APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-274/93-01

Operating License: R-113

Licensee: U.S. Department of the Interior
Geological Survey
P.O. Box 25046 - Mail Stop 974
Denver Federal Center
Denver, Colorado 80225-0046

Facility Name: Geological Survey TRIGA Reactor Facility
(Class II, TRIGA Mark I)

Inspection At: Geological Survey TRIGA Reactor site, Federal Center,
Denver, Colorado

Inspection Conducted: November 15-18, 1993

Inspector: J. Blair Nicholas, Ph.D., Senior Radiation Specialist
Facilities Inspection Programs Section

Approved: Blaine Murray 12/14/93
Blaine Murray, Chief, Facilities Inspection Programs Section — Date

Inspection Summary

Areas Inspected: Routine, announced inspection of the licensee's organization and management controls, training and qualifications, special nuclear material and accountability, reviews and audits, logs and records, procedures, reactor operations, surveillances, experiments, transportation of radioactive materials, radiation protection, radiological effluents and environmental monitoring, emergency preparedness, physical security, and reports and notifications.

Results:

- Licensed operator positions were filled with qualified personnel. The licensee was actively recruiting to fill the vacant reactor health physicist position. Supervisory controls and reactor operational responsibilities were being implemented as required (Section 1.1).

**DOCUMENT CONTAINS PROPRIETARY INFORMATION
DECONTROLLED WHEN SEPARATED FROM ATTACHMENT 2**

- The Reactor Operations Committee membership met requirements and performed its required duties and responsibilities (Section 1.1).
- The Reactor Operations Committee membership met qualification requirements (Section 2.1).
- An NRC-approved requalification training program for reactor operators was being implemented (Section 2.1).
- The reactor facility's radiation safety training program met regulatory requirements (Section 2.1).
- The inventory and control of special nuclear material met the conditions of the reactor Operating License (Section 3.1).
- Required safety and operations reviews and reactor facility inspections were performed by the Reactor Operations Committee (Section 4.1).
- Detailed reactor maintenance and operations logs and records were maintained (Section 5.1).
- Approved procedures, checklists, and data forms for reactor safety-related operational and surveillance activities were currently updated and well maintained (Section 6.1).
- The reactor was being operated in accordance with the reactor Operating License and Technical Specification requirements (Section 7.1).
- The reactor had experienced numerous unscheduled scrams since the installation of a new digital computerized reactor control console. The licensee had taken steps to reduce the frequency of unscheduled reactor scrams (Section 7.1).
- All Technical Specification surveillance requirements were performed (Section 8.1).
- Reactor experiments had been reviewed and authorized in accordance with Technical Specification requirements. Six new experiments were reviewed and approved per requirements (Section 9.1).
- Transfer of radioactive byproduct material met applicable regulatory requirements (Section 10.1).
- A good radiation protection program was being effectively implemented. Routine gamma radiation surveys and contamination surveys of the reactor facility were performed (Section 11.1).

- Emergency equipment, instrumentation, and supplies were maintained in a state of operational readiness. Licensee staff and support organization personnel were trained and demonstrated knowledge of the NRC-approved Emergency Plan and emergency procedures (Section 13.1).

- An NRC-approved Physical Security Plan was being implemented. The reactor facility security system was installed and operated as committed to in the Physical Security Plan (Section 14.1).

- Annual operating reports and one special report for the reactor included the required information and met reporting requirements (Section 15.1).

- The inspector's radiation survey results were comparable to the licensee's radiation survey results. The smear samples and the reactor pool water sample will be analyzed by the NRC and compared to licensee's results when available. The results of these comparisons will be transmitted at a later date (Section 16.1).

Summary of Inspection Findings:

- Violation 274/9101-01 was closed (Section 17.1).

- Violation 274/9101-02 was closed (Section 17.2).

- Violation 274/9101-03 was closed (Section 17.3).

- Unresolved Item 274/9101-04 was closed (Section 17.4).

- Violation 274/9101-05 was closed (Section 17.5).

Attachment:

- Attachment 1 - Persons Contacted and Exit Meeting

- Attachment 2 - Physical Security Plan - PROPRIETARY INFORMATION

DETAILS

1 ORGANIZATION AND MANAGEMENT CONTROLS (40750)

Organization, management controls, and staffing were reviewed to determine compliance with Technical Specifications H.1, H.2 and H.3.

1.1 Discussion

The inspector verified from discussions with licensee personnel and by direct observation that the organizational structure of the nuclear reactor facility for the reactor operations was as defined in the Technical Specifications. The reactor facility staff assignment responsibilities were described in Section 3 of the US Geological Survey Reactor Operations Manual approved by the Reactor Operations Committee in February 1990. Since the previous inspection conducted in June 1991, the US Geological Survey Health Physicist (Federal Center Radiation Safety Officer) and the Reactor Health Physicist retired. These positions were currently filled with temporary personnel acting in those positions. All other reactor facility staff positions were filled with qualified personnel. Also one reactor facility staff change was made in October 1992 with the appointment of Dr. Carl E. Hedge to the position of Reactor Administrator. The Reactor Supervisor was a full-time reactor facility employee and devoted 100 percent of his time to directly overseeing reactor activities. The Reactor Supervisor was supported by two Senior Reactor Operators (one also acting as the Reactor Health Physicist) in conducting the reactor facility operations. The licensee was actively recruiting to fill the Reactor Health Physicist position. The inspector determined from discussions with licensee personnel that the supervisory control and reactor operational responsibilities were being implemented in accordance with Technical Specification requirements.

The Reactor Operations Committee's membership was reviewed and found to be in accordance with Technical Specification requirements. The inspector reviewed Reactor Operations Committee meeting agendas and minutes and determined that the Reactor Operations Committee meetings were being conducted semiannually during the period April 1991 through October 1993 in accordance with Technical Specification requirements. The Reactor Operations Committee meeting minutes documented that the Reactor Operations Committee had performed the required reviews of facility modifications, experiments, procedures, surveillance tests, and biennially reviews of the Emergency Plan and Physical Security Plan.

1.2 Conclusions

Licensed operator positions were filled with qualified personnel. The licensee was actively recruiting to fill the Reactor Health Physicist position. Supervisory controls and reactor operational responsibilities were

being implemented as required. The Reactor Operations Committee membership met requirements and performed its required duties and responsibilities.

2 QUALIFICATIONS AND TRAINING (40750)

The training and requalification programs for the Senior Reactor Operators and experimenters working in the reactor facility were reviewed to determine agreement with recommendations Industry Standard ANSI/ANS 15.4-1988; Regulatory Guides 8.13, 8.27, and 8.29; and compliance with 10 CFR Parts 19.12 and 55.

2.1 Discussion

The inspector reviewed the experience of the present reactor facility staff and Reactor Operations Committee members and determined that all of the reactor facility staff and the Reactor Operations Committee members met the qualifications required in the Technical Specification H.2 and ANSI/ANS 15.4-1988.

The inspector reviewed the reactor operator requalification program dated September 1989. It was noted that the reactor operator requalification program had been approved by the NRC, and it conformed to the requirements of 10 CFR 55.59. Appendix 3-1 to the US Geological Survey Reactor Operations Manual was reviewed and found to be satisfactory to implement the reactor operator requalification program. Senior reactor operator requalification examinations for 1991, 1992, and 1993 were reviewed and the completed examinations were included in the training records for the senior reactor operators. The individual requalification training records for the three Senior Reactor Operators (which included the Reactor Supervisor) were reviewed and found to contain the documentation required by the reactor operator requalification training program including the annual written requalification examinations, annual reactor operations examination records, and biennial medical examination records. All three of the Senior Reactor Operators took the NRC-administered requalification written and operational examinations on December 8, 1992, and passed. Copies of the examination and the results were filed in each individual's requalification training records.

The inspector reviewed the reactor facility's orientation and radiation safety training programs given to experimenters and personnel who work in Building 15 and the reactor facility. The radiation safety training material was described in Section 8.6 of the US Geological Survey Reactor Operations Manual and met the requirements of 10 CFR 19.12 and included the material in Regulatory Guides 8.13 and 8.29. All personnel working in Building 15 and the reactor facility must complete the key control training and radiation safety training prior to being granted unescorted access to the reactor facility. It was determined that no new personnel had been trained or granted unescorted access to the reactor facility since the previous inspection in June 1991.

2.2 Conclusions

The reactor facility maintained a well qualified reactor operator staff. The Reactor Operations Committee membership met qualification requirements.

An NRC-approved requalification training program for reactor operators was being implemented.

The reactor facility's radiation safety training program met regulatory requirements.

3 LICENSEE CONDITIONS AND SPECIAL NUCLEAR MATERIAL CONTROL AND ACCOUNTABILITY (85102)

The special nuclear material and accountability program was reviewed to determine compliance with 10 CFR Part 70 and the Reactor Operating License R-113.

3.1 Discussion

The inspector reviewed the storage and inventory of the licensee's special nuclear material for compliance with the Reactor Operating License R-113 as revised January 1989. Operating License Conditions 2.B and 2.C authorize the possession of up to 9.0 kilograms of contained uranium-235 at various enrichments and a 3 curie sealed americium-beryllium neutron startup source and a 10 curie sealed polonium-beryllium neutron source, either of which may be used for reactor startup. The inspector performed an inventory of the special nuclear material on site. It was determined that the licensee possessed a 3 curie americium-beryllium neutron start-up source and verified that it was stored in the reactor tank for use in starting up the reactor. The inspector performed a visual inventory of the reactor fuel which the licensee had on site. The inspector verified that the licensee had 2 fuel elements stored in fuel storage well "E", 1 fuel element stored in fuel storage well "C", 9 fuel elements stored in the hexagonal fuel storage rack in the reactor tank, 27 fuel elements stored in the fuel storage racks at the bottom and on the inside perimeter of the reactor tank, and 123 fuel elements in the reactor core. These values agreed with the licensee's inventory of 163 fuel elements on site performed September 30, 1993. The inspector reviewed the licensee's calculations for possession of uranium-235 in the fuel elements. The calculations indicated a total of 5.039 kilograms of uranium-235 on site in the 163 fuel elements as of September 30, 1993. This quantity of uranium-235 was less than the 9.0 kilograms of uranium-235 allowed by the reactor Operating License R-113. The inspector reviewed the licensee's special nuclear material status forms 741, 742, and 742C submitted semiannually to the Nuclear Materials Management Safeguards System Program Control at Oak Ridge, Tennessee, during the time period April 1, 1991, through March 31, 1993. The licensee's forms were found in order and correct as verified by the inspector's inventory of the reactor fuel elements placed in

the reactor core and stored in the reactor tank and facility fuel storage wells.

During the time period January 1 through March 31, 1993, the licensee placed 11 fuel elements from the Michigan State reactor into the reactor core to increase the excess reactivity. On July 8, 1993, fuel was moved within the reactor core to increase the core reactivity. A gain of about $0.35 was realized. Following each of these fuel movements the control rods were recalibrated.

3.2 Conclusion

The licensee's inventory and control of special nuclear material on site met the conditions of the reactor Operating License.

4 REVIEWS AND AUDITS (40750)

The review and inspection programs conducted by the Reactor Operations Committee were reviewed to determine compliance with Technical Specifications H.1, H.2, and H.4.

4.1 Discussion

The inspector determined that the Reactor Operations Committee's reviews and inspections of the reactor facility's experiments, procedures, and operations and maintenance activities were performed semiannually as required by the Technical Specifications. Reactor Operations Committee reactor facility inspection reports were included in the Reactor Operations Committee meeting minutes and were reviewed for scope to ensure thoroughness of program evaluation. The Reactor Operations Committee reviews of reactor operations, reactor maintenance, and Technical Specification requirements were satisfactory to adequately verify that all reactor operating parameters were in compliance with the reactor Operating License and the Technical Specifications.

Minutes of the Reactor Operations Committee meetings held during the period April 1991 though October 1993 were reviewed. The Reactor Operations Committee meeting minutes indicated that the required Reactor Operations Committee reviews were completed in accordance with Technical Specifications H.1 and H.2. The inspector reviewed the 1991 and 1992 annual reports submitted pursuant to 10 CFR 50.59(b) requirements involving the Reactor Operations Committee review of changes to the reactor facility, procedures, tests, and experiments. During 1991, several reactor facility changes were made after being reviewed and approved by the Reactor Operations Committee. These reactor facility changes included the installation in April of an 8-inch diameter vertical beam tube irradiation facility, two 1.5-inch diameter in-core irradiation tubes, one of which was temporarily installed for testing in December, and the replacement of the reactor operating console with

a new digital control console in April. The safety analysis report approved by the Reactor Operations Committee for the installation of the vertical beam tube irradiation facility and the review and approval of the associated experiment were the subjects of two violations resulting from an enforcement conference conducted following the previous inspection performed in June 1991. These violations were closed during this inspection. During 1992, a leaking instrumented fuel element was detected and replaced in June, and neutron detector mounting brackets were replaced. One new neutron detector mount was installed in December 1992, and the installation of the second neutron detector mount was completed in February 1993. Reactor power calibrations were performed and documented following the neutron detector mount replacements. Changes made and approved by the Reactor Operations Committee to operations, test, and maintenance procedures; experiments; the Emergency Plan; and the Physical Security Plan since the last inspection conducted in June 1991 were reviewed. Minutes of the semiannual Reactor Operations Committee meetings for the period April 1991 through October 1993 were reviewed, and it was noted that the required Reactor Operations Committee reviews and activities listed in Technical Specification H.1 were completed and documented.

4.2 Conclusion

Required safety and operations reviews and reactor facility inspections were performed by the Reactor Operations Committee.

5 LOGS AND RECORDS (40750)

The program for documentation of the reactor operations and maintenance activities was reviewed to determine compliance with reactor Operating License Condition 3.C.

5.1 Discussion

The inspector reviewed the documentation of reactor maintenance and operations for the period June 1991 through October 1993. The logs and records documenting reactor maintenance, routine operation, fuel inventory and storage, fuel inspection, experiment authorization and performance, reactor startup checklists, instrument checks and calibrations, radiation surveys, and personnel radiation exposure were reviewed. The inspector determined, by direct observation and review, that the annual reactor operating reports, the quarterly reactor facility operations reports and health physics reports, and the maintenance and operations logs and records adequately documented reactor maintenance and operations activities. The monthly reactor facility surveillance checklists for the period June 1991 through October 1993 were reviewed. The licensee's logs and records were clear, concise, and legible. Reactor operations, inspections, maintenance, and testing were satisfactorily documented in accordance with the reactor Operating License conditions and Technical Specification requirements.

Significant reactor maintenance activities which were performed since the previous inspection conducted in June 1991 included the replacement of regulating rod and shim rod no. 1 fueled follower sections in December 1991, the replacement of a leaking instrumented fuel element in June 1992, the installation of new neutron detector mounts in December 1992 and February 1993, and the removal of the 8 inch beam tube from the reactor tank on January 13, 1993.

5.2 Conclusion

Detailed reactor maintenance and operations logs and records were maintained.

6 PROCEDURES (40750)

Reactor facility procedures were reviewed to determine compliance with Technical Specification H.3.

6.1 Discussion

The licensee had written and approved procedures, checklists, and data forms for safety-related operational and surveillance activities that included reactor startup, operation, and shutdown; maintenance; and checks and calibration of equipment and instrumentation. All twenty operating procedures contained in Section 5 of the US Geological Survey Reactor Operations Manual had been updated, reviewed, and approved by the Reactor Operations Committee since the last inspection conducted in June 1991. A review of selected procedures, checklists, and data forms indicated that the licensee had sufficient and satisfactory programmatic procedures to meet Technical Specification requirements. The procedural reviews conducted by the Reactor Operations Committee were documented in the semiannual Reactor Operations Committee meeting minutes.

6.2 Conclusion

Approved procedures, checklists, and data forms for reactor safety-related operational and surveillance activities were currently updated and well maintained.

7 REACTOR OPERATIONS (40750)

Reactor logs and records were reviewed and reactor operations were observed to determine compliance with reactor Operating License Conditions 3.A, 3.B, and 3.C and Technical Specifications C, D, E, F, and I.

7.1 Discussion

The inspector inspected the reactor facilities and reviewed operations and maintenance logs and records, annual reports, and records of experiment performance to determine compliance with the reactor Operating License and Technical Specification requirements and observed the licensee start-up and operate the reactor at 100 percent power (1000 kilowatts). The inspector determined that the reactor was routinely operated approximately 8 hours per day, 4 days per week, for the purpose of sample irradiations, reactor system tests, and reactor surveillances. The licensee initiated a routine reactor start-up on November 17, 1993, and operated the reactor for 8 hours at approximately 1000 kilowatts steady-state power during which time the inspector observed operation of the reactor protective systems and the digital reactor control console. The inspector noted that between June 1, 1991, and November 15, 1993, that the licensee had not exceeded a thermal power level of 1000 kilowatts (thermal) as specified in Operating License Condition 3.A.

Technical Specification reactor safety limits for operation were reviewed. The reactor pool water temperature and fuel element temperature were verified to be in compliance with Technical Specifications C.1 and D.3.

Technical Specification limiting conditions for operation were reviewed. The total reactor shutdown margin was verified to be $7.13 on November 17, 1993. This value was greater than 0.4 percent delta k/k ($0.60) and in compliance with Technical Specification E.5. The excess reactivity in the reactor was verified to be $4.34 as of September 30, 1993, which was less than 4.9 percent delta k/k ($7.00) and in compliance with Technical Specification D.2. All other reactor reactivity limitations were verified, by review of reactor operations records, to be in compliance with Technical Specifications D and E. The maximum rates of reactivity insertion for the standard control rods were determined to be in the range of $0.074 - $0.164 per second which were less than 0.2 percent delta k/k/sec ($0.286 per second) and in compliance with Technical Specification E.6.

The reactor control and safety requirements were reviewed. The inspector verified, by direct observation, that all of the reactor control system instrument channels, safety circuits, and safety interlocks required in Technical Specifications E.7, E.8, and E.9 were tested and operable and were included on the Reactor Startup Checklist which was completed prior to each startup of the reactor in accordance with Geological Survey Reactor Facility Procedure 1, "Reactor Startup, Operation, and Shutdown." The reactor room area radiation monitors were checked and verified, by direct observation and review of calibration records, to be calibrated and operational in the reactor room. Two area radiation monitors had gamma-sensitive detectors, and one area radiation monitor had a neutron-sensitive detector. The alert and alarm setpoints were verified to be calculated and set to initiate an alarm at predetermined radiation levels. The continuous air monitor, which monitors airborne concentrations in the reactor room, was verified, by direct

observation and review of calibration records, to be operational and calibrated, and that it would provide an audible alarm in accordance with Technical Specification F.2. The reactor room ventilation system interlocks were verified operable per Technical Specification E.12.d.

The design features for the reactor building, reactor pool water systems, reactor fuel, reactor core, control rod elements, and fuel storage per Technical Specifications B, C, D, E, and G were verified from discussion with licensee personnel and by direct observation. The minimum free volume of the reactor room met the Technical Specification B.1 requirement. The reactor pool water cooling system was verified in compliance with Technical Specification C.1. The reactor fuel was verified of the type and enrichment described and required in Technical Specification D.1. The inspector reviewed the current reactor core configuration map and verified, by direct observation, that the fuel elements were positioned in the reactor grid plate in accordance with the current core map and in compliance with Technical Specification D.1. The four reactor control elements were verified, by review of reactor surveillance records, to contain the materials specified for standard TRIGA control elements and have the required scram capabilities in compliance with Technical Specifications E.1, E.5, and E.6. All fuel elements not positioned in the reactor core were stored in the reactor pool in storage racks or in the fuel storage wells. The fuel elements stored in the reactor pool were stored in racks at the bottom of the reactor pool in an arrangement where the K_{eff} had been calculated to be less than 0.8 in compliance with Technical Specification G.1.

The inspector noted that the reactor facility had experienced a significant number of unscheduled reactor scrams and computer lockups after the installation of the new digital computerized reactor control console in April 1991. A total of 122 unscheduled reactor scrams were recorded during the time period April 1 1991, through September 30, 1993, using the new digital computerized reactor control console. These scrams seemed to be caused by communication errors between the data acquisition computer and the control system computer. The new reactor control console also would not perform pulsing operations. The pulse rod would not fire in the pulse mode. In October 1992 new control console software was installed in an attempt to correct the rod withdrawal interlock problem. Subsequent checks of the new software confirmed that the rod withdrawal interlock problem in the rod withdrawal mode was fixed and worked as specified. In December 1992 a representative from the reactor control console manufacturer visited the reactor facility in an attempt to correct the reactor control console computer problems. At that time, pulsing operational problems were corrected, and the troubleshooting of the frequent unscheduled reactor scrams and computer lockups indicated that one of the central processing unit circuit boards might be causing the unscheduled reactor scrams. A new central processing unit circuit board was installed in the control system computer on January 25, 1993. This replacement circuit board reduced the unscheduled reactor scram frequency by approximately 50 percent. On February 8, 1993, a computer

communications network board failed and was replaced. On February 11, 1993, a control rod "UP" optoisolator was replaced in the data acquisition computer because of erratic operation. At the time of this inspection, the number of unscheduled reactor scrams had been reduced to a rate of about 2 or 3 per month.

7.2 Conclusions

The reactor was being operated in accordance with the reactor Operating License and Technical Specification requirements.

The reactor had experienced numerous unscheduled scrams since the installation of a new digital computerized reactor control console. The licensee had taken steps to reduce the frequency of unscheduled reactor scrams.

8 TECHNICAL SPECIFICATION SURVEILLANCE REQUIREMENTS (40750)

Reactor surveillance test results were reviewed to determine compliance with Technical Specifications C, D, E, F, and I.

8.1 Discussion

The inspector verified, from discussions with licensee personnel and by direct observation that the reactor room area radiation monitors and continuous air monitor were operational and would provide an audible alarm in compliance with Technical Specifications F.1 and F.2. The radiation monitors were calibrated annually and the setpoints and alarms verified at least once per week in compliance with Technical Specification F.3. The reactor primary water temperature was monitored during reactor operation and recorded in the reactor operations log and on the Reactor Startup Checklist in compliance with Technical Specification C.1. The reactor pool water was tested for conductivity at least weekly, and the results were documented in the reactor operations log and on the Reactor Startup Checklist prior to each reactor startup. The inspector verified, by review of reactor operations logs and records that the reactor pool water conductivity had not exceeded 5 micromhos per square centimeter averaged over a month for the period April 1991 through October 1993 in compliance with Technical Specification C.2.

The inspector verified, by review of reactor operations logs and reactor shutdown checklists that the reactor shutdown margin had been determined every operating day and properly documented. The results of these determinations were reviewed to determine compliance with Technical Specification E.5. Technical Specification D.6 required that each fuel element be checked for transverse bend and longitudinal elongation after the first 100 pulses of any magnitude and after every 500 pulses or every 60 months, which ever comes first. Surveillance records indicated that the total number of pulses for the life of the reactor was 169 leaving 431 pulses remaining before the fuel element physical measurement inspection would be required or every 60 months,

which ever came first. The reactor operation of 500 pulses of any magnitude had not been achieved to require fuel element physical measurement inspection in accordance with Technical Specification D.6. Therefore, reactor surveillance records indicated that each fuel element was physically inspected and measured in accordance with Technical Specification D.6 in December 1992 to satisfy the 60-month requirement.

The inspector verified, by review of reactor surveillance records, that the control rods had been visually inspected at least once every 2 years for indication of significant distortion or deterioration in compliance with Technical Specification E.2. The last visual fuel element inspection of the control rods was performed in December 1991.

Channel checks of each of the reactor instrument channels and safety circuits were performed before each day's operation in compliance with Technical Specification E.9 and documented on the Reactor Startup Checklist. The inspector verified that the reactor controls and safety interlocks were tested operable and that the reactor power level safety circuits were tested operable at least semiannually in compliance with Technical Specification E.12. Control rod drop times were measured and recorded on the monthly checklist. The monthly checklist dated October 25, 1993, indicated that the control rod drop times for the transient rod, shim rod no. 1, shim rod no. 2, and the regulating rod were 0.58 second, 0.61 second, 0.51 second, and 0.62 second, respectively. These results were less than the 1.0 second required in Technical Specification E.12.b.

Channel calibrations of the reactor power level monitoring safety channels were performed annually in accordance with Geological Survey Reactor Facility Procedure No. 2, "Reactor Power Calibration," and in compliance with Technical Specification E.12.e. The inspector reviewed the results of selected reactor power level instrument calibrations. Reactor power calibrations performed February 10, 1992, indicated channel NM1000 was about 1.6 percent low, Channel NP1000 was about 8.4 percent high, and Channel NPP1000 was within 1.5 percent. Appropriate adjustments were made to bring all reactor power level monitoring channels to within 1.5 percent of the experimentally determined power level according to reactor power calibration procedure calculations. Reactor power calibrations were also performed on August 13, 1992, and Channel NM1000 indicated 800 kilowatts, Channel NP1000 indicated 770 kilowatts, and Channel NPP1000 indicated 800 kilowatts. All reactor power channels gave high power indication when compared to the experimentally determined power level, which was calculated to be 738 kilowatts. All reactor power level monitoring channels were adjusted to indicate 740 kilowatts.

The inspector verified, by direct observation, that the required radiation monitoring systems were installed and operational. The licensee's records indicated that the radiation monitoring systems were checked, maintained, and calibrated in compliance with Technical Specification F.3.

8.2 Conclusion

The licensee had performed all Technical Specification surveillance requirements.

9 EXPERIMENTS (40750)

The program for control and conduct of reactor experiments including evaluations, authorizations, conduct, and documentation of experiments performed was reviewed to determine compliance with Technical Specification I.

9.1 Discussion

Experiments were categorized as either Class I or Class II in accordance with Section 4.5 of the US Geological Survey Reactor Operations Manual. Class I experiments were experiments that had been performed previously or incorporated minor modifications to a previous experiment. A review of selected reactor experiment authorization forms verified that an analysis of irradiation experiments had been performed by the Reactor Supervisor for each Class I experiment configuration prior to issuing an experiment authorization in compliance with Technical Specification I.1. Class II experiments included all new experiments or major modifications to previous experiments. Class II experiments were reviewed by the Reactor Supervisor and approved and authorized by the Reactor Operations Committee. The following Class I experiments were reviewed and authorized by the Reactor Supervisor since the previous inspection: Experiment O-16, routine fission track irradiation; Experiment O-17, activation of rock or coal samples in the G-ring tube; Experiment L-109, activation of a bromine tracer compound; and Experiment C-27, routine Ar-AR age dating of rocks and minerals. The following Class II experiments were reviewed and approved by the Reactor Supervisor and the Reactor Operations Committee since the previous inspection: Experiment O-13 was reviewed and reapproved with minor modifications and subsequently removed from active status, and Experiment O-15 was amended and approved for the irradiation of Charpy specimens in the incore irradiation tubes. The inspector noted that the experiment authorization forms were updated annually and documented the licensee's compliance with the Technical Specification requirements regarding the evaluation, review, and approval of reactor irradiation experiments. The inspector verified, by direct observation, that the experiment authorizations included all of the Technical Specification requirements regarding experiments performed in the reactor. The inspector also reviewed selected reactor irradiation authorization, receipt, and transfer forms which were completed prior to, during, and following the performance of the reactor irradiation experiments. The reactor experiments involved the irradiation of various samples primarily including geology ore samples for isotopic production and various sample types for activation analysis.

9.2 Conclusion

Reactor experiments had been reviewed and authorized in accordance with Technical Specification requirements. Four Class I experiments were reviewed and approved by the Reactor Supervisor, and two Class II experiments were reviewed and approved by the Reactor Supervisor and the Reactor Operations Committee per requirements.

10 TRANSPORTATION OF RADIOACTIVE MATERIALS (86740)

The programs for the transfer of radioactive materials and special nuclear materials were reviewed to determine compliance with the requirements in 10 CFR Part 20, 10 CFR Part 71, and 49 CFR Parts 172-189.

10.1 Discussion

The inspector determined that the licensee had made no shipments of special nuclear material since the previous inspection conducted in June 1991.

The licensee had transferred radioactive byproduct material produced during the irradiation of samples in conducting experiments to other licensed personnel authorized to receive such byproduct material. The inspector reviewed selected reactor irradiation authorization, receipt, and transfer forms which had been completed for each irradiation experiment and found them to be completed satisfactorily.

The reactor facility had generated small quantities of solid radioactive waste as a result of reactor operations and experiments. This solid radioactive waste was primarily reactor system demineralizer resin which was solidified with Portland cement in 55-gallon drums and transferred to the US Geological Survey Byproduct License where it was stored under the supervision of the US Geological Survey Radiation Safety Officer and was subsequently transferred to a licensed hazardous waste broker and shipped for burial. The total amount of solidified radioactive waste released from the reactor facility for burial in 1991 was approximately 20 millicuries solidified in four 55-gallon drums. In 1992 approximately 10 millicuries of solidified radioactive waste was prepared and released from the reactor facility for burial in four 55-gallon drums.

10.2 Conclusion

Transfer of radioactive byproduct material met applicable regulatory requirements.

11 RADIATION PROTECTION (40750)

The radiation protection program was reviewed to determine agreement with the recommendations of Industry Standards ANSI/ANS-15.11-1977 and ANSI N323-1978,

Regulatory Guides 8.4 and 8.21, and to determine compliance with 10 CFR Part 20.

11.1 Discussion

The inspector reviewed selected records and logs, interviewed personnel, made observations, and performed independent radiological survey in the reactor facility.

Radiation exposure records for reactor facility staff were reviewed. It was noted that all personnel with duties in the reactor facility were issued a personal dosimeter on a monthly basis. The inspector determined that the whole body cumulative dose for the calendar years of 1991 and 1992 was less than 200 millirems. Only one personnel contamination was noted since the previous inspection in June 1991. During the time period April 1 through June 30, 1992, an experimenter, while diluting an irradiated bromine powder with benzene, contaminated his left hand to a level of 400 counts per minute beta. Decontamination was accomplished using soap and water.

The program for issuance of self-reading pocket dosimeters to visitors in the reactor facility was reviewed. The issuance of self-reading pocket dosimeters to visitors was performed in accordance with Section 4.3.4 of the US Geological Survey Reactor Operations Manual. The licensee had nine 0-200 millirem self-reading pocket dosimeters available at the entrance to the reactor facility. These self-reading pocket dosimeters had been calibrated and drift checked semiannually. The licensee had a calibration and quality control program established for self-reading pocket dosimeters as recommended by Regulatory Guide 8.4.

The inspector determined that gamma radiation surveys were performed routinely in the reactor room during reactor operation by the reactor health physicist on a monthly basis. Monthly radiation survey data was reviewed for the time period June 1991 through October 1993. The data indicated that personnel working in the reactor room would not exceed 10 CFR 20.101 limits. The inspector reviewed selected monthly contamination survey records for the time period June 1991 through October 1993. The contamination surveys were performed in the reactor room and adjacent laboratory areas and indicated several smearable contamination areas on work table in the reactor room, sink area in the laboratory, work bench top in the laboratory, and hood lip in the laboratory. The highest level of contamination measured was 2500 disintegrations per minute per 100 square centimeters on a bench top in the laboratory. All contaminated areas were decontaminated with soap and water.

According to the January 1993 radiation survey, the highest gamma dose rate was 9 millirem per hour directly over the reactor pool. The radiation surveys were taken while the reactor was being operated at 1000 kilowatts.

The inspector reviewed the licensee's inventory of portable radiation survey instruments. The licensee's inventory of portable radiation survey instruments was adequate. The licensee's portable radiation monitoring instrumentation calibration and quality control programs satisfied the recommendations of Regulatory Guide 8.21 and Industry Standard ANSI N323-1978. Semiannual calibrations of the portable radiation survey instruments were performed, and the calibration records were up-to-date.

The two gamma radiation monitors and one neutron monitor located in the reactor room and the continuous air monitor were sufficient to provide adequate radiation detection capability in the reactor room. The two gamma monitor alarm setpoints were verified, by discussion with licensee personnel, to be set at 50 millirem per hour for the monitor located on the ceiling directly above the reactor and 20 millirem per hour for the monitor located on the west wall of the reactor room. The neutron monitor alarm setpoint was verified to be set at 15 millirem per hour, and the continuous air monitor low alarm setpoint was established at a value of 3000 counts per minute and the high alarm setpoint was established at a value of 10,000 counts per minute so as to provide an alarm prior to exceeding the 10 CFR Part 20, Appendix B, airborne concentration limits.

The inspector noted that the licensee maintained a personnel hand and foot monitor at the exit of the reactor facility to identify possible contamination on individuals leaving the reactor facility.

11.2 Conclusions

The radiation protection program was being effectively implemented. Adequate gamma radiation surveys and contamination surveys of the reactor facility were performed.

12 RADIOLOGICAL EFFLUENTS AND ENVIRONMENTAL MONITORING (40750)

The radiological effluent and environmental programs were reviewed to determine compliance with the requirements in reactor Operating License Condition 3.C.2, Technical Specifications B.3 and B.4, and 10 CFR 20.106.

12.1 Discussion

The inspector reviewed the reactor facility annual reports for 1991 and 1992 concerning effluent releases and environmental monitoring. During 1991, no contaminated water was released to the Federal Center sewer system. The total amount of argon-41 released to the environment during 1991 was calculated to be 9.33 curies which was 13.4 percent of the allowable limit. The total amount of tritium released through evaporation from the reactor pool to the environment during 1991 was calculated to be 2.29 millicuries which was 0.1 percent of the allowable limit. During 1992, 340 liters of seepage water was pumped from the reactor tank annulus. In November 1992, 170 liters of

water containing 0.945 microcuries was diluted to a concentration of 5.9 E-10 microcuries per milliliter prior to discharge into the Federal Center sewer system. In December 1992, 170 liters of water containing 0.267 microcuries was diluted to a concentration of 1.68 E-10 microcuries per milliliter prior to discharge into the Federal Center sewer system. The inspector determined that there had been no uncontrolled radioactivity releases from the reactor facility during 1991, 1992, and 1993 to the time of this inspection.

There is no specific license or Technical Specification requirement to maintain an environmental monitoring program for collection and analysis of direct radiation measurements and samples of air, water, soil, or vegetation. The reactor facility had established an environmental monitoring program as described in Section 8.8 of the US Geological Survey Reactor Operations Manual. The reactor facility had established a network of eight thermoluminescent dosimeter stations around the reactor facility (Building 15) which were exchanged and read by a contractor approximately every 2 months. Six surface water sample locations surrounding and on the Federal Center property had been established. These locations included lakes, ponds, and streams. Thirteen offsite soil sample locations within a 4-mile radius of the Federal Center and thirteen onsite soil sample locations on the Federal Center property had been established. The water and soil samples were collected and analyzed biennially. Water and soil samples were collected and analyzed in 1990 and 1992. The inspector reviewed the environmental water and soil analysis results for 1990 and 1992 and found no problems. The inspector reviewed the environmental thermoluminescent dosimeter data for the time period January 1991 through August 1993 and found no problems.

12.2 Conclusions

Radioactive liquid and gaseous wastes released from the reactor facility met reactor Operating License, Technical Specification, and regulatory requirements. An adequate environmental monitoring program was maintained around the reactor facility.

13 EMERGENCY PLANNING AND PREPAREDNESS (40750)

The inspector reviewed emergency equipment and supplies, changes to the Emergency Plan and emergency procedures, and documentation related to emergency preparedness to determine if the licensee's emergency preparedness program had been maintained in a state of operational readiness. The inspector met with licensee personnel and representatives of offsite emergency response organizations to determine whether the licensee's staff and offsite emergency personnel were trained and prepared to respond to emergency conditions and all emergency response personnel understood their responsibilities.

13.1 Discussion

13.1.1 Changes to the Emergency Plan and Implementing Procedures

The inspector reviewed the current Emergency Plan, Revision 5, dated December 1992. Revision 5 removed the emergency class of "Site Emergency" from the Emergency Plan. It also clarified the remaining classifications of "Alert" and "Unusual Event." Revision 5 was properly reviewed and approved by the Reactor Operations Committee, and it was approved by the NRC in March 1993. The Reactor Operations Committee had performed biennial reviews of the Emergency Plan as required by Technical Specification H.5. The inspector verified, by direct observation, that the licensee had maintained the Emergency Plan as specified in Section 7 of the US Geological Survey Reactor Operations Manual.

The inspector reviewed the emergency procedures contained in Section 7 of the US Geological Survey Reactor Operations Manual dated April 1992. The inspector reviewed these procedures and found them to be satisfactory. The emergency procedures were approved by the Reactor Operations Committee.

13.1.2 Facilities and Equipment

The inspector toured the reactor facility to inspect emergency equipment and supplies. The licensee had maintained emergency equipment and supplies in accordance with the Emergency Plan and emergency procedures. Instrumentation and equipment were maintained for emergency use for conducting radiation surveys and collecting air samples. Emergency sampling equipment and radiation survey instruments were in current calibration. Radiation survey and monitoring instruments were found to conform to the types of instrumentation specified in Sections 7.3 and 7.4 of the US Geological Survey Reactor Operations Manual and the Emergency Plan.

The inspector verified, by direct observation, that fire extinguishers were located in the reactor room and adjacent laboratories as specified in Section 7.4 of the US Geological Survey Reactor Operations Manual.

13.1.3 Emergency Preparedness Program Implementation

The inspector reviewed the licensee's organization and staffing as it related to emergency preparedness and found that all emergency response positions were assigned and staffed. Licensee representatives stated that all emergency response personnel lived within 15 minutes driving time to the reactor facility. The licensee's organizational structure for emergency response conformed to Section 3 and Figure 4 of the Emergency Plan.

The inspector conducted a tabletop discussion with licensee representatives and support organizations to determine if personnel who would be expected to implement the Emergency Plan were trained on the Emergency Plan and could

demonstrate this knowledge and the capability to implement it properly. The tabletop discussion included representatives from the US Federal Protective Service, Lakewood-Bancroft Fire Department, Department of Energy - Rocky Flats Emergency Preparedness Branch, and University of Colorado Health Sciences Center which was designated for treatment of contaminated injury victims. Individuals participating in the tabletop discussion are noted in Attachment 1 to this report.

The tabletop discussion included an evaluation of the licensee's understanding of organizational responsibilities for emergency response activities, the classification and notification of emergencies, and the implementation of emergency procedures. Several reactor facility specific accident scenarios were discussed to evaluate the licensee's and the support emergency response organizations' responses. Representatives of support emergency response organizations described their responsibilities specific to the reactor facility emergency scenarios and their procedures and resources available.

All personnel participating in the tabletop discussion demonstrated a clear understanding of their respective organizations' responsibilities for responding to emergencies at the reactor facility. Representatives from the US Federal Protective Service, fire department, emergency medical services, and the health sciences center (hospital) indicated that specific training had been conducted for response to accidents involving radioactive materials. The health sciences center representative stated that decontamination equipment, radiation survey instruments, and procedures were maintained for treatment of contaminated injury victims. The inspector noted that all representatives participating in the tabletop discussion had an excellent understanding of emergency response procedures. Support representatives indicated that a good relationship was established with the licensee and good cooperation occurred during training exercises.

During the discussion, licensee representatives were able to describe accurately how they would classify certain scenario events, how they would make specific notifications, and how they would respond to certain emergency conditions. Assessment criteria for determining initiating conditions for emergency classification were accurately described for the scenario events presented.

13.1.4 Offsite Support and Emergency Alarms

The inspector verified that intrusion alarms from the reactor facility were received in the US Federal Protective Service dispatcher's office and that fire alarms from the reactor facility were received in the Lakewood-Bancroft fire department dispatcher's office. The inspector noted that an alarm response instruction and a current copy of the emergency call list were readily accessible in the US Federal Protective Service dispatcher's office. The inspector performed a successful test of the alarm system in the

US Federal Protective Service dispatcher's office with the activation of an intrusion alarm at the reactor facility.

The inspector reviewed letters of agreement between the licensee and offsite support organizations. The letters of agreement were current and had been updated biennially.

13.1.5 Emergency Preparedness Exercises and Drills

The inspector reviewed documentation of the annual emergency exercises conducted in June 1992 and June 1993. The emergency exercises were conducted as specified in Section 4.7 of the Emergency Plan. The emergency exercises included participants from the US Federal Protective Service, Lakewood-Bancroft Fire Department, and the Department of Energy's Radiological Assistance Team from Rocky Flats. The inspector noted that the emergency exercises involved excellent participation by the emergency response organizations, were based on realistic scenarios which involved fire and contaminated injury victims, and were followed by a good critique process and training sessions.

13.1.6 Training

The Senior Reactor Operators were trained in the Emergency Plan and emergency procedures during the course of their annual requalification reactor operator training. The inspector noted that the emergency preparedness training for the licensee's staff and offsite emergency response organization personnel was conducted in accordance with Sections 4.7 of the Emergency Plan.

13.2 Conclusions

Licensee personnel responsible for emergency response were trained in the Emergency Plan and implementing emergency procedures and were prepared to respond. An excellent level of participation in licensee's emergency drills and exercises was achieved by support emergency response organizations. Emergency equipment, instrumentation, and supplies were maintained in a state of operational readiness. During the tabletop exercise, the licensee's staff demonstrated their ability to implement the Emergency Plan and emergency procedures and to properly assess and classify emergency conditions.

14 PHYSICAL SECURITY (81401, 81402, 81403, 81431, and 81810)

The inspector reviewed the physical security program to determine compliance with 10 CFR 50.54(p) and the Physical Security Plan, Revision 5, dated August 25, 1989.

In accordance with 10 CFR Part 2.790(d), the material concerning the Physical Security Plan is exempt from disclosure. Therefore, this material is discussed in Attachment 2 and will not be placed in the Public Document Room.

15 REPORTS AND NOTIFICATIONS (40750)

The inspector reviewed the licensee's submittal of reports and notifications to the NRC to determine compliance with reactor Operating License Condition D.

15.1 Discussion

The two annual reactor operating reports for 1991 and 1992 were reviewed. It was determined that the annual reports met the reactor Operating License requirements. One special report was issued to the NRC since the previous inspection of the reactor facility conducted in June 1991. This special report documented the detection of a fuel element cladding leak in June 1992. An investigation determined that an instrumented fuel element (Serial No. 5667), which was originally installed in the reactor core in May 1969, was leaking fission gases into the reactor room as detected by the continuous air monitor. A calculated estimate showed that 54.6 microcuries of activity were released over a 15 day period (June 1-16, 1992). None of the 10 CFR 20 limits were exceeded, the NRC was kept fully informed of the situation, and a special written report was issued to the NRC on June 24, 1992, in compliance with the reporting requirements of reactor Operating License Condition D. The instrumented fuel element was removed from the core and replaced. The reactor was subsequently tested at full power operation and scrammed with no further indication of increased airborne activity by the continuous air monitor.

15.2 Conclusion

Annual operating reports and one special report for the reactor included the required information and met reporting requirements.

16 INDEPENDENT INSPECTION EFFORT (40750)

The inspector performed independent radiation surveys of the reactor room and an isotopic analysis of the reactor pool water for the purpose of comparing measurement results with the licensee.

16.1 Discussion

The inspector performed independent gamma radiation surveys and collected smear samples in the reactor room and adjacent laboratory on November 17, 1993, while the reactor was operating at 1,000 kilowatts. The inspector's radiation survey results compared very closely to the radiation survey results obtained by the Reactor Health Physicist during his monthly survey conducted November 12, 1993, while the reactor was operating at 1000 kilowatts. The inspector also collected and split with the licensee a reactor pool water

sample for the purpose of comparing isotopic analysis results with the licensee. The smear survey results and the isotopic analysis results of the split reactor water sample were not available at the time of the report issuance. The comparison of the results of the smear survey samples and the isotopic analysis results with the licensee will be transmitted by separate correspondence at a later date.

16.2 Conclusions

The NRC's radiation survey results were comparable to the licensee's radiation survey results. The smear samples and the reactor pool water sample will be analyzed by the NRC and compared to licensee's results when available. The results of these comparisons will be transmitted at a later date.

17 FOLLOWUP (92701)

17.1 (Closed) Violation 274/9101-01: Experiment O-13 Authorization Form

This violation was discussed in NRC Inspection Report 50-274/91-01 and involved the lack of adequate procedural guidance being included on the experiment authorization form for the performance of Experiment O-13. Procedures had not been established to provide adequate guidance regarding radiological precautions, handling the 8-inch beam tube, and personnel response in an emergency situation while performing Experiment O-13. The licensee informed the reactor facility staff and the Reactor Operations Committee of the need for more detailed documentation on the experiment authorization form and experiment proceduralization. These discussions were documented in the October 1991 Reactor Operations Committee meeting minutes. The Reactor Operations Committee performed a re-evaluation of Experiment O-13 and added a number of additional requirements and precautions to the Experiment O-13 authorization form dated October 11, 1991. Experiment O-13 was subsequently deleted from the authorized experiments and the 8-inch beam tube was removed from the reactor pool on January 13, 1993, and placed in storage. This was done because there was no near-term experiments that required the use of the beam tube. The inspector determined that the licensee's corrective actions were satisfactory to close the violation.

17.2 (Closed) Violation 274/9101-02: Air Flow Meter Calibration

This violation was discussed in NRC Inspection Report 50-274/91-01 and involved the failure to use a calibrated air flow meter to calibrate the continuous air monitor used to monitor the radiological environment in the reactor room. The licensee had the air flow meter used to calibrate the continuous air monitor calibrated over a range of 1 to 8 cubic feet per minute using a standard flow rate traceable to the National Institute of Standards and Technology on a biennial frequency in July 1991 and June 1993. The flow meter calibration requirement was added to the perpetual activity calendars for both the Reactor Health Physicist and the Reactor Supervisor. The

inspector reviewed the licensee's corrective action for the calibration of the air flow meter and determined them to be satisfactory to close the violation.

17.3 (Closed) Violation 274/9101-03: Radiation Alarm System

This violation was discussed in NRC Inspection Report 50-274/91-01 and involved the fact that the reactor facility radiation alarm system was not directly connected to the Lakewood Fire Department dispatcher's alarm system as described in paragraph 4.4.1 of the Emergency Plan, Revision 2, dated April 1989. The licensee submitted Revision 3 to the Emergency Plan on August 9, 1991, which deleted the requirement to have the reactor facility radiation alarm system connected directly to the Lakewood Fire Department alarm system. Revision 3 to the Emergency Plan was approved by the NRC on September 6, 1991. The inspector determined that the licensee's corrective action was satisfactory to close the violation.

17.4 (Closed) Unresolved Item 274/9101-04: Power Instrument Calibration

This item was discussed in NRC Inspection Report 50-274/91-01 and involved the differences in the readings from the three digital power channels and the possibility that the differences in the power level instrumentation indications might have allowed the reactor power level to exceed the maximum steady-state power level specified in the Operating License R-113. This item was reviewed by the Office of Nuclear Reactor Regulation and a technical position resolution was communicated that this had been noted as a common occurrence at several reactor facilities which had digital power channel indications and did not constitute a violation. This satisfactorily resolved this item.

17.5 (Closed) Violation 274/9101-05: Unreviewed Safety Question - Experiment O-13

This violation was discussed in NRC Inspection Report 50-274/91-01 and involved the lack of a 10 CFR 50.59 evaluation of Experiment O-13. The unreviewed safety question involved the amount of argon-41 which could be released into the reactor room at one instant after prolonged reactor operation in performing Experiment O-13. The calculated argon-41 concentration exceeded the concentrations discussed in the original Facility Safety Analysis Report for the reactor facility. As a result of the violation, the licensee took corrective action of informing the Reactor Operations Committee to perform a more rigorous and detailed safety evaluation of future experiments with regard to the provisions of 10 CFR 50.59. The Reactor Operations Committee subsequently re-evaluated the safety significance of the installation of the 8-inch beam tube in the reactor pool and the performance of Experiment O-13. The NRC accepted the licensee's revised argon-41 hazard analysis on October 9, 1991, and the Reactor Operations Committee re-evaluation was completed on October 11, 1991. The experiment authorization form was revised to provide for a more formal and thorough

process of evaluating the hazards associated with new experiments and the documentation of the evaluation of unreviewed safety questions. Experiment O-13 was subsequently deleted from the authorized experiments and the 8-inch beam tube was removed from the reactor pool. The inspector determined that the licensee's corrective actions were satisfactory to close the violation.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

†*C. E. Hedge, Reactor Administrator
†*T. M. DeBey, Reactor Supervisor
†*P. F. Helfer, Senior Reactor Operator
†*R. E. Perryman, Senior Reactor Operator

1.2 Other Personnel

†H. M. Cullings, Radiation Safety Officer, University of Colorado Health Sciences Center
†K. Germolus, Emergency Management Specialist, Emergency Preparedness Branch, Department of Energy, Rocky Flats
†D. P. Gonzales, Lieutenant, Detail Coordinator, U.S. Federal Protective Service
J. Herrick, Student Health Physicist
†D. Lucas, Lakewood-Bancroft Fire Department
†J. A. Nauman, Fire Fighter, Lakewood-Bancroft Fire Department
†J. Padgett, Assistant Chief, Lakewood-Bancroft Fire Department
†C. Row, Chief, Emergency Preparedness Branch, Department of Energy, Rocky Flats

1.3 NRC Personnel

†*B. Murray, Chief, Facilities Inspection Programs Section

†Indicates those present at the emergency preparedness tabletop discussion on November 18, 1993.

*Indicates those present at the exit meeting on November 18, 1993.

2 EXIT MEETING

An exit meeting was conducted on November 18, 1993. During this meeting, the inspector reviewed the scope and findings of the inspection. The licensee identified the Physical Security Plan, which was provided to and reviewed by the inspector, as proprietary information.

**DOCUMENT CONTAINS PROPRIETARY INFORMATION
DECONTROLLED WHEN SEPARATED FROM ATTACHMENT 2**