

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Acceptance appraisal for the NRC/State of Nebraska Environmental Monitoring Cooperative Agreement.

Facility: State of Nebraska Department of Health
Division of Radiological Health
Division of Health Laboratories

Appraisal At: Lincoln, Nebraska

Appraisal Conducted: October 17-18, 1985

Appraiser:

J. Blair Nicholas

J. Blair Nicholas, Senior Radiation Specialist
Facilities Radiological Protection Section

11/22/85
Date

Approved:

J. Blair Nicholas
for Blaine Murray, Chief, Facilities Radiological
Protection Section

11/22/85
Date

Appraisal Summary

Inspection Conducted October 17-18, 1985 (Report 99990004/85-10)

Appraisal Purpose: To perform a preagreement review to determine the capability of the State of Nebraska to provide services of the quality necessary for conducting an environmental monitoring program for the NRC around the Fort Calhoun Nuclear Station and Cooper Nuclear Station.

Areas Discussed and Appraised: Terms of the environmental monitoring cooperative agreement, management support, organizational structure, technical implementation procedures, counting instrumentation, laboratory instrumentation, and facilities. The appraisal involved a total of 28-hours onsite by one NRC appraiser and the Chief, Facilities Radiological Protection Section.

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Results: The state is presently conducting a limited environmental monitoring program around Fort Calhoun Nuclear Station and Cooper Nuclear Station. Some of the sampling and analyses requirements specified in the proposed NRC/State of Nebraska Environmental Monitoring Cooperative Agreement are currently being performed by the state. The state is presently under contract with the NRC to exchange the TLDs associated with the NRC's TLD direct radiation monitoring networks established around Fort Calhoun Nuclear Station and Cooper Nuclear Station. The state should be able to accomplish the work specified in the proposed cooperative agreement with only a few additional samples to their present program such as milk, food products, fish, and shoreline sediment. It is recommended that the necessary actions be completed in order to implement the proposed cooperative agreement effective January 1, 1986.

DETAILS

1. Persons Contacted

Nebraska State Department of Health (NDH)

- *R. Beck, Deputy Director - Administration, NDH
- *B. Macy, Deputy Director - Programs, NDH
- *J. Balk, Radiochemist, Health Laboratories
- *J. Blosser, Director, Division of Health Laboratories
- *H. Borchert, Director, Division of Radiological Health
- *B. Casari, Director, Bureau of Health Protection
- J. DeFraine, Radiation Health Specialist
- *C. Horn, Chief Chemist, Health Laboratories
- C. Rogers, Health Physicist
- *E. Simmons, Radiological Health
- *M. Smith, Laboratory Supervisor, Health Laboratories

Others

- *B. Murray, Chief, Facilities Radiological Protection Section,
U.S. Nuclear Regulatory Commission, Region IV

*Denotes those present during the exit briefing on October 18, 1985.

2. General

The purpose of this appraisal was to review the capability of the State of Nebraska to enter into an Environmental Monitoring Cooperative Agreement with the NRC and discuss the terms and conditions of the cooperative agreement. The environmental independent measurements performed under the cooperative agreement are to be associated with the Fort Calhoun Nuclear Station and Cooper Nuclear Station located near Fort Calhoun, Nebraska, and Brownville, Nebraska, respectively.

The discussion and ensuing appraisal included history and purpose of the NRC environmental monitoring program, explanation of the terms and conditions of the proposed cooperative agreement, and a review of the technical staffing, staff training and experience, organizational structure, managerial support, procedures, technical instrumentation, and laboratory facilities.

It should be noted that the State of Nebraska, Division of Radiological Health, with the support of the Division of Laboratories presently conducts a limited environmental monitoring program around Fort Calhoun Nuclear Station and Cooper Nuclear Station sites. Some of the sampling and analyses requirements specified in the proposed NRC/State of Nebraska

Environmental Monitoring Cooperative Agreement are currently being performed by the state. The state is presently under contract with the NRC to exchange the TLDs associated with the NRC's TLD direct radiation monitoring networks established around Fort Calhoun Nuclear Station and Cooper Nuclear Station.

3. Summary and Conclusion

In general the state has the capability to satisfy the conditions of the proposed cooperative agreement. However, the NRC appraisal team identified the following items which require the state's attention:

- a. The state appeared to need an additional technician to support the professional personnel in order to satisfy the requirements of the proposed cooperative agreement. See paragraph 8 for details.
- b. The state does not currently have an established, comprehensive environmental monitoring program around the two nuclear power facilities. See paragraph 10 for details.
- c. The state had not completed all procedures regarding the environmental radiological monitoring program. See paragraph 12 for details.
- d. The state had not completed calibration of the gamma spectroscopy system for all sample media and counting geometries required by the proposed cooperative agreement. See paragraph 13 for details.
- e. The state had not verified all lower levels of detectability for radionuclides in all environmental sample media against the requirements of the proposed cooperative agreement. See paragraph 14 for details.

The NRC appraisal team found the state's laboratory equipment, nuclear counting instrumentation, and facilities adequate to meet the requirements of the proposed cooperative agreement. However, several items of concern were identified and listed above which require the state's attention. The NRC appraisal team feels that most of these items of concern can be resolved by December 1985. Accordingly, the NRC appraisal team recommends that an Environmental Monitoring Cooperative Agreement be negotiated and put in force with the State of Nebraska effective January 1, 1986.

4. Areas Evaluated

The NRC appraisal team evaluated the following areas which would affect the performance of the proposed cooperative agreement specifications:

- a. Management Support

- b. Organizational Structure
- c. Budget
- d. Staffing
- e. Training
- f. Environmental Monitoring Experience
- g. Facilities and Equipment
- h. Procedures
- i. Quality Assurance Program
- j. Lower Limits of Detection

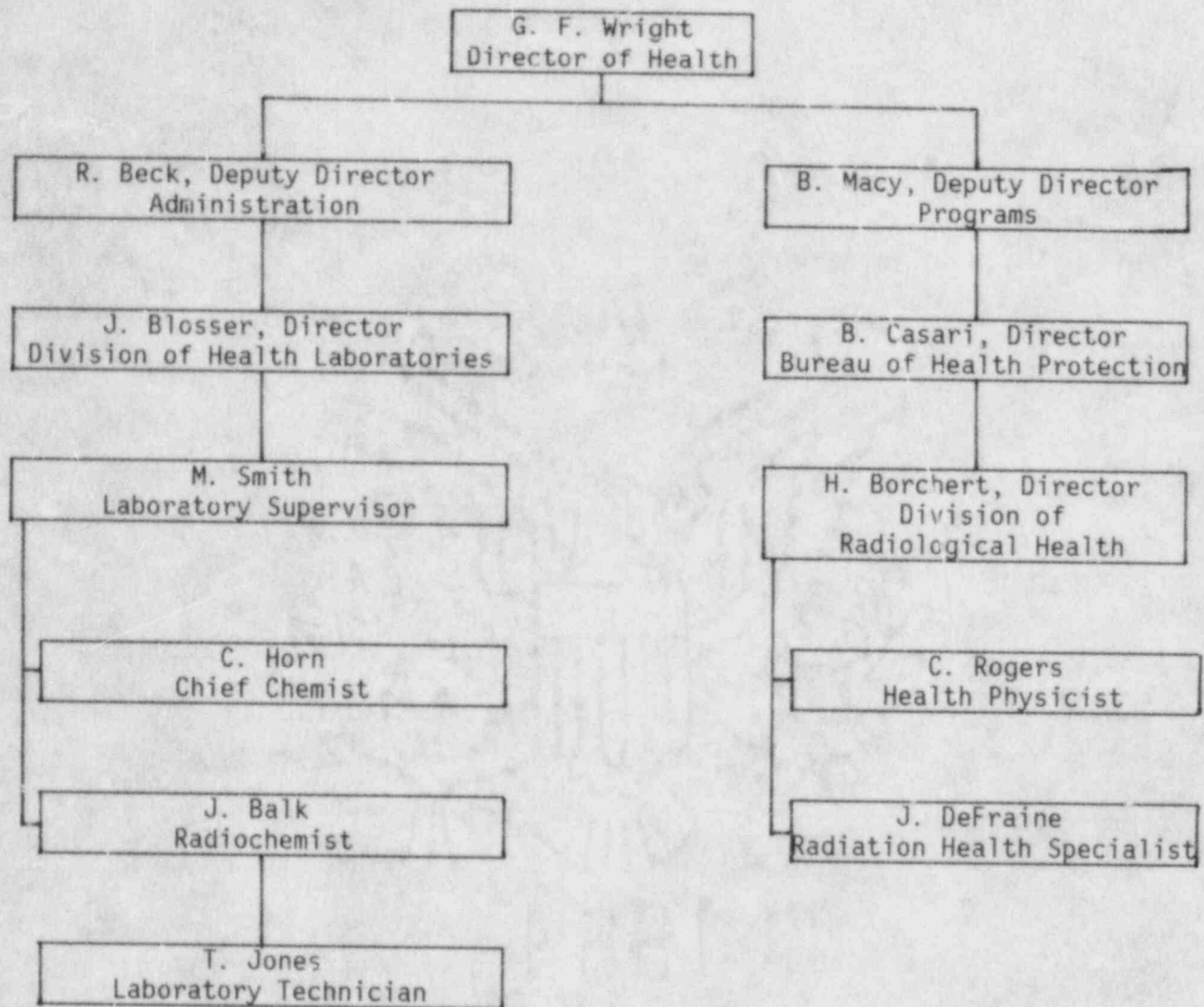
The status of the above items is detailed in the following paragraphs.

5. Management Support

The state currently has a limited environmental monitoring program around the two nuclear power stations located in Nebraska. Discussions with the NDH management indicated that there was a strong interest in initiating an environmental monitoring program as proposed in the cooperative agreement and that the Division of Radiological Health with the support of the Division of Health Laboratories was ready to administer and conduct such a cooperative agreement by providing personnel, facilities, and budget.

6. Organizational Structure

The NRC appraisal team reviewed the current NDH staff assignments and responsibilities as to how they would relate to performing the proposed cooperative agreement. The following diagram shows the present structure and assigned individuals:



The NRC appraisal team determined that the organizational lines of authority were such that the contracting officer, the Director of Health, had direct control over the administration of the cooperative agreement and the analytical laboratory and field personnel.

7. Budget

The NRC appraisal team discussed the state's budget as it relates to funding a sampling and analysis program for environmental monitoring. The state is currently funding administrative personnel and two laboratory staff in radiochemistry. The budget supports the current activities of

the limited environmental monitoring program including sampling, radiochemistry laboratory equipment, and instrument support.

The cooperative agreement is not intended to provide full cost recovery to the state and the state informed the NRC appraisal team that state resources would be made available to accomplish the requirements of the cooperative agreement.

8. Staffing

The NRC appraisal team reviewed the educational backgrounds and qualifications of the technical staff. The Division of Radiological Health and the Division of Laboratories should have sufficient personnel so that the requirements of the cooperative agreement do not degrade the efficiency of the radiological health staff or radiochemistry laboratory. The laboratory should have at least one full time professional radiochemist supported by one technician working full time on sample preparation and radiochemistry analyses and at least one technician working part time coordinating sample collection and sample receipt. It is considered satisfactory to have the environmental samples collected by a local individual near the respective reactor sites or the licensee provided the sample collectors receive sufficient training in collecting representative samples.

The laboratory personnel who will be performing the analytical requirements of the cooperative agreement should have experience in conventional chemistry, radiochemistry, and radiation measurements, particularly gamma spectroscopy. The professional staff responsible for the analyses required by the cooperative agreement should have a minimum of five years experience in chemistry, of which a minimum of one year should be in radiochemistry. The NRC appraisal team found that the present radiochemistry laboratory professional staff met the qualification criteria, but was limited in technician support to adequately perform the analytical workload required by the proposed cooperative agreement.

9. Training

The NRC appraisal team reviewed training activities that would be associated with the cooperative agreement. The state stated that offsite training for laboratory personnel is encouraged, but dictated by budget and availability of applicable courses. The NRC appraisal team noted that Jim Balk had completed the "Radiochemistry Course for State Regulatory Personnel" offered by the NRC at the Radiological and Environmental Sciences Laboratory in Idaho Falls, Idaho. The NRC appraisal team recommended that the radiological health staff involved in supporting the requirements of the proposed cooperative agreement be encouraged to attend the above course. Most of the onsite training has been self motivated and strictly on-the-job as needed. Training records had not been maintained that would

indicate supervision had reviewed and accepted employee proficiency for specific analytical procedures.

The NRC appraisal team indicated that a specific program should be established for the on-the-job training of new laboratory employees. Laboratory personnel should be encouraged to attend specific short courses and workshops to maintain an appropriate level of technical competence.

10. Environmental Monitoring Experience

The NRC appraisal team reviewed the state's experience in performing an environmental monitoring program and radiochemical analyses on environmental samples. The state has conducted a limited statewide surveillance program for the purpose of determining the concentrations of radioactivity in the environment for the past 15 years. The state has monitored the environment surrounding the decommissioned Hallam Nuclear Power Plant site for the past 15 years by taking direct radiation measurements and analyzing well water samples from the surrounding area. Since 1974, the Division of Radiological Health has been taking independent air samples from the areas around Fort Calhoun Nuclear Station and Cooper Nuclear Station. In July 1985, the Division of Radiological Health initiated a split sampling program with the Fort Calhoun Station environmental group including samples of air, milk, fish, surface water, food products, and shoreline sediment. The Division of Radiological Health was currently working with the Cooper Nuclear Station environmental group to establish a similar sampling program.

11. Facilities and Equipment

The NRC appraisal team appraised the radiochemistry laboratory and radiation counting facilities located in the State Department of Health Laboratory and reviewed the equipment and instruments which would be used to perform the work required by the proposed cooperative agreement. The radiochemistry facility is located in the basement of the laboratory building and is divided into two rooms. One room is designed as the instrument counting room and the other room is equipped to be used as the radiochemistry laboratory for sample preparation and analysis, record storage, and personnel office space. The instrument counting room is approximately 150 square feet and is equipped with regulated electrical service, humidity control, and air conditioning. The laboratory area is approximately 400 square feet and equipped with a sink, utilities, approximately 100 square feet of laboratory bench space, and a fume hood to handle radioactive materials.

The NRC appraisal team found that the laboratory equipment, facilities, and counting room instruments appeared to be adequate to perform the requirements of the cooperative agreement. Service agreements were in force on all the nuclear counting instrumentation.

12. Procedures

The NRC appraisal team reviewed existing procedures in the following areas: sample collection, sample control, sample preparation, sample analysis, counting instrument operation and calibration, and quality control of counting instrumentation.

The NRC appraisal team noted that good progress had been made in the area of procedure development. However, it was noted that the procedures reviewed were not written in a format which included for each procedure a title page indicating title, author, procedure number, revision number, date of issuance, and supervision authorizing approval for use.

13. Quality Assurance Program

The NRC appraisal team reviewed the state's quality control program associated with the radiochemistry laboratory instrumentation. The state is a participant in the Environmental Protection Agency (EPA) cross-check program. The state's performance during 1984 and 1985 was reviewed and found acceptable within the EPA acceptance criteria.

The state also performs an internal quality control program. This program consists mainly of calibration and performance checks of the various counting instruments. The calibrations and performance checks have been performed with radioactive sources traceable to the National Bureau of Standards. The NRC appraisal team reviewed the quality control data and calibration data for the radiochemistry laboratory counting instruments. It appeared that the state was performing adequate quality control tests to verify the performance of the radioanalytical counting instruments. However, the review of calibration data for the Nuclear Data gamma spectroscopy system indicated that an air particulate filter composite standard of 12-13 filters had not been prepared for the quarterly composite requirement, a fish or meat calibration standard had not been prepared, and a vegetation/food products calibration standard had not been prepared. These calibration standards must be prepared to specifications which will meet the lower limits of detectability (LLD) and analysis requirements of the proposed cooperative agreement and the Nuclear Data gamma spectroscopy system calibrated for all required counting geometries.

14. LLD

The NRC appraisal team reviewed the LLDs the state had established for the various analyses of the environmental sample media to determine the state's capability in meeting the requirements in Attachment 2 to the proposed cooperative agreement. The LLDs which were reviewed met most of the required limits. The NRC appraisal team informed the laboratory staff

that they should verify that all the required LLDs proposed in the cooperative agreement are being met and for those not being met analytical procedures should be modified to meet the required LLDs.

15. Exit Briefing

At the conclusion of the appraisal on October 18, 1985, the NRC appraisal team discussed the scope and findings of the appraisal with the individuals denoted in paragraph 1. The NRC appraisal team expressed concern regarding those items which did not meet the conditions of the proposed cooperative agreement as outlined in paragraph 3 of this report.