

**Cooper Power Systems**

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March 14, 2001

CERTIFIED MAIL, RETURN RECEIPT REQUESTED  
VIA FACSIMILE



Mr. Darrel Weideman  
Sr. Health Physics Inspector  
US Nuclear Regulatory Commission  
801 Warrenville Rd.  
Lisle, IL 60532

Re: Reporting Number 37739

Dear Mr. Weideman:

In accordance with 10 CFR 20.2201(b), this letter serves as our follow-up written report for the notification of the loss of a radioactive source made to the NRC Operations Center on February 13, 2001.

- i. The source is a Ni63 <15 millicuries Perkin Elmer ECD, Serial No. 1648, with a protective cover made of stainless steel. This source was used in conjunction with a Perkin Elmer Gas chromatograph to analyze for Polychlorinated Biphenyls.
- ii. A review of our records on January 18, 2001 revealed a discrepancy in our inventory. We determined that seven ECDs were transferred to the license of NSSI/Sources and Services, INC. in Houston, TX on October 14, 1992 while previous inventories indicated that eight ECDs were present at the facility before October 14, 1992. A thorough review of our records and several comprehensive searches of the facility did not account for the ECD 1648. A research scientist, lab associate and the radiation safety officer (RSO) who were familiar with the ECD in question performed the searches on January 19 through January 22 and February 12 through February 16. The searches included looking through every cabinet in the analytical lab, in all storage boxes for the analytical lab in the basement and a storage area for the analytical lab in another building on the site. The record review consisted of reviewing the operating books for the Perkin Elmer analytical equipment to determine possible dispositions of the ECD as well as the records of the employees that performed the searches. The review of the records resulted in the conversation with NRD Inc. that is discussed below.
- iii. The disposition of ECD 1648 is unknown. We know that the ECD was not part of Perkin Elmer analytical equipment that would have contained the ECD that was sent to a recycler in December 1998. It is our standard practice to check equipment for removal of ECDs prior to shipment; and the research scientist and lab associate that performed the searches discussed above attest to checking the equipment in question.
- iv. Exposure of individuals to radiation is no higher than background levels, because the type of radiation is a beta source and the source is encased in stainless steel. This was verified by checking similar ECDs at the facility on February 22, 2001 with a Geiger counter. The results were at background levels.
- v. Actions taken to recover the ECD include: 1) conducting extensive searches of our facility; 2) contacting NSSI on January 22 to determine if ECD 1648 was mistakenly left off the paperwork; and 3) contacting our ECD repair vendor (NRD Inc. in Grand Island, NY) on February 22 to verify they do not have the source. As discussed above, our records review included questioning the RSO, research scientist and lab associate because they were the most familiar with the ECD in question.
- vi. We have taken comprehensive measures to ensure that all ECDs are accounted for from now on. 1) We initiated a thorough review, revision and upgrade of our radiation safety program. The revised program is attached and its provisions are incorporated by reference in this item. 2) The ECDs not in use are locked in a properly labeled laboratory drawer near the analytical equipment using them and only the RSO and RSO backup have a key. 3) A logbook is in the locked drawer and an entry must be made every time an ECD is added to or removed from the

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drawer. 4) The sources are inventoried every six months as part of the leak test wipe sampling and the results are noted in the logbook for both the ECDs in the drawer and the analytical equipment. 5) The RSO trained the RSO backup and the scientist that is responsible for the analytical equipment that uses the ECD or the upgraded radiation safety program on March 2, 2001 and March 13, 2001 respectively. 6) Cooper Power Systems hired a certified health physicist from Englehardt and Associates to review the radiation protection program February 22, 2001.

This issue was discussed at all levels of the organization, including the CEO of Cooper Industries, and management and all employees of the company are fully committed to maintaining an effective radiation safety program. We believe that the corrective actions outlined above will maintain an effective radiation safety program and prevent any recurrence of a similar event.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert E. Owen", with a long horizontal flourish extending to the right.

Robert E. Owen, Ph.D.

Vice President, Technology Development

COOPER INDUSTRIES, INC.  
COPPER POWER SYSTEMS DIVISION  
FRANKSVILLE, WI

RADIATION PROTECTION PROGRAM

1.0 APPLICATION

This procedure applies to all employees of the Franksville facility of Power Systems Division.

2.0 PURPOSE

The purpose of this program is to establish the necessary requirements to protect personnel from potential injury which could occur while working in, on, or around radiation equipment or materials.

3.0 SUMMARY

A Radiation Protection Program has been established at the Franksville Facility of the Power Systems Division for all individuals who are utilizing equipment capable of producing ionizing radiation or equipment that contains radioactive materials. A written Radiation Protection Program has been established and consists of radiation inventory inspection and measurement, radiation control measures, personal protective equipment, emergency contingency procedures, employee education, recordkeeping, receipt transfer and disposal procedures, licensing/registration (when applicable), and auditing.

4.0 DESCRIPTION

- A. The Franksville Facility utilizes equipment capable of producing ionizing radiation or equipment which contains radioactive materials. A written Radiation Protection Program has been developed to ensure compliance with all applicable governmental regulations.
- B. The Franksville Facility shall use procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and public doses that are as low as is reasonably achievable (ALARA).
- C. The Franksville Facility has designated a Radiation Safety Officer (RSO), and a backup individual. These individuals are: Gary Gauger RSO, and Kevin Rapp RSO backup. These two individuals shall review and update the written Radiation Protection Program annually. These individuals shall have appropriate training on radiation protection techniques periodically.
- D. The Franksville Facility's Radiation Protection Program includes the following key elements:
  - 1. Radiation inventory inspection and monitoring program;
  - 2. Radiation control measures;

3. Education of personnel;
4. Emergency contingency procedures;
5. Recordkeeping, registration, and program auditing; and
6. Receipt, transfer, disposal of sources of radiation.

## 5.0 RADIATION INVENTORY INSPECTION AND MONITORING PROGRAM

- A. The RSO and backup shall conduct a physical inventory and inspection annually to account for the equipment capable of producing ionizing radiation or equipment that contains radioactive materials on-site. Appendix A contains the inventory of radiation sources on site. Appendix B (Located in the Radiation Protection Binder) contains the Radiation Inspection audit sheets for all sources. Records are maintained for all physical inventories and inspections according to the appropriate governing regulations, and are located at the RSO's office.
- B. The Franksville Facility has established a monitoring frequency ( wipe tests, X-ray leakage), based upon the manufacturer's written instructions on each radiation source and device, which is outlined in Appendix A. Results of the monitoring shall be compared to appropriate standards and reviewed by the RSO, the backup individual, and all appropriate employees. Any personnel Records shall be kept on file for the duration of the employees work history plus 30 years. Monitoring wipe tests made every six months and kept on site for a period of at least three years (see Appendix B).
- C. An ECD operational log is maintained in the ECD storage cabinet. This log serves to document any changes in detector use and records the wipe test schedule and results as well as any changes in the ECD inventory.

## 6.0 RADIATION CONTROL MEASURES

The Franksville Facility utilizes several radiation control measures to ensure potential exposures to ionizing radiation are kept as low as is reasonably achievable (ALARA). Examples of these control measures are engineering enclosures, monitoring radiation sources via wipe tests and a geiger counter, equipment hazard labeling, work area hazard posting, limited employee access, and written employee job procedures on safe operation of the equipment. Additional safeguards may be utilized during equipment maintenance and set-up. All operations (production, maintenance and set-up) follow guidelines established by the equipment manufacturer.

## 7.0 EDUCATION OF PERSONNEL

The Franksville Facility provides a detailed education program for all personnel working with, on, or around the radiation source. This training includes the manufacturer's safe operating instructions, a review of all radiation control measures, general radiation protection awareness training, and a review of this written Radiation Protection Program. This training is completed prior to the job assignment and annually thereafter. A detailed description of the training program is included in Appendix C. The manufacturer's safe operating instructions and radiation control measures are located in the RSO's office.

## 8.0 EMERGENCY CONTINGENCY PROCEDURES

A. The Franksville Facility's emergency contingency program is as follows:

1. If any problems are encountered by operators during the operation of the equipment associated with the radiation source, operations will cease and the identified problem will be immediately reported to their supervisor.
2. The supervisor shall assess the problem and correct the deficiency if he/she is capable, otherwise the manufacturer of the equipment shall be contacted immediately for assistance. The manufacturer can be contacted at (302) 633-8000. If the manufacturer is not available, an outside consultant, Susan Engelhardt, Health Physicist of Engelhardt & Associates shall be contacted to provide expertise in radiation protection. Susan Engelhardt can be contacted at (608) 274-4227 or (608) 244-1811.
3. In case of fire, operations will immediately cease and employees shall follow the established facility procedures on Fire Evacuation and Emergency Response. Notification to the Fire Department of the location of the radiation device shall be made by the Radiation Safety Officer to ensure appropriate precautions can be made. If the fire involves the radiation device, the manufacturer shall be immediately contacted at (302) 633-8000. If the manufacturer is not available, an outside consultant, Susan Engelhardt shall be contacted to provide expertise in radiation protection. Susan Engelhardt can be contacted at (608) 274-4227 or (608) 244-1811.
4. If any other safety concerns may arise with the radiation device, the manufacturer shall be contacted. If the manufacturer cannot be reached, the identified outside radiation consultant shall be utilized to provide expertise. The phone numbers of the manufacturer and outside radiation protection consultant are listed above.

## 9.0 RECORDKEEPING, LICENSING/REGISTRATION, AND PROGRAM AUDITING

- A. The RSO and the RSO backup audits the operating parameters and instructions periodically, and annually reviews the regulations to ensure all governmental and manufacturer's requirements for use of the radiation equipment are safely being met. This review/update is documented.
- B. A current copy of the applicable governmental regulations are maintained at this facility and are located at the RSO's office.

## 10.0 RECEIPT, TRANSFER, DISPOSAL OF SOURCES OF RADIATION

The RSO and his backup shall maintain records showing receipt, transfer, and disposal of any radiation source or device. These records shall include the date of receipt, transfer, or disposal, the name of the individual making the record, and make, model, and serial number of the radiation device. Records shall be maintained at this facility until such time as the governing Agency indicates in writing that such records may be disposed. Shipment of the ECD for the purpose of repair or disposal shall comply with DOT or IATA regulations as appropriate. These regulations can be found on pages 43 and 44 in the Hewlett Packard "Information for General Licensees (1998 Edition) found in Appendix D of the Radiation Protection Program.

This document is reviewed annually by: Gary Gauger



Date of Review: February 1, 2001

This document is approved annually by: Robert E. Owen



Date of Review: February 2, 2001

Next Review Date: February 1, 2002

## APPENDIX A

RADIATION DEVICE	LICENSE HOLDER	PHYSICAL LOCATION	MONITORING TYPE	FREQUENCY	MONITORING CONDUCTED BY
S9937	Hewlett Packard (302) 633-8000	Secure Storage	Wipe Test	Six Months	Dick Martin
L0983	Hewlett Packard (302) 633-8000	Secure Storage	Wipe Test	Six Months	Dick Martin
L2318	Hewlett Packard (302) 633-8000	HP 5890 GC SN2536A05792	Wipe Test	Six Months	Dick Martin
F2906	Hewlett Packard (302) 633-8000	HP 5890 Series II SN3033A30422	Wipe Test	Six Months	Dick Martin
F2858	Hewlett Packard (302) 633-8000	HP 5890 Series II SN 3033A30442	Wipe Test	Six Months	Dick Martin
M1234	Hewlett Packard (302) 633-8000	HP 5890 Series II SN 2950A27722	Wipe Test	Six Months	Dick Martin
S9753	Hewlett Packard (302) 633-8000	Secure Storage	Wipe Test	Six Months	Dick Martin

Notes: All ECDs wipe tested every six months (See Appendix B for test results). In the case that wipe test results are greater than 0.005 microcuries GC must be shut down immediately and ECD removed from service.  
Kevex Delta 8000/770 X-Ray Fluorescence Spectrometer System

## APPENDIX C

### Training Information



Electron Capture Detector ECD  
Monitoring and Recordkeeping Policy

- All Electron Capture Detectors (ECD's) are wipe tested every six months.
- All wipe tests are reviewed and approved by the RSO or backup.
- A copy of the ECD wipe test results is provided to the RSO for the records.
- All back-up ECD's are kept in a labeled, locked drawer along with the ECD log book.
- Any abnormal conditions regarding any ECD are reported immediately to the RSO and immediate supervisor.
- Any new operators of gas chromatographs using an ECD are trained before they operate the systems.
- Prior to disposal of any ECD, the RSO will be notified and the proposed disposal company will be reviewed and approved by the RSO.
- The RSO will notify the Nuclear Regulatory Agency in writing prior to the disposal of the ECD.
- The RSO will be notified if any additional detectors are brought on site in either new or used equipment.
- Any additional detectors will be noted in the ECD log book and appropriate agencies notified in writing.
- The source company will be notified of any additional detectors in the case of used equipment originating from a third party.

Training for users of ECD equipment will include the following:

- ECD description and nature of the source
- Read and understand the associated JSA and wipe test procedure
- ECD maintenance
- ECD temperature limitations
- Geiger counter operation and when to use a Geiger counter



## Job Safety Analysis Worksheet

Employee Class: Analytical Laboratory Staff		Date: 13 March 2001	Performed By: L Woodie
Job Activity: ECD Detector Wipe Test Procedure		Original <input checked="" type="checkbox"/>	Reviewed By: <i>[Signature]</i>
		Revision <input type="checkbox"/>	Dept. Mgr.: <i>[Signature]</i>
		Recheck <input type="checkbox"/>	Director: R. Willoughby

Steps		Hazards	Controls
Sequence of Basic Job Steps	Potential Accident Type Code*	Potential Job Hazards	Recommended Safe Job Procedures, Operation Improvement/Redesign, Personal Protective Equipment, and Safety Training
1. Turn off oven on GC	9	Possible burns if not turned off and allowed to cool	1. Assure that sufficient time has elapsed to allow oven temperature to become ambient.
2. Put on gloves and carefully remove glass column	11	Possible cut from sharp edge of column if breakage occurs	1. Assure that gloves are worn to reduce possibility of cuts if breakage occurs..
3. Turn off Detector	7	Possible exposure to low level radiation	1. Assure leakage is not occurring by checking with Geiger counter.
4. Remove ECD cover and inspect for signs of leakage	7	Possible exposure to low level radiation	1. Assure leakage is not occurring by checking with Geiger counter.
5. Wipe column, detector inlet, inside of detector cover, outer portion of detector and detector outlet with IPA.	7	Possible exposure to IPA	1. Wear IPA resistant gloves.
6. Check Wipe with Geiger counter	7	Possible exposure to low level radiation	1. Assure leakage is not occurring by checking with Geiger counter.

\* 1-Struck by or against objects, 2-Contact by or against objects, 3-Caught in or between objects, 4-Falls to same level, 5-Falls from other elevation, 6-Overexertion, 7-Environmental exposure, 8-Electrical contact, 9-Temperature extremes, 10-Hazardous substance exposure.

11 Cut by sharp object

### ECD Detector Wipe Test Procedure

The following can be used with any wipe test kit. Currently test kits from Stan A. Huber Consultants, Inc. are used.

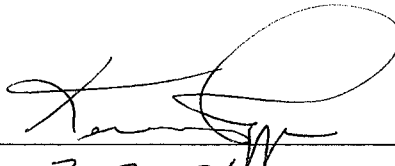
- 1) Set oven temperature to 30°.
- 2) Set packed column injector temperature to 30°.
- 3) Set detector temperature to 30°.
- 4) When 30° temperatures are reached, turn OFF detector.
- 5) Turn OFF oven.
- 6) Make sure disposable gloves are worn until the cover and column are reinstalled.
- 7) Remove packed column and disconnect detector adapter on capillary column.
- 8) Remove ECD detector cover.
- 9) Visually inspect detector for any residue that might indicate leakage.
- 10) Perform wipe test according to instructions included in the kit. Currently the following: First wipe with wet wipe (wetted with isopropyl alcohol); Second wipe the same areas with the dry wipe.
  - end of column or column adapter
  - inside and outside of detector inlet (inside oven)
  - inside of the detector cover
  - outer portions of the detector (gently)
  - detector outlet
- 11) Check the wipes with a Geiger counter and determine if any radiation above background exists. If abnormal radiation is detected, cease further operations and notify the RSO immediately.
- 12) Reinstall detector cover and column.
- 13) Record wipe test and any observations in log.
- 14) Set detector temperature at 310°C and allow to reach temperature.
- 15) When detector temperature has reached greater than 250°C, turn up oven temperature.
- 16) Set injector temperature to 250°C.
- 17) Turn ON detector when temperatures are reached.
- 18) GC should be allowed to sit idle over night to purge system.

## ECD Training Record

I have read and understood the instruction for proper operation, maintenance and record keeping associated with ECD's and have reviewed this information with the RSO.

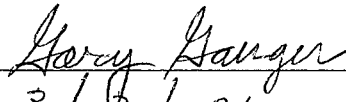
Name of Person Trained \_\_\_\_\_

Date \_\_\_\_\_

  
3-2-01

RSO Signature \_\_\_\_\_

Date \_\_\_\_\_

  
3/2/01

## ECD Training Record

I have read and understood the instruction for proper operation, maintenance and record keeping associated with ECD's and have reviewed this information with the RSO.

Name of Person Trained Anda Woodie  
Date 3/13/01

RSO Signature Gary Ganger  
Date 03/13/01

## ECD Training Record

I have read and understood the instruction for proper operation, maintenance and record keeping associated with ECD's and have reviewed this information with the RSO.

Name of Person Trained

Date

Allen Cabren  
3/13/01

RSO Signature

Date

Gary Ganger  
3/13/01