficiencies noted:

a. Airborne- Particulates and Radioiodine

The cooperative agreement requires two continuous air samplers: one sampler in close proximity to the licensee's sampler in a high calculated X/Q direction and one at a control location in close proximity to the licensee's sampler. The state and licensee have air samplers located about 0.8 miles south of the plant at a farm building. The state's and the licensee's control sample station is located about 10 miles north of the plant in Johnstown, Colorado. The state operates two additional air sampling stations not required by the cooperative agreement.

Airborne particulate and radioiodine samples were collected weekly by the state at its four sample locations. Gross beta, gamma isotopic, and <sup>131</sup>I analyses were performed in the state health laboratories by state personnel.

The results reported by the state in the 1984 annual report met most of the specific requirements of the cooperative agreement; however, the NRC appraiser noted the following deficiency:

Several airborne sample data were missing from the 1984 annual report. State representatives stated that the missing data was the result of inoperability of sampling equipment and lost samples.

b. Surface Water

The cooperative agreement requires gamma isotopic and tritium analyses on a monthly frequency from two sampling locations for 1984.

The licensee collected immediate area discharge samples and upstream control water samples which were split with the state. The gamma isotopic and tritium analyses were performed in the radiation counting facility by state personnel. The licensee did not perform  $^{129}\text{I}$  analyses on surface water samples.

The results reported in the 1984 annual report met most of the specific requirements of the cooperative agreement; however, the NRC appraiser noted the following deficiencies:

- (1) Sample data for the upstream control water sample for January 1984 was not included in the annual report. State representatives stated that the sample was not obtained because the river was frozen.
- (2) The NRC appraiser noted significant differences in some of the comparative results for the tritium analyses between the state and the licensee for both the area discharge and the upstream control locations. State representatives stated that they would review the results.
- (3) The NRC appraiser noted that the LLD for radiiodine in water did not meet the criteria of 1.0 pCi/liter as specified in Attachment 2 of the cooperative agreement for 1984. The state committed to evaluating some alternative methods for performing this analysis.

c. Milk

The cooperative agreement requires one monthly sample at an offsite dairy located in the highest X/Q direction from the plant. This sample location had been determined to be at Station F44 which is approximately 1.1 miles east of the plant and the sample is collected by the licensee and split with the state. The monthly gamma isotopic analyses were performed in the state radiation counting facility by state personnel.

The results reported in the 1984 annual report met most of the specific requirements of the cooperative agreement; however, the NRC appraiser noted the following deficiencies:

- (1) Sample data for milk samples for January and May 1984 were not included in the annual report. State representatives stated that the sample for January was not received by the state laboratory and the sample for May was not obtained by the state because no milk was available. State personnel are now picking up the sample at the dairy at the time of sampling thereby eliminating potential losses of samples and delays through the mail.
- (2) The NRC appraiser noted that the LLD for radioiodine in milk did not meet the criteria of 1.0 pCi/liter as specified in Attachment 2 of the cooperative agreement for 1984. The state committed to evaluating some alternate methods for performing this analysis.

d. Fish

The cooperative agreement requires one sample of a commercially or recreationally important species in the vicinity of the plant discharge to be sampled semiannually or in season.

The results reported in the 1984 annual report met part of the requirements of the cooperative agreement; however, the NRC appraiser noted the following deficiency:

Only one sample was collected in 1984. The state has corrected the problem and the NRC appraiser noted that two fish samples had been obtained for 1985.

e. Food Products

The cooperative agreement requires two samples split with the licensee of principal food products grown near a point having the highest X/Q, or area irrigated by water into which the plant discharges waste or green leafy vegetables at a private garden or farm in the immediate area of the plant.

The results reported in the 1984 annual report met the requirements of the cooperative agreement.

f. Sediment from Shoreline

The cooperative agreement requires one annual sample split with the licensee for gamma isotopic analysis of shoreline sediment along a body of water into which plant discharge flows.

The results reported in the 1984 annual report met the requirements of the cooperative agreement.

g. Direct Radiation Levels

The cooperative agreement requires the state to exchange the NRC TLDs quarterly and send them for analysis by Region I personnel. The state has a TLD network of locations around the Fort St. Vrain nuclear station in conjunction with the NRC TLD network established in 1980.

The NRC appraiser noted that the licensee's results were about a factor of 2 higher than the state's and NRC's results in 1984. This problem was identified in the previous appraisal conducted in May 1984.

12. Reports

The 1984 annual report was submitted by the state within the time period specified in the cooperative agreement.

13. Exit Briefing

At the conclusion of the appraisal on January 10, 1986, the NRC appraiser discussed the scope and findings of the appraisal with the individuals denoted in paragraph 1. The NRC appraiser discussed those items which did not meet the conditions of the cooperative agreement. The state committed to review the NRC appraiser's findings and implement the necessary program improvements in order to comply with the cooperative agreement.