NUCLEAR POWER SYSTEMS DIVISION

ENGINEERING & DEVELOPMENT

AUGUST 1977 TAB: 3-2

VICE PRESIDENT, ENGINEERING & DEVELOPMENT	F. M. Stern
VICE PRESIDENT, DEVELOPMENT	W. P. Chernock
DIRECTOR, FUELS DEVELOPMENT	R. N. Duncan
DIRECTOR, ENGINEERING DEVELOPMENT & SERVICES	B. J. Selig
DIRECTOR, MATERIALS & CHEMISTRY DEVELOPMENT	P. E. C. Bryant
DIRECTOR, PRODUCT ENGINEERING & DEVELOPMENT	W. T. Withers
MANAGER, HEALTH PHYSICS	P. R. Rosenthal

EXHIBIT 9

Intero[illegible]e Correspondence

CE POWER SYSTEMS

Development Dept. Managers and Supervisors

Radiation Work Permits (RWP)

[redacted] Rosenthal

DDH-77-030

August 2, 1977

cc: P. E. C. Bryant
W. P. Chernock
R. B. Clark
R. N. Duncan
J. M. Limbert
T. G. Moreau
B. J. Selig
R. F. Abrahamsen
J. J. Kurpen

In order to establish a more efficient method for limiting personnel exposure and for monitoring contamination control, effective immediately a radiation work permit (RWP) will be required for all work with radioactive materials under the control of the Development Department. The RWP system is invoked for work to be performed with materials covered by both the SNM and Byproduct material licenses.

The following procedure and rules are applicable to the use of RWPs:

1. The job coordinator or cognizant engineer should complete Items (1) through (5) and present the RWP to the Health Physics Technician assigned to monitor the job (see attached RWP).

2. The Health Physics Technician will establish radiological control requirements, set individual exposure limits and return a copy of the RWP to the job coordinator to be posted in the vicinity of the job.

3. An RWP will normally be issued for a 24-hour day. The Health Physics Technician may extend the RWP on a daily basis for a maximum of a seven-day week.

4. It is the responsibility of the job coordinator to close out the RWP with the Health Physics Technician.

5. In cases where the exposure limit set by the Health Physics Technician is insufficient to complete the job in a seven-day week, a request may be made by the individual's supervisor to increase the exposure limit. Requests of this type shall be approved by Mr. J. M. Limbert.

EXHIBIT 10

6. In cases where work is being performed on a routine basis and the operations are covered by procedures, an RWP may be issued for a 30-day period. For example, routine chemical analysis of uranium in the "warm" chemistry lab could be covered by a 30-day RWP. RWPs issued for a 30-day period shall be approved by J. M. Limbert.

7. RWPs in the following categories shall be approved by the undersigned:

   a. All cases where an individual's total exposure to ionizing radiation for the calendar quarter may exceed 1250 mr.

   b. Cases where individuals may be exposed to air activity greater than 4 MPC hours in any seven consecutive days.

P. R. Rosenthal

PRR/lgd

Attachment

ork Area (3)	If RWP is for more than one day RWP must be initialed and dated by HP before work starts	Date							
		Init							

ob Description (4)

uthorized Personnel (5)	Allowable Weekly Exposure	Date / Expo	Date / Expo	Date / Expo	Date / Expo	Date / Expo	Date / Expo	Date /

tion Levels	Mrem/hr	Contamination Levels	DPM/100 = Beta Alph

Requirements					
___	TLD	___	Full PC's	___	Rubber Gloves
___	Dosimeter (0-200 mr)	___	Cloth Booties	___	Cotton Gloves
___	B-2 Air Sampler	___	Cloth Hood	___	Plastic Suit
___	Lab Coat	___	Rubbers	___	Approved Procedure
		___	Plastic Gloves	___	Other (Specify Bel

SPECIAL INSTRUCTION

Approved By	Date	Terminated By

MAR 9 1978

Combustion Engineering, Inc.
Power Systems Group
ATTN: Philip R. Rosenthal
Manager
1000 Prospect Hill Road
Windsor, Connecticut 06095

License No. 06-00217-06

Control No. 93241

SUBJECT: LICENSE RENEWAL APPLICATION

Gentlemen:

This is to acknowledge receipt of your application for renewal of the material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Leah Tremper
Radioisotopes Licensing Branch
Division of Fuel Cycle and
Material Safety

ITEM # 40 B/40

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

MAY 1 1978

Docket Nos. 70-1100
03003754

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P. O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Inspection 70-1100/78-03; 03003754/78-01

This refers to the inspection conducted by Mr. P. Clemons of this office on April 12-14, 1978 of activities authorized by NRC License Nos. SNM-1067 and 06-00217-06 and to the discussions of our findings held by Mr. Clemons with yourself and Mr. Pianki of your staff at the conclusion of the inspection, and to a subsequent telephone discussion between Mr. Clemons and Mr. Bakevich on April 17, 1978.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Our inspector also verified the steps you have taken to correct the item of noncompliance brought to your attention in a letter dated December 7, 1977. We have no further questions regarding your action at this time.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information

ITEM # 41

B/41

from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which addresses with specificity the items which will be considered by the Commission as listed in subparagraph (b)(4) of Section 2.790. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

No reply to this letter is required; however, should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

Paul R. Nelson, Chief
Fuel Facility and Materials Safety
Branch

Enclosure: Office of Inspection and Enforcement Inspection Report
Number 70-1100/78-03; 03003754/78-01

bcc w/encl:
IE Mail & Files (For Appropriate Distribution)
Central Files
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
Technical Information Center (TIC)
REG:I Reading Room
State of Connecticut

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 70-1100/78-03
03003754/78-01
~~70-1100~~

Docket No. 03003754

License No. SNM-1067
~~06-00217-06~~ Priority 1 Category UR

Licensee: Combustion Engineering
P. O. Box 500
Windsor, Connecticut 06095

Facility Name: Nuclear Manufacturing Facility

Inspection at: Windsor, Connecticut

Inspection conducted: April 12-14, 1978

Inspectors: P. E. Clemons, Radiation Specialist — date signed 4/27/78

_____ — date signed

_____ — date signed

Approved by: P. J. Knapp, Chief, Radiation Support Section, FF&MS Branch — date signed 4-27-78

Inspection Summary:

Inspection on April 12-14, 1978 (Report No. 70-1100/78-03; 03003754/78-01)
Areas Inspected: Routine, unannounced inspection of the Radiation Protection Program including respiratory protection, dosimetry, leak tests, breathing zone air samples, general air samples, stack samples, audits, bioassay, annual report, termination reports, smears, instrument calibration, ventilation, posting and procedures. Shortly after arrival, areas where work was being conducted were examined to review radiation safety control procedures and practices. The inspection involved 20 inspector hours onsite by one NRC inspector.
Results: No items of noncompliance were observed.

DETAILS

1. Persons Contacted

Principal Licensee Employees

*Mr. H. Lichtenberger, Vice President
*Mr. F. Pianki, General Manager, Fuel Fabrication
Mr. J. Limbert, Laboratory Radiation Engineer
Mr. P. Rosenthal, Supervisor, Quality Control and Health Physics - Nuclear Laboratories

The inpsector also interviewed other licensee employees during the course of the inspection. They included operators and health physics specialists.

* denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (1100/77-09-01): Failure to wear film badges in the Pellet Shop. The inspector observed that a sign had been installed at the entrance to the Pellet Facility reminding operators to wear their film badges. The inspector was informed that additional training in the wearing of film badges had been provided to all foremen and Pellet Facility operators in December 1977. The inspector was also informed that the wearing of film badges had been the subject of at least one monthly safety meeting.

3. Respiratory Protection

On April 13, 1978, the inspector asked a licensee representative if they made allowance for the use of respiratory protective equipment. The individual responded in the affirmative. 10 CFR 20.103(c) states that if allowance for the use of respiratory protective equipment is taken, the equipment must be used as stipulated in Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection." The inspector asked the licensee representative if a written policy statement on respirator usage as required by Section C.1 of Regulatory Guide 8.15 had been issued from a high management level. The inspector was shown a written policy statement that had been issued over the general manager's signature.

The inspector also asked the licensee representative if written procedures, such as those discussed in Regulatory Guide 8.15, Sections C.4 (b, c, d, e), and records, as discussed in Section C.4.g, had been developed and maintained. The inspector observed that procedures had been developed in compliance with Sections C.4.b (Selection, supervision and training), C.4.c (Fitting and testing of equipment, and C.4.d (Maintenance of equipment, including cleaning, inspection, repair and storage). The licensee has not developed procedures in compliance with C.4.e (Written operational and administrative procedures for control, issuance, proper use and return of respiratory protective equipment). The procedure will be developed according to a licensee representative. The licensee representative informed the inspector that training in respiratory protection had been provided certain employees in January 1978. The inspector asked if records had been maintained of the training provided. The licensee representative stated that the training had been documented, but the employee was unable to provide the inspector with the required documentation. Section C.4.g of Regulatory Guide 8.15 requires that records sufficient to permit periodic evaluation of the adequacy of the respiratory protection program be maintained.

The licensee has a medical program in which appropriate employees must participate to assure that they are physically able to wear the respiratory protective equipment. The licensee also has an air sampling program and a bioassay program to permit the evaluation of personnel exposures, and to assess the protection actually provided.

The inspector will review the status of program completion at the next inspection (78-03-02).

4. Dosimetry

The inspector reviewed dosimetry records for 1977 for personnel monitored at the Nuclear Fuel Manufacturing Facility and the Nuclear Laboratories. Approximately 400 employees were monitored during the period. According to the data, the maximum whole body exposure received, by one individual, at the Nuclear Fuel Manufacturing Facility was 1265 millirem. The maximum whole body exposure received at the Nuclear Laboratories, by one individual, was 380 millirem.

No items of noncompliance were identified.

5. Leak Tests

Condition 15 of SNM-1067 requires that each Plutonium source shall be tested for leakage at intervals not to exceed six months. The inspector reviewed the leak test data for the four Plutonium sources associated with the Bulk and Powder Assay Unit located in the Pellet Facility Annex. The data indicated that the sources were leak tested on June 29, 1977, and again on February 10, 1978, a period exceeding the six month leak test requirement. The inspector asked the licensee representative if there was an explanation as to why the six month interval was exceeded. The licensee representative stated that the sources were placed in storage during the interval, and they were leaked tested in February, just prior to use. The leak test does not apply to sealed sources that are stored and not being used.

No items of noncompliance were identified.

6. Breathing Zone Air Samples

The inspector reviewed breathing zone air sample data for the period November 1977 to March 1978, for personnel performing operations under the special nuclear materials license and the by-product materials license to determine if the licensee was in compliance with the regulatory requirements.

No items of noncompliance were identified.

7. Stack Samples

The inspector reviewed stack sample data for the period January to March 1978 to determine if the licensee was in compliance with regulatory requirements.

No items of noncompliance were identified.

8. Audits

The inspector questioned licensee representatives regarding the conduct of periodic internal audits as required by Section 8.3 of SNM-1067 for the period of January to March 1978. The inspector reviewed the reports of several audits conducted at the Manufacturing Facility and the Nuclear Laboratories. All of the audits reviewed were concerned with the radiation protection program.

No items of noncompliance were identified.

9. Bioassay

The inspector reviewed bioassay data for the period June to December 1977 for approximately 280 licensee personnel. The data did not indicate any problem with exposure control or any condition exceeding any regulatory limit.

No items of noncompliance were identified.

10. Annual Report

10 CFR 20.407 requires appropriate licensees submit, within the first quarter of each calendar year to the Director of Inspection and Enforcement, personnel monitoring information recorded by the licensee for individuals for whom personnel monitoring was either required or provided.

The inspector reviewed a statistical summary report dated March 7, 1978, that the licensee had submitted to the Director of Inspection and Enforcement.

No items of noncompliance were identified.

11. Termination Reports

10 CFR 20.408 requires a licensee to submit to the Director of Inspection and Enforcement a report of an individual's exposure to radiation and radioactive material, incurred during the period of employment in the licensee's facility when the individual terminates employment with the licensee.

The inspector reviewed nine exposure reports during the period September to December 1977 of employees that had terminated employment with the licensee. These reports had been submitted to the Director of Inspection and Enforcement.

No items of noncompliance were identified.

12. Form NRC-5

10 CFR 20.401(a) requires that "each licensee shall maintain records showing the radiation exposures of all individuals for whom personnel monitoring is required under 10 CFR 20.202 of the regulations. Such records shall be kept on Form NRC-5 in accordance with the instructions contained in that form or on clear and legible records containing all the information required by Form NRC-5. The doses entered on the forms

or records shall be for periods of time not exceeding one calendar quarter."

The inspector reviewed licensee records, the equivalent of Form NRC-5, to determine if the licensee was in compliance with the regualtory requirements.

No items of noncompliance were identified.

13. Instrument Calibration

The inspector reviewed the schedules established for instrument calibration and selected seven survey meters to determine if the instruments had been calibrated at the scheduled frequency.

No items of noncompliance were identified.

14. Smear Survey

Section 15.6.1 of SNM-1067 states that smear samples are routinely taken and analyzed for alpha activity to determine if the contamination is fixed or removable, and to verify compliance with the licensee's internal limits.

The inspector reviewed smear survey data for the period January to March 1978 to determine if the licensee was in compliance with his license condition.

No items of noncompliance were identified.

15. Ventilation

Section 15.7 of License SNM-1067, Ventilation, states, "The capacities of the ventilation systems have been matched to provide a negative pressure differential between the Pellet Processing Facility and all surrounding work areas.

At the inspector's request, a licensee representative made velocity measurements to determine if the Pellet Processing Facility was at a negative pressure differential with reference to the surrounding work areas. The measurement confirmed the fact.

No items of noncompliance were identified.

16. Facilities and Equipment

The inspector toured the facilities and examined equipment and instrumentation to verify that the items were available for use and maintained in an operable state. The inspection included examination of friskers, survey meters, remote area monitors and linear velocities across the "face" of hoods.

No items of noncompliance were identified.

17. Posting

The inspector reviewed the facilities posting against the regulatory requirements, and observed that the licensee was in full compliance with the requirements.

No items of noncompliance were identified.

18. Procedures

Section 8.2 of SNM-1067 states that "written operating procedures are provided by the cognizant engineering supervisor for all operations, including equipment and floor cleanup. These include all criticality and radiological safety restrictions, and limits."

The inspector reviewed procedures located at two operations to assure that the license requirement was being complied with.

No items of noncompliance were identified.

19. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on April 14, 1978. The inspector summarized the purpose and the scope of the inspection and the findings as presented in this report.

C-E Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Tel. 203/688-1911
Telex: 99297

DDH-78-056

POWER SYSTEMS

October 30, 1978

U. S. Nuclear Regulatory Commission
Radioisotopes Licensing Branch
Division of Fuel Cycle and Material Safety
Washington, D. C. 20555

Attention : Mr. F. Combs

Subject : Byproduct Material License 06-00217-06, Control Number 93241

References: (a) CE Letter DDH-78-009, dated February 24, 1978, Radioisotope Licensing Branch

Dear Mr. Combs:

This letter forwards additional information in support of the subject license renewal application. The item numbers below refer to Form NRC-313 and supplemental attachments submitted by reference (a).

Item 13 - Facilities and Equipment

It is a practice of the Development Department that whenever unclad radioactive materials are used in the various research laboratories, the equipment involved is enclosed, where practicle, for protection of personnel and the environment. Generally all laboratory or equipment areas where loose contamination may exceed 10,000 DPM/100CM^2 are candidates for protective enclosures. These enclosures may be of permanent construction or semi-permanent controlled zones. Typical examples of restricted areas utilizing permanent enclosures or controlled zones may be seen in Figures 1 through 5.

All equipment enclosures located in Building 5 exhaust into six HEPA filtered exhaust stacks. Each stack is sampled using a fixed particulate monitor. The stacks are equipped with sample heads designed to Appendix A of ANSI N13.1-1969. Isokinetic samples are obtained using a separate vacuum pump for each stack. Stack samples are normally counted on a daily basis, however, in laboratories where work is performed on a periodic basis, samples may be counted less frequently.

The controlled zones in Building 2 exhaust into a double HEPA filtered system. This system discharges the filtered air into the room in which the controlled zones are located. An isokinetic sample head designed to Appendix A of ANSI N13.1-1969 is located between the two sets of HEPA filters and is connected to a Nuclear Measurement, Inc. continuous air monitor.

ITEM # 42 B/42

Item 14 - Radiation Protection Program

Supplemental information submitted by reference (a) identifies the membership of the Radiological Control Committee. The fifth member of that committee is stated as being an engineer or scientist with a minimum of five years experience in the handling of radioactive materials. The minimum qualifications of the other committee members was not stated because the nature of their professional positions (Manager of Health Physics, Radiological Engineer, etc.) indicates that their expertise in radiation protection was understood. It should be clarified that all members of the Radiological Control Committee will have four years training in radiological health and related sciences or five years of practical experience in the handling of radioactive materials.

The following schedule expands upon the frequency of performing radiological surveys as referred to by reference (a).

SMEAR SURVEYS

Controlled Zones and other restricted work areas	Weekly when in use
Buffer Zones	Daily when in use
Radioactive Material Storage Areas	Monthly
Offices, Hallways, and other unrestricted areas	Weekly

METER SURVEYS

Controlled Zones and other restricted work areas	Weekly when in use
Radioactive Material Storage Areas	Monthly

I trust you will find that this additional information clarifies and/or expands upon statements contained in the referenced renewal application and will allow for continuing review of the subject application.

Very truly yours,

P. R. Rosenthal

P. R. Rosenthal
Manager of Health Physics
Development Department
Nuclear Power Systems

PRR:ki

Attachments

It is further requested that item 6(a) 1) be extended to include isotopes with atomic numbers 1 thru 83 inclusive in lieu of 3 thru 83. This would then include possession of tritium during the analysis of boron carbide (B4C) movable reactor poisons.

P.R. Rosenthal 11/6/78

FIGURE 1

Glove box enclosure used to prepare and polish radioactive samples for metallurgical examination.

FIGURE 2

Glove box enclosure used for analytical weighting and measuring of radioactive material samples.

FIGURE 3

Metallography examination and photography area. Radioactive materials used in this area are not readily dispersible.

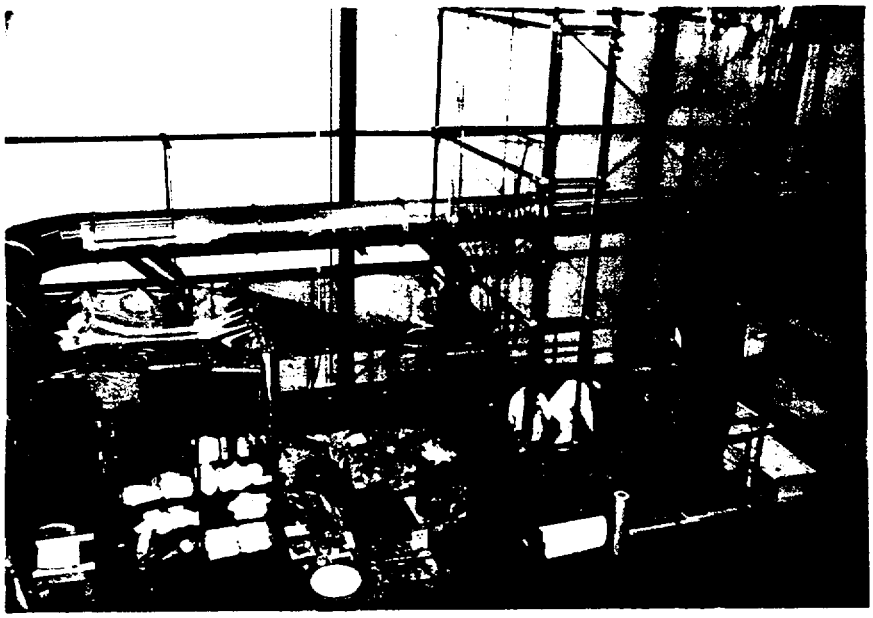

FIGURE 4

Semi-permanent controlled zones used during decontamination, refurbishment and repair of reactor inspection equipment. Health Physics control point and buffer zone is shown between the two controlled zones.

FIGURE 5

View of Building 2-A showing semi-permanent controlled zones and power reactor inspection equipment crated for shipment and storage.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

NOV 1 1978

Docket Nos. 70-1100
03003754

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P. O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Combined Inspection 70-1100/78-08; 03003754/78-02

This refers to the inspection conducted by Mr. P. Clemons of this office on October 11-13, 1978, of activities authorized by NRC License Nos. SNM-1067 and 06-00217-06 and to the discussions of our findings held by Mr. Clemons with Mr. Pianki of your staff at the conclusion of the inspection, and to a subsequent telephone discussion between Mr. Clemons and Mr. Limbert on October 16, 1978.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, measurements made by the inspector, and observations by the inspector.

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. This item of noncompliance has been categorized into the levels as described in our correspondence to you dated December 31, 1974. This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

B/43

ITEM # 43

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which addresses with specificity the items which will be considered by the Commission as listed in subparagraph (b)(4) of Section 2.790. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

George H. Smith

George H. Smith, Chief
Fuel Facility and Materials Safety
Branch

Enclosures:
1. Appendix A, Notice of Violation
2. Office of Inspection and Enforcement Combined Inspection Report Number 70-1100/78-08; 03003754/78-02

bcc w/encls:
IE Mail & Files (For Appropriate Distribution)
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Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
Technical Information Center (TIC)
REG:I Reading Room
State of Connecticut

APPENDIX A

NOTICE OF VIOLATION

Combustion Engineering Docket No. 03003754

Based on the results of an NRC inspection on October 11-13, 1978, it appears that one of your activities was not conducted in full compliance with NRC regulations as indicated below:

10 CFR 71.3, Requirement for license states, "No licensee subject to the regulations in this part shall (a) deliver any licensed materials to a carrier for transport or (b) transport licensed material except as authorized in a general license or specific license issued by the Commission, or as exempted in this part."

Contrary to the above, the licensee shipped 60 curies of Cesium-137, a type B quantity, on July 7, 1978, in a container that was not authorized for Type B quantities of radioactive materials.

This item is an Infraction.

U . NUCLEAR REGULATORY COMMISSIC)
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 70-1100/78-08
03003754/78-02
~~70-1100~~

Docket No. 03003754

License No. SNM-1067
06-00217-06 Priority 1 Category UR

Licensee: Combustion Engineering

P. O. Box 500

Windsor, Connecticut 06095

Facility Name: Nuclear Manufacturing Facility

Inspection at: Windsor, Connecticut

Inspection conducted: October 11-13, 1978

Inspectors: P. E. Clemons, Radiation Specialist — date signed

_____ — date signed

_____ — date signed

Approved by: _____ — date signed
P. J. Knapp, Chief, Radiation Support Section, FF&MS Branch

Inspection Summary:

Inspection on October 11-13, 1978 (Report No. 70-1100/78-08; 03003754/78-02)
Areas Inspected: Routine unannounced inspection by a regional based inspector of the Radiation Protection Program including: respiratory protection, dosimetry, audits, leak tests, breathing zone air samples, stack samples, smears, bioassay, ventilation, termination reports, posting and labelling, training, procedures and shipping. Shortly after arrival, areas where work was being conducted were examined to review radiation control procedures and practices. The inspection involved 20 inspector-hours on site by one regional based NRC inspector.
Results: Of the 14 areas inspected, no items of noncompliacne were identified in 13 areas. One apparent item of noncompliance was observed in one area (infraction - failure to ship in proper container - Paragraph 2).

DETAILS

1. Persons Contacted

Principal Licensee Employees

*Mr. F. Pianki, General Manager, Fuel Fabrication
Mr. G. Bakevich, Nuclear Licensing and Safety Supervisor
Mr. P. Rosenthal, Supervisor, Quality Control and Health Physics - Nuclear Laboratories
Mr. J. Limbert, Laboratory Radiation Engineer

The inspector also interviewed four other licensee employees during the course of the inspection.

* denotes those present at the exit interview.

2. Shipping

On October 13, 1978, as the inspector reviewed smear survey records, he observed a survey of a shipment of radioactive material that was made on July 7, 1978. The inspector asked to see the shipping papers associated with the shipment. A licensee representative provided the inspector with the appropriate documentation.

The Bill of Lading (Shipper's Number 100900117, dated July 7, 1978,) indicated that 60 curies of Cesium -137, Transport Group III, had been shipped in a DOT-7A, Type A container, and according to a licensee representative, the DOT-7A container was contained in a wooden box.

The inspector asked the licensee representative what authorized him to make the shipment in such a fashion. The licensee representative stated that the shipment consisted of two densitometers, fabricated in accordance with the DOT-7A specifications, each containing 30 curies of Cesium-137, in a single wooden box. The licensee representative stated that the densitometers were being returned to Idaho Falls in the manner that they were received.

The inspector requested verification that the densitometers had been fabricated in accord with the DOT-7A specification. The licensee did not have any documents verifying the fact that the densitometers had been fabricated as stated.

The inspector noted that 10 CFR 71.3 Requirement for license states, "No licensee subject to the regulations in this part shall (a) deliver any licensed materials to a carrier for transport or (b) transport licensed material except as authorized in a general license or specific license issued by the Commission, or as exempted in this part."

Assuming that the densitometer meets the requirements of the DOT-7A container, this container is only approved for the shipment of Type A quantities of radioactive material. The upper limit for the Type A category is 3 curies of transport Group III nuclides. As stated earlier, the licensee shipped a total of 60 curies in a single wooden box, consisting of two densitometers, each containing 30 curies of Cesium-137, a Type B quantity of radioactive material. The inspector stated that this represents noncompliance with 10 CFR 71.3. (78-08-01)

In addition to the above, 49 CFR 173.394(a)(1) states "... Each shipper of a Specification 7A packaging must maintain on file for at least one year after the latest shipment, and be prepared to provide the Department, a complete certification and supporting safety analysis demonstrating that the construction methods, packaging design, and materials of construction are in compliance with the specification."

The licensee did not have any of the required documents in his possession.

3. Respiratory Protection

In Item 3 of the Details of Inspection Report 78-03, it was noted that the licensee had developed certain procedures in accord with Regulatory Guide 8.15, Section C.4. The licensee had not developed a procedure to comply with Section C.4.d (Maintenance of equipment, including cleaning, inspection, repair and storage) at the time of Inspection No. 78-03. The inspector verified during this inspection that the licensee had developed the procedure as required.

No items of noncompliance were identified.

4. IE Bulletin No. 78-07

The inspector informed the licensee representative that Region I had not received a reply to IE Bulletin No. 78-07. The licensee representative stated that the Bulletin had been received but a response had not been submitted because the information cited in the Bulletin was not applicable to their situation.

5. Dosimetry

The inspector reviewed dosimetry records for the period January - August 1978, for personnel monitored at the Nuclear Fuel Manufacturing Facility and the Nuclear Laboratories. Approximately 400 people were monitored during the period, and according to the data, no employee exceeded the 10 CFR 20.101 limits.

No items of noncompliance were identified.

6. Audits

The inspector questioned licensee representatives regarding the conduct of periodic internal audits as required by Section 8.3 of Special Nuclear Material License No. SNM-1067 for the period May - September 1978. The inspector reviewed the reports of several audits performed at the Nuclear Laboratories and the Manufacturing Facility. The inspector reviewed only the aspects of the audits concerned with the radiation protection program.

No items of noncompliance were identified.

7. Leak Tests

Condition 15 of SNM-1067 and condition 13.A(1) of Materials License No. 06-00217-06 requires that each radioactive source shall be tested for leakage at intervals not to exceed six months. The inspector reviewed leak test data for sources possessed under the licenses previously cited at the Manufacturing Facility and the Nuclear Laboratories for the period January - August 1978. The data indicated that the sources in use were leak tested as required within the proper time frame.

No items of noncompliance were identified.

8. Breathing Zone Air Samples

The inspector reviewed breathing zone air sample data for the period March - October 1978, for personnel performing operations under the special nuclear materials license and the byproduct materials license to determine if the licensee's operations were being performed in compliance with the regulatory requirements. Approximately forty-five employees were monitored during the period.

No items of noncompliance were identified.

9. Stack Samples

The inspector reviewed stack sample data for the period April - October 1978, to determine if the licensee was in compliance with the regulatory requirements.

No items of noncompliance were identified.

Item 4.a.(3) of Inspection Report 70-1100/78-01 stated that a problem existed with the FA-2 stack sampler being water logged. The inspector determined during this inspection that the licensee has apparently corrected the situation with the addition of an electrical heat tape on the sampling line. A licensee representative stated that it should eliminate the condensation problem.

10. Smear Surveys

Section 15.6.1 of SNM-1067 requires that smear samples of the restricted areas be routinely taken and analyzed for alpha activity to determine if the contamination is fixed or removable, and to verify compliance with the licensee's internal limits.

The inspector reviewed smear survey data for the period April - October 1978, to determine if the licensee was in compliance with the license condition.

No items of noncompliance were identified.

11. Bioassay

The inspector reviewed bioassay data for June 1978 for approximately 250 licensee personnel. The data did not indicate any problem with exposure control or any condition exceeding any regulatory limits.

No items of noncompliance were identified.

12. Ventilation

Section 15.7 of License SNM-1067, Ventilation, states "The capacities of the ventilation systems have been matched to provide a negative pressure differential between the Pellet Processing Facility and all surrounding work areas." It also states, "Filters will be changed whenever a pressure drop of 4 inches of water is measured across the filter bank, or when the face velocity at a hood opening drops below 100 fpm."

At the inspector's request, a licensee representative made velocity measurements to determine if the Pellet Processing Facility was at a negative pressure differential with reference to the surrounding work areas. The licensee representative also made velocity measurements at several hood openings to verify that the velocity exceeded 100 fpm. The inspector reviewed documentation of pressure drop determinations.

No items of noncompliance were identified.

13. Termination Reports

10 CFR 20.408 requires a licensee to submit to the Director of Inspection and Enforcement a report of an individual's exposure to radiation and radioactive material, incurred during the period of employment in the licensee's facility when the individual terminates employment with the licensee.

The inspector reviewed five exposure reports during this inspection for people who had terminated employment with the licensee in 1978. These reports had been submitted to the Director of Inspection and Enforcement as required by the regulations.

No items of noncompliance were identified.

14. Posting

The inspector reviewed the facilities posting against the regulatory requirements, and observed that the licensee was in compliance with the requirements.

No items of noncompliance were identified.

15. Training

Section 15.13 of SNM.1067 requires all persons who are to handle radioactive materials in the Manufacturing Facility receive training in the health and safety requirements.

The inspector reviewed training related documentation which indicated approximately ten new employees had received appropriate training during 1978; the documents also indicated that established employees had been provided training in December 1977, and again in June 1978.

No items of noncompliance were identified.

16. Liquid Waste

The inspector reviewed liquid waste discharge data for the period May - October 1978, to determine if the requirements of 10 CFR 20 were being adhered to.

No items of noncompliance were observed.

During Inspection 70-1100/78-03, the inspector raised the question about the potential presence of beta activity in the liquid waste discharged from Building No. 6 at the Windsor site. During this inspection, the inspector learned that the liquid waste that may contain beta activity is not discharged via Building No. 6, and the waste that is discharged from Building 6 is analyzed for beta activity as well as alpha activity.

17. Shipping Containers

The licensee uses the UNC-2900 shipping container for shipping uranium residue off site. The inspector asked a licensee representative what gave the licensee the authorization to use this container. The licensee provided the inspector with a copy of the certificate of compliance, copies of referenced documents, and the licensee demonstrated that he was a registered user of the UNC container as required by 10 CFR 71.12(b).

No items of noncompliance were identified.

18. Radioactive Material Receipt

10 CFR 20.205(b)(1) requires that "Each licensee, upon receipt of a package of radioactive material, shall monitor the external surfaces of the package for radioactive contamination caused by leakage of the radioactive contents."

The inspector reviewed documentation of ten receipts of radioactive material during the period June - October 1978 to determine if the licensee was in compliance with the monitoring requirement.

No items of noncompliance were identified.

19. Surveys

The licensee has five Plutonium-Lithium neutron sources that are used in the nondestructive assay system and the bulk powder assay system.

On October 11, 1978, the inspector requested to see the survey data as required by 10 CFR 20.201. At this time, the licensee representative could not locate the data, but stated that he was certain surveys had been made. On October 12, 1978, the licensee representative did provide the inspector with the results of three surveys that were performed in January 1977. The maximum dose rates reported were 30 mrem/hr gamma and 22 mrem/hr neutron, both surveys made at contact with the source.

According to the licensee representative, all of the sources are locked in their respective containers and are never moved from these locations, therefore, more frequent surveys are not required.

No items of noncompliance were identified.

20. Exit Interview

The inspector met with the licensee representative (denoted in Paragraph 1) at the conclusion of the inspection on October 13, 1978. The inspector summarized the purpose and the scope of the inspection and the findings as presented in this report.

DEC 8 1978

Docket Nos. 70-1100
03003754

Combustion Engineering, Incorporated
ATTN: Mr. H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P. O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Combined Inspection 70-1100/78-08; 03003754/78-02

This refers to your letter dated November 17, 1978, in response to our letter dated November 1, 1978.

Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a subsequent inspection of your licensed program.

Your cooperation with us is appreciated.

Sincerely,

George H. Smith, Chief
Fuel Facility and Materials Safety
Branch

cc:
W. P. Chernock, Vice President of Development,
Nuclear Power Systems Development Department

bcc:
IE Mail & Files (For Appropriate Distribution)
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State of Connecticut

B/44

ITEM # 44

OFFICE ▶	FFMS	FFMS	FFMS			
SURNAME ▶	Clemons/clc	Crocker	Smith			
DATE ▶	12/5/78	12/6/78	12/7/78			

NRC Form 318 (81) (5-76) NRCM 0240 U. S. GOVERNMENT PRINTING OFFICE: 1978-273-693

C-E Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06

Tel. 203/688-1911
Telex 99297

POWER SYSTEMS

November 17, 1978

U. S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Attention: Mr. George H. Smith, Chief
Fuel Facility and Material Safety Branch

Reference: Letter from G. H. Smith to H. V. Lichtenberger dated 11/1/78
Combined Inspection 70-1100/78-08 and 03003754/78-02

Gentlemen:

This is in response to the above referenced letter in which you report an infraction that was determined during your inspector's visit to our facility on October 11-13, 1978.

The inspector noted that on July 7, 1978, 60 curies of Cesium-137 was shipped in a container that was not authorized for Type B quantities of radioactive material.

A review of the circumstances at the time of the shipment indicates that the employees involved in specifying packaging requirements for the material did not have a clear understanding of some of the requirements of 10 CFR 71 and compatible parts of Title 49. In an effort to avoid similar occurrences in the future, a procedure will be implemented by Nuclear Power Systems Development Department whereby knowledgeable personnel will review each plan for packaging and shipping radioactive materials under purview of 10 CFR 71 to insure compliance with that regulation. It is anticipated that the procedure will be in effect by December 15, 1978.

It is noted that the referenced letter presents results of a combined inspection of both the Special Nuclear Material License and the Byproduct Radioisotope License. Since the latter license is under the jurisdiction of the Nuclear Power Systems Development Department and not the Nuclear Power Systems Manufacturing Organization, it would be helpful if results of inspections of the Byproduct License would be forwarded to the Vice President of Development, Mr. W. P. Chernock.

Very truly yours,

H V Lichtenberger

H. V. Lichtenberger
Vice President-Nuclear Fuel
Nuclear Power Systems Manufacturing

HVL/PRR/ssb

cc: W. P. Chernock

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

APR 17 1980

Docket Nos. 70-1100
30-03754 ✓

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P. O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Inspection 70-1100/80-02 and 30-03754/80-01

This refers to the inspection conducted by Mr. J. Roth of this office on March 10-12, 1980, of activities authorized by NRC License Nos. SNM-1067 and 06-60217-06 and to the discussions of our findings held by Mr. Roth with Mr. Pianki and other members of your staff at the conclusion of the inspection, and to subsequent telephone discussions between yourself and Mr. G. H. Smith on March 13, 1980, Mr. G. Bakevich and Mr. Roth on March 20, 1980 and Mr. P. R. Rosenthal and Mr. Roth on March 26, 1980.

During this inspection, the inspector examined those activities conducted under your licenses relating to the subject covered in IE Bulletin 79-19 "Packaging of Low-Level Radioactive Waste for Transport and Burial" dated August 10, 1979 which are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed. However, it appears that certain aspects of your operation were not conducted as required by IE Bulletin 79-19. These aspects concerning the maintenance of current copies of the DOT Regulations for both operations and establishment of a formal audit program in the byproduct material area are described in detail in the enclosed inspection report. Please submit to this office, within twenty (20) days of your receipt of this notice, a written statement in reply including (1) the actions to be completed and (2) the date when these actions will be completed.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC's Public Document Room. If this report contains

B/45

ITEM # 45

any information that you (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which addresses with specificity the items which will be considered by the Commission as listed in subparagraph (b) (4) of Section 2.790. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

for George H. Smith, Chief
Fuel Facility and Materials Safety
Branch

Enclosure: Office of Inspection and Enforcement Inspection Report
Numbers 70-1100/80-02 and 30-03754/80-01

bcc w/encl:
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REG:I Reading Room
State of Connecticut
IE Headquarters, FFMSI (Attn: A. Grella)
DOT Office Local to the Facility
NRC Office of State Program (Attn: G. W. Kerr) 3 copies
NMSS, Division of FCMS (Attn: D. A. Nussbaumer)
NMSS, Division of WM (Attn: R. Browning)

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 70-1100/80-02
30-03754/80-01
70-1143

Docket No. 30-03754

License No. SNM-1067
06-00217-06 Priority 1
4 Category UR
E

Licensee: Combustion Engineering, Incorporated

P. O. Box 500

Windsor, Connecticut 06095

Facility Name: Nuclear Fuel Manufacturing and Nuclear Laboratories

Inspection at: Windsor, Connecticut

Inspection conducted: March 10-12, 1980

Inspectors: J Roth
J. Roth, Project Inspector — 4/7/80 date signed

_____ date signed

_____ date signed

Approved by: H. W. Crocker
H. W. Crocker, Chief, Fuel Facility
Projects Section, FF&MS Branch — 4/14/80 date signed

Inspection Summary:

Inspection on March 10-12, 1980 (Report Nos. 70-1100/80-02 and 30-03754/80-01)
Areas Inspected: Special unannounced inspection by a region-based inspector of the licensee's response to IE Bulletin No. 79-19. The inspection was initiated on the day shift and involved 19 inspector-hours onsite by one NRC region-based inspector.
Results: Of the one area inspected; no apparent items of noncompliance were identified.

Region I Form 12
(Rev. April 77)

DETAILS

1. Persons Contacted

*G. Bakevich, Manager, Nuclear Licensing, Safety and Accounting
*F. Pianki, General Manager, Fuel Fabrication
P. R. Rosenthal, Manager, Health Physics
T. B. Bowie, Manager, Nuclear Materials and Security
*G. Johnston, Radiation Specialist

The inspector also interviewed 15 other licensee employees during the course of this inspection. These included operators; foremen; health and safety, engineering, shipping and general office personnel.

*denotes those present at the exit interview.

2. Review of Licensee's Response to IE Bulletin No. 79-19

The inspector reviewed the licensee's response to IE Bulletin No. 79-19 dated September 24, 1979, to assure that all information required by the bulletin was included, and, to ascertain that corrective action commitments were also included. It was noted that the licensee's response did not include the plan of action and schedule of completion for items 3, 4, 5, 6, 7 and 8.

3. Regulatory Documents

The inspector verified that the licensee had a current set of NRC regulations. The licensee maintains copies of the NRC Regulations from the U.S. Government Printing Office, Superintendent of Documents, as part of a subscription service. This service assures that the NRC regulations are maintained current. The licensee maintains bound copies of the DOT regulations. The most current revision of these regulations is current to October 1, 1978. The licensee is considering subscribing to a subscription service provided by DAT-O-LINE, Inc. of Charleston, South Carolina to assure that the DOT regulations are maintained current. The licensee expected to obtain at least one copy of this subscription service by March 31, 1980.

Copies of available regulatory documents were being maintained in the Building 17 Health Physics Office, the Building 5 Health Physics Office and the Office of the Manager, Nuclear Materials and Security. The copy of the DOT subscription service will be maintained the Building 17 Health Physics Office. Additional copies of the subscription

service will be supplied to the other locations when available. (1100/80-02-01) (3754/80-01-01)

4. Burial Site Requirements

According to licensee representatives, radioactive waste shipments are made only to the burial site in South Carolina.

The inspector verified that the licensee maintained current copies of Chem-Nuclear's NRC and State of South Carolina licenses. The inspector also reviewed a current copy of the burial site criteria for the South Carolina site. Copies of these documents were also being maintained at the same locations as the DOT and NRC regulations as indicated in paragraph 3.

5. Organization

The inspector determined through discussions with licensee representatives that the ultimate responsibility to assure that low-level radioactive waste is properly packaged, transferred and transported rests with the Manager, Nuclear Material and Security.

a. Nuclear Fuel Manufacturing

According to a memorandum dated November 5, 1979, responsibility for activities related to low-level radioactive waste in the Nuclear Fuel Manufacturing Department is as follows:

(1) Manufacturing Engineering was responsible for writing procedures and specifications.

(2) The Production Control Group was responsible for packaging and transport of radioactive materials with overchecks provided by the Nuclear Licensing, Safety and Accountability Group.

(3) The Nuclear Licensing, Safety and Accountability Group was responsible for obtaining copies of the NRC and DOT regulations, for maintaining cognizance of current NRC, DOT and burial site requirements and for establishing a training program and training applicable personnel.

b. Nuclear Laboratories

The inspector determined that byproduct radioactive waste materials generated in the Nuclear Laboratories are packaged and prepared for shipment and subsequent disposal under the direct supervision of the radiological engineer or a health physics technician. Radioactive wastes containing special nuclear material are transferred to Nuclear Fuel Manufacturing for final packaging and preparation for shipment.

6. Procedures

a. Nuclear Fuel Manufacturing

The inspector verified that the following procedures had been reviewed, revised as needed, approved, and released by licensee management for use by applicable personnel for the transfer, packaging and transport of low-level radioactive waste material.

(1) OS 1747, "Filter Knockdown Procedure," released November 28, 1979

(2) OS 1753, "Waste Generation Control Procedure," released December 7, 1979

(3) OS 1764, "17-H Drum Waste Packaging, Assaying and Releasing," released January 22, 1980

(4) OS 1768, "Packaging, Assaying and Releasing Procedures for UO_2 Liners," released February 13, 1980

(5) OS 1773, "Parts Washing Procedure - (for Filter Parts)", released February 13, 1980

(6) "Surveys of Incoming and Outgoing Trailers", dated February 13, 1980

In addition, the following written specification for 17-H 55 gallon drums has been prepared but not released for use as of the date of this inspection.

PS-14-01, "17-H Drum Specification"

The inspector examined the above procedures and noted that in many cases specific regulatory requirements were not addressed

but sufficient information was given to allow personnel to generate or provide the data or information required by the regulatory requirements.

b. Nuclear Laboratory

The following instructions and procedures were being implemented and maintained by the Nuclear Laboratory Health Physics Group responsible for the transfer packaging and transport of low-level radioactive waste material.

(1) "Radioactive Material Shipping Transaction Record" dated April 17, 1979

(2) Procedure No. 00000ESH-001, "Operating Procedure for Building 2A Barrel Compactor" Revision 0, dated October 31, 1979

(3) "Radioactive Waste Storage Area", dated October 24, 1979

In addition, the licensee has been prepared and is currently reviewing a draft procedure "Low-Level Byproduct Waste Handling" which, according to licensee representatives, should be issued by May 1, 1980. This procedure addresses the applicable NRC and DOT regulatory requirements which must be followed to assure compliance. (3754/80-01-02)

7. Training

a. Nuclear Fuel Manufacturing

The licensee has provided training to operators and other personnel who transfer, package and transport low-level radioactive waste. The inspector determined that the training consisted of: the importance of minimizing waste; packaging procedures; condition of the packages; sealing of the package; labeling of the package; DOT, NRC and burial site requirements; techniques of health physics release; loading of the packages onto transport vehicles; and, the necessity of following procedures. Each training session lasted between 1 and 1½ hours and was conducted for each of the three operating shifts on March 4, 1980. Personnel who were not available on March 4, 1980 were trained during a makeup session conducted on March 10, 1980.

Licensee respresentatives indicated that similar retraining sessions will be conducted on an annual cycle.

b. Nuclear Laboratories

The Nuclear Laboratories' Radiological Engineer attended a "Hazardous Materials Training Course on the Hazardous Materials Regulations of the US-DOT" which was conducted by UNZ Company/Taggart Associates. This course was attended in Hartford, Connecticut during the month of April, 1979. The course contents included material relative to the transportation of radioactive materials. The radiological engineer trained the health physics technicians in the contents of this course upon completion of the course in April, 1979. Byproduct radioactive materials from the Nuclear Laboratories are packaged and prepared for shipment under the direct supervision of the radiological engineer and/or a health physics technician.

Personnel generating radioactive waste materials in the Nuclear Laboratories were trained in applicable topics on October 10, 1979. Retraining session had been scheduled to be given to these personnel on March 13-14, 1980.

8. Audit Program

a. Audit Function

(1) Nuclear Fuel Manufacturing

The inspector verified that the licensee has established an audit function which is management controlled. This audit function is described in Section 8.3 "Audits" of the approved license application for NRC License No. SNM-1067. The Nuclear Licensing, Safety and Accountability Manager conducts monthly audits of the facility. Included in this audit is a review of the information designated on the "Radioactive Waste Drum Release Data Sheet." Information given on this sheet includes information on each drum concerning, drum number, enrichment, type of material, total uranium content, U-235 content, drum seal number, radiation level, surface contamination level and labeling information. Release authorizations are signed off by process engineering, accountability and health physics.

(2) Nuclear Laboratories

Activities of the Nuclear Laboratories involving the use of special nuclear material are audited monthly by the Nuclear Licensing Safety and Accountability Manager as required by

Section 8.3.1 of the approved facility license application. In addition, the Manager of Health Physics conducts an informal weekly audit of areas where byproduct materials are handled. This audit includes surveillance of waste handling procedures. However, since the audits of the byproduct material areas are informal in nature, no records are maintained of the results. This was discussed with the Manager Health Physics and the inspector was informed that records of these audits would be maintained. The inspector was also informed during a telephone discussion with the Manager, Health Physics on March 26, 1980, that he would establish a formal audit program and start conducting documented audits of the byproduct area with respect to shipping by May 30, 1980. (3754/80-01-03)

b. Management-Controlled Audit

(1) Nuclear Fuel Manufacturing

The inspector verified that an audit of the licensee's low-level waste transfer, packaging and transportation program was conducted. A report dated September 18, 1979 discussed the areas examined. These areas included applicable regulations specified in Title 10 CFR, Title 49 CFR, the burial site NRC and State of South Carolina licenses and the burial site disposal criteria.

As a result of this audit, 4 weaknesses in the licensee's transportation program were identified. These weaknesses concerned; the designation of responsible personel; the unavailability of current copies of the DOT regulations, unavailability of written procedures concerning packaging, transfer and transport of low-level radioactive waste and training of operators and other personnel who generate waste and/or package, transfer and transport low-level radioactive waste. The inspector verified that corrective actions had been initiated or completed on each of these items prior to the end of this inspection.

(2) Nuclear Laboratories

According to licensee representatives, an audit of transportation activities relating to byproduct waste material shipped from the facility was conducted on/or about September 12, 1979. However, no record was maintained on the results of this audit. The audit was conducted by the Manager, Health Physics and no problem areas were identified.

9. Observations

a. SNM Waste

The licensee was not packaging waste at the time of this inspection. However, the inspector has observed this operation during previous inspections at this facility. The inspector noted that about 40 drums (DOT Specification 17-H Shipping Containers) and 5 boxes had been packaged and stored on the outside Waste Storage Pad located along side Building 21 awaiting shipment to the burial site. The boxes contained used filters and were labeled "Radioactive-LSA". Each drum was labeled "Radioactive-LSA", "Caution-Radioactive Waste" and "Caution-Radioactive Material." In addition, each drum was sealed with a type E seal, designated with a drum number, labeled with a completed Health Physics Release Form, and identified as to type of contents, enrichment, grams U-235, date filled and operators initials.

The inspector requested the licensee to open 2 drums obtained from the waste storage pad which were identified as indicated above. One drum identified as NL943, drum No. 2723, seal No. 1992 was opened and found to contain the type of waste as indicated on the label. This drum obtained from the Nuclear Laboratories was found to be satisfactory. The other drum was identified as drum No. 3024, seal No. 2222 and was also observed to contain the type of waste as indicated on the label (contaminated waste metal). In this case, the drum which was a DOT specification 17-H container did not have the sealing gasket installed as required by 49 CFR 178.118-8(a). In addition, the inspector requested the licensee to open 5 other 17-H drums (Drum Nos. 3073, 3058, 3052, 3028, and 3019) which were located inside the facility. Although these containers had been initially prepared and sealed for outside storage and eventual shipment, analysis indicated that the containers held SNM in excess of the quantities authorized by internal procedures. Thus, these containers were scheduled for opening and repackaging. None of these five containers had the required sealing gaskets installed in the lid prior to closure.

The above was discussed during a telephone conversation between Mr. H. V. Lichtenberger, Vice President, Nuclear Fuel and Mr. G. H. Smith, Chief, Fuel Facility and Materials Safety Branch on March 13, 1980. Mr. Lichtenberger indicated that the shipping containers in question

were in storage, were not in shipment and were not prepared for shipment since Combution Engineering Inc. employees still had work to be done on the containers. (1100/80-02-02)

b. Byproduct Material Waste

The Nuclear Laboratory personnel were not packaging compacted waste in drums at the time of the inspection. The licensee installed a compactor in Building 2 during November 1979. A cage was constructed around the compactor to control ventilation flow. The area inside the cage was then established as an RWP area and personnel must wear a breathing zone sampler to enter the control zone area. No drums containing compacted byproduct material waste were opened due to the contamination hazard from potentially torn plastic bags which contained the radioactive waste material. At the request of the inspector, licensee representatives conducted radiation surveys at the surface of three compacted drums (NL 966, NL 965 and NL 968). The maximum radiation readings observed was about 90 mR/hr on drum NL 965. The area in which the drums were stored was posted as a radiation area.

10. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection at 3:00 PM on March 12, 1980. The inspector presented the scope and findings of the inspection.

For actions and discussions subsequent to the inspection, see paragraph 9a of the report details.

OUTSTANDING ITEMS FILE

NRC:I Form #6 Dec 76

DOCKET # 03754

Combustion Engineering — Facility Name

J Roth — Project Inspector

JR — PI's Initials

3/26/80 — Date Acknowledged

ITEM NUMBER	TYPE	MODULE #	AREA	RESP.	ACTION DUE DATE	CLOSEOUT ACTION
80-01-01	IFI	28002B	FPI	M/F	__-__-__	__-__-__

DESCRIPTIVE TITLE

LICENSEE HAS COMMITTED TO OBTAIN CURRENT LICOSE LEAF CODLES OF THE DOT REGS (BULLETIN 79-19)

ITEM NUMBER	TYPE	MODULE #	AREA	RESP.	ACTION DUE DATE	CLOSEOUT ACTION
80-01-02	IFI	28002B	FPI	M/F	__-__-__	__-__-__

DESCRIPTIVE TITLE

LICENSEE HAS COMMITTED TO ISSUE A DRAFT PROCEDURE "LOW LEVEL BY PRODUCT ASSTE HANDLING" BY 5/1/80 (BULLETIN 79-19)

ITEM NUMBER	TYPE	MODULE #	AREA	RESP.	ACTION DUE DATE	CLOSEOUT ACTION
80-01-03	IFI	28002B	FPI	M/F	__-__-__	__-__-__

DESCRIPTIVE TITLE

LICENSEE HAS COMMITTED TO ESTABLISH ADDITIONAL AUDIT PROGRAM FOR THE SHIPMENT OF LOW LEVEL WASTE BY PRODUCT MATERIAL BY 5/31/80 (BULLETIN 79-19)

ITEM NUMBER	TYPE	MODULE #	AREA	RESP.	ACTION DUE DATE	CLOSEOUT ACTION
__-__-__		____B		/	__-__-__	__-__-__

DESCRIPTIVE TITLE

Information entered by WPC on __/__/__ by _____
Date Initials

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket Nos. 70-1100
30-03754

SEP 04 1980

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P. O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Combined Inspection 70-1100/80-05; 30-03754/80-02

This refers to the routine inspection conducted by Mr. P. Clemons of this office on July 9-11, 1980 of activities authorized by NRC License Nos. SNM-1067 and 06-00217-06 and to the discussions of our findings held by Mr. Clemons with Mr. Pianski and Mr. Rosenthal of your staff at the conclusion of the inspection, and to a subsequent telephone discussion between Mr. Clemons and Mr. Johnstone on July 14, 1980.

Areas examined during this inspection are described in the Office of Inspection and Enforcement Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Our inspector also verified the steps you have taken to correct the items of noncompliance brought to your attention in the enclosure to our letters dated June 15, 1979 and November 13, 1979. We have no further questions regarding your action at this time.

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. This item of noncompliance has been categorized into the levels as described in our correspondence to you dated December 31, 1974. This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

B/46

10

ITEM # 4/6

SEP 04 1980

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractor) believe to be proprietary, it is necessary that you make a written application within 20 days to this office to withhold such information from public disclosure. Any such application must be accompanied by an affidavit executed by the owner of the information, which identifies the document or part sought to be withheld, and which contains a statement of reasons which addresses with specificity the items which will be considered by the Commission as listed in subparagraph (b) (4) of Section 2.790. The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified period, the report will be placed in the Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

George H. Smith, Chief
Fuel Facility and Materials Safety
Branch

Enclosures:
1. Appendix A, Notice of Violation
2. Combined Office of Inspection and Enforcement Inspection Report Numbers 70-1100/80-05; 30-03754/80-02

bcc w/encl:
IE Mail & Files (For Appropriate Distribution)
Central Files
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
Technical Information Center (TIC)
REG:I Reading Room
State of Connecticut
License Fee Management Branch

APPENDIX A

NOTICE OF VIOLATION

Combustion Engineering, Inc.

Docket Nos. 70-1100
30-03754

Based on the results of an NRC inspection conducted on July 9-11, 1980, it appears that one of your activities was not conducted in full compliance with the conditions of your license as indicated below. Item A is an infraction.

A. Condition No. 16 of License No. 06-00217-06 states,

"Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in applications dated February 24, 1978 and October 30, 1978."

Item No. 14 of the application dated February 24, 1978 states,

"A Radiological Control Committee has been organized to perform the following functions:

a) Evaluate proposed changes in the handling of byproduct materials for personnel safety and protection of the environment.

b) Perform an annual audit of all operations involving byproduct materials. The committee shall submit its findings and recommendations to the Vice-President for Development."

Contrary to the above, a Radiological Control Committee has not been organized to perform the intended functions.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 70-1100/80-05
30-03754/80-02

Docket No. 70-1100
30-03754

License No. SNM-1067
06-00217-06 Priority 1 Category UR

Licensee: Combustion Engineering, Inc.

P.O. Box 501

Windsor, Connecticut 06095

Facility Name: Nuclear Manufacturing Facility

Inspection at: Windsor, Connecticut

Inspection conducted: July 9-11, 1980

Inspectors: J. Clemons 7/24/80
P. Clemons, Radiation Specialist date signed

date signed

date signed

Approved by: J. A. Seraba for 8-28-80
J. J. Knapp, Chief, Radiation Support Section, FF&MS Branch date signed

Inspection Summary:
Inspection on July 9-11, 1980 (Combined Report Nos. 70-1100/80-05; 30-03754/80-02)
Areas Inspected: Routine, unannounced inspection by a regional based inspector of the Radiation Protection Program including: outstanding items, source inventory and leak test, radiological control committee, monthly and annual audits, organization, training, dosimetry, stack samples, breathing zone samples, bioassay, ventilation, liquid waste, termination reports, and "contaminated storage area". Shortly after arrival, areas where work was being conducted were examined to review radiation control procedures and practices. The inspection involved 20 inspector-hours onsite by one regional based inspector.
Results: Of the 15 areas inspected no items of noncompliance were identified in 14 areas. One apparent item of noncompliance was identified in one area (Infraction - radiological control committee not formed and functioning - Paragraph 3).

DETAILS

1. Persons Contacted

Mr. G. Johnstone, Health and Safety Supervisor
Mr. J. Limbert, Laboratory Radiation Engineer
*Mr. F. Pianski, General Manager, Fuel Fabrication
*Mr. P. Rosenthal, Manager, Health Physics

The inspector interviewed several other licensee employees during the course of the inspection.

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (1100/79-03-01): Did not obtain Radiation Work Permit (RWP) prior to decreasing ventilation. Operating procedure has been revised, as observed by the inspector, that permits the removal of only one side of the ventilation enclosure which should eliminate the possibility of decreasing the ventilation flow rate.

(Closed) Noncompliance (1100/79-03-02): Failed to survey for beta contamination. SNM-1067 has been amended eliminating the requirement to perform beta surveys.

(Closed) Noncompliance (1100/79-03-03): Failed to monitor upon exiting an unclad fuel handling area. The inspector was informed that appropriate personnel had received additional training in proper monitoring techniques and the inspector observed a sign located near the Ceramics Lab informing personnel of the monitoring requirement.

(Closed) Noncompliance (1100/79-07-01): Failed to do urine bioassay. The licensee has started a new "checklist procedure" that is intended to assure that all appropriate personnel are included in the bioassay program.

(Closed) Noncompliance (1100/79-07-02): Failed to do fixed alpha survey. Fixed alpha surveys are now being performed as observed by the inspector.

(Closed) Noncompliance (1100/79-07-03): Failed to train. The licensee has started a new "checklist procedure" that is intended to assure that all appropriate personnel are included in the training program.

(Closed) Noncompliance (1100/79-07-04): Failed to monitor thoroughly. SNM-1067 has been amended, and the amendment requires that personnel must monitor themselves thoroughly upon exiting a contaminated area.

(Closed) Noncompliance (1100/79-07-05): Failed to collect breathing zone sample every four hours. The inspector reviewed data which indicated that breathing zone samples are collected every four hours when required.

(Closed) Noncompliance (1100/79-07-06): Failed to submit termination report in a timely manner. The licensee has started a new procedure that is intended to assure that termination reports are submitted in a timely manner.

(Closed) Noncompliance (1100/79-07-07): Failed to post area. The area was posted during inspection 79-07 but the sign was covered. The area is properly posted at this time as observed by the inspector.

(Closed) Noncompliance (1100/79-07-08): Failed to label container. Containers are labeled properly as observed by the inspector.

(Closed) Noncompliance (1100/79-07-09): Form did not comply with Form NRC-5 requirements. Licensee has revised the form that is equivalent to Form NRC-5 and the revised form contains all of the required information as observed by the inspector.

(Closed) Noncompliance (1100/79-07-10): Failed to follow procedure. The licensee has revised procedures and the revision is intended to assure that all containers bearing SNM waste materials shall be identified as to the uranium content and the enrichment.

3. Radiological Control Committee - Materials License No. 06-00217-06

On July 9, 1980, the inspector asked a licensee representative for a copy of the Radiological Control Committee audit findings for 1979. The representative stated that he was not aware of the audit findings, but he would inquire of others.

Condition No. 16 of License No. 06-00217-06 states,

"Except as specifically provided otherwise by this license, the licensee shall possess and use licensed material described in Items 6, 7, and 8 of this license in accordance with statements, representations, and procedures contained in applications dated February 24, 1978 and October 30, 1978."

"A Radiological Control Committee has been organized to perform the following functions:

a) Evaluate proposed changes in the handling of byproduct materials for personnel safety and protection of the environment.

b) Perform an annual audit of all operations involving byproduct materials. The committee shall submit its findings and recommendations to the Vice-President for Development."

The inspector then asked the Manager, Health Physics, for the audit findings and he was informed that the Radiological Control Committee does not exist, therefore no audits were performed during 1979.

The inspector noted that failure to comply with the conditions of License No. 06-00217-06 represents noncompliance. (80-02-01)

The Manager, Health Physics, informed the inspector that the committee would be established as required and it would perform the functions as stated in the license application dated February 24, 1978.

4. Internal Audits - SNM-1067

Section 8.3 of the licensee's application, which is incorporated by License Condition 9 of SNM-1067, requires that monthly audits for radiological considerations be performed by a qualified individual. The inspector questioned licensee representatives regarding the conduct of the monthly internal audits as required by Section 8.3. The inspector reviewed audit reports for the period January-July 1980 for the monthly radiological safety audits.

The Nuclear Safety Committee is also required to perform an annual audit of the radiological aspects of SNM-1067. The inspector reviewed the report of an audit conducted by the Nuclear Safety Committee on November 27, 1979.

No items of noncompliance were identified.

5. Dosimetry

The inspector reviewed dosimetry records for the period January-December 1979 for approximately 150 individuals monitored at the Nuclear Fuel Manufacturing Facility and the Laboratories. The data indicated that all exposures were well within the 10 CFR 20.101 limits.

No items of noncompliance were identified.

6. Organization

The former Nuclear Licensing and Safety Supervisor resigned his position with the licensee in May 1980. His responsibilities have been assigned to the Health and Safety Supervisor for the radiological implications, and to a member of the Physics Department for the criticality implications.

No items of noncompliance were identified.

7. Source Leak Test

License Condition 15 of SNM-1067 requires "Each encapsulated plutonium source...shall be tested for leakage at intervals not to exceed six months." The licensee has five plutonium sources that must be tested.

The inspector reviewed leak test data for the period January-July 1980. The data indicated that all sources had been leak tested at the specified intervals.

License Condition 13(c) of Materials License No. 06-00217 requires sealed sources be also leak tested at intervals not to exceed six months.

The inspector reviewed this data for the same period as stated above, and the data also indicated that the sources had been tested at the required frequency.

No items of noncompliance were identified.

8. Air Samples

The inspector reviewed general air sample data for the period January-July 1980 to determine if the licensee was in compliance with regulatory requirements.

The inspector also reviewed breathing zone air sample data for approximately 15 employees for the same period.

No items of noncompliance were identified.

9. Stack Samples

Amendment No. 25 to SNM-1067 states "if the radioactivity in plant gaseous effluents exceeds 18 uCi gross alpha activity of total uranium per calendar quarter, the licensee shall within 30 days, prepare and submit to the Commission a report which identifies the cause for exceeding the limit and the corrective actions to be taken by the licensee to reduce release rates."

As the inspector reviewed stack sample data during the first two calendar quarters for 1980 he noted that during the second quarter (during the week of June 24, 1980) the licensee discharged 22 uCi gross alpha activity. A licensee representative showed the inspector a copy of a rough draft of a report that was being prepared for submission to the Commission. The report indicated that the cause of the problem was absolute filters that were too small for the filter housing thereby permitting the uranium to bypass the filters and be discharged to the environs. According to the General Manager, the corrective action will be to modify the filter housing so that only the proper sized filters will fit the system.

The 30 day report had not been submitted to the Commission by the time the inspection was completed, but the report was not due to be submitted until the week of July 24, 1980.

No items of noncompliance were identified.

10. Bioassay

Condition No. 17 of SNM-1067 requires the licensee to develop and maintain a bioassay program which meets the specifications of Regulatory Guide 8.11, "Application of Bioassay for Uranium". Regulatory Guide 8.11 has an annual sampling frequency for minimum programs.

The inspector reviewed urine bioassay data for about 15 employees for 1979 to determine that the employees were participating in the program as required. The employees are participating in the program, and the data did not indicate any problems with exposure control.

No items of noncompliance were identified.

11. Termination Reports

10 CFR 20.408 requires a licensee to submit to the Director of Management and Program Analysis a report of an individual's exposure to radiation and radioactive material, incurred during the period of employment in the licensee's facility when the individual terminates employment with the licensee. The inspector reviewed approximately 15 exposure reports for 1979 of employees that had terminated employment with the licensee. These reports had been submitted as required.

No items of noncompliance were identified.

12. Ventilation

Section 15.7 of Special Nuclear Material License No. SNM-1067 requires face velocities at hood openings to be at least 100 feet per minute. The licensee performs weekly ventilation surveys in the Pellet Shop, and monthly ventilation surveys in the laboratories, to determine that the face velocities were as required.

The inspector reviewed ventilation data for the Pellet Shop for the period January-June 1980 to confirm that the required flow rate was maintained. The data indicated that in every instance the face velocities were in excess of 100 feet per minute.

No items of noncompliance were identified.

13. Smears

Section 15.6.1 of the licensee's application requires that smear surveys be taken and analyzed for alpha activity to verify compliance with internal limits. The inspector reviewed smear survey records for the period January-June 1980 to assure that the licensee was in compliance with this license requirement.

No items of noncompliance were identified.

14. "Contaminated Storage Area"

On July 9, 1980 the inspector toured the "contaminated storage area", which had been identified during an aerial radiation survey, and that the licensee had reported to Region I on June 13, 1980. The purpose of the tour was to get an appreciation of the magnitude of the situation, and to collect confirmatory samples. The inspector collected eleven samples that were sent to Idaho Falls for analyses. The results of these analyses will be intercompared with licensee results.

15. Exit Interview

The inspector met with the licensee representative (denoted in Paragraph 1) at the conclusion of the inspection on July 11, 1980. The inspector summarized the purpose and scope of the inspection, and the findings as presented in this report.

C-E Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Tel. 203/688-1911
Telex: 99297

DDH-80-069

POWER SYSTEMS

September 30, 1980

U. S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, Pennsylvania 19406

Attention: Mr. George H. Smith, Chief
Fuel Facility/Material Safety Branch

Reference: Letter from Mr. G. H. Smith to Mr. H. V. Lichtenberger, dated September 4, 1980; Combined Inspection 70-1100/80-05;30-03754/80-02.

Gentlemen:

This is in response to the above referenced letter in which you reported an infraction that was determined during your inspector's visit to our facility on July 9-11, 1980.

Appendix A to the referenced letter reported that a Radiological Control Committee had not been organized to perform functions as stated in item 14 of the application for byproduct material license 06-00217-06. As of this writing the Committee has been organized and intends to complete its annual audit function by October 31, 1980.

Very truly yours,

H V Lichtenberger

H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing

HVL/PRR/kfg

B/47

ITEM # 47

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

OCT 15 1980

Docket Nos. 70-1100
30-03754

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P. O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Combined Inspection 70-1100/80-05; 30-03754/80-02

This refers to your letter dated September 30, 1980, in response to our letter dated September 4, 1980.

Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a subsequent inspection of your licensed program.

Your cooperation with us is appreciated.

Sincerely,

George H. Smith, Chief
Fuel Facility and Materials
Safety Branch

bcc: (w/cy of licensee's response)
IE Mail & Files (For Appropriate Distribution)
Central Files
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
Technical Information Center (TIC)
REG:I Reading Room
State of Connecticut

B/48

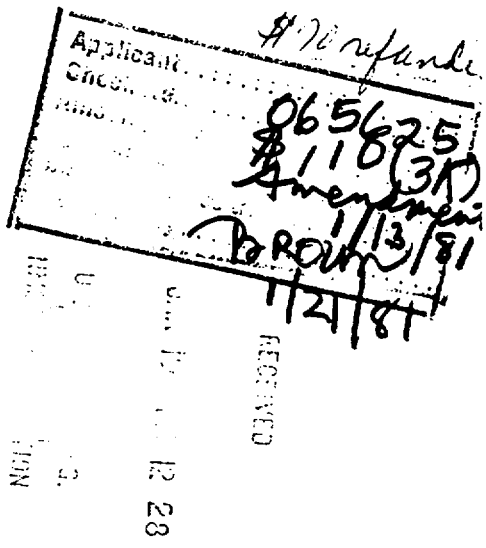
ITEM # 48

C-E Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Tel. 203/688-1911
Telex: 99297

DDH-81-102

C-E POWER SYSTEMS



January 12, 1981

U.S. Nuclear Regulatory Commission
Material Licensing Branch
Division of Fuel Cycle and Material Safety
Washington, DC 20555

Attention: Mr. Paul R. Guinn

Subject: Byproduct Material License 06-00217-06;Request for Amendment

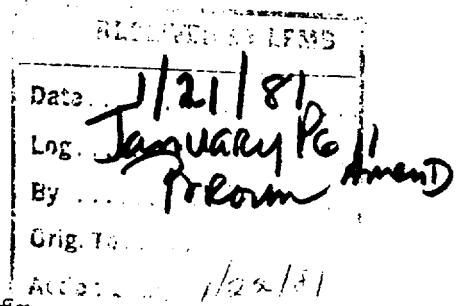
Dear Mr. Guinn:

Combustion Engineering, Inc. requests that the subject license be amended to authorize receipt, use, storage, and transfer of 10 curie Americium - Beryllium neutron sources. The source, manufactured by Monsanto Research Corporation, is doubly encapsulated in stainless steel with welded closures and is listed with the Nuclear Regulatory Commission as Model 2727. This request for amendment includes authorization to possess 20 sources at any one time.

These sources are used in conjunction with fission chambers to measure the boron concentration in water utilizing the principle of neutron absorption. Combustion Engineering, Inc. has over 10 years of experience handling 1 curie. Am-Be sources for this purpose and now finds it necessary to increase the strength of the source to satisfy current research and development programs.

Enclosed please find a check in the amount of $110 to cover the amendment fee in accordance with 10 CFR 170.31.

If you have any questions concerning this application, please contact the undersigned on extension 3366.



Very truly yours,

Philip R. Rosenthal
Manager of Health Physics
Development Department
Nuclear Power Systems

B/49

ITEM # 49

PRR/kfg
cc: W. P. Chernock

COPIES SENT TO OFF. OF
INSPECTION AND ENFORCEMENT

06625

NRC FORM 218 (4-76) NRCM 0240

U.S. NUCLEAR REGULATORY COMMISSION

TELEPHONE OR VERBAL CONVERSATION RECORD

DATE: 11/10/81

TIME: 2:32 ☐ A.M. ☒ P.M.

☒ INCOMING CALL ☐ OUTGOING CALL ☐ VISIT

PERSON CALLING	OFFICE/ADDRESS	PHONE NUMBER	EXTENSION
Phil Rosenthal	Combustion Engineering, CT	(203) 688-1911	Ext. 3366

PERSON CALLED	OFFICE/ADDRESS	PHONE NUMBER	EXTENSION
Mike Varela			

CONVERSATION

SUBJECT: Wants to know if Reg. I handles

~~SUMMARY~~

If so, then: Broadscope Byproduct Material

Lic. # 06-00317-06

At. No 1-83 inclusively

rec. amend. ~~Wants to~~ ~~add~~ for $Cs-137$ $A_s \leq 10$ Ci total.

But wants $Cs-137$ Not to exceed ~~10~~ 10 Ci per source.

Will distribute to Reactor Licensees

Whose Case?

REFERRED TO: Call Paul Guinn

☐ ADVISE ME OF ACTION TAKEN.

ACTION REQUESTED: Call back inform HQ will handle.

INITIALS

DATE

INITIALS B/50

ACTION TAKEN: Letter should point out distribution

Called 11/13 told to Send to HQ [initials]

DATE

ITEM # 50

NRC FORM 218 (4-76)

2/24/78

10 Bd7

11/5/81

C-E Power Systems
Combustion Engineering, Inc
1000 Prospect Hill Road
Windsor Connecticut 06095

Tel 203/688-1911
Telex 99297

POWER SYSTEMS

License SNM-1067
Docket 70-1100

February 4, 1982

U. S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Attention: Mr. R. W. Starostecki, Director
Division of Resident & Project Inspection

Reference: Letter from R. W. Starostecki, NRC to H. V. Lichtenberger, C-E dated January 14, 1982; Combined Inspections 70-1100/81-10; 30-3754/81-01

Dear Mr. Starostecki:

This is in response to the above referenced letter in which you reported three items of noncompliance which were determined during your inspector's visit to our facility on December 14-17, 1981.

Appendix A - Item A

License Condition 27 incorporated into your facility license by Amendment #25 dated April 30, 1980 requires, in part, that transients and employees, upon exiting unclad fuel handling area monitor their hands, shoes and any exposed personal clothing with the alpha monitor located at the change line.

Contrary to the above, on December 15, 1981 the inspector and the accompanying licensee representative could not monitor their hands, shoes and exposed personal clothing upon exiting the contaminated area of the FA-3 ventilation system mezzanine (an area which was part of an unclad fuel handling area) because there was no alpha monitor at the change line.

Response

The area referred to is the equipment mezzanine in the Building #17 pellet shop which is entered from the main building mezzanine stairway that is posted, "Authorized Personnel Only Allowed on Mezzanine". The door to the equipment area on the mezzanine is posted, "Health Physics, Restricted Area; Protective Clothing Required, call Health Physics Before Entering, X-5684 or 3150". Personnel do not enter this contaminated area without first calling Health Physics. When Health Physics agrees there is a need to enter the area, they then will bring the necessary alpha monitoring equipment, which is kept in the main Health Physics office, to the mezzanine. Upon exiting the contaminated area, the Health Physics personnel

ITEM # 5 B/05

Response (Cont'd)

and the personnel working in the area will monitor their hands, shoes and any exposed personal clothing with the alpha monitor. No alpha equipment is kept permanently at the change line to this area because of the infrequent visits that are required. Maintaining the equipment because of the infrequent use would be a problem and it would be necessary for Health Physics to check the instrument each time a visit was made in any case.

On the day in question, the Health Physics Technician and your inspector entered the contaminated area without making provisions for bringing an alpha monitor to the mezzanine area. This was a mistake and we agree that it should not have happened. However, the present practice of controlling the personnel that have access to the mezzanine area and Health Physics bringing the equipment to the area as needed meets the license requirements. In addition, this method provides better control over who is in the area and also assures that the monitoring equipment used at the change line is functioning properly.

Appendix A - Item B

Condition 9 of your facility License No. SNM-1067 which incorporates Section 15.5.2 "Bioassay" of your approved license application dated January 5, 1975 requires, in part, that in-vivo counting shall be conducted once per year on personnel working with uranium.

Contrary to the above, in-vivo counting was not conducted once per year on at least one individual in the Nuclear Laboratories who worked with uranium during the time period November 20, 1979 to December 11, 1981.

Response

Due to illness, the individual in question was unavailable for the next scheduled in-vivo counting subsequent to November 20, 1979. Contrary to the inspector's claim, the individual did not work with uranium during the period November 20, 1979 to December 11, 1981. Results of an in-vivo count performed on the individual in December 1981 revealed no significant difference from the results obtained in November 1979. Regardless of the fact that the individual did not work with uranium during the period in question, we recognize that the individual is employed as a Health Physics Technician whose services could be used in an emergency. An effort will be made in the future to ensure that in-vivo counting for individuals in this capacity is maintained current.

Appendix A - Item C

Condition 16 of your facility Materials License No. 06-00217-06 which incorporate Item 12 of your approved license application dated February 24, 1978 requires, in part, that whole body counting will be performed semi-annually on personnel working with by-product radioactive materials.

Contrary to the above, whole body counting was not performed semi-annually on up to 5 individuals in the Nuclear Laboratories who worked with by-product radioactive materials during the time period July 15, 1980 through December 1, 1981.

Response

Contrary to the inspector's claim, the individuals in question did not work with radioactive materials during the period July 15, 1980 through December 11, 1981 and therefore were not required to have a body count. All Development Department employees who work with radioactive materials are required to work under an authorized Radiation Work Permit (RWP). A check of our records indicates that the subject individuals did not work with radioactive materials during the period of concern. This item was never in noncompliance.

Very truly yours,

H. V. Lichtenberger
Vice President-Nuclear Fuel
Nuclear Power Systems-Manufacturing

HVL/RES/ssb

FEB 25 1982

Docket Nos. 70-1100, 30-3754

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P. O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Combined Inspection 70-1100/81-10, 30-3754/81-01

This refers to your letter dated February 4, 1982, in response to our letter dated January 14, 1982.

Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a future inspection of your licensed program.

With respect to Item A of the Notice of Violation appended to our letter dated January 14, 1982, it is our understanding, based on telephone discussions of February 10, 1982 between Mr. J. Roth of this office and Mr. R. Sheeran of your staff, that the health physics technicians were retrained in the access control requirements for the area in question during the month of January, 1982.

With regard to Item B, it is our understanding, based on the telephone discussion of February 19, 1982 between Mr. Roth and Mr. P. Rosenthal of your staff, that you have established a personnel list to assure that all personnel who may be used in an emergency have been whole body counted annually. This list will be verified by the Manager, Health Physics to assure that all required personnel have been whole body counted.

With respect to Item C, the new information which you submitted in your letter of February 4, 1982, will be examined during a subsequent inspection of your licensed program.

Your letter of February 4, 1982 failed to address the question concerning the qualifications of your current Health and Safety Supervisor to conduct the Health Physics evaluations and assessments as specified in your approved license application. It is our understanding that you have submitted a letter dated February 4, 1982 which specifies the background, experience and qualifications of your Health and Safety Supervisor to conduct the required radiological safety evaluations and assessments. This information will be reviewed during a subsequent inspection of your licensed program.

ITEM # 53 2 B/52 IE05

OFFICE	RI:DPRP	RI:DPRP	RI:DPRP				
URNAME	Roth/meo	Keimig	Starostecki				
DATE	2/23/82	2/23	2/23				

USGPO 1981—335-9

NRC FORM 318 (10-80) NRCM 0240

Your cooperation is appreciated.

Sincerely,

Original Signed By: E.C. McCabe for

Richard W. Starostecki, Director
Division of Project and Resident
Programs

cc:
Public Document Room (PDR) (w/cy of Licensee's Response)
Local Public Document Room (LPDR) (w/cy of Licensee's Response)
Nuclear Safety Information Center (NSIC) (w/cy of Licensee's Response)
State of Connecticut (w/cy of Licensee's Response) ✓

bcc:
Region I Docket Room (with concurrences) (w/cy of Licensee's Response)
H. Ketzlach, NRC/NMSS (w/cy of Licensee's Response) ✓

OFFICE ▶	.....	.....	.....	.....	.....	.....	.....
SURNAME ▶	.....	.....	.....	.....	.....	.....	.....
DATE ▶	.....	.....				.....	.....

SEP 19 1983

Docket Nos. 70-1100
30-3754

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P.O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Combined Inspection Report No. 70-1100/83-03, 30-3754/83-01

This refers to the routine safety inspection conducted by Mr. J. Roth of this office on July 18 - 21, 1983, of activities authorized by NRC License Nos. SNM-1067 and 06-00217-06 and to the discussions of our findings held by Mr. Roth with Mr. F. J. Pianki and other members of your staff at the conclusion of the inspection, and to a subsequent telephone discussion between Mr. P. R. Rosenthal of your facility and Mr. J. Roth on July 28, 1983.

Areas examined during this inspection are described in the NRC Region I Inspection Report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Our inspector also verified the steps you have taken to correct the violation brought to your attention in the enclosure to our letter dated January 14, 1982. We have no further questions regarding your action at this time.

Within the scope of this inspection, no violations were observed. However, one activity appears to be a deviation from proper industry practice. The filter paper for a breathing zone air sampler being prepared by an operator for his own use, in a known contaminated area, was handled with potentially contaminated gloves. Therefore, the samples collected at the breathing zone of the individual during performance of his duties could have been nonrepresentative of the concentration of airborne radioactive materials to which the operator was exposed. This item is set forth in the Notice of Deviation enclosed herewith as Appendix A. You are requested to respond to this letter and, in preparing your response, should follow the instructions in Appendix A.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). The telephone notification of your intent to request

ITEM # 54

14

53

238ROTH8/3/83 - 0001.0.0

1E01

withholding, or any request for an extension of the 10-day period which you believe necessary, should be made to the Supervisor, Files, Mail and Records, USNRC Region I, at (215) 337-5223.

The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

Your cooperation with us in this matter is appreciated.

Sincerely,

Original Signed By:

R. Kleinig for

Richard W. Starostecki, Director
Division of Project and Resident Programs

Enclosures:
1. Appendix A, Notice of Deviation
2. Combined NRC Region I Inspection Report No. 70-1100/83-03; 30-3754/83-01

cc w/encls:
Public Document Room (PDR)
Nuclear Safety Information Center (NSIC)
State of Connecticut

bcc w/encls:
Region I Docket Room (w/concurrences)
Senior Operations Officer (w/o encl)
A. L. Soong, NMSS
N. Ketzlach, NMSS

RI:DPRP
Roth:as
9/14/83

RI:DPRP
Elsasser
9/16

RI:DPRP
Greenman
9/16

RI:DPRP
Starostecki
9-16-83

RI:DETP
Bellamy
9/16/83

238ROTH8/3/83 - 0002.0.0

1E01

APPENDIX A

NOTICE OF DEVIATION

Combustion Engineering, Incorporated
Windsor, Connecticut

Docket No. 30-3754
License No. 06-00217-06

As a result of the inspection conducted on July 18 - 21, 1983, and in accordance with the NRC Enforcement Policy (10 CFR 2, Appendix C), 47 FR 9987 (March 9, 1982), the following deviation was identified:

> ANSI Standard N7.2-1963 "Radiation Protection in Nuclear Reactor Fuel Fabrication Plant" states that Breathing Zone Air Samples are collected at the breathing zone of an individual during performance of his duties and are a measure of the concentration of airborne radioactive materials to which the individual is exposed.
>
> Contrary to the above, on July 20, 1983, the breathing zone air sampler practice observed by the NRC inspector did not assure measurement of the concentration of airborne radioactive materials which an individual would be exposed: an operator installing filter paper for use in a breathing zone air sampler did so while wearing gloves potentially contaminated by wiping down the external surfaces of the air sampler, which was stored in a contaminated table in a contaminated laboratory.

Combustion Engineering, Incorporated, is hereby requested to submit to this office within thirty days of the date of the letter transmitting this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; and (2) corrective steps which will be taken to avoid further deviations.

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 70-1100/83-03
30-3754/83-01

Docket No. 70-1100
30-3754

License No. SNM-1067 Priority 1 Category UR
06-00217-06

Licensee: Combustion Engineering, Incorporated
P.O. Box 500
Windsor, Connecticut 06095

Facility Name: Nuclear Fuel Manufacturing and Nuclear Laboratories

Inspection At: Windsor, Connecticut

Inspection Conducted: July 18 - 21, 1983

Inspectors: J. Roth 8/12/83
J. Roth, Project Engineer date signed

Accompanied by: A. L. Soong, NMSS, Health Physics Reviewer

Approved by: T. C. Elsasser 8/12/83
T. C. Elsasser, Chief, Reactor Projects Section 1B, DPRP date signed

Inspection Summary:
Inspection on July 18 - 21, 1983 (Combined Report No. 70-1100/83-03; 30-3754/83-01

Areas Inspected: Routine, unannounced inspection by a region-based inspector (36 hours) of the licensed program including: organization, facility changes and modifications, internal review and audit; safety committees, review of operations, nuclear criticality safety, radiation protection and licensee actions on previously identified enforcement items. The inspection was initiated on the evening shift.

Results: Of the eight areas inspected, no violations or deviations were identified in seven areas. One deviation was identified in one area (deviation - failure to properly handle breathing zone sampler head filter paper with clean gloves, paragraph 8c).

Details

1. Persons Contacted

Nuclear Fuel Manufacturing

* F. J. Pianki, General Manager, Nuclear Fuel Manufacturing
R. E. Sheeran, Supervisor, Health Physics and Safety
R. J. Klotz, Nuclear Licensing Consultant
* J. Volaro, Lead Health Physics Technician

Nuclear Laboratories

P. R. Rosenthal, Manager, Health Physics
W. P. Chernock, Vice President, Development
J. M. Limbert, Radiological Engineer

* denotes those present at the exit interview

2. Licensee Action on Previously Identified Enforcement Items

(Closed) Violation (1100/81-10-05) Failure to whole body count personnel. The inspector verified that each individual was whole body counted as required either annually (uranium) or semi-annually (byproduct material) during 1982, as required by license conditions.

(Closed) Inspector Follow Item (1100/82-11-01) Calibration of waste tank level gauges. The inspector verified that the Building 6 waste tank level gauges were calibrated on February 7 - 8, 1983, and placed on an annual calibration cycle.

3. Review of Operations

The inspector examined all areas of the plant and the nuclear laboratories to observe operations and activities in progress; to inspect the nuclear safety aspects of the facilities and to examine the general state of cleanliness, housekeeping, and adherence to fire protection rules.

a. Nuclear Fuel Manufacturing Facilities

(1) Storage of Paint and Flammables

The inspector noted that paint and flammable solvents were properly stored in special flame resistant enclosed storage cabinets in the facility.

No violations were identified.

(2) Nuclear Safety Log Sheets

The inspector examined the micronizer and hammermill log sheets, since the last enrichment cleanup, for the period May 18, 1983 to July 11, 1983. The records indicated that the appropriate posted nuclear safety limits were not exceeded.

No violations were identified.

b. Nuclear Laboratories

(1) SNM Running Balance

The inspector examined the SNM transfer log book located in the chemistry laboratory. The SNM running balance was being maintained as required by licensee procedures.

No violations were identified.

(2) Ceramics Laboratory

The inspector noted that the licensee had completed decontamination of two of the three rooms located in the Ceramics Laboratory. The licensee installed new laboratory furniture and initiated use of the decontaminated rooms for nonfuel operations.

No violations were identified.

4. Nuclear Criticality Safety

a. Nuclear Fuel Manufacturing

(1) Internal Review and Audit

(a) Daily Audits

Records of daily audits conducted by health physics technicians for the time period June 1, 1983, through July 20, 1983, were examined by the inspector. The licensee has developed a detailed checklist covering all aspects of the operation as an aid to the health physics technicians when they conduct this facility review. Areas examined include signs, logs, radiation alarms, criticality safety compliance, contamination levels, and airborne contamination levels. Items requiring correction were corrected immediately.

No violations were identified.

b. Monthly Audits

The inspector examined documentation of monthly audits conducted by the Supervisor, Health Physics and Safety and/or a Criticality Safety Specialist during the time period January 28, 1983, through June 20, 1983. The inspector verified that appropriate corrective actions were taken or had been initiated by the licensee for the items identified in the 12 reports which required correction except in one instance.

During the February 25, 1983 nuclear safety audit, it was noted that nuclear safety spacing zones identified on the floor in the press feed hopper annex had to be enlarged to assure nuclear criticality safety in the zones for storage of filled press feed hoppers. Enlargement of the zones were required because of the potential for interaction between zones located on the floor and on the overhead mezzanine in the unclad fuel handling area. As of the end of this inspection, the licensee had not taken actions to correct this licensee identified item. Licensee representatives stated that the zones would be enlarged during a plant shutdown which was to start on August 1, 1983. This will be reexamined by the inspector during a subsequent inspection (83-03-01). However, the inspector verified that the licensee was maintaining adequate spacing of the press feed hoppers to assure nuclear safety until the identified zones were enlarged.

No violations were identified.

c. Quarterly Audits

The inspector examined records of quarterly nuclear safety audits conducted by a consultant of the Nuclear Safety Committee from October 4, 1982, through March 30, 1983. The inspector verified that corrective actions were taken or initiated for the items identified in the three reports which required correction. The second quarter 1983 report was not available at the time of this inspection.

(2) Nuclear Safety Evaluations

(a) Facility Changes and Modifications

No significant facility changes or modifications were made by the licensee since the last inspection.

No violations were identified.

(b) Review of Nuclear Safety Evaluations

The inspector reviewed the records of the review and approval of process equipment or facility changes performed by the Nuclear Licensing Consultant for criticality safety or by the Supervisor, Health Physics and Safety for radiological safety. From November 3, 1982, through December 16, 1982 (Request No. 1), 11 requests for review and approval were made by Engineering. All of the requests were reviewed and approved. Five of the requests involved nuclear criticality and radiological safety considerations and six involved only radiological safety considerations. Conditions of approval were imposed, as needed, for criticality and radiological safety considerations. The requests involving criticality safety considerations were independently reviewed by a qualified person designated by the Nuclear Safety Committee and by the Nuclear Licensing Consultant if the original review was conducted by the Supervisor, Health Physics and Safety. The requests involving radiological safety considerations were independently reviewed by the Supervisor, Health Physics and Safety and the Nuclear Licensing Consultant. The evaluations were then countersigned by the qualified persons as required.

No violations were identified.

b. Nuclear Laboratories

(1) Monthly Audits of the Nuclear Laboratories

The inspector examined the records of nine audits of the Nuclear Laboratories conducted by the Supervisor, Health Physics and Safety for the time period October 29, 1982, through June 29, 1983. The inspector determined that no problem areas were identified during the conduct of these monthly audits.

No violations were identified.

(2) Facility Changes and Modifications

No significant facility changes or modifications were made by the licensee since the last inspection.

No violations were identified.

c. Calibration of Criticality Monitors

The inspector examined licensee records to assure that the facility criticality monitors were calibrated quarterly between September 2, 1981 and July 6, 1983. The inspector determined that the dual detector criticality monitoring system installed in Building 17 went into full time operation on April 6, 1983. This system meets the requirements of 10 CFR 70.24(a)(1). The licensee's old criticality monitoring system located in Building 17 remains operational. The two systems will remain in operation until the licensee can develop confidence which shows that the new system is reliable.

No violations were identified.

5. Organization

Through discussions with licensee representatives, the inspector determined that the licensee's current organizational structure and incumbents is as follows:

a. Nuclear Fuel Manufacturing

J. M. West, Vice President, Nuclear Power Systems Division
R. L. Hellens, Chairman, Nuclear Safety Committee
H. V. Lichtenberger, Vice President, Nuclear Fuel
T. B. Bowie, Manager, Nuclear Materials and Security
F. J. Pianki, General Manager, Nuclear Fuel Manufacturing
P. W. Hubert, Manager, Engineering
G. C. Kersteen, Manager, Production and Material Control
R. Ward, Production Superintendent
R. Klotz, Nuclear Licensing Consultant
H. T. Cohen, Supervisor, Nuclear Material Accountability
R. E. Sheeran, Supervisor, Health Physics, Safety and Security

Mr. R. Klotz replaced Mr. G. Bakevitch as Nuclear Licensing Consultant during January 1983. Mr. R. Harding replaced Mr. Klotz as a nuclear criticality consultant to the Nuclear Safety Committee on February 18, 1983.

No violations were identified.

b. Nuclear Laboratories

J. M. West, Vice President, Nuclear Power Systems Division
W. P. Chernock, Vice President, Research and Development
C. L. Storrs, Director, Advanced Development
R. N. Duncan, Director, Fuels Development
P. E. C. Bryant, Director, Materials and Chemistry
W. T. Withers, Director, Product Engineering and Development
D. F. Streinz, Director, Engineering Development and Testing
E. P. Flynn, Director, Contract Research and Development Management
A. D. McWhirter, C-E/KWU Coordination
P. R. Rosenthal, Manager, Health Physics

Mr. W. P. Chernock originally reported to Mr. J. M. West through Mr. F. M. Stern, Vice President, Products, Services and Development. Mr. Stern continues to report to Mr. West with the title, Vice President, Operating Reactors. Mr. B. J. Selig, Director, Engineering Development and Services originally reported to Mr. Chernock but now reports directly to Mr. Stern.

No violations were identified.

6. Safety Committee

The Nuclear Safety Committee conducted the annual meeting and tour of the Nuclear Fuel Manufacturing facilities on December 10, 1982. Discussion topics included: possible flooding of the bundle assembly room, radiation dose evaluation of the bundle assembly room, nuclear safety criteria for the license renewal application and radiation exposure data for the years 1977 to 1981 (trends, etc.). The inspector verified that actions were taken by the licensee to correct items of concern discussed by the committee.

No violations were identified.

7. Contaminated Storage Area

The inspector examined the contaminated storage area which was located in a wooded area of the licensee's site approximately 900 feet northwest of Building 2. This area had been initially discovered during an aerial radiation survey and was subsequently reported to Region I on June 13, 1980.

The licensee has completed radiation survey and soil sampling in this area. The soil samples have been analyzed. Licensee sample results were compared to values in the NMSS "Branch Technical Position on Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations" published in the Federal Register on October 23, 1981. All grid blocks (25 feet x 25 feet) met the criteria for uranium (30 picocuries/gram of soil). Eight of the grid blocks exceeded the criteria for Thorium and three of the grid blocks approached (87 to 98%) the criteria for Thorium (10 picocuries/gram of soil, Th-228 plus Th-232). Licensee representatives stated that the surface of the grid blocks approaching or exceeding the criteria would be recleaned and resampled for analysis.

No violations were identified.

8. Radiation Protection

a. Ventilation System Stack Sampling

During inspection 70-1100/82-11, the inspector examined particulate stack sampling devices located in Buildings 5 and 17. It was observed that long sampling lines leading from the stack to the sampling point made multiple 90 degree turns upon exiting the stack until they en-

tered the sampling point. In particular, the sampling line on the FA-1 system in Building 17 made a 360 degree turn prior to entering the sampling point and the line on the Ceramics Laboratory stack in Building 5 went through a desiccant trap before entering the sampling point. The inspector questioned the reliability of particulate stack sampling at this facility. The inspector also questioned how representative the stack sampling was.

During this inspection, the inspector determined that the stack samplers on ventilation systems in Building 17 had been reevaluated and revised as necessary. However, the licensee did not reevaluate the sampler on the Ceramics Laboratory and Chemistry Laboratory stacks in Building 5. The inspector stated that the facility license requires that the adequacy of sampling techniques to obtain representative samples will be verified annually in the Nuclear Laboratories (Building 5). This was identified as an open, unresolved item pending completion of the reevaluation (82-11-02).

b. Breathing Zone General Air Sampling - Nuclear Fuel Manufacturing

License Condition 14 of the facility license as renewed March 14, 1983, authorizes the licensee to evaluate an individual's internal exposure to airborne radioactivity based on continuous portable breathing zone sampling or by permanently mounted breathing zone air sampling equipment. The licensee has elected to install permanently mounted air sampling equipment. During evaluation of this permanently mounted equipment, individual exposure is being monitored by portable air samplers. The inspector examined the licensee's rationale and installation of the permanently mounted equipment. It was determined that the location of each air sampler appeared to be reasonable. However, the licensee could not justify the height of the samplers off the floor. Each sampling point was placed at seven feet off the floor which is above an individual's breathing zone. The licensee will reevaluate each sampling location and will retain the justification for the final position of each sampling point for future review by the inspector and NMSS personnel (83-03-02).

No violations were identified.

c. Radiation Work Permits - Nuclear Laboratories

The inspector observed operations performed in the Building 5 Warm Metallurgical Laboratory. The technicians were suiting-up with Anti-C equipment to start work on contaminated metallurgical samples. One of the technicians wiped down the external surfaces of a portable breathing zone sampler which was stored on a contaminated (500 dpm beta-gamma/100cm^2) table in the laboratory. He then proceeded to install a piece of filter paper into the sampling head of the portable sampler without changing his gloves. The inspector identified this action as a poor practice because of the potential to contaminate the filter paper (from contaminated gloves) and thus indicate an

artificially high breathing zone sample. As a result, the licensee immediately removed the filter paper from the sampling head, properly installed a new filter, and analyzed the used filter. No significant contamination was found on the filter. Work in the laboratory was to be accomplished under Radiation Work Permit (RWP) No. 83-5-112, which required the use of a Thermal Luminescent Dosimeter, a portable breathing zone air sampler, a laboratory coat, cloth booties and two pair of plastic gloves. The RWP also indicated that the general area in the laboratory was contaminated to <5,000 dpm beta/100cm^2. Failure to properly handle the breathing zone sampler head filter paper with clean gloves was identified as a deviation from proper industry practice (3754/83-03-03).

d. Surveys - Nuclear Fuel Manufacturing

(1) Stack Samples

The inspector reviewed stack air sample records for the period January 8, 1983 through July 2, 1983, to determine that samples were taken and to assure that regulatory requirements were being adhered to. The records indicated that air concentrations were within regulatory limits and that corrective actions were taken whenever activity increases occurred.

The inspector noted that there appeared to be a trend, for the FA-3 and FA-4 ventilation systems, showing increased activity releases after each system cleanout operation. This trend will be reexamined by the licensee.

No violations were identified.

(2) Smear Samples

The inspector reviewed smear survey data for equipment released from the unclad fuel handling area from January 3, 1983 to July 19, 1983. The surveys were performed as required.

No violations were identified.

e. Instrument Calibration

The inspector examined calibration records for portable survey instruments used in the fuel manufacturing and laboratory facility from June 21, 1982 through June 24, 1983. The records indicated that each instrument was calibrated quarterly and after repair as required.

No violations were identified.

9. Inspector Accompaniment

The inspector was accompanied during this inspection by the NMSS Health Physics license reviewer to review actions taken by the licensee to comply with the breathing zone air sampling requirements of License Condition No. 14, which was previously discussed in paragraph 8b.

10. Exit Interview

The inspector met with license representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 21, 1982. The inspector summarized the scope and findings of the inspection. At no time during this inspection was written material provided to the licensee by the inspector. The licensee was informed by telephone on July 28, 1983 that a deviation from proper industry practice was identified during the inspection.

Transaction Type

☒ New Item

☐ Modify

☐ Delete

M-3

NRC:1 Form 6 Rev. Oct 80 (Side 1)

OUTSTANDING ITEMS FILE
SINGLE DOCKET ENTRY FORM

Docket # 70110

Roth — Originator

Elsasser — Reviewing Supervisor Name

Item Number	Type	Module #	Area	Resp	Action Due Date (M M D D Y Y)	Updt/Clsout Rpt #	Date O/M/Clsd (M M D D Y Y)
83-03-01	IFI	7/8/6	FPI	F/			

Originator: ROTH

Modifier/Closer:

Descriptive Title: ASSURE THAT CRITERIA FOR POWDER HOPPERS IN THE ANNEX HAVE BEEN ENLARGED

Item Number	Type	Module #	Area	Resp	Action Due Date (M M D D Y Y)	Updt/Clsout Rpt #	Date O/M/Clsd (M M D D Y Y)
83-03-02	IFI	83322	FPI	F/			

Originator: ROTH

Modifier/Closer:

Descriptive Title: FOLLOW EVALUATION OF GENERAL AIR BREATHING ZONE SAMPLER LOST ALARMS

Item Number	Type	Module #	Area	Resp	Action Due Date (M M D D Y Y)	Updt/Clsout Rpt #	Date O/M/Clsd (M M D D Y Y)
83-03-03	DEV	83322	FPI	F/			

Originator: ROTH

Modifier/Closer:

Descriptive Title: FAILURE TO PROPERLY HANDLE BREATHING ZONE SAMPLER HEAD FILTER PAPER WITH CLEAN GLOVES

Item Number	Type	Module #	Area	Resp	Action Due Date (M M D D Y Y)	Updt/Clsout Rpt #	Date O/M/Clsd (M M D D Y Y)
- -				/			

Originator:

Modifier/Closer:

Descriptive Title:

C-E Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Tel. 203/688-1911
Telex: 99297

POWER SYSTEMS

undated

License No. 06-00217-06
Docket No. 30-3754
DDH-83-105

U.S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

ATTENTION: Mr. R. W. Starostecki, Director
Division of Project and Resident Programs

REFERENCE: Letter from R. W. Starostecki, NRC, to H. V. Lichtenberger, C-E, dated September 19, 1983; Combined Inspections 70-1100/83-03, 30-3754/83-01

Dear Mr. Starostecki:

This is in response to the above referenced letter in which you reported a notice of deviation which was determined by your inspector during his visit to our facility on July 18-21, 1983.

Deviation

ANSI Standard N7.2-1963 "Radiation Protection in Nuclear Reactor Fuel Fabrication Plant" states that Breathing Zone Air Samples are collected at the breathing zone of an individual during performance of his duties and are a measure of the concentration of airborne radioactive materials to which the individual is exposed.

Contrary to the above, on July 20, 1983, the breathing zone air sampler practice observed by the NRC inspector did not assure measurement of the concentration of airborne radioactive materials which an individual would be exposed: an operator installing filter paper for use in a breathing zone air sampler did so while wearing gloves potentially contaminated by wiping down the external surfaces of the air sampler, which was stored on a contaminated table in a contaminated laboratory.

ITEM # 55

B/54

Response

We have reviewed our procedure for the issuance of breathing zone air samplers. As a result of this review, we have re-instructed applicable personnel in the proper use of the devices. We believe that the deviation cited by your inspector to be an isolated case and that a change to our current procedure would not enhance the effectiveness of our internal exposure control methods.

Very truly yours,

COMBUSTION ENGINEERING, INC.

H. V. Lichtenberger
Vice President - Nuclear Fuel
Nuclear Power Systems - Manufacturing

HVL/EG:amb

OCT 2 0 1983

Docket Nos. 70-1100
30-3754

Combustion Engineering, Inc.
ATTN: Mr. H. V. Lichtenberger
Vice-President - Nuclear Fuel
Nuclear Power Systems - Manufacturing
P. O. Box 500
Windsor, Connecticut 06095

Gentlemen:

Subject: Combined Inspection Nos. 70-1100/83-03 and 30-3754/83-01

This refers to your undated letter in response to our letter dated September 19, 1983.

Thank you for informing us of the corrective and preventive actions documented in your letter. These actions will be examined during a future inspection of your licensed program.

Your cooperation with us is appreciated.

Sincerely,
Original Signed By:
Thomas C. Elsasser for
Richard W. Starostecki, Director
Division of Project and Resident Programs

cc:
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
State of Connecticut

bcc:
N. Ketzlach, NMSS
Region I Docket Room (with concurrences)
Senior Operations Officer

RI:DPRP	RI:DPRP	RI:DPRP	RI:DPRP
Roth/dmg	Elsasser	Greenman	Starostecki
10/19/83	10/20/83	10/20/83	10/21/83

B/55

ITEM # 56

MAT[illegible]LS RADIOLOGICAL PROTECTION [illegible] ON MLER-RI-84-116
LICENSEE EVENT REPORT
Lic. # 06-00217-06

I. ACTION CONTROL DATA

Licensee C-E POWER SYSTEMS

Event Description OVEREXPOSURE TO HANDS

Event Date JUNE 1984 Report Date 8-28-84

II. REPORTING REQUIREMENT

[ ] 10 CFR 20.402 - theft or loss
[ ] 10 CFR 35.42 Therapeutic Misadministration
[ ] 10 CFR 20.403(a)(b) overexposure/release
[ ] 10 CFR 35.43 Diagnostic Misadministration
[X] 10 CFR 20.405 - 30 day report
[ ] License Condition
[ ] Other

III. REGION I RESPONSE

[ ] Immediate Site Inspection Inspector Date
[✓] Special Inspection Inspector Date
[ ] Telephone Inquiry Inspector Date

Licensee Representative and Title

[ ] PN [ ] Daily Report

[ ] Information entered - Region I log and Outstanding Items List

[ ] Review at next routine inspection

IV. REPORT EVALUATION

[ ] Description of Event
[ ] Corrective Actions
[ ] Levels of R/M involved
[ ] Calculation Adequate
[ ] Cause of Event
[ ] Letter to Licensee requesting additional information

Completed by: R. H. Ladue Date 9/18/84

Reviewed by: [signature] Date 9/27/84

V. SPECIAL INSTRUCTIONS OR COMMENTS

SPECIAL INSPECTION
NE-0080

B/56

ITEM # 59

CONVERSATION RECORD

TIME 2:20pm DATE 1/11/85

TYPE ☐ VISIT ☐ CONFERENCE ☒ TELEPHONE ☐ INCOMING ☒ OUTGOING

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU	ORGANIZATION (Office, dept., bureau, etc.)	TELEPHONE NO.
Philip R. Rosenthal Manager Health Physics	Combustion Engineering	203 285-9866

ROUTING

NAME/SYMBOL	INT

SUBJECT Renewal Application 06-00217-06
Defficiencies - in submittal

SUMMARY

1. Bioassay program: current license states urine analysis - when accident or emergency occurs - whole body counting semi-annually - * will send commitment to Bioassay as per current license.

2. ALARA - at 2.5 Rem/Q? Please justify - * personnel working at CE. also "rent a tech type" - CE does accumulative exposure when they work a other facilities - so may be that they (worker) receives 100 mRem at CE but 2 Rem at reactor outage.

ACTION REQUIRED

MS-11 LTR from licensee

NAME OF PERSON DOCUMENTING CONVERSATION: Jenny M Johansen | SIGNATURE: Johansen | DATE: 1/11/85

ACTION TAKEN

B157

SIGNATURE ITEM # 62 | TITLE "OFFICIAL RECORD COPY" | DATE ML10

50271-101 ☆ GPO : 1981 0 - 361-526 (7227) CONVERSATION RECORD OPTIONAL FORM 271 (12-76) DEPARTMENT OF DEFENSE

COMBUSTION ENGINEERING

April 12, 1985

Mr. Thomas T. Martin, Director
Division of Radiation Safety
and Safeguards
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Mr. Martin:

I am in receipt of your letter of April 10, 1985 concerning the results of the special safety inspection conducted on December 13, 1984 and the Enforcement Conference to be held at your office on April 18, 1985. I have been told by Mr. Rosenthal that, as a result of discussions with you, my attendance at this meeting will not be necessary. I believe that Mr. Rosenthal explained the new organizational arrangements within NPS. Within this new organization, Mr. Streinz, Director of Nuclear Services Research and Development, is now responsible for the functions referred to in your April 10 letter and is authorized to represent Combustion Engineering, Inc. in this matter.

Messrs. Donald F. Streinz and Philip R. Rosenthal are planning to attend the April 18, 1985 meeting in your office.

Very truly yours,

Warren P. Chernock

Warren P. Chernock
Vice President
Advanced Nuclear Systems

WPC:mk

cc: P. R. Rosenthal
D. F. Streinz

B/58

ITEM # 68

Power Systems
Combustion Engineering, Inc.

1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500

(203) 688-1911
Telex: 99297

APR 17 1985

Docket No. 030-03754 License No. 06-00217-06

MEMORANDUM FOR: Thomas E. Murley, Regional Administrator

THRU: Thomas T. Martin, Director
Division of Radiation Safety and Safeguards

FROM: James H. Joyner, Chief
Nuclear Materials Safety and Safeguards Branch

SUBJECT: ENFORCEMENT CONFERENCE WITH COMBUSTION ENGINEERING, INCORPORATED

Attached is background information for the Enforcement Conference to be held at Region I at 10:30 a.m., April 18, 1985, with Combustion Engineering, Inc. The meeting will include a discussion of apparent violations identified during an inspection conducted on December 4, 1984 and which included an in-office inspection of a licensee report on February 25, 1985. The principal area of concern is the extremity overexposure and the inadequate survey which resulted in this overexposure.

A pre-briefing will be held in Mr. T. Martin's office at 8:30 a.m. on April 18, 1985.

James H. Joyner, Chief
Nuclear Materials Safety and
Safeguards

Attachments:
1. Notice of Significant Licensee Meeting
2. Inspection Report No. 030-03754/85-01
3. Inspection History
4. Appendix A

cc w/attachments:
T. Allan
T. Martin
J. Joyner
J. Kinneman
J. Gutierrez
F. Costello
C. Rowe
M. J. Cioffi
D. Holody
V. Miller

B/59

ITEM # 69

APR 10 1985) No. 85-40

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

NOTICE OF SIGNIFICANT LICENSEE MEETING

Name of Licensee:	Combustion Engineering
Name of Facility:	Combustion Engineering
Docket No.:	030-03765
License No.:	06-00217-06
Time and Date of Meeting:	10:30 a.m., April 18, 1985
Location of Meeting:	USNRC Region I Office, 1008 8th Avenue King of Prussia, Pennsylvania, 19406
Purpose of Meeting:	Discuss the Findings of Inspection No. 84-01
NRC Attendees:	J. M. Allan, Deputy Regional Administrator T. Martin, Director, Division of Radiation Safety and Safeguards J. Joyner, Chief, Nuclear Materials Safety and Safeguards Branch, DRSS J. Gutierrez, Regional Counsel J. Kinneman, Chief, Nuclear Materials Safety Section A C. Rowe, Radiation Specialist D. J. Holody, Enforcement Specialist
Licensee Attendees:	W. P. Chernock, Vice President P. Rosenthal, Manager, Health Physics

Note: Attendance by NRC personnel at this meeting should be made known by 4:45 p.m., Wednesday, April 17, 1965 via telephone call to F. Costello, Region I, at FTS 8-488-1275.

Prepared by: Francis M. Costello
Francis M. Costello

Distribution:
William J. Dircks, Executive Director for Operations
Victor Stello, Jr., Deputy Executive Director Regional Operations and Generic Requirements
James Taylor, Director, Office of Inspection and Enforcement
Jane Axelrad, Director, Enforcement Staff, IE
J. Lieberman, Director and Chief Counsel, Regional Operations and Enforcement Division, OELD
V. Miller, Chief, Materials Licensing Branch
D. Chapell, Deputy Director, Division of Fuel Cycle and Materials Safety, NMSS
L. Cobb, Chief, Safeguards and Materials Program Branch, IE
Public Document Room (PDR)

bcc:
Regional Administrator
Deputy Regional Administrator
Division Directors
Branch Chiefs
Public Affairs Officer
Region I Receptionist
F. Costello, DRSS
C. Rowe, DRSS
J. Kinneman, DRSS
J. Kinneman, DRSS
D. Holody, EC
J. Gutierrez, RC
Marie Oprendek, DPRP
DRMA File

ENFORCEMENT HISTORY (1981-1985)

Combustion Engineering, Inc.
(License No. 06-00217-06)

Inspection	Results
85-01	Violation - extremity exposure (19.5 rem) in excess of 10 CFR 20.101 limit. Violation - failure to perform survey to comply with 10 CFR 20.101
83-01 (July 18-21,1983)	No violations Deviation - failure to assure adequate breathing zone sample.
81-01 (December 14-17, 1981)	Violation - failure to perform required semi-annual whole body counting (License Condition 16)

This licensee is also licensed as a nuclear fuel manufacturer under SNM-1067. No significant or similar violations were identified during inspections of this license during this time period.

APPENDIX A

NOTICE OF VIOLATION

Combustion Engineer, Inc.
Windsor, Connecticut 06095

Docket No. 030-03754
License No. 06-00217-06

As a result of the inspection conducted on December 13, 1984 and February 25, 1985, and in accordance with the NRC Enforcement Policy (10 CFR 2, Appendix C), the following violations were identified:

A. 10 CFR 20.101(a) prohibits the use of licensed material in such a manner as to cause any individual in a restricted area to receive from radioactive materials or other sources of radiation a total occupational radiation exposure in excess of 18.75 rem to the hands in any calendar quarter.

Contrary to the above, during the second calendar quarter of 1984, a technician performing tests on Charpy specimens in a restricted area of your facility, received an occupational exposure of 19.5 rem to the hands.

This is a Severity Level III violation (Supplement IV)

B. 10 CFR 20.201(b) requires that each licensee make such surveys as may be necessary to comply with all sections of Part 20. As defined in 10 CFR 20.201(a), "survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions.

Contrary to the above, adequate surveys were not taken prior to or during the testing of Charpy specimens during the period June 13, 1984 through June 21, 1984 to evaluate the potential extremity exposure for individuals performing the tests.

This is a Severity Level IV violation. (Supplement VI)

Pursuant to the provisions of 10 CFR 2.201, Combustion Engineering, Inc. is hereby required to submit to this office within thirty days of the date of the letter which transmitted this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Where good cause is shown, consideration will be given to extending this response time.

1

MAY 07 1985

Docket No. 030-03754
License No. 06-00217-06

MEMORANDUM FOR: James M. Taylor, Director, Office of Inspection and Enforcement

FROM: Thomas E. Murley, Regional Administrator, Region I

SUBJECT: PROPOSED ENFORCEMENT ACTION - COMBUSTION ENGINEERING, INC.

Enclosed for your review and concurrence is a proposed enforcement action (letter and "Notice of Violation and Proposed Imposition of Civil Penalty") for two violations of NRC requirements which occurred at Combustion Engineering, Windsor, Connecticut. The violations are categorized in the aggregate at Severity Level III and a $5,000 civil penalty is proposed.

Please note that this memo and Enclosure 1 are being sent on this date to you, the Director of Enforcement, and ELD via the 5520. Enclosure 2 (the inspection report), was issued on April 10, 1985 and was previously sent to the Director of Enforcement, and ELD via the Document Control Room as part of the standard distribution list for all inspection reports.

Original signed by
Thomas E. Murley
Thomas E. Murley
Regional Administrator

Enclosures:

1. Proposed letter and "Notice of Violation and Proposed Imposition of a Civil Penalty"
2. Inspection Report No. 85-01

B/60

RI	ES:RI	D:DRSS:RI	RC:RI	DRA:RI	RA:RI
AShropshire	DHolody	TMartin	JGutierrez	JAllan	TMurley
4/ /85	4/ /85	4/25/85	4/29/85	5/2/85	5/ /85

OFFICIAL RECORD COPY

CP PKG COMBUSTION ENG - 0001.0.0
04/22/85

ITEM # 70

Ma. 12th
add 2/B
when issued

EXPEDITE

COMBUSTION ENGINEERING

Info Comp
By: Jackson

RECEIVED

DDH-86-562

May 13, 1986

'86 MAY 23 P2:15

U.S. Nuclear Regulatory Commission
Region 1
631 Park Avenue
King of Prussia, Pennsylvania 19406

Attention: Ms. Jenny Johansen

Subject: Materials License 06-00217-06 - Request for Amendment

Dear Ms. Johansen:

Combustion Engineering, Inc. requests that the subject Materials License be amended to authorize receipt, possession, and transfer of small quantities of trans-uranium elements in the form of surface contaminations on nonradioactive tools and equipment.

Specifically, it is requested that the license be amended to authorize possession of the following:

Material	Chemical/Physical	Quantity
any radioactive material with atomic numbers between 84 and 103, inclusive	any	not to exceed 3 millicuries for each nuclide except as stated below
Uranium 233	any	1 gram
Uranium 235	any	7 grams
Plutonium	any	2 grams

Possession of the materials identified above will be in the form of surface contamination on tools and equipment received for decontamination, repair, modification or storage.

In accordance with 10 CFR 170.31, please find enclosed a check in the amount of $350.00 to cover the amendment fee.

continued ...

B/6)

1986 MAY 14 AM 10:08

ML10 "OFFICIAL RECORD COPY"

Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500
(203) 688-1911
Telex: 99297

ITEM # 76

105487

MAY 14 1986

2

If you have any questions concerning this amendment application, please contact the undersigned at (800) 243-7085 or (203) 285-9266.

Very truly yours,

COMBUSTION ENGINEERING, INC.

Philip R. Rosenthal

Philip R. Rosenthal
Manager,
Radiological Protective Services

PRR/nrc
encl. (ck.-$350.00)

COMBUSTION ENGINEERING

License SNM-1067
Docket 70-1100

May 19, 1986

U. S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Attention: Mr. Thomas T. Martin, Director
Division of Radiation Safety and Safeguards

Reference: 1) Letter from Thomas T. Martin, NRC, to H. V. Lichtenberger, CE, Dated April 23, 1986; Combined Inspection No's 70-1100/86-01 and 30-3754/86-01
2) Letter from H. V. Lichtenberger, CE, to W. T. Crowe, NRC, Dated December 16, 1985
3) Letter from N. Ketzlach, NRC, to H. V. Lichtenberger, CE, Dated February 14, 1986
4) Letter from H. V. Lichtenberger, CE, to N. Ketzlach, NRC, Dated March 18, 1986

Dear Mr. Martin:

This is in reply to the above referenced letter in which you reported that as a result of your inspector's visit to our facility on January 13-17, 1986, certain of our activities were not in full compliance with NRC requirements. Our response to the Notice of Violation and Notice of Deviation, Appendixes A and B, respectively, is as follows:

APPENDIX A, ITEM A

Section 4.14, "Posting of Limits", of your NRC-approved license application (Part 1-Criteria), dated June 15, 1984, states, in part, that all work stations and storage areas shall be posted with a nuclear safety limit approved by the Manager, Nuclear Licensing, Safety, Accountability and Security (NLSA&S) or the Nuclear Criticality Specialist.

Contrary to the above, on January 13, 1986, the work station in the bundle storage room, used to store up to two open or closed fuel bundle shipping containers in designated locations, was not posted with nuclear safety limits.

B162

5

Power Systems
Combustion Engineering Inc.
1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500
(203) 688-1911
Telex 99297

ITEM # 77

RESPONSE

At the time of your inspector's visit, the bundle storage room was posted with a nuclear safety limit sign. However, your inspector was not satisfied with the sign because it did not include a restriction on the number of fully loaded fuel bundle shipping containers in the room even though SNM-1067 allows us a maximum of two containers at one time. It was explained to your inspector that our normal practice is to limit the number of containers in the room to a maximum of two since placing a third container in the room makes it difficult, if not impossible, to perform routine operations. Your inspector was not satisfied with this explanation and we agreed to modify the safety sign to place a limit of two containers in the room at one time. The new sign was posted on February 6, 1986.

APPENDIX A, ITEM B

Section 2.2.2, "Nuclear Fuel Manufacturing - Windsor", of Part 1 (Criteria) of your NRC-approved license application states that the General Manager delegated to the Production and Material Control Manager and to the Engineering Manager responsibility to assure that all operations involving nuclear materials have been analyzed to establish the required safety limits and controls. The Manager, NLSA&S or Nuclear Criticality Specialist shall assist the Engineering Manager and the Production and Material Control Manager by performing the analysis required and establishing the appropriate controls.

Contrary to the above, on January 13, 1986, the inspector identified that the following two operations involving nuclear materials had not been analyzed to establish the required safety limits and controls: (1) in the fuel rod prestacking operation, the configuration of fuel rods was modified to include 20 blank, hollow spacers in the array of fuel rods in storage trays; and (2) in the pellet press operation, there was an additional tray located underneath the press to pellet boat transfer ramp (screen) which increased the slab thickness from 4.0 to 4.5 inches.

RESPONSE TO ITEM (1)

On December 16, 1985 we submitted a license change request including appropriate analysis results, Reference 2, which would allow us to stack fuel rods in storage boxes, using hollow bars as spacers, to a maximum height of six inches.

It should be noted that the five and one-half inch slab height presently approved in SNM-1067 was based on a 0.48 water/fuel ratio (Ref. Para. 8.33, Page II.8-17) which was based on the following conservative assumptions:

- the fuel rods in the rod box were stacked in a close packed hexagonal array, and

- the cladding and clad/fuel gap were assumed to be water (UO_2 pellet stacks were assumed to be surrounded by an imaginary water film)

Utilizing the 0.48 water/fuel ratio, a critical infinite slab thickness of 11 inches was established for a 4.1% enrichment using Figure 1.E.16 of UKAEA Handbook AHSB 1. Applying the license safety factor for slabs (Para. 4.2.4, Page I.4-6) of 1.2 yields an allowable slab thickness of about nine inches which is much higher than the five and one-half inches approved in the original license or the six inches requested in our Reference 2 submittal.

In reply to our Reference 2 submittal, we received Reference 3 requesting clarification and further information regarding our change request. One of the items discussed in Reference 3 was the fact that we had not provided sufficient information regarding the use of hollow spacer bars in the pre-stacking of fuel rods in rod storage boxes. It was felt that the hollow spacer bars introduced more water into the rod storage box which in turn changed the water/fuel ratio and the critical infinite slab thickness.

In answer to the Reference 3 letter, we submitted Reference 4 which provided additional information to clarify our original Reference 2 submittal. This information is further elaborated on as follows:

By introducing the 20 hollow spacer bars into the array of fuel rods in storage trays, the water/fuel ratio was recalculated using the following assumptions:

- the fuel rods in the box were stacked in a close packed hexagonal array, and

- the cladding and clad/fuel gap were not displaced by water and the neutron absorbing property of the cladding was neglected, and

- the 20 hollow spacers were assumed to be water which was uniformly distributed throughout the rod box.

Utilization of the noted assumptions resulted in a new water/fuel ratio of 0.37 which is less than the 0.48 water/fuel ratio specified in the license. Again, utilizing Table 1.E.16 of UKAEA Handbook AHSB 1, it was found that the critical infinite slab thickness, utilizing either a 0.48 or 0.37 water/fuel ratio and a 1.2 safety factor, is still about nine inches which is much higher than the presently approved five and one-half inch slab height or the requested change to a six inch slab height.

RESPONSE TO ITEM (2)

The area in question within the pellet presses was originally analyzed on the basis of a slab limit. The trays in question have always been located in the position noted since they were considered to be part of the original slab limit analysis. However, UO_2 powder sometimes overflows the trays and increases the overall slab height to four and one-half inches. To eliminate this problem we have performed preliminary analysis which shows that the slab height can be increased to five inches without impairing the safety of the operation. A formal request for approval for the new five inch slab limit will be submitted to the NRC within the next several weeks. In the interim we will require the pellet press operator to empty the powder tray on a more frequent basis to eliminate the possibility that the press slab limit will be exceeded.

APPENDIX B

As a result of the inspection conducted on January 13-17, 1986, and in accordance with NRC Enforcement Policy (10 CFR 2, Appendix C), the following deviation from standard industry practice was identified:

> Acceptable radiation control procedures do not permit the co-mingling of protective clothing that is potentially contaminated with removable radioactivity with protective clothing that is not contaminated.

Contrary to the above, on January 14, 1986, the inspector observed lab coats (protective clothing) that were potentially contaminated with removable radioactivity on the outside hanging on top of one another in the Building 5 chemistry laboratory such that the inside of one garment was in contact with the outside of the garment beneath. The inspector also observed an individual starting to don one of the garments without conducting a contamination survey to determine whether the inside was contaminated.

RESPONSE

Appendix B indicates that employees working in the Building 5 chemistry laboratory were observed hanging potentially contaminated lab coats on top of one another. This practice could result in the transfer of radioactive contamination from the outside of the bottom garment to the inside of the top garment. Results of a subsequent review of the incident revealed that an insufficient number of hangers were available for the number of employees authorized to work in the laboratory. An adequate number of coat hangers have been installed in each of the

licensed laboratories in Building 5. In addition, laboratory employees have been instructed in the proper procedure for handling potentially contaminated protective clothing. This corrective action was completed within one week of the inspectors visit.

Very truly yours,

H. V. Lichtenberger
Vice President
Nuclear Fuel

HVL/RES/sam

REGION 1

NMSS LICENSEE EVENT REPORT

License No. 06-00217-06

Docket No. 030-03754

MLER-RI-88-191

I. ACTION CONTROL DATA

Licensee COMBUSTION ENGINEERING

Event Description _____

Event Date 11/9/88 Report Date 12/8/88

II. REPORTING REQUIREMENT

[ ] 10 CFR 20.402 - theft or loss

[ ] 10 CFR 20.403(a)(b) overexposure/release

[ ] 10 CFR 20.405 - 30 day report

[X] Other 20.205

[ ] 10 CFR 35.33 Therapeutic Misadministration

[ ] 10 CFR 35.33 Diagnostic Misadministration

[ ] License Condition

III. REGION I RESPONSE

[ ] Immediate Site Inspection Inspector _____ Date _____

[ ] Special Inspection Inspector _____ Date _____

[ ] Telephone Inquiry Inspector _____ Date _____

Licensee Representative and Title _____

[X] PN [ ] Daily Report

[X] Information entered - Region 1 log and Outstanding Items List

[ ] Review at next routine inspection

IV. REPORT EVALUATION

[X] Description of Event

[X] Levels of R/M involved

[ ] Cause of Event

[ ] Corrective Actions

[ ] Calculation Adequate

[ ] Letter to Licensee requesting additional information

Completed by: Elizabeth Ullrich Date 1/3/89

Reviewed by: _____ Date 1/5/89

B/63

V. SPECIAL INSTRUCTIONS OR COMMENTS

Telephone notification 11/9/88

ITEM # 87 34

Lice p No. 06-00217-06
Docket No. 030-03754
MLER-8 8-191

COMBUSTION ENGINEERING

December 8, 1988
LD-88-153

Mr. William T. Russell
Regional Administrator
U. S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, Pennsylvania 19406

Subject: Incident Report Involving Transportation of Radioactive Material

Dear Mr. Russell:

The purpose of this letter is to formally report a recent incident involving transportation of radioactive materials. Mr. J. Roth (NRC-Region I) was informed of this incident by phone on November 9, 1988 by Mr. J. M. Limbert (C-E). Combustion Engineering is providing this material as a followup to the telephone contact for your information.

If you have any questions regarding this matter, please do not hesitate to call me or Mr. C. M. Molnar of my staff at (203) 285-5205.

Very truly yours,

COMBUSTION ENGINEERING, INC.

A. E. Scherer
Director
Nuclear Licensing

AES:jeb

Enclosure: As noted

cc: J. Roth (NRC-Region I)

1X30

Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500
(203) 688-1911
Telex: 99297

Return Original to Region I

Enclosure to
LD-88-153
32 Pages

Incident Report Involving Transportation of Radioactive Material

A shipment of radioactive materials of low specific activity (LSA), in an exclusive use vehicle, was received at our Windsor, CT facility from Arkansas Power and Light Company's Arkansas Nuclear One Nuclear Plant at approximately 1130 hours on November 7, 1988. A receipt survey was performed that afternoon in accordance with 10 CFR 20.205 and our Radiological Protection Instruction Number 13 with the following results:

(1) The cover of one of the boxes had slipped open during transport - (see photos of box S-05-05, Figure 1).

(2) The vehicle receipt smear survey showed no radiation contamination in excess of 0.01 microcuries. Please note: Smear number 14 was taken on the inside of box S-05-05. (See Table 1).

(3) No external surface contact radiation levels were greater than 200 millirem per hour (See Figure 2).

The following actions were taken since the workday had ended:

(1) The partially open box was closed.

(2) The vehicle was re-locked by Health Physics Personnel.

(3) On the morning of November 8, 1988 box number C-05-01 was subjected to Hot Particle Surveillance, Radiation, and Contamination Surveys. It was then off loaded from the vehicle due to the high contact dose rate on the box. The box was moved to a high radiation storage area. The box survey is provided as Table 2.

(4) The vehicle was locked and remained so until the morning of November 9, 1988.

On November 9, 1988 the vehicle was unloaded with the following results:

(1) Hot particle surveillance in accordance with our Radiological Protection Instruction Number 21 was conducted on all packages.

A. A hot particle was discovered on the outside of Box S-05-05. The activity was approximately 50,000 DPM by RM-14, RAD-205.

B. The Radiation Safety Officer and Manager, Radiation Protection Services were notified.

C. The particle was sent to radiochemistry for analysis. (Figure 3).

D. Mr. Limbert (C-E) called Mr. Roth (NRC-Region I) at this time.

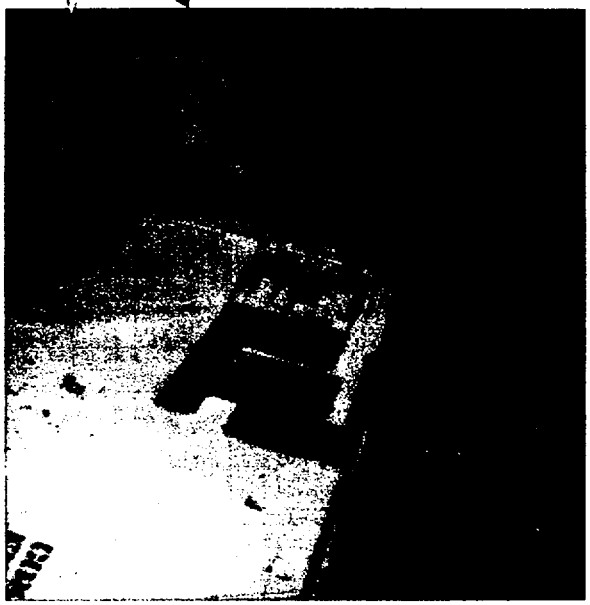
E. The incident was reported to Arkansas Power & Light Company.

F. The remainder of the packages were surveyed and off-loaded, no external, loose, radioactive contamination in excess of 100 DPM/100 CM^2 was found. (Table 3).

G. The trailer (RO-16) was then surveyed (smeared and frisked) and released. (Table 4).

A review of the shipping documents revealed that the container No. S-05-05 dose rate indicated 960 mrem/hr on contact [page 8 of 16 of the ANO Radioactive Shipment Record, (Appendix A)]. Our receipt survey indicated a dose rate of approximately 10 mrem/hr on contact. The shipper was notified of this condition.

Photos of Box S-05-05
in the As Found Condition



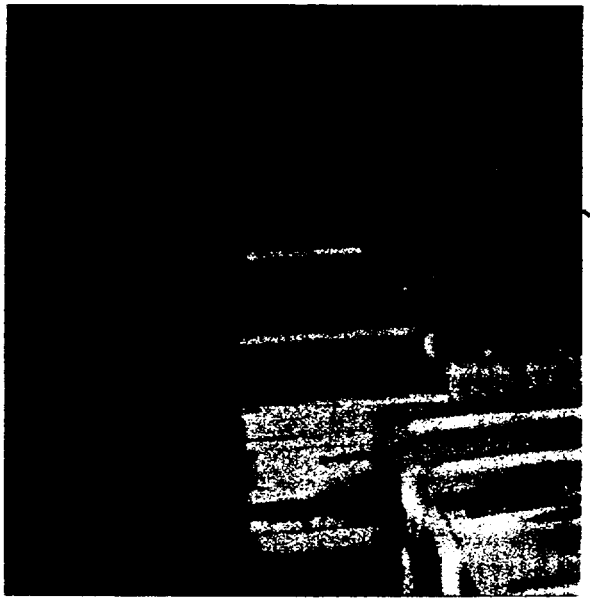
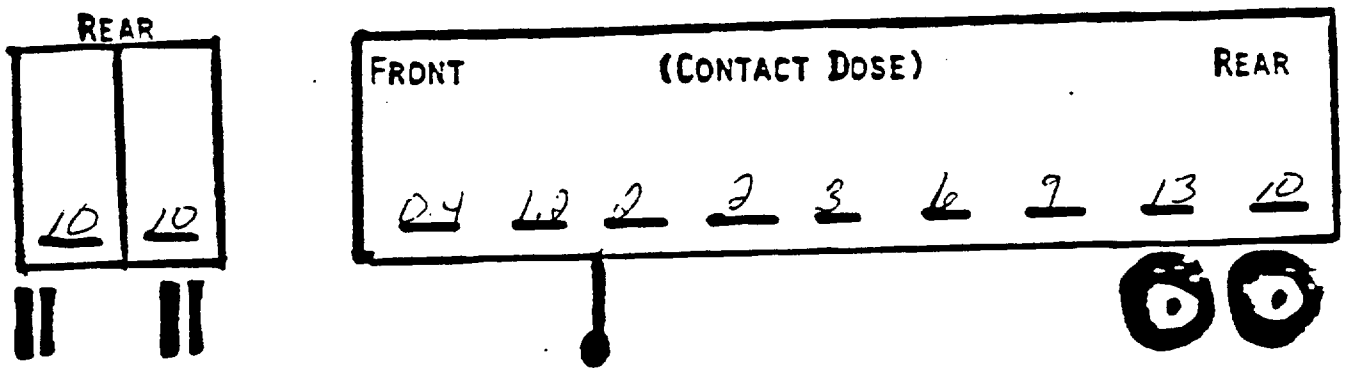


FIGURE 2

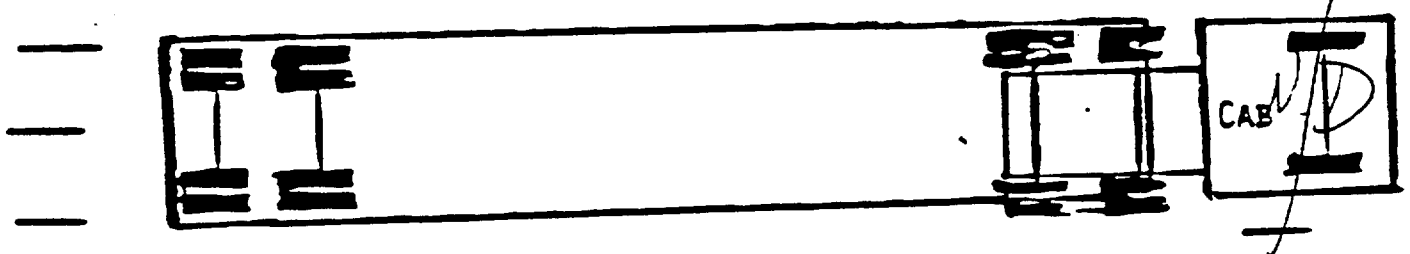
RADIOACTIVE MATERIALS TRANSPORT VEHICLE SURVEY	RMSR #
DESTINATION: Receipt Survey	TRAILER NUMBER: 2016
SURVEYED BY: Basil O. Price	DATE: 11/7/88
INSTRUMENT USED: Teletector 6112B Due 12/12/88 Rad 210	TIME: 2:15 pm
LEGEND: • ALL DOSE RATES IN MREM/HR.	

REMARKS: This was a Prior to Unloading Survey

* Dose Taken on Center of Bottom of Trailer

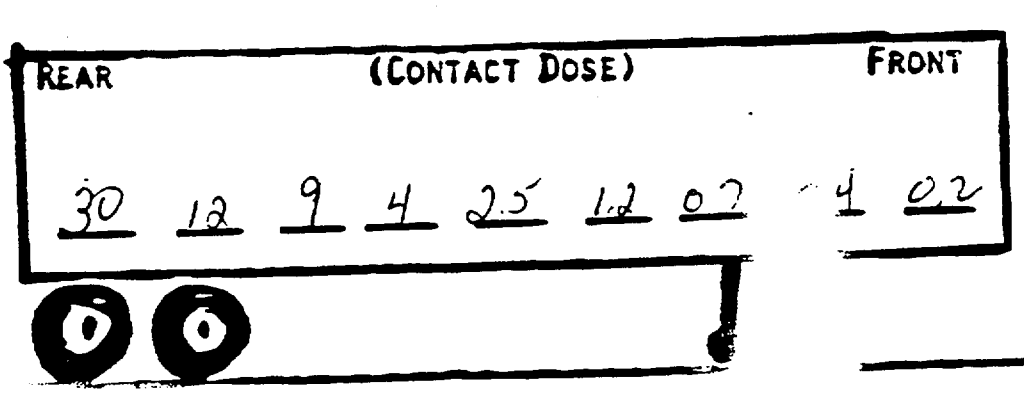


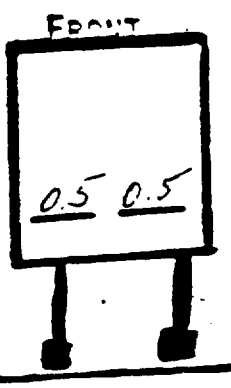
DOSE AT 2 METERS



* 14 3 2 15 0.6 0.2 0.1

DOSE AT 2 METERS





ARKANSAS TRUCK RO-16

TIME (L) = 3000 #27 HOT PART. 15: 23 9 NOV 88
PSET (L) = 3000 UNIT# 1 DT= 1%
TAG NO.= 0

0.3 KEV VFS= 8192 CRT= (01-16) 2050.3 KEV

CANBERRA

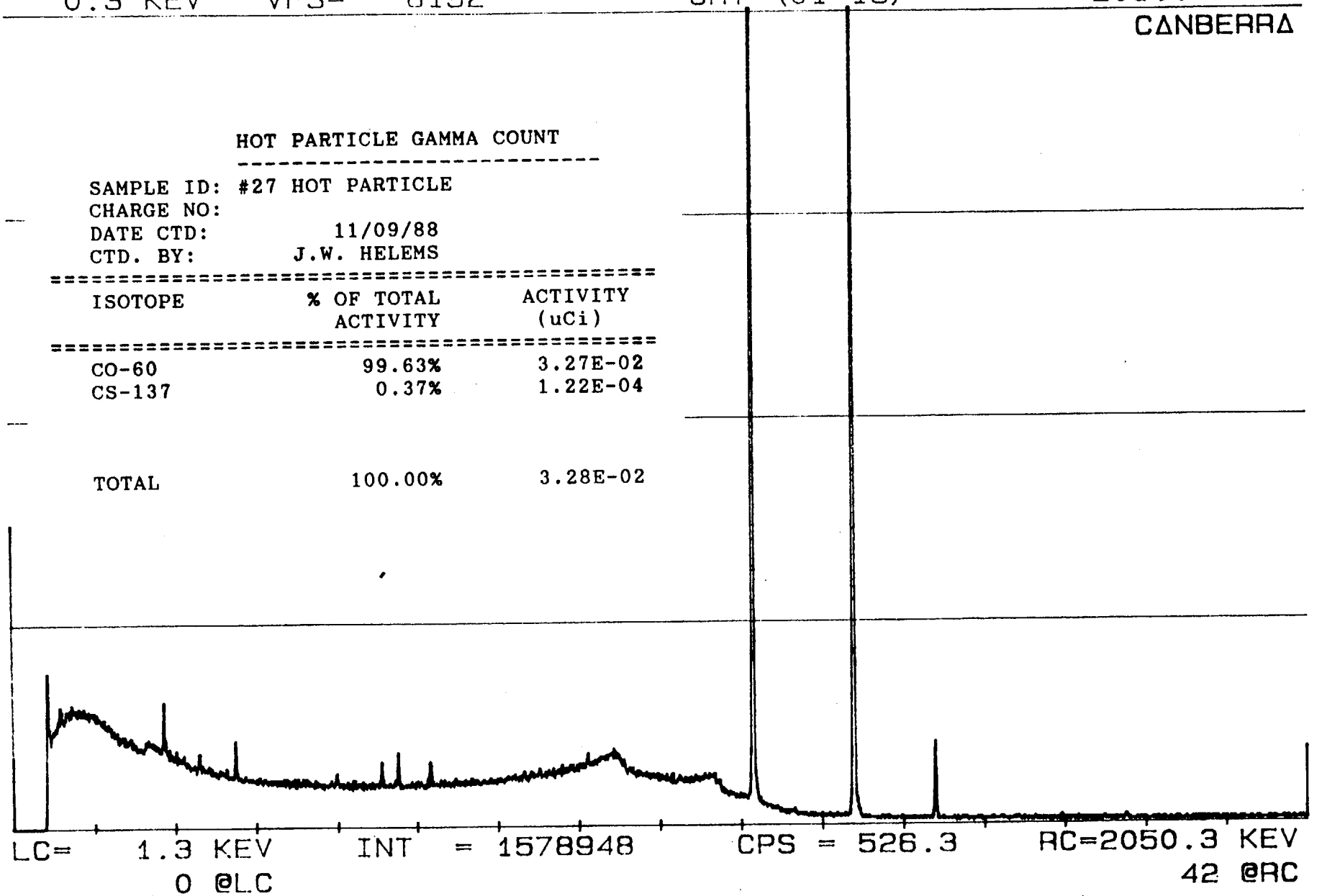


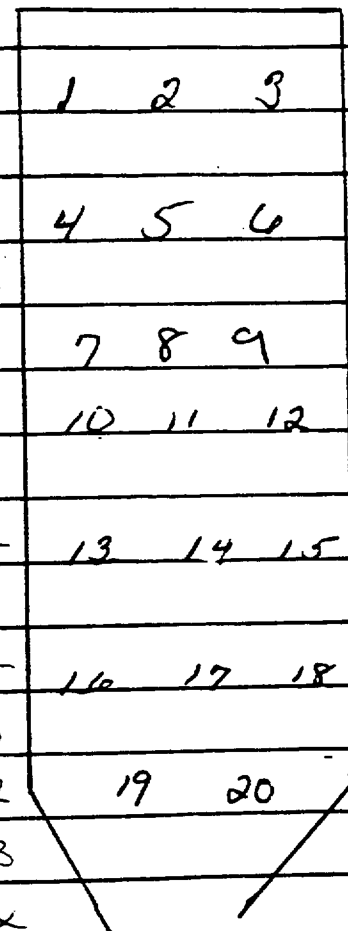
FIGURE 3

RADIATION & CONTAMINATION SURVEY

		Contamination	Radiation
Date Sampled: 11/7/88	**Instrument No:**	MS-3 / Ecl 100	
Date Counted: Same	**Counter Efficiency:**	10.8%	47.1%
Operator: [illegible signature]	**Smear Counted For:** Alpha ■ Beta ■		

Location of Survey: Prior to unloading Trailer # R016

Smear No.	Gross CPM	BKG CPM	Net CPM	DPM*	Contact MR/HR	1 meter MR/HR	Description/Remarks
1	46	47	0	ND	N/A	N/A	β
1	5	4	1	2	↓	↓	α
2	52	47	5	46			β
2	4	4	0	ND			α
3	48	47	1	9			β
3	4	4	0	ND			α
4	57	47	10	92			β
4	3	4	0	ND			α
5	57	47	10	90			β
5	3	4	0	ND			α
6	35	47	0	ND			β
6	0	4	0	ND			α
7	52	47	5	46			β
7	2	4	0	ND			α
8	49	47	2	18			β
8	3	4	0	ND			α
9	54	47	10	100			β Smear # 1-10
9	3	4	0	ND			α taken on floor
10	53	47	6	55			β
10	0	4	0	ND	↓	↓	α



* ND = None Detectable

RADIATION & CONTAMINATION SURVEY

	Contamination	Radiation
Date Sampled: 11/7/88 **Instrument No:**	MS 3 Rad 100	

Date Counted: Same **Counter Efficiency:** 10.8% β / 47 1%

Operator: [illegible] **Smear Counted For:** Alpha ☒ Beta ☒

Location of Survey: Prior to unloading trailer # R016.

Smear No.	Gross CPM	BKG CPM	Net CPM	DPM*	Contact MR/HR	1 meter MR/HR	Description/Remarks
11	49	47	2	18	N/A	N/A	β on Box
11	0	4	0	ND	↓	↓	α on Box
12	44	47	0	ND			β on Box
12	2	4	0	ND			α on Box
13	53	47	6	55			β on Floor
13	8	4	4	8			α on Floor
14	67	47	20	184			β inside Box
14	1	4	0	ND			α inside Box
15	44	47	0	ND			β on Box
15	0	4	0	ND			α on Box
16	56	47	9	83			β on Floor
16	5	4	1	2			α on Floor
17	45	47	0	ND			β on Box
17	2	4	0	ND			α on Box
18	48	47	1	9			β on Box
18	2	4	0	ND			α on Box
19	55	47	8	74			β on Box
19	1	4	0	ND			α on Box
20	32	47	0	ND			β on Floor
20	5	4	1	2	↓	↓	α on Floor

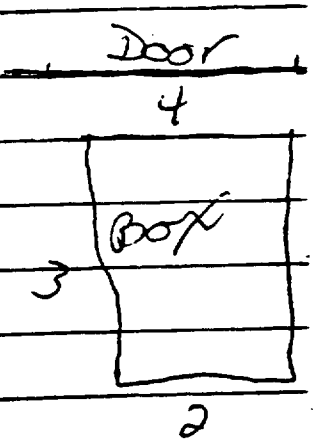
* ND = None Detectable

WORK ONLY

RADIATION & CONTAMINATION SURVEY FOR WORK

Date Sampled: 11/8/88	Rad 176 Instrument No: Canberra	Contamination X	Radiation X
Date Counted: 11/8/88		Counter Efficiency: 10% B 20% a	
Operator: A. O. Pike		Smear Counted For: Alpha ■ Beta ■	
Location of Survey: Bldg 2 – Box ~~S-05-01~~ C-05-01 JWS			

	GROSS CPM	BKG CPM	NET CPM	DPM	CONTACT ** γ	18" ** α	18" ** γ	1 METER ** γ	Description/Remarks
1.	21	32	0	ND	110	N/A	N/A	N/A	
1.	0	0	0	ND	↓	↓	↓	↓	
2.	22	32	0	ND					
2.	0	0	0	ND					
3.	32	32	0	ND					
3.	0	0	0	ND					
4.	35	32	3	30					
4.	0	0	0	ND	↓	↓	↓	↓	



* ND = None Detectable

** – All Readings MR/HR

TABLE 3

RADIATION & CONTAMINATION SURVEY

Date Sampled: 11/9/88 Instrument No: Rad 176 Canberra | Contamination: X | Radiation: X

Date Counted: 11/9/88 Counter Efficiency: 19.4 β / 30.5 α

Operator: W Fagel Smear Counted For: Alpha ☒ Beta ☒

Location of Survey: Package receipt survey as RO 16 from ANO is unloaded

Smear No.	Gross CPM	BKG CPM	Net CPM	β DPM	α DPM*	Contact MR/HR	1 meter MR/HR	Description/Remarks
1				30	3	2.5	N/A	V-08-03
2	C			ND	ND	0.2		V-08-43
3	O			5	ND	0.2		Case 1
4		U		56	ND	0.2		Case 2
5		N		15	ND	0.2		V-08-23
6		T		ND	ND	0.2		CB-1
7	C	O	E	ND	ND	0.2		ISI-033
8	A	N	D	ND	ND	1.0		V-08-08
9	N			5	3	0.5		V-08-05
10		B		5	3	0.2		V-08-19
11		E R		ND	ND	0.5		V-08-44
12		R		ND	ND	0.2		J-01-23
13			A	5	ND	9.0	↓	S-05-05

* ND = None Detectable

TABLE 4

RADIATION & CONTAMINATION SURVEY

Contamination: X Radiation:

Date Sampled: 11/10/88 Instrument No: Eberline

Date Counted: 11/10/88 Counter Efficiency:

Operator: W Tagel Smear Counted For: Alpha ☑ Beta ☑

Location of Survey: Release survey of RO16

Smear No.	Gross CPM	BKG CPM	Net CPM	β DPM*	α DPM*	Contact MR/HR	1 meter MR/HR	Description/Remarks
1				8	ND	N/A	N/A	
2				3	ND			
3				3	ND			
4	C			13	3			
5		O		34	ND			
6		U		3	ND			
7		N		3	ND			
8		T		ND	ND			
9			E	29	3			
10	C	D	O	3	ND			
11	A	N		3	ND			
12	N			3	3			
13	B			13	ND			
14		E		13	ND			
15		R		19	ND			
16		R		8	ND			
17			A	24	ND			
18				13	ND			
19				ND	ND			
20				3	3	↓	↓	

1 2 3 4 5 7 8 10 11 13 14 16 17 19 20

all smears taken on floor

* ND = None Detectable

W. Tagel 11/10/88

Floor of Trailer Masslin Mopped no readings above Bkgd as measured on RM-14 RAD DOT I.T. Diesel

APPENDIX A

[redacted]

ROBERTS EXPRESS

P.O. BOX 7182
AKRON, OHIO 44306-0162
PHONE 1-800-ROBERTS

CONSIGNEE COPY

ROBERTS # 1103083.08

DATE 11-3-88

SHIPPER
NAME Arkansas Power & Light
Arkansas Nuclear Plant 1
STREET Hiway 333
CITY Russellville ST. Ark ZIP

CONSIGNEE
NAME Combustion Engineering
Prospect Hill Rd
CITY Windsor ST. Ct ZIP

INTERMEDIATE STOP NAME
STREET CITY ST.

SHIPPER'S B/L #

DECLARED VALUE

NO. PIECES	DESCRIPTION OF ARTICLES AND SPECIAL REMARKS	WEIGHT	MILES	TOTAL CHARGES
1	Trailer (Van) Food Radioactive Material LSA NOS UN2912 Metal Oxides & Fission Products On Equipment in Strong tight Container Contents & Condition Unknown - Loaded by Shipper	8000 lbs Trailer #R016		

YOUR DECLARED VALUE DAMAGE OR LOSS
We are liable for no more than $50,000. per shipment in the event of physical loss or damage, unless you fill in a higher Declared Value and document higher actual loss in the event of a claim. We charge 10¢ for each additional $100 of declared value up to the maximum of $100,000.

DELAY
There is always a risk of late delivery or non-delivery. In the event of a late delivery Roberts Express will, at your request within 30 days, refund part of transportation charges paid.

CONSEQUENTIAL DAMAGES
We will not be responsible or liable for any loss or damage resulting from delay, non-delivery or damage to a shipment except as noted above. This includes loss of sales, income, interest, profits, attorneys fees and other costs, but is not limited to these items. Such damages are called "consequential damages."

BILLING INSTRUCTIONS

PAYMENT ☐ BILL SHIPPER ☑ BILL CONSIGNEE OTHER (SPECIFY BELOW)

☐ BILL OTHER
NAME
STREET CITY ST. ZIP

SPECIAL HANDLING REQUIRED

☐ AIR RIDE ☐ REFRIGERATION ☐ HEAT

☑ HAZARDOUS ☐ C.O.D. AMOUNT $ _____ GBL NO. _____

DELIVERY RECORD

Received shipment described above in good order and condition except as noted

Consignee William Nagel

11-7-88 1150

Show complete company name and signature - initials not accepted

Time _____ Date _____

DELIVERED BY Ken Jackson
DRIVER NAME

LOAD		DATE	TIME	AM	PM
	SCHEDULED	11-3-88	9:30	✓	
	ARRIVED	11-3-88	9:30	✓	
	DEPARTED	11-3-88	1:00		✓

UNLOAD		DATE	TIME	AM	PM
	SCHEDULED	11-7-88	11:30		✓
	ARRIVED	11-7-88	11:30		
	DEPARTED	11-7-88	12:30		✓

[redacted]

[redacted]

TRANSPORTATION PERMIT
RADIOACTIVE MATERIAL

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
P O DRAWER A WETHERSFIELD CT 06109

7308

DATE ISSUED	DATE EFFECTIVE	EXPIRATION DATE	PERMIT ISSUED VIA
11-4-88	11-7-88	11-7-88	Trans. 914-457-3492

Roberts Express
P.O. Box 7162
Akron, Ohio 44306

ORDERED BY: Combustion Engineering

SHIPPER: Combustion Engineering

LIMITATIONS:

1. Vehicle shall be operated at a safe rate of speed under favorable weather and road conditions
2. Permit covers State highways and State bridges only
3. Gross load may not exceed posted capacity of any bridge
4. Permit does not exonerate the permittee from legal liability or responsibility for damages to any highway, street or bridge resulting from use of the vehicle described below
5. Permit is void after expiration date and on Saturdays, Sundays and holidays
6. No further permit will be issued unless this permit is duly signed, dated, and returned to this office within one week after the expiration date
7. Permit (or confirmation of the existence of such permit) must be on vehicle while on State highways
8. Vehicle and load must conform to Section 19-409 of the General Statutes of Connecticut as amended

	MAKE	YEAR	COLOR	REGISTRATION	STATE
TRACTOR:	Kenworth	1988	Mauve	LH2923	N.C.
TRAILER:	Frauhauf	1986	White	E16768	ME.

GROSS VEHICLE WT	NO OF AXLES	OVERALL HEIGHT	OVERALL WIDTH	DRIVER(S)
legal	legal	legal	legal	Ken Jackson

SHIPMENT DATE	TIME	MAJOR ISOTOPES	QUANTITY (Curies)	REQUIRED LABEL
11-7-88	0900	Co^{58} Cs^{137} Co^{60} Ag^{110m}	.02504	L.S.A.

ORIGIN: Russelville, Ark. Arkansas Power & Light

DESTINATION: Windsor, Ct. Combustion Engineering

ROUTES: 84E, I91N, 75N Day Hill Rd. Prospect Hill Rd.

STATE PERMIT FEE: $25.00-paid

PERMIT ISSUED BY: Shirley Kerelejza

STATE POLICE CONTACT: Dispatcher Burton Time 2:20 11-4-88

ESCORT REQUIREMENTS: ☐ Front ☐ Rear ☐ Appropriate Signs Required

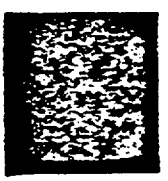
HOURS OF TRAVEL: ☐ Daylight ☒ 9:00 A.M -4:00 P.M ☐ No Restriction

PERMITTEE (Sign and return as instructed)

DATE

PMT-019 Rev 6/84

IMPORTANT: SIGN, DATE AND RETURN THIS ...



STRAIGHT BILL OF LADING — SHORT FORM — Original — Not Negotiable

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading

ORDER NO.

SHIPPER'S NO. (SHOW THESE NUMBERS ON PRT. BILL): 147-88

CUST. ORDER NO.

DATE: 11-3-88

FROM
AT (PICK-UP POINT): ARKANSAS POWER & LIGHT

MAIL FREIGHT BILLS TO (POST OFFICE BOX): RT 3 BOX 137G RUSSELLVILLE, AR 72801

CONSIGNED TO (MAIL OR STREET ADDRESS OF CONSIGNEE — FOR PURPOSES OF NOTIFICATION ONLY)
COMBUSTION ENGINEERING
1000 PROSPECT HILL RD
WINDSOR, CT 06095

ROUTE

CAR OR VEHICLE INITIAL AND NO.: (KW) E-690

DELIVERING CARRIER: ROBERTS EXPRESS

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property, over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Uniform Freight Classification in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certified that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.
Signature of Consignor

If charges are to be prepaid, write or stamp here "To be Prepaid."

NOTE — Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ____ per ____

NO. PKGS.	‡HM	CLASSIFICATION DESCRIPTION [If Hazardous Material Use D.O.T. Description & Class, No Abbreviations]	WEIGHT SUB. TO COR.
12	X	RADIOACTIVE MATERIAL, LSA, NOS, UN2912	8,000
		METAL OXIDES AND FISSION PRODUCTS ON	
		EQUIPMENT IN STRONG TIGHT CONTAINERS	
2		CLEAN (NON-RADIOACTIVE) PACKAGES	
		PLACARDED	
		SEALED # 86C	
		25.04 MILLICURIES	
		EXCLUSIVE USE	
		Carrier please note: All 16 pages of the attached shipping	
		documents must accompany this shipment to	
		destination and must be given to consignee. Page 16 of 16 Pages.	

‡ HM This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable regulations of the Department of Transportation.

PLACARDS SUPPLIED OR APPLIED: [X] RADIOACTIVE TYPE

Shipper, Per Harold Bishop

Carrier, Per Ken Jackson

CONSIGNEE COPY

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: RADIO. SHIPMENT CHECK LIST & SHIPPING PAPERS | FORM NO. 1603.003A

REV. #11 Pg 1

SHIP TO COMBUSTION ENGINEERING
1000 PROSPECT HILL RD.
WINDSOR, CT. 06095

RSR NUMBER 147-88

License Number of Organization Receiving Radioactive Material

06-00217-06

a) Description of Material: RADIOACTIVE MATERIAL, LSA, NOS, UN2912, METAL OXIDES AND FISSION PRODUCTS ON EQUIPMENT
Chemical Form, if Applicable

b) Prominent Radionuclides NB95, CO58, CO60, CS134, CS137, N163, FE55, RU106, SB125

c) Quantity 25.04 Millicuries

d) Type Shipment LSA

e) Type Container STRONG TIGHT

f) Sole Use Vehicle Required YES

g) NRC and/or DOT Labels on all Containers, as Applicable YES

h) Maximum Vehicle Radiation Levels:
External Surface of Vehicle 65 mRem/hr
2 Meters from External Surface 9 mRem/hr
Reading in Cab <1 mRem/hr

i) Maximum Loose Surface Contamination: Alpha <50 DPM/100cm2
Beta-Gamma <1000 DPM/100cm2

Surveyor's Name B. BLAKESLEE Title H.P. TECH Date 11-3-88

j) Required Placards on Vehicle YES

k) RSR and Applicable Forms Completed: YES

This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

l) Signed By Harold Bishop Date 11-3-88
Assistant Radioactive Waste Supervisor

m) Reviewed By Harold Bishop Jr. Date 11-3-88
Radioactive Waste Supervisor

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: RADIOLOGICAL SURVEY FORM | FORM NO. 1622.001A | REV. # 2 | PC #

SMR NO	GROSS CPM	CPM-BG	DPM 100cm²	REMARKS
1	<200	<100	<1000	AS NOTED ON MAP
2	↓	↓	↓	↓
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21	↓	↓	↓	↓

N
A

beta/gamma

DATE 11-3-88 TIME 1000

COUNTING INST. PC 026 RM 073 CAL DUE 4-10-89 1-23-89

d/c 10 BKG 100 COUNT TIME (min) 0.25

COUNTED BY B. BLAKESLEE

SMR NO	GROSS CPM	CPM-BG	DPM 100cm²	REMARKS
4	0	0	<50	α
5	1	1	<50	α
6	0	0	<50	α

N
A

alpha

DATE 11-3-88 TIME 1010

COUNTING INST. TN 002 CAL DUE 5-12-89

d/c 4.3 BKG 0 COUNT TIME (min) 2

COUNTED BY TRACY SHANNON

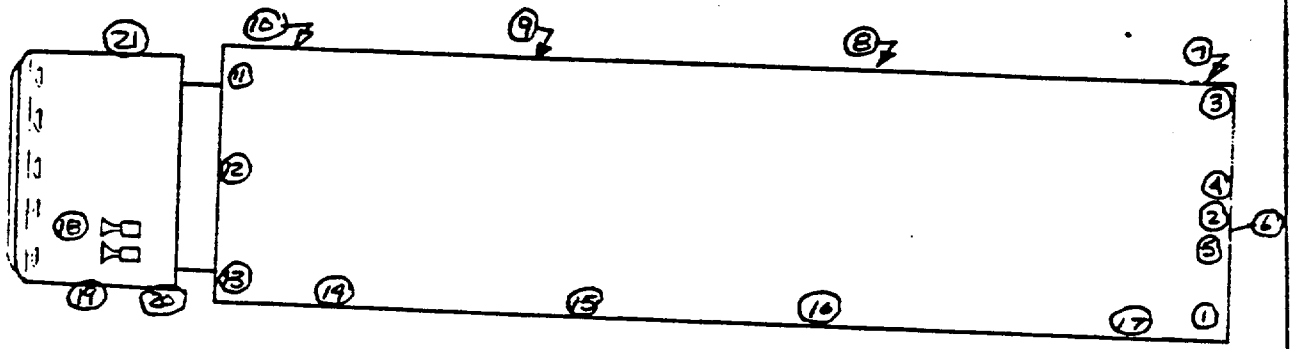
SURVEY NO RW 11-3-3 PAGE 1 of 1 REV BY

MANIFEST PAGE 2 of 16

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: HEALTH PHYSICS SURVEY MAP | SURVEY ID:

MAP # | LOCATION: OLD RAD WASTE BLDG AREA.



SURVEY TYPE ENTRY / (EXIT)

TRACTOR ID# E-690

TRAILOR ID# R016

VENDOR ROBERTS/CE

HIGHEST mR/hr CONTACT 65

HIGHEST mR/hr @ ~~6 FT.~~ 2METERS 9
BB 11-3-88

HIGHEST mR/hr in CAB <1

HIGHEST dpm/100cm^2 <1000

DATE 11-3-88 TIME 0945 RX. PWR N/A %

PURPOSE: TRUCK EXIT SURVEY

INST. ASP-1 SER.# AGC009 CAL DUE 9-11-89 B/F N/A

INST. N/A SER.# N/A CAL DUE N/A B/F N/A

REMARKS: N/A.

SURVEYOR BILL BLAKESLEE 3242

LEGEND:

All readings in mR/hr unless otherwise noted.

- ▭ Denotes beta doserate in mrad/hr
- △ Denotes neutron doserate in mrem/hr
- ✳ Denotes contact doserate
- ○ Denotes smear locations
- ▨ Denotes large area smear locations

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One RSR # 147-88

TITLE: AP&L DRIVERS INSTRUC. FOR EXCL. USE VEHICLES | FORM NO. 1603.003J

REV. #4

The Code of Federal Regulation 49 CFR 173.425 requires that specific instructions for maintenance of exclusive use shipment controls be provided by the shipper to the carrier. These instructions shall be included with the radioactive waste shipment document.

The following instructions shall be complied with for all exclusive use vehicles:

- Do not move or transfer packages within the van or between vans while enroute to destination.
- The shipment shall be loaded by consignor and unloaded by consignee from the transport vehicle in which originally loaded.
- Shipments shall be braced so as to prevent leakage or shifting of load under conditions normally incident to transportation.
- The vehicle shall be placarded "Radioactive" on all four sides of the trailer until shipment is unloaded.
- If the vehicle is involved in an accident which could shift the load and change radiation levels, notify the shipper immediately. Make notification to AP&L by calling collect (501) 968-7410 day or night.
- Shipment shall be transported to consignee in as expeditious a manner as is practicable. If transport delays of more than 24 hours occur notify consignor and dispatcher immediately.
- Tractor is not to be changed without prior notification to shipper.
- 5th wheel location is not to be moved without prior notification to shipper.

NOTICE: Driver must inform Plymouth Weight Station or Station on I-90 near Spokane at least four (4) hours before arrival and prior to entering the state of Washington (509) 783-4014.

Any deviations from these instructions or violations of State and Federal Laws could result in carrier penalty.

Ken Jackson — Driver's Signature

11-3-88 — Date

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: VEHICLE INSPECTION FOR RADIOACTIVE MATERIAL SHIPMENTS | FORM NO. 1603.003K | REV. #1

RSR 147-88 Carrier ROBERTS EXPRESS

Truck Make, Number (KW) E-690 Trailer Type, Number VAN R016

1. Tires

   a) Tractor: No regrooved or retread tires on steering axle; no cuts, no abrasions or gashes on sides, minimum tread thickness of 1/32 inch. SAT

   b) Trailer: No cuts, abrasions or gashes on sides, minimum tread thickness 1/32 inch. SAT

2. Air hoses from tractor to trailer: No rub marks, hoses separated, no leakage. SAT

3. Trailer and tie down fixtures: No loose or broken boards, tie down cables not touching at cross. SAT

4. Tractor: All lights operating, no cracks in windshield to impair driver's vision, general physical condition, in date safety inspection. SAT

5. Description of load and method of securing:

   12 STRONG TIGHT CONTAINERS SECURED WITH SHORING

Harold C. Bishop
Assistant Radioactive Waste/Supervisor

11-3-88
Date

Date: 11-3-88
To: COMBUSTION ENGINEERING
1000 PROSPECT HILL RD
WINDSOR, CT 06095
Carrier: ROBERTS
Driver's Signature: Ken Jackson

ARKANSAS NUCLEAR ONE
RADIOACTIVE SHIPMENT RECORD
ARKANSAS POWER AND LIGHT
P.O. BOX 608
RUSSELLVILLE, AR 72801
(501) 968-2519

RSR: 147-88
Material Description: RADIOACTIVE MATERIAL, LSA, NOS, UN2912
Type Container: STRONG TIGHT
Trailer No.: R016

Item No.	Cubic Feet	Transport Index	Physical State	Chemical Form	mRem/HR @ Surface	mRem/HR @ 3 ft.	Isotopes	Activity (milli-curies)	Source lbs.	SNM grams	Label Used
							NB95	1.1E-3			
V08	13	N/A	SOLID	METAL	.2	.1	CO58	2.55E-3	N/A	N/A	LSA
23				OXIDES			CO60	6.9E-4			
				AND			CS134	2.9E-4			
				FISSION			CS137	6.1E-4			
				PRODUCTS			N163	9.66E-4			
				ON			FE55	1.08E-3			
				EQUIPMENT			NN54	2.9E-4			
							AG110M	1.69E-3			
							CR51	1.33E-3			
							ZR95	7.3E-4			
							RU106	5.7E-4			
							SB125	2.1E-4			
REESE	13	N/A	SOLID	METAL	.2	.1	NB95	1.1E-3	N/A	N/A	LSA
#1				OXIDES			CO58	2.55E-3			
				AND			CO60	6.9E-4			
				FISSION			CS134	2.9E-4			
				PRODUCTS			CS137	6.1E-4			
				ON			N163	9.66E-4			
				EQUIPMENT			FE55	1.08E-3			
							NN54	2.9E-4			
							AG110M	1.69E-3			
							CR51	1.33E-3			
							ZR95	7.3E-4			
							RU106	5.7E-4			
							SB125	2.1E-4			
2	26	N/A	Totals				Totals	2.4E-2	N/A	N/A	

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to applicable regulations of the Department of Transportation.

Harold Bishop
Assistant Radioactive Waste Supervisor

PAGE 5 OF 16

TITLE: ANO RADIOACTIVE SHIPMENT RECORD
FORM NO. 1603.003G
REV. # 7 PC #

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

3 BB 11-7-88

Date: 11-4-88
To: COMBUSTION ENGINEERING
1000 PROSPECT HILL RD
WINDSOR, CT 06095
Carrier: ROBERTS
Driver's Signature: Ken Jackson

ARKANSAS NUCLEAR ONE
RADIOACTIVE SHIPMENT RECORD
ARKANSAS POWER AND LIGHT
P.O. BOX 608
RUSSELLVILLE, AR 72801
(501) 968-2519

RSR: 147-88
Material Description: RADIOACTIVE MATERIAL, LSA, NOS, UN2912
Type Container: STRONG TIGHT
Trailer No.: R016

Item No.	Cubic Feet	Transport Index	Physical State	Chemical Form	mRem/HR @ Surface	mRem/HR @ 3 ft.	Isotopes	Activity (milli-curies)	Source lbs.	SNM grams	Label Used
							CO 58	2.55E-3			
V08	13	N/A	SOLID	METAL	.5	.1	NB95	1.1E-3	N/A	N/A	LSA
44				OXIDES			CO60	6.9E-4			
				AND			CS134	2.9E-4			
				FISSION			CS137	6.1E-4			
				PRODUCTS			N163	9.66E-4			
				ON			FE55	1.08E-3			
				EQUIPMENT			MN54	2.2E-4			
							AG110M	1.69E-3			
							CR51	1.33E-3			
							ZR95	7.3E-4			
							RU106	5.7E-4			
							SB125	2.1E-4			
V08	13	N/A	SOLID	METAL	.2	.1	NB95	1.1E-3	N/A	N/A	LSA
19				OXIDES			CO58	2.55E-3			
				AND			CO60	6.9E-4			
				FISSION			CS134	2.9E-4			
				PRODUCTS			CS137	6.1E-4			
				ON			N163	9.66E-4			
				EQUIPMENT			FE55	1.08E-3			
							MN54	2.2E-4			
							AG110M	1.69E-3			
							CR51	1.33E-3			
							ZR95	7.3E-4			
							RU106	5.7E-4			
							SB125	2.1E-4			
			Totals				Totals				
2	26	N/A						2.4E-2	N/A	N/A	

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to applicable regulations of the Department of Transportation.

Harold Bisby
Assistant Radioactive Waste Supervisor

PAGE 6 OF 16

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: ANO RADIOACTIVE SHIPMENT RECORD
FORM NO. 1603.003C
REV. # 7 PC #

Date: 11-3-88
To: COMBUSTION ENGINEERING
1000 PROSPECT HILL RD
WINDSOR, CT 06095
Carrier: ROBERTS
Driver's Signature: Ken Jackson

ARKANSAS NUCLEAR ONE
RADIOACTIVE SHIPMENT RECORD
ARKANSAS POWER AND LIGHT
P.O. BOX 608
RUSSELLVILLE, AR 72801
(501) 968-2519

RSR: 147-88
Material Description: RADIOACTIVE MATERIAL, LSA, NOS, UN2912
Type Container: STRONG TIGHT
Trailer No.: R016

Item No.	Cubic Feet	Transport Index	Physical State	Chemical Form	mRem/HR @ Surface	mRem/HR @ 3 ft.	Isotopes	Activity (milli-curies)	Source lbs.	SNM grams	Label Used
							NB95	2.2E-3			
Y-08 03	13	N/A	SOLID	METAL OXIDES AND FISSION PRODUCTS ON EQUIPMENT	.8	.1	CO58	5.10E-3	N/A	N/A	LSA
							CO60	1.38E-3			
							CS134	5.8E-4			
							CS137	1.22E-3			
							NI63	1.93E-3			
							FE55	2.15E-3			
							MN54	4.4E-4			
							AG110M	3.38E-3			
							CR51	2.66E-3			
							ZR95	1.46E-3			
							RU106	1.14E-3			
							SB125	4.2E-4			
Y08 43	13	N/A	SOLID	METAL OXIDES AND FISSION PRODUCTS ON EQUIPMENT	.15	.1	NB95	1.0E-3	N/A	N/A	LSA
							CO58	2.55E-3			
							CO60	6.9E-4			
							CS134	2.9E-4			
							CS137	6.1E-4			
							NI63	9.66E-4			
							FE55	1.08E-3			
							MN54	2.2E-4			
							AG110M	1.69E-3			
							CR51	1.33E-3			
							ZR95	7.3E-4			
							RU106	5.7E-4			
							SB125	2.1E-4			
2	26	N/A	Totals				Totals	3.61E-2	N/A	N/A	

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to applicable regulations of the Department of Transportation.

Harold B Ushey
Assistant Radioactive Waste Supervisor

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: ANO RADIOACTIVE SHIPMENT RECORD
FORM NO. 1603.003G
REV. # 7 PC #

Date: 11-3-88
To: COMBUSTION ENGINEERING
1000 PROSPECT HILL RD
WINDSOR, CT 06095
Carrier: ROBERTS
Driver's Signature: Ken Jackson

ARKANSAS NUCLEAR ONE
RADIOACTIVE SHIPMENT RECORD
ARKANSAS POWER AND LIGHT
P.O. BOX 608
RUSSELLVILLE, AR 72801
(501) 968-2519

RSR: 147-88
Material Description: RADIOACTIVE MATERIAL, LSA, NOS, UN2912
Type Container: STRONG TIGHT
Trailer No.: R016

Item No.	Cubic Feet	Transport Index	Physical State	Chemical Form	mRem/HR @ Surface	mRem/HR @ 3 ft.	Isotopes	Activity (milli-curies)	Source lbs.	SNM grams	Label Used
S-05 05	40	N/A	SOLID	METAL OXIDES AND FISSION PRODUCTS ON EQUIPMENT	960	1.0	NB95	1.14E-1	N/A	N/A	LSA
							CO58	2.65E-1			
							CO60	7.18E-2			
							CS134	3.02E-2			
							CS137	6.34E-2			
							NI63	1.0E-1			
							FE55	1.12E-1			
							MN54	2.89E-2			
							AG110M	1.76E-1			
							CR51	1.38E-1			
							ZR95	7.59E-2			
							RU106	5.93E-2			
							SB125	2.18E-2			
C-05 01	192	N/A	SOLID	METAL OXIDES AND FISSION PRODUCTS ON EQUIPMENT	160	27	NB95	2.16E	N/A	N/A	LSA
							CO58	5.0			
							CO60	1.35			
							CS134	5.68E-1			
							CS137	1.20			
							NI63	1.89			
							FE55	2.11			
							MN54	4.31E-1			
							AG110M	3.31			
							CR51	2.61			
							ZR95	1.43			
							RU106	1.12			
							SB125	4.12E-1			
2	232	N/A	Totals				Totals	24.85	N/A	N/A	

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to applicable regulations of the Department of Transportation.

Harold B. Bishop
Assistant Radioactive Waste Supervisor

PAGE 8 OF 16

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: ANO RADIOACTIVE SHIPMENT RECORD
FORM NO. 1603.003C
REV. # 7 PC #

Date: 11-3-88
To: COMBUSTION ENGINEERING
1000 PROSPECT HILL RD
WINDSOR, CT 06095
Carrier: ROBERTS
Driver's Signature: Ken Jackson

ARKANSAS NUCLEAR ONE
RADIOACTIVE SHIPMENT RECORD
ARKANSAS POWER AND LIGHT
P.O. BOX 608
RUSSELLVILLE, AR 72801
(501) 968-2519

RSR: 147-88
Material Description: RADIOACTIVE MATERIAL, LSA, NOS, UN2912
Type Container: STRONG TIGHT
Trailer No.: R016

Item No.	Cubic Feet	Transport Index	Physical State	Chemical Form	mRem/HR @ Surface	mRem/HR @ 3 ft.	Isotopes	Activity (milli-curies)	Source lbs.	SNM grams	Label Used
							NB95	5.5E-3			
Y08	13	N/A	SOLID	METAL	1.4	.15	CO58	1.28E-2	N/A	N/A	LSA
08				OXIDES			CO60	3.45E-3			
				AND			CS134	1.45E-3			
				FISSION			CS137	3.05E-3			
				PRODUCTS			NI63	4.83E-3			
				ON			FE55	5.38E-3			
				EQUIPMENT			MN54	1.10E-3			
							AG110M	8.45E-3			
							CR51	6.65E-3			
							ZR95	3.65E-3			
							RU106	2.85E-3			
							SB125	1.05E-3			
Y08	13	N/A	SOLID	METAL	.9	.1	NB95	2.2E-3	N/A	N/A	LSA
05				OXIDES			CO58	5.1E-3			
				AND			CO60	1.38E-3			
				FISSION			CS134	5.8E-4			
				PRODUCTS,			CS137	1.22E-3			
				ON			NI63	1.93E-3			
				EQUIPMENT			FE55	2.15E-3			
							MN54	4.4E-4			
							AG110M	3.38E-3			
							CR51	2.66E-3			
							ZR95	1.46E-3			
							RU106	1.14E-3			
							SB125	4.2E-4			
2	26	N/A	Totals				Totals	8.43E-2	N/A	N/A	

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to applicable regulations of the Department of Transportation.

Harold Bishop
Assistant Radioactive Waste Supervisor

PAGE 9 OF 16

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: ANO RADIOACTIVE SHIPMENT RECORD
FORM NO. 1603.003G
REV. # 7 PC #

Date: 11-3-88
To: COMBUSTION ENGINEERING
1000 PROSPECT HILL RD
WINDSOR, CT 06095
Carrier: ROBERTS
Driver's Signature: Ken Jackson

ARKANSAS NUCLEAR ONE
RADIOACTIVE SHIPMENT RECORD
ARKANSAS POWER AND LIGHT
P.O. BOX 608
RUSSELLVILLE, AR 72801
(501) 968-2519

RSR: 147-88
Material Description: RADIOACTIVE MATERIAL, LSA, NOS, UN2912
Type Container: STRONG TIGHT
Trailer No.: R016

Item No.	Cubic Feet	Transport Index	Physical State	Chemical Form	mRem/HR @ Surface	mRem/HR @ 3 ft.	Isotopes	Activity (milli-curies)	Source lbs.	SNM grams	Label Used
							NB95	1.1E-3			
ISI	4	N/A	SOLID	METAL	.2	.1	CO58	2.55E-3	N/A	N/A	LSA
033				OXIDES			CO60	6.9E-4			
				AND			CS134	2.9E-4			
				FISSION			CS137	6.1E-4			
				PRODUCTS			NI63	9.66E-4			
				ON			FE55	1.08E-3			
				EQUIPMENT			MN54	2.2E-4			
							AG110M	1.69E-3			
							CR51	1.33E-3			
							ZR95	7.3E-4			
							RU106	5.7E-4			
							SB125	2.1E-4			
J-01	9	N/A	SOLID	METAL	.2	.1	NB95	1.10E-3	N/A	N/A	LSA
033				OXIDES			CO58	2.55E-3			
				AND			CO60	6.9E-4			
				FISSION			CS134	2.9E-4			
				PRODUCTS			CS137	6.1E-4			
				ON			NI63	9.66E-4			
				EQUIPMENT			FE55	1.08E-3			
							MN54	2.2E-4			
							AG110M	1.69E-3			
							CR51	1.33E-3			
							ZR95	7.3E-4			
							RU106	5.7E-4			
							SB125	2.1E-4			
2	13	N/A	Totals				Totals	2.4E-2	N/A	N/A	

This is to certify that the above named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to applicable regulations of the Department of Transportation.

Harold Bilsher
Assistant Radioactive Waste Supervisor

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One
TITLE: ANO RADIOACTIVE SHIPMENT RECORD
FORM NO. 1603.003G
REV. # 7 PC #

INSTRUCTIONS

1. Six smears should be taken per box, one on each side.
2. Smears should be approximately 100 cm^2.
3. Record the highest contact radiation level in mR/hr per box.
4. Record the 3' radiation level.

Box No.	Radiation Level Contact	3'	Smear 1 Gross	Net	dpm	Smear 2 Gross	Net	dpm	Smear 3 Gross	Net	dpm	Smear 4 Gross	Net	dpm	Smear 5 Gross	Net	dpm	Smear 6 Gross	Net	dpm
V-08-3	.8	<.1	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K
V-08-43	.15	<.1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
V-08-08	1.4	.15	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
V-08-05	.9	<.1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
V-08-44	.5	<.1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
V-08-19	.2	<.1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
V-08-23	.2	<.1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Reese #1	.2	<.1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
ISI-033	.2	<.1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

Smear/Survey By J. Crawford 2311 Date 10-20-88 Time 2200

Counted By J. Crawford 2311 Date 10-20-88 Time 2200

Survey Inst. ASP-1 Bkg < .1 mr/hr Serial No. 725

Counting Inst. RM-14/054 d/c 10 Bkg 150 CPM Type B-Y

Date 11-3-88 Reviewed By Butch Bishop

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: SURVEY OF RADIOACTIVE WASTE BOXES

FORM NO. 1603.010B

REV. # 1

INSTRUCTIONS

1. Six smears should be taken per box, one on each side.
2. Smears should be approximately 100 cm^2.
3. Record the highest contact radiation level in mR/hr per box.
4. Record the 3' radiation level.

Box No.	Radiation Level Contact	3'	Smear 1 Gross	Net	dpm	Smear 2 Gross	Net	dpm	Smear 3 Gross	Net	dpm	Smear 4 Gross	Net	dpm	Smear 5 Gross	Net	dpm	Smear 6 Gross	Net	dpm
J-01-023	.2	<.1	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K
										N/A										

Smear/Survey By J. Crawford 2311 Date 10-20-88 Time 2200

Counted By J. Crawford 2311 Date 10-20-88 Time 2200

Survey Inst. ASP-1 Bkg <.1 MR/hr Serial No. 775

Counting Inst. RM-14/054 d/c 10 Bkg 150 CPM Type B-8

Date 11-3-88 Reviewed By Butch Bishop

page 12 of 16

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: SURVEY OF RADIOACTIVE WASTE BOXES

FORM NO. 1603.010B

REV. # 1

INSTRUCTIONS

1. Six smears should be taken per box, one on each side.
2. Smears should be approximately 100 cm^2.
3. Record the highest contact radiation level in mR/hr per box.
4. Record the 3' radiation level.

Box No.	Radiation Level Contact	3'	Smear 1 Gross	Net	dpm	Smear 2 Gross	Net	dpm	Smear 3 Gross	Net	dpm	Smear 4 Gross	Net	dpm	Smear 5 Gross	Net	dpm	Smear 6 Gross	Net	dpm
S-05-05	960	1.0	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K
S-05-01	160	27	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K	≤BKGD	0	<1K

Smear/Survey By J. Crawford 2311 Date 11-2-88 Time 0200

Counted By J. Crawford 2311 Date 11-2-88 Time 0200

Survey Inst. ASP-1 / 776 Bkg 0.1 mR/hr Serial No. 776

Counting Inst. RM 14 / 054 d/c 10 Bkg 150 CPM Type B, S

Date 11-3-88 Reviewed By Butch Bishop

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: SURVEY OF RADIOACTIVE WASTE BOXES

FORM NO. 1603.010B REV. # 1

Contractor Making Shipment CE
Items Shipped RADIOACTIVE EQUIPMENT
Shipment Date 11-3-88 Survey Date 10-20-88
Inst. Used ASP-1/775 Cal. Due Date 4-11-89

No. of Items to be shipped 10
Survey No. RW 10-20-3
Performed by J. Crawford 2311

Container No.	Container Dimension L x W x H	Area (in^2)	Radius 0.7R (in.)	Dist at LLD Meas.	Dose Rate at 0.7R, D_1 (mr/hr)	LLD Dose Rate D_1 (mr/hr)	Dose Rate at 1 meter D_2 (mr/hr)	Est. mCi
V-08-03	42 x 27 x 20	1134	13.3	N/A	.2	N/A	.02	.02
V-08-43	42 x 27 x 20	1134	13.3	N/A	.1	N/A	.01	.01
V-08-08	42 x 27 x 20	1134	13.3	N/A	.4	N/A	.05	.05
V-08-05	42 x 27 x 20	1134	13.3	N/A	.2	N/A	.02	.02
V-08-44	42 x 27 x 20	1134	13.3	N/A	.1	N/A	.01	.01
V-08-19	42 x 27 x 20	1134	13.3	N/A	.1	N/A	.01	.01
V-08-23	42 x 27 x 20	1134	13.3	N/A	.1	N/A	.01	.01
Reese #1	24 x 24 x 6	576	9.5	N/A	.1	N/A	.01	.01
I&I-033	21 x 18 x 20	378	7.7	N/A	.1	N/A	.01	.01
J-01-023	36 x 24 x 18	1224	13.8	N/A	.1	N/A	.01	.01

Calculations performed by J. Crawford 2311 Date 10-20-88

Reviewed by TWM Health Physics Supervisor Date 11-2-88

* Form 1622.021A for Records Retention

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: CURIE CONTENT OF LSA CONTAINERS

FORM NO. 1622.021A

REV. # 2 PC #

Contractor Making Shipment C-E
Items Shipped RADIOACTIVE EQUIPMENT
Shipment Date 11-3-88 Survey Date 11-2-88
Inst. Used ASP-1 1776 Cal. Due Date 4-11-89

No. of Items to be shipped 2
Survey No. RW 11-2-8
Performed by J. Crawford 2311

Container No.	Container Dimension L x W x H	Area (in^2)	Radius 0.7R (in.)	Dist at LLD Meas.	Dose Rate at 0.7R, D_1 (mr/hr)	LLD Dose Rate D_1 (mr/hr)	Dose Rate at 1 meter D_2 (mr/hr)	Est. mCi
S-05-05	142 x 21 x 23	2982	21.6	N/A	3.4	N/A	1.04	1.04
C-05-01	79 x 50 x 84	3950	24.8	N/A	46	N/A	19.6	19.6

NA

Calculations performed by J Crawford 2311 Date 11-2-88

Reviewed by [signature] Health Physics Supervisor Date 11-3-88

* Form 1622.021A for Records Retention

page 15 of 16

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: CURIE CONTENT OF LSA CONTAINERS

FORM NO. 1622.021A

REV. # 2 PC #

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: HEALTH PHYSICS SURVEY MAP

MAP #

LOCATION: 404' Aux. Bldg Unit II Side

SURVEY ID:

Box CE V-08-03
H.P. Light Bag #8 Smears (1)-(2)
H.P. Light Bag #9 " " (3)-(4)
H.P. Camera Bag #10 " " (5)-(6)
H.P. Camera Bracket Bag #11 Smears (7)-(8)
H.P. P/S Bag #12 Smears (9)-(10)
" " #13 Smears (11)-(12)
BNC Cables #14 Smears (13)-(14)
H.P. Camera Bag #15 Smears (15)-(16)

REES' Box
Rees Cntrl Bag #23 Smears (17)-(18)
" " Camera Bag #24 Smears (19)-(20)
" " Rt. Angle Bag #25 Smears (21)-(22)

Box V-08-43
Panasonic VCR Bag #1 Smears (23)-(24)
" " " Bag #2 (25)-(26)
Rees Camera #3 (27)-(28)
H.P. Camera Cable Bag #4 (29)-(30)
Power Strip Bag #5 (31)-(32)
" " Bag #6 (33)-(34)
Rees Rt. Angle Lens Bag #7 (35)-(36)

Box CE V-08-19
RCA Monitor Bag #26 Smears (37)-(38)
Sony Monitor Bag #41 Smears (39)-(40)

Box ISI-033
Electronics Parts Bag #32 (Clean) Smears (41)-(42)

Box J-01-23
Clean Tool Box Bag #31 Smears (43)-(44)

COPY.

Box V-08-05
H.P. P/S Bag, Bag #19 Smears (45)-(46)
H.P. P/S Bag #20 Smears (47)-(48)
H.P. Camera Bag #21 Smears (49)-(50)
H.P. Camera Bd's Bag #22 Smears (51)-(52)

Box V-08-44
H.P. Camera Bd's Bag #27 Smears (53)-(54)
" " Cable Bag #27 (55)-(56)
" " " Bag #37 (57)-(58)
" " " Bag #38 (59)-(60)
Rees Camera Bag #39 (61)-(62)

Box V-08-23
RCA Monitor Bag #16 Smears (63)-(64)
" " Bag #17 (65)-(66)
Rheostat Bag #18 (67)-(68)
Rees Camera Cable Bag #45 (69)-(70)
HP P/s Bag #46 (71)-(72)
Power Strip Bag #47 (73)-(74)

Box V-08-08
H.P. Rt Angle Bag #30 (75)-(76)
H.P. P/s Bag #29 (77)-(78)
H.P. Camera Bag #33 (79)-(80)
H.P. Light Bag #34 (81)-(82)
" " Bag #35 (83)-(84)
HP Light Bracket Bag #36 (85)-(86)
H.P. Camera Bag #40 (87)-(88)
H.P. Light Bag #42 (89)-(90)
" " " Bag #43 (91)-(92)
HP Light Bracket Bag #44 (93)-(94)

Tools & Tool Box (Clean) Smears (95)-(100)

DATE 10/18/88 TIME 1600 RX. PWR 00 %

PURPOSE: Shipping Offsite Survey

INST. E-2A SER. # 8ow 105 CAL DUE 3-20-89 B/F 3.2

INST. N/A SER. # CAL DUE B/F

REMARKS: All Boxes < 1 mr/hr *, All < 1K dpm/100cm² on Outside Surfaces of Boxes NB Related

SURVEYOR [signature] 2910

LEGEND:

All readings in mr/hr unless otherwise noted.

- ▭ Denotes beta doserate in mrad/hr
- △ Denotes neutron doserate in mrem/hr.
- * Denotes contact doserate
- ○ Denotes smear locations
- ▨ Denotes large area smear locations

[redacted]

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: RADIOLOGICAL SURVEY FORM

FORM NO. 1622.001A
REV. # 2 PC #

SMR NO	GROSS CPM	CPM-BG	DPM 100cm²	REMARKS
1	200	100	1K	Survey # 8
2				" " 4
3				
4				" " 10
5				
6				
7				" " 11
8	250	150	1.5K	
9				" " 12
10				
11				" " 13
12				
13				" " 14
14				
15				" " 15
16				
17				" " 23
18				
19				" " 24
20				
21				
22	200	100	1K	" " 25
23				
24				" " 1
25				
26				" " 2
27				
28				" " 3
29	300	200	2K	
30				" " 4
31				
32				" " 5
33				
34				" " 6

COPY

SMR NO	GROSS CPM	CPM-BG	DPM 100cm²	REMARK
35	200	100	1K	" " 7
36				
37				" " 26
38				
39				" " 41
40				
41				" " 32
42				
43				" " 31
44				
45				" " 19
46				
47				" " 20
48				
49				" " 21
50				
51				" " 22
52				
53				" " 27
54				
55				" " 28
56				
57				" " 29
58				
59				" " 37
60				
61				" " 38
62				
63				" " 39
64				
65				" " 16
66				
67				" " 17
68				

beta/gamma

DATE 10/18/88 TIME 1635
COUNTING INST. RM-034 PC-014 CAL DUE 3-25-89 4-10-89
d/c 10 BKG 100 COUNT TIME (min) .25
COUNTED BY Jeffrey Todd Clute 3910

alpha

DATE _____ TIME _____
COUNTING INST. N/A CAL DUE _____
d/c _____ BKG _____ COUNT TIME (min) _____
COUNTED BY _____

SURVEY NO 10-18-29 PAGE 1 of 2 REV BY

ARKANSAS POWER & LIGHT COMPANY
Arkansas Nuclear One

TITLE: RADIOLOGICAL SURVEY FORM

FORM NO. 1622.001A
REV. # 2 PC #

beta/gamma

SMR NO	GROSS CPM	CPM-BG	DPM 100cm²	REMARKS
19	22C	10C	1K	Bag # 45
20				" "
21				Bag # 46
22				↓
23				Bag # 47
24				↓
25				Bag # 30
26				↓
27				Bag # 29
28				↓
29				Bag # 32
30				↓
31				Bag # 34
32				↓
33				Bag # 35
34				↓
35				Bag # 36
36				↓
37				Bag # 40
38				↓
39				Bag # 42
40				↓
41				Bag # 43
42				↓
43				Bag # 44
44				"
45	12C	2C	2IK	Tool Box
46				↓
47				
48				
49				
50				

alpha

SMR NO	GROSS CPM	CPM-BG	DPM 100cm²	REMARKS
2	0	0	2.5	Bag # 8
13				" " 14
24				" " 1
35				" " 2
46				" " 19
57				" " 37
68				" " 18
79				" " 53
90				" " 42
99				Tool Box
100				↓

DATE 10/18/88 TIME 1635
COUNTING INST. RM-035 RC-014 CAL DUE 3-25-89 4-10-89
d/c 10 BKG 100 COUNT TIME (min) .35
COUNTED BY [signature] 3910

DATE 10/15/88 TIME 1640
COUNTING INST. TN-00.2 CAL DUE 5/12/89
d/c 4.3 BKG 0 COUNT TIME (min) 2
COUNTED BY [signature] 3910.

SURVEY NO 10-18-29 PAGE 2 of 2 REV BY [signature]

Letter is for info. only. The next amendment will include changes per A.E. Scherer 8/2/88. Dorin Forte

COMBUSTION ENGINEERING

July 15, 1988
LD-88-056

License No. 06-00217-06
Docket 030-03754

Dr. John E. Glenn, Chief
Nuclear Materials Safety Section
Division of Radiation Safety and Safeguards
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Subject: License No. 06-00217-06 Organization Changes

Dear Dr. Glenn:

Combustion Engineering recently informed the Nuclear Regulatory Commission of changes within the Nuclear Fuel organization that are designed to strengthen the management team of the Windsor Fuel Manufacturing Facility. These organizational changes have affected some of the individuals associated with our Byproduct Material License (No. 06-00217-06, Docket 030-03754). The purpose of this letter is to formally advise you of changes to our Byproduct license regarding the "person to be contacted" and "individuals who will use or directly supervise the use of licensed material". The Enclosure to this letter summarizes these changes.

The organizational changes will not impact Combustion Engineering's programs related to the Byproduct Material License or previous commitments made in that regard to the Nuclear Regulatory Commission. It is our intent, therefore, to incorporate the subject organizational changes in the next formal amendment request for our Byproduct Material License.

If I can be of further assistance in this matter, please do not hesitate to call me or Mr. C. M. Molnar of my staff at (203) 285-5205.

Very truly yours,

COMBUSTION ENGINEERING, INC.

A. E. Scherer
Director
Nuclear Licensing

B/64

ITEM # 88

AES:ss
cc: J. Roth (NRC-Region I)

Power Systems
Combustion Engineering, Inc.

1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500

(203) 688-1911
Telex: 99297

22 JUL 1988

Summary of the Changes to the

Byproduct Material License No. 06-00217-06 Organization

Mr. James J. Holloway, Vice President of Nuclear Services, is the individual to recieve all formal correspondence regarding the Byproduct Material License No. 06-00217-06.

Mr. Louis F. Kesselman, Director of Outage Services, is responsible for all aspects of compliance with Byproduct Material License No. 06-00217-06 conditions. Mr. Kesselman reports directly to Mr. Holloway.

Mr. Steven M. Sorensen, Manager of Radiological Protection Services, is responsible for all radiological protection activities for Outage Services and is the individual to be contacted concerning the day-to-day administration of the Byproduct Material License. Mr. Sorensen can be reached at (203) 285-5285 and he reports directly to Mr. Kesselman.

The following individuals will use or directly supervise the use of licensed material:

Mr. Robert L. Clark, Lead Senior Health Physics Technician

Mr. Michael E. Firsick, Health Physics Technician

Mr. James M. Limbert, Radiological Engineer/Radiation Safety Officer

Ms. Carol A. Little, Health Physics Technician

Mr. William A. Pagel, Lead Senior Health Physics Technician

Mr. Philip R. Rosenthal, Manager of Radiological and Industrial Safety

Mr. Stephen M. Sorensen, Manager of Radiological Protection Services

Messrs. Clark, Firsick, Limbert, and Pagel, and Ms. Little, all report to Mr. Sorensen. Mr. Rosenthal reports directly to Mr. F. M. Stern, Vice President of Nuclear Fuel Manufacturing.

JAN 10 1990

Combustion Engineering, Inc.
ATTN: Stephen M. Sorensen
1000 Prospect Hill Road
Windsor, CT 06095-0500

Gentlemen:

This refers to your application dated December 14, 1989, for renewal of Materials License 06-00217-06.

We received your two checks for $700 totalling $1,400. Your application, however, is subject to renewal fees totalling $2,100 as specified in fee Categories 3L ($700), 1D ($350), 3P ($120), and 3N ($930) of §170.31, 10 CFR 170, copy enclosed. Payment of the additional $700 should be made to the U.S. Nuclear Regulatory Commission and mailed to the attention of Sandra Kimberley at our Washington, D.C. address.

Your application will be processed by the Region I Licensing staff located at 475 Allendale Road, King of Prussia, Pennsylvania 19406. The additional fee, however, is required prior to issuance of the renewal. When submitting the fee, please refer to CONTROL NUMBER 111757.

If we do not receive a reply from you within 30 calendar days from the date of this letter, we shall assume that you do not wish to pursue your application and will void this action.

Sincerely,

(Signed) Maurice Messier

Maurice Messier
License Fee and Debt Collection Branch
Division of Accounting and Finance
Office of the Controller

Enclosure:
10 CFR 170

cc: Region I

DISTRIBUTION:
Pending Fee File
OC/DAF R/F
LFDCB R/F (2)
DW/REGI/COMBUSTION

B/65

OFFICE:	OC/LFDCB	OC/LFDCB	OC/LFDCB
SURNAME:	SKimberley:bg	MMessier	GJackson
DATE:	1/9/90	1/9/90	1/10/90

ITEM # 90

COMBUSTION ENGINEERING

January 17, 1990
DDH-90-003

United States Nuclear Regulatory Commission
License Fee and Debt Collection Branch
Washington, DC 20555
Attention: Ms. Sandra Kimberly
References: CONTROL NUMBER 111757
NRC Letter Dated January 10, 1990

Dear Ms. Kimberly:

Enclosed is our check for $700.00 to satisfy the additional fee required for the renewal of Combustion Engineering, Inc. Radioactive Material License No. 06-00217-06.

Please do not hesitate to call the undersigned at 203-285-5285 if you have any questions regarding this communication.

Very truly yours,
Combustion Engineering Inc.

Stephen M. Sorensen
Manager, Radiation
Protection Services

SMS/klm
DDH90003
Enclosure

B/66
ITEM # 91

Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500
(203) 688-1911
Telex: 99297

NRC Form 591
(12-81)
10 CFR 2.201

NUCLEAR REGULATORY COMMISSION

SAFETY INSPECTION

1. LICENSEE	2. REGIONAL OFFICE
COMBUSTION ENGINEERING WINDSOR, CT 06095	NRC REGION 1 KING OF PRUSSIA PA 19406

3. DOCKET NUMBER(S)	4. LICENSE NUMBER(S)	5. DATE OF INSPECTION
070-03754	06-00217-06	3/7-8/90

Licensee:

The inspection was an examination of the activities conducted under your license as they relate to radiation safety and to compliance with the Nuclear Regulatory Commission's (NRC) rules and regulations and the conditions of your license. The inspection consisted of selective examinations of procedures and representative records, interviews, with personnel, and observations by the inspector. The findings as a result of this inspection are as follows:

[X] 1. Within the scope of this inspection, no violations were observed.

[X] 2. The inspector also verified the steps you have taken to correct the violations identified during the last inspection. We have no further questions on those actions at this time.

[ ] 3. During this inspection certain of your activities, as checked below, were in violation of NRC requirements.
THIS IS A NOTICE OF VIOLATION which is required to be posted in accordance with 10 CFR 19.11.

[ ] A. _____ was not properly posted to indicate the presence of a _____. 10 CFR 20.203(b), (c), (d), (e) or 34.42.

[ ] B. Containers located in _____ were not properly labeled to indicate the presence of radioactive material. 10 CFR 20.203(f)(1), or (f)(2).

[ ] C. _____ of sealed sources were not performed at the proper frequencies. 10 CFR _____ License Condition Number _____.

[ ] D. Records of _____ were not properly maintained. 10 CFR _____ or License Condition Number _____.

[ ] E. Documents were not properly posted or otherwise made available. 10 CFR 19.11.

[ ] F. Reports or notifications of _____ were not made in accordance with 10 CFR _____ or License Condition Number _____.

[ ] H. _____

[ ] I. _____

[ ] J. _____

[ ] K. _____

ITEM # 92

DESIGNATED ORIGINAL

Certified By: _____

Return Original to Region I

I hereby state that within 30 days the actions described by me to the inspector will be taken to correct the violations identified in the items checked above. This statement of corrective actions is made in accordance with the requirements of 10 CFR 2.201. No further response will be submitted unless required by the NRC.

SIGNATURE – LICENSEE	DATE	SIGNATURE – NRC INSPECTOR	DATE
		Francis Costello	3/8/90

REGION I Form 198-D
(October 88)

INDUSTRIAL/ACADEMIC

LICENSEE: Combustion Engineering Inc.

REPORT NO. 90-001

ADDRESS: 1000 Prospect Road
Windsor, Connecticut

LICENSEE CONTACT: Steve Sorenson

TELEPHONE NO.

LICENSE NUMBER	DOCKET NUMBER	CATEGORY	PRIORITY	PROGRAM CODE
06-00217-06	030-03754			

INSPECTION DATE (S) March 7-8, 1990

LOCATION(S) Windsor, Connecticut

TYPE OF INSPECTION

/__/ SPECIAL /X/ ROUTINE

/__/ ANNOUNCED /X/ UNANNOUNCED

/__/ DAYSHIFT /__/ BACKSHIFT

SUMMARY OF FINDINGS AND ACTION

/X/ NO NONCOMPLIANCE, 591

/__/ NO NONCOMPLIANCE, LETTER

/__/ NONCOMPLIANCE, 591

/__/ NONCOMPLIANCE, LETTER

/X/ ACTION ON PREVIOUS NONCOMPLIANCE, APPENDIX B

/__/ SUPPLEMENTAL INFORMATION, APPENDIX C APPENDIX C

PERSONS CONTACTED (Name, Title)

* S. Sorenson, Manager Radiological Protection

* Walt Marchinney, V.P. Health Services

* Jim Limbert, Rad Mat Engineer

* Other technicians

* attended exit meeting

Francis Costello 4/27/90
Inspector Signature, Date

[signature]
Inspector Signature, Date

APPROVED Joel D Kinneman 4/27/90
Signature, Date

RESULTS

1.	ORGANIZATION	C	NC

a. Describe the management structure. C NC

V.P. - Bill Skibitsky

Jim Fesselman - Director, Outage Services

Steve Sorenson, Manager Radiological Protection Services

b. Describe the radiation protection organization. C NC

c. Individuals identified in the license as being responsible for the programs still hold these positions. C NC

d. Radiation Safety Committee operates as required. C NC NA NI

1. meeting frequency: [illegible]
2. records maintained y/n/na/ni
3. records reviewed by inspector for period [illegible] to [illegible]
4. required persons in attendance y/n/na/ni

e. Management control programs conducted as required. C NC NA NI

1. records maintained y/n/na/ni
2. Describe scope, frequency, etc.

Comments

	RESULTS
2. SCOPE OF LICENSED ACTIVITIES	C NC
a. Describe the types of current activities.	C NC

~~[illegible]~~

1) [illegible] Decontamination
2) [illegible]
3) instrument Calibration

b. Describe the current workload in terms of number of workers, quantities of radioactive material used each week/month/year, frequency of use, other appropriate information.

c. Describe any changes since the last inspection, and any which may be planned.

Comments

RESULTS

3. TRAINING AND INSTRUCTIONS TO EMPLOYEES	C	NC		
a. Instruction to all persons working in a restricted area (19.12).	C	NC		
b. Additional required training for users and other specified workers.	C	NC	NA	NI
1. approved training program	y/n/na/ni			
2. training provided by [illegible]				
3. users complete on-the-job training	y/n/na/ni			
4. tests are given				
a. written	y/n/na/ni			
b. oral	y/n/na/ni			
c. practical	y/n/na/ni			
d. records of tests maintained	y/n/na/ni			
e. deficiencies noted	y/n/na/ni			
5. test results reviewed by NRC inspector for period ____ to ____	y/n/na/ni			
c. Periodic training is implemented as required.	C	NC	NA	NI
1. records of retraining maintained	y/n/na/ni			
2. Describe frequency and scope of periodic training				
d. Employees interviewed appeared familiar with safe handling practices and other requirements.	C	NC	NA	NI

Comments

[illegible handwritten comment]

	RESULTS
4. MATERIALS	C NC
a. Radioactive material as authorized by license.	C NC
1. type and quantity authorized	y/n
2. inventory records maintained	y/n/na/ni
3. inventory records reviewed for period _____ to _____	
b. Control of source material (Part 40) and special nuclear material (Part 70) as required.	C NC NA NI
1. transfers in accordance with 40.51/70.42,70.54	y/n/na/ni
2. records and inventory required by 40.61/70.51	y/n/na/ni
3. reports in accordance with 40.64/70.53, 70.54	y/n/na/ni

Comments

	RESULTS
5. FACILITIES MAINTAINED AS DESCRIBED IN APPLICATION	C NC
a. postings and labelings as required	C NC
1. 20.203(b) radiation area	y/n/na/ni
2. 20.203(d) airborne radiation area	y/n/na/ni
3. 20.203(e) use or storage areas posted with "Caution - Radioactive Material"	y/n/na/ni
4. 20.203(f) containers and devices properly labeled	y/n/na/ni
5. 19.11(a)(b) posting of documents	y/n/na/ni
6. 19.11(c) posting of NRC-3	y/n/na/ni
7. 20.203(c) high radiation areas	y/n/na/ni
b. Security of licensed material is maintained.	C NC
1. locked in device cabinet or room	y/n/na/ni
2. secured to prevent unauthorized removal from an unrestricted area	y/n/na/ni
3. devices and materials secured at field location	y/n/na/ni
c. High Radiation Area operated as required.	C NC NA NI
1. posted as required by 20.203(c)(1)	yes/no
2. interlocked as required by 20.203(c)(2)(i)	yes/no
3. entrance controlled in accordance with 20.203(c)(2)	yes/no
4. exit controlled in accordance with 20.203(c)(3)	yes/no
5. surveillance or locked to prevent unauthorized entry as required by 20.203(c)(4)	yes/no
6. visible and audible signals operate correctly to warn of the presence of radiation	yes/no
7. alarm tested at required intervals	yes/no
8. records of alarm system test maintained	yes/no
9. exposure devices and storage containers meet radiation level limits of 20.203	yes/no

Comments

RESULTS

6. INSTRUMENTS, EQUIPMENT, AND DEVICES	C	NC

a. calibrated and operable meters available and used properly. C NC NA NI

1. number, type, and ranges (e.g. 2, ion chamber, 1R/hr; 3, GM, 10,000 cpm)

Number	Type	Range

3. calibrated by: _____
4. calibration method as authorized y/n/na/ni
5. calibration interval _____ as required y/n/na/ni
6. Records reviewed by NRC inspector for the period _____ to _____

b. other special equipment (ventilation, hoods, shielding, etc) operable and available as described in license. Description: C NC NA NI

_____

_____

_____

_____

_____

_____

_____

Comments

7. RECEIPT AND TRANSFER OF MATERIALS	RESULTS C	NC	NA	NI
a. Procedures for picking up, receiving, and opening of packages performed as required by 20.205.	(C)	NC	NA	NI
1. written procedures available				y/n/na/ni
2. procedures approved in application				y/n/na/ni
3. survey of packages when received				y/n/na/ni
4. 20.401 records of survey of packages				y/n/na/ni
5. 20.401 records of receipt of packages				y/n/na/ni
b. Licensed material transferred as required.	C	NC	NA	(NI)
1. 30.41 verification of recipient's license				y/n/na/ni
2. 20.401, 30.51 records of transfer maintained				y/n/na/ni
3. Licensee makes shipments of radioactive materials				yes/no
a. delivered by common carrier				yes/no
b. transported in licensee's own vehicle as a private carrier.				yes/no

*IF ABOVE IS ANSWERED "YES", COMPLETE 7.A TRANSPORTATION

COMMENTS

7.A. TRANSPORTATION		RESULTS C	NC	NA	NI
1.	Are authorized packages used	173.415-416			yes/no
2.	Types of packages used (for example, DOT-7A)	173.415			
3.	Performance test records on file	173.416(a)			yes/no
4.	Licensee aware of 6/30/85 cutoff on use ( ) certified	173.416(b			yes/no
5.	NRC COC's on file	71.12(c)(1)			yes/no
6.	Registered with NRC as user	71.12(c)(3)			yes/no
7.	Documented NRC-approved Q/A program? NRC Q/A Approval number_____	71.12(b)			yes/no
8.	Special Form Material Performance test records available for each source design	173.476(a)			yes/no/na
9.	packages labeled as required	172.403 (a-f)			yes/no
	a. Excepted				
	b. White I				
	c. Yellow II				
	d. Yellow III				
10.	Surveys performed to select correct label category and compliance with radiation limits	175.475(i)			yes/no
11.	Packages marked as required with	172.300-310			yes/no
	a. shipping name				yes/no
	b. Spec No.				
	c. Certificate of Compliance (COC) No. etc.				
12.	Shipping papers are prepared for each shipment	172.200			yes/no
13.	Shipping papers contain required information	172.203(d)			yes/no
14.	For private carrier shipments:				
	a. vehicles placarded as required	172.500,504			yes/no
	b. cargo blocked, braced, tied down in vehicle	177.842(d)			yes/no
	c. any incidents reported to DOT	171.15-16			yes/no
15.	Licensee carries shipping papers that are readily accessible when transporting radioactive material				

Comments

Reviewed Rad Waste Shipment #
Burnell 5/25/89

8. PERSONNEL MONITORING	RESULTS
	C NC NA NI

a. Personnel dosimetry assigned and worn as required. C NC NA NI

1. whole-body dosimeter used — y/n/na/ni
   a. ________ film ✓ TLD
   b. exchange frequency: Monthly
   c. supplier [illegible]
   d. supplier NVLAP accredited 10 CFR 20.202 — y/n/na/ni
2. extremity dosimetry used — y/n/na/ni
3. workers observed wearing required dosimetry — y/n/na/ni

b. Personnel dosimetry reports maintained as required C NC NA NI

1. records reviewed by management frequency: ________ — y/n/na/ni
2. NRC inspector reviewed personnel monitoring records from ________ to ________ — y/n/na/ni
   a. whole body ~~quarterly~~ dose: typical ________ max ________
   b. extremity quarterly dose: typical ________ max ________
3. Forms NRC-4, NRC-5 or equivalent records completed — y/n/na/ni
4. Termination and annual reports to individuals and NRC, as required — y/n/na/ni

c. Formal ALARA program is implemented C NC NA NI

Comments

	RESULTS
9. RADIATION AND CONTAMINATION SURVEYS	C NC
a. Radiation and Contamination surveys	C NC NA NI
1. radiation and contamination surveys recorded	y/n/na/ni
2. surveys performed at required frequency: ____________	y/n/na/ni
3. appropriate instruments used	y/n/na/ni
4. action limits observed, and post-docontamination surveys performed when necessary	y/n/na/ni
5. NRC inspector reviewed survey records for the period ____________ to ____________	
6. maximum radiation levels in unrestricted area: ____________	
b. Airborne Radioactivity Surveys performed	C NC NA NI
1. Air sampling in restricted areas	y/n/na/ni
a. maximum concentration levels: ____________	
b. typical concentration levels: ____________	
2. bioassay procedures performed	y/n/na/ni
a. type(s) ____________	[illegible]
b. maximum results ____________	
c. typical results ____________	
3. bioassay and air sampling records maintained as required	y/n/na/ni
4. Principal isotopes ____________	
c. Leak tests of sealed sources performed as required	C NC NA NI
1. performed by user and method approved	y/n/na/ni
2. tested at required interval: ________	y/n/na/ni
3. records maintained	y/n/na/ni
4. records reviewed by NRC inspector for the period _______ to _______	

Comments

Program is in place to monitor for hot particles; calculate dose based on [illegible] and [illegible] dose in personnel records

10. EFFLUENT CONTROL, WASTE DISPOSAL	RESULTS C	NC	NA	NI
a. Releases to the environment in accordance with requirements.	(C)	NC	NA	NI
1. airborne releases are made		y/n/na/ni		
a. evaluations adequate		y/n/na/ni		
b. releases within limits (10 CFR 20.106)		y/n/na/ni		
c. typical concentrations NONE SIGNIFICANT				
d. principal isotopes released				
2. liquid releases are made to _____ (sewer, unrestricted)		y/n/(na)/ni		
a. evaluations adequate		y/n/na/ni		
b. releases within limits (10 CFR 20.106, 10 CFR 20.303)		y/n/na/ni		
c. typical concentrations _____				
d. principal isotopes released				
3. Records maintained		(y)/n/na/ni		
b. Waste disposal in accordance with requirements	(C)	NC	NA	NI
1. methods: NO SEA for volume reduction + disposal				
2. records of waste transfer maintained		(y)/n/na/ni		
3. surveys of waste containers and material in storage-for-decay performed		y/n/(na)/ni		
4. obliteration of labels		y/n/(na)/ni		
c. Burial of licensed material done in past		Yes/(No)		
1. Location of past burials _____				
2. types of materials buried _____				
3. types of surveys of area, results: _____				
d. 10 CFR 61 Requirements Reviewed		y/n/na/(ni)		

Comments

11. NOTIFICATIONS AND REPORTS	RESULTS C	NC	NA	NI
1. Licensee is in compliance with				
a. reports of thefts or losses (20.402)	y/n/na/ni			
b. reports of incidents (excessive releases, fires, or other catastrophes) (20.403)	y/n/na/ni			
2. Licensee took appropriate action in response to the following Bulletins, Circulars, and Information Notices.	y/n/na/ni			
a. _____				
b. _____				
c. _____				

Comments

RESULTS

12. OTHER LICENSE CONDITIONS — C NC NA NI

List any other license conditions which were reviewed during the inspection, and describe the results.

a. C NC

b. C NC

c. C NC

Comments

13. INDEPENDENT AND CONFIRMATORY MEASUREMENTS	RESULTS C	NC	NA	NI

a. Type of Survey	Areas Surveyed	Results (indicate units)
1. Radiation level		
2. Wipe		
3. Sample (describe)		

4. Attach any sample analysis data from Region I laboratory

b. Survey Instruments Used

1. Type	a.		b.	
2. NRC #	a.		b.	
3. last calibration date	a.		b.	

Comments

APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Requirement	Basis for noncompliance
1. 10 CFR _____ Lic Cond _____	
2. 10 CFR _____ Lic Cond _____	
3. 10 CFR _____ Lic Cond _____	
4. 10 CFR _____ Lic Cond _____	
5. 10 CFR _____ Lic Cond _____	
6. 10 CFR _____ Lic Cond _____	

APPENDIX B - LICENSEE ACTION ON PREVIOUS INSPECTION FINDINGS

Identification and summary of action taken	Status
Report No: [illegible] **Severity Level** IV	
Describe previous violation: Failure to label boxes of waste and ~~opening notation~~	
Corrective Action taken: Licensee has labeled all containers of [illegible] and reviewed this [illegible]	OPEN CLOSED (circled)
Report No.: [illegible] **Severity Level** II	
Describe previous violation: [illegible]	
Corrective Action taken: [illegible]	OPEN CLOSED (circled)
Report No: [illegible] **Severity Level** [illegible]	
Describe previous violation: Failure to comply with DOT requirements for shipment of rad waste	
Corrective action taken: The licensee has implemented FPI-18 (11/14/85) which provides instructions to ensure that waste is packaged and loaded properly. No further problems have been identified at disposal site	OPEN CLOSED (circled)

APPENDIX B (continued)

Identification and summary of action taken	Status
Report No: _____ Severity Level _____	
Describe previous violation:	
Corrective action taken:	OPEN
	CLOSED
Report No: _____ Severity Level _____	
Describe previous violation:	
Corrective action taken:	OPEN
	CLOSED
Report No: _____ Severity Level _____	
Describe previous violation:	
Corrective action taken:	OPEN
	CLOSED

APPENDIX C - SUPPLEMENTARY INFORMATION

( ) Unusual occurrence, conditions, etc.

( ) Description of attachments to field notes

( ) Unresolved items

( ) Inspector's comments

MAR 12 1990

License No. 06-00217-06
Docket No. 030-03754
Control No. 111757

Combustion Engineering, Incorporated
ATTN: S. M. Sorensen, Manager
Radiological Protection Services
1000 Prospect Hill Road
Windsor, Connecticut 06095-0202

Gentlemen:

This is in reference to your application dated December 14, 1989 License No. 06-00217-06. In order to continue our review, we need the following additional information:

1. 10 CFR 30.32(g) requires that an application for a specific license to use byproduct material in the form of a sealed source or in a device that contains the sealed source must either (1) identify the source or device by manufacturer and model number as registered with the NRC under 10 CFR 32.210 or with an Agreement State; or (2) contain the information identified in 10 CFR 32.210(c). Please provide this information for the sealed sources requested in your application.

2. Please confirm that your Radiation Safety Committee will meet once each calendar quarter and that the minutes of these meetings will be recorded.

3. Your application makes reference to Radiation Protection Instructions which were not included. Please describe the preparation and approval process for the Instructions and confirm that licensed materials will be used in accordance with the requirements of all approved Radiation Protection Instructions.

4. Your application requests authorization for gamma, beta, and neutron sources. However, your NVLAP accreditation appears to cover only one category. Please describe how your personnel monitoring will meet the requirements of 10 CFR 20.202(c).

5. Item 10.5.10 states that whole body counts are performed twice per year. Please describe the criteria for selecting worker who require whole body counts.

B/68

ITEM # 93 OFFICIAL RECORD COPY ML 195 COSTELLO - 0001.0.0
03/06/90

137

ML 10

6. In your application, you didn't describe a training program for ancillary personnel (maintenance, security, etc.) and personnel involved in radionuclide work. Please describe a program that it will:

   (a) be of sufficient scope to ensure that all personnel using radioactive materials receive proper instruction in accordance with 19.12 of 10 CFR Part 19 (enclosed);

   (b) provide for personnel to be properly instructed before assuming duties with, or in the vicinity of, radioactive materials with retraining as necessary.

   The training given to each group should be commensurate with the duties and responsibilities of the group and need not be the same for each group.

7. Please provide a copy of your laboratory instructions. Typical instructions should include:

   a) Wear laboratory coats or other protective clothing at all times in areas where radioactive materials are used.

   b) Wear disposable gloves at all times while handling radioactive materials.

   c) Either after each procedure or before leaving the area, monitor your hands for contamination in a low-background area.

   d) Do not eat, drink, smoke or apply cosmetics in any area where radioactive material is stored or used.

   e) Do not store food, drink, or personnel effects in areas where radioactive material is stored or used.

   f) Wear personnel monitoring devices at all times while in areas where radioactive materials are used or stored.

   g) Dispose of radioactive waste only in designated, labeled and properly shielded receptacles.

   h) Never pipette by mouth.

   i) Wipe-test radioactive material storage, preparation and use areas weekly from contamination. If necessary, decontaminate or secure the area for decay.

   j) Refrigerators shall not be used jointly for foods and radioactive materials.

   k) Confine radioactive solutions in shielded containers that are clearly labeled.

1) Secure all radioactive material when not under the constant surveillance and immediate control of the authorized users.

8. In your application, no mention was made of establishing and posting emergency procedures. Regulatory Guide 10.7 recommends that licensees establish emergency procedures that address immediate actions to be taken and persons to be contacted (including appropriate phone numbers). Please confirm that you will draft and post a set of emergency procedures. It is recommended that such procedures contain:

   a. Instructions to be followed during minor spills.

   b. Instructions to be followed during major spills.

      Your radiation safety officer's name, his office phone number, and a phone number to be used during off hours.

9. Please provide procedures for examining incoming packages for leakage, contamination, or damage and for safely opening packages in accordance with 20.205 of 10 CFR Part 20. The monitoring should be performed as soon as practicable after receipt of the package of radioactive material. The procedures may vary depending upon the quantity of radioactive material received, but should, at a minimum, include instructions for surveying packages, wearing gloves while opening packages, and checking packing material for contamination. Even though 20.205 of 10 CFR Part 20 exempts certain packages from immediate monitoring, all packages should be monitored before they are opened.

10. 10 CFR 20.103(b)(2) requires that licensees make evaluations and take actions to assure against recurrence whenever an intake of radioactive materials exceeds the intake which would result from inhalation of such material for 40 hours at the concentration specified in 10 CFR 20, Appendix B, Table 1, Column 1. This intake of radioactive materials is frequently referred to as "40 MPC - hours". Please describe how your bioassay procedure will be able to detect an intake of 40 MPC-hours and confirm that, when such an intake is identified, you will make the required evaluation and take the actions necessary to assure against recurrence.

We will continue our review upon receipt of this information. Please reply in duplicate to my attention at the Region I office and refer to Mail Control No. 111757.

MAR 12 1990

Combustion Engineering, Incorporated 4

In order to continue prompt review of your application, we request that you submit your response to this letter within 30 calendar days from the date of this letter.

Sincerely,

Original Signed By:
Francis M. Costello

Francis M. Costello
Nuclear Materials Safety Section B
Division of Radiation Safety
and Safeguards

Enclosures:
1. 10 CFR Part 30
2. Regulatory Guide 10.7

FMC
RI:DRSS
Costello/tlm/pmb
03/ 9 /90

OFFICIAL RECORD COPY ML 195 COSTELLO - 0004.0.0
03/06/90

ITEM 7

INDIVIDUALS RESPONSIBLE
FOR RADIATION SAFETY PROGRAM
AND THEIR TRAINING AND EXPERIENCE

Item 7 Individual (s) Responsible for the Radiation Safety Program and their Training and Experience

Item 7.1 Individual(s) Responsible for Radiation Safety Program and their Training and Experience:

* - Stephen M. Sorensen - Manager, Radiological Protection Services. Resume Submitted and Approved as part of Amendment No. 35 dated 10/30/87 and Position Change in Letter LD 88-056 dated 7-15-88. (Attachment 7.1).

* - James M. Limbert - Radiation Safety Officer. Resume Submitted with License Renewal Application dated 11/30/83 and Position Change in Organization Change Letter LD 88-056 dated 7-15-88. (Attachment 7.1).

- William A. Pagel - Lead Senior H.P. Technician. Resume submitted with License Renewal Application dated 11/30/83. (No Change).

- Robert B. Clark - Lead Senior H.P. Technician. Resume submitted with License Renewal Application dated 11/30/83. (No Change).

* TO BE NAMED ON LICENSE DOCUMENT

7.1 (Cont'd)

- Carol A. Little - Health Physics Technician. Resume submitted with License Renewal Application dated 11/30/83. (No Change).

- Michael E. Firsick - Health Physics Technician. Resume submitted as part of Amendment No. 35 dated 10/30/87.

- Philip R. Rosenthal - Program Manager of Radiological and Industrial Safety. Mr. Rosenthal reports to the Vice-President of Nuclear Fuel and is a frequent consultant to the Radioactive License Personnel.

ATTACHMENT 7.1

ORGANIZATION LETTER

LD-88-056

L KESSELMAN

JUL 21 1988

XFC

COMBUSTION ENGINEERING

July 15, 1988
LD-88-056

License No. 06-00217-06
Docket 030-03754

Dr. John E. Glenn, Chief
Nuclear Materials Safety Section
Division of Radiation Safety and Safeguards
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Subject: License No. 06-00217-06 Organization Changes

Dear Dr. Glenn:

Combustion Engineering recently informed the Nuclear Regulatory Commission of changes within the Nuclear Fuel organization that are designed to strengthen the management team of the Windsor Fuel Manufacturing Facility. These organizational changes have affected some of the individuals associated with our Byproduct Material License (No. 06-00217-06, Docket 030-03754). The purpose of this letter is to formally advise you of changes to our Byproduct license regarding the "person to be contacted" and "individuals who will use or directly supervise the use of licensed material". The Enclosure to this letter summarizes these changes.

The organizational changes will not impact Combustion Engineering's programs related to the Byproduct Material License or previous commitments made in that regard to the Nuclear Regulatory Commission. It is our intent, therefore, to incorporate the subject organizational changes in the next formal amendment request for our Byproduct Material License.

If I can be of further assistance in this matter, please do not hesitate to call me or Mr. C. M. Molnar of my staff at (203) 285-5205.

Very truly yours,

COMBUSTION ENGINEERING, INC.

A. E. Scherer
Director
Nuclear Licensing

AES:ss
cc: J. Roth (NRC-Region I)

Power Systems
Combustion Engineering, Inc.

1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500

(203) 688-1911
Telex: 99297

Summary of the Changes to the

Byproduct Material License No. 06-00217-06 Organization

Mr. James J. Holloway, Vice President of Nuclear Services, is the individual to recieve all formal correspondence regarding the Byproduct Material License No. 06-00217-06.

Mr. Louis F. Kesselman, Director of Outage Services, is responsible for all aspects of compliance with Byproduct Material License No. 06-00217-06 conditions. Mr. Kesselman reports directly to Mr. Holloway.

Mr. Steph en M. Sorensen, Manager of Radiological Protection Services, is responsible for all radiological protection activities for Outage Services and is the individual to be contacted concerning the day-to-day administration of the Byproduct Material License. Mr. Sorensen can be reached at (203) 285-5285 and he reports directly to Mr. Kesselman.

The following individuals will use or directly supervise the use of licensed material:

Mr. Robert L. Clark, Lead Senior Health Physics Technician

Mr. Michael E. Firsick, Health Physics Technician

Mr. James M. Limbert, Radiological Engineer/Radiation Safety Officer

Ms. Carol A. Little, Health Physics Technician

Mr. William A. Pagel, Lead Senior Health Physics Technician

Mr. Philip R. Rosenthal, Manager of Radiological and Industrial Safety

Mr. Stephen M. Sorensen, Manager of Radiological Protection Services

Messrs. Clark, Firsick, Limbert, and Pagel, and Ms. Little, all report to Mr. Sorensen. Mr. Rosenthal reports directly to Mr. F. M. Stern, Vice President of Nuclear Fuel Manufacturing.

ITEM 7

7.2

RADIATION SAFETY COMMITTEE

Item 7.2 RADIATION SAFETY COMMITTEE

A. Radiation Safety Committee has been organized in accordance with paragraph 33.13 (C) (1) of 10CFR33.

The membership of this committee shall consist of:

Radiation Safety Officer (Chairman)

Manager, Radiological Protection Services

Lead Senior Health Physics Technician

Supervisor of Analytical Radiochemistry

*One (1) other Scientist or Engineer

**One (1) Administrative Member

---

*This member must have at least five (5) years of experience in the use of Radioactive Materials.

**This member shall represent the organization's interest from a business, legal and financial standpoint on an as required basis.

Individual's membership on the Radiation Safety Committee may be changed without notification to the NRC, providing, the new member meets training and experience requirements for the position.

ITEM 8

TRAINING FOR INDIVIDUALS

WORKING IN OR FREQUENTING

RESTRICTED AREAS

Item 8 TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS

Addressed in Item 10

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406

JAN 30 1990

Combustion Engineering, Inc.
ATTN: Stephen M. Sorensen
Manager, Radiological Protection
Services
1000 Prospect Hill Road
Windsor, Connecticut 06095-0500

DOCKET NO. 030-03754
LICENSE NO. 06-00217-06
CONTROL NO. 111757

SUBJECT: LICENSE RENEWAL APPLICATION

Gentlemen:

This is to acknowledge receipt of your application for renewal of material(s) license identified above. Your application is deemed timely filed, and accordingly, the license will not expire until final action has been taken by this office.

Any correspondence regarding the renewal application should reference the control number specified and your license number.

Sincerely,

Original Signed By:
Doris J. Foster

Doris J. Foster, Chief
Licensing Assistant Section
Division of Radiation Safety
and Safeguards

OFFICIAL RECORD COPY ML 10

030-03754

COMBUSTION ENGINEERING

December 14, 1989

License No. 06-00217-06
Docket No. 030-03754

U.S. Nuclear Regulatory Commission
Region I
Nuclear Material Section B
475 Allendale Road
King of Prussia, Pennsylvania 19046

Subject: Renewal of Combustion Engineering, Inc. Radioactive Material License

Gentlemen:

This letter transmits an application for renewal of Radioactive Material License No. 06-00217-06 by Combustion Engineering's Windsor, Connecticut based Nuclear Services Department. This renewal is being submitted not less than thirty (30) days prior to expiration of the existing license in accordance with 10CFR30.37(b). The current license expires on January 31, 1990, and renewal is requested for a period of ten (10) years.

Enclosure I to this letter provides two (2) copies of NRC Form 313 with supportive exhibits. All prior amendments have been incorporated in the renewal application. While the application reflects the current status of calibration procedures, facilities, training programs and staff; Combustion Engineering's use of radioactive materials, under the license, remains basically unchanged.

Enclosure II to this letter provides a check (No. 050120) in the amount of $700.00 to cover the renewal fee in accordance with 10CFR170.31, Classifications 3A and 3L.

For your information, on or about January 1, 1990, I will be ending my tenure as Vice President, Nuclear Services and assuming new responsibilities within the Combustion Engineering organization. At that time, Mr. William S. Skibitsky will take over as Vice President, Nuclear Services. Mr. Skibitsky is coming to Nuclear Power Businesses from Combustion Engineering's Impell business unit where he is currently the Vice President and Regional Manager, Western Region.

License Fee Information
on Application. 111757

Power Systems
Combustion Engineering, Inc.
1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500
(203) 688-1911
Telex: 99297

If I can be of any assistance on this matter, please do not hesitate to call me, Mr. S. M. Sorensen, our Manager of Radiological Protection Services at (203) 285-5285 or Mr. A. E. Scherer our Director of Nuclear Licensing at (203) 285-5200.

Very truly yours,

COMBUSTION ENGINEERING, INC.

J. J. Holloway
Vice President
Nuclear Services

JJH:jeb

Enclosures: As stated

NRC FORM 313
(1-84)
10 CFR 30, 32, 33, 34, 35 and 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- [ ] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER ________
- [X] C. RENEWAL OF LICENSE NUMBER 06-00217-06

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Combustion Engineering, Inc
1000 Prospect Hill Road
Windsor, CT 06095-0500
Attn: S.M. Sorensen 9459-0202

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

Facilities at: Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, CT 06095-0500

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Stephen M. Sorensen 9459-0202

TELEPHONE NUMBER

203-285-5285

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES (See 10 CFR 170 and Section 170.31)
FEE CATEGORY 3A & 3L
AMOUNT ENCLOSED $ 700.00

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE—CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
Stephen M. Sorensen (signature)	Stephen M. Sorensen	Manager, Radiological Protection Services	12-14-89

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS
- [ ] <$250K
- [ ] $250K–500K
- [ ] $500K–750K
- [ ] $750K–1M
- [ ] $1M–3.5M
- [ ] $3.5M–7M
- [ ] $7M–10M
- [ ] >$10M

b. NUMBER OF EMPLOYEES (Total for entire facility including outside contractors)

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (labor and/or staff hours) ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency in confidence)
- [ ] YES
- [ ] NO

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY			
REN	Dec 18	3L 3N 1D 3P	Fees totalling $2,100 required— 2 Checks for $700 received: Check Nos: 51286 2 for $700 } 1D $350, 3P $120, 3N 230 +	SK 1/30/90	111757

Check No. 050120 ($700) ① for 3L

③ Check No. 514421 $700 ← totalling $930 for 3N fee

ITEM 5

RADIOACTIVE MATERIAL

Item 5 RADIOACTIVE MATERIAL

a. Element and Mass No.	b. Chemical and/or Physical Form	c. Maximum Amount which will be possessed at any one time
A. Any byproduct material with Atomic Numbers between 1 and 83, inclusive.	A. Any	A. Not to exceed 2 curies total
B. Any byproduct material	B. Irradiated and/or contaminated reactor components, inspection and test equipment, test samples, monitoring instruments	B. Not to exceed 51 curies
C. Cesium 137	C. Sealed sources	C. 125 curies
D. Cobalt 60	D. Sealed sources	D. 250 millicuries
E. Americium 241	E. Any	E. 1 millicurie
F. Americium 241	F. Sealed neutron sources	F. 10 sources not to exceed 1.0 curie per source
G. Americium 241	G. Sealed neutron sources	G. 10 sources not to exceed 10 curies per source
H. Neptunium 237	H. Sealed sources	H. 10 sources not to exceed 0.5 millicuries per source
* I. Any by product material with Atomic Nos. between 84 and 103, inclusive	I. Irradiated and/or contaminated reactor components, tools and equipment, test samples, or reactor coolant samples	I. Not to exceed 3 millicuries each nuclide Atomic Nos. between 84 and 103 inclusive
J. Uranium 233	J. Any	J. 1 gram
K. Uranium 235	K. Any	K. 7 grams
L. Plutonium	L. any	L. 1 milligram
M. Cesium 137	M. Sealed Sources (Amersham Model CDC.93)	M. 1.2 curies
N. $U_3 O_8$	N. Fission Chambers	N. 8 sources not to exceed 1.7 U235 per source

111757

12-19-89

ITEM 6

PURPOSES FOR WHICH

LICENSED MATERIAL

WILL BE USED

Item 6 Purpose (s) For which licensed material will be used

A. through E. For use in research and development as defined in Section 30.4 (q) 10 CFR Part 30, and for possession incident to calibration, maintenance, repair, decontamination, and study of reactor components.

F. For use in testing and calibration of boron measuring devices and for distribution to persons holding operating reactor licenses and/or to persons authorized to receive the licensed materials pursuant to the terms and conditions of specific licenses issued by the Nuclear Regulatory Commission or an Agreement State.

G. and H. For possession, storage, and transfer to persons holding operating reactor licenses and/or to persons authorized to receive the licensed material pursuant to the terms and conditions of specific licenses issued by the Nuclear Regulatory Commission or an Agreement State.

I. through L. For possession as surface contamination on tools or equipment incident to maintenance, repair, modification or storage. (Amendment No. 34 dated 5/22/86).

M. For use in J.L. Shepherd Model 28-6 Dosimeter Calibrator for calibration of instruments. (Letter dated 9/25/85 DDH-87-676)-Amendment No. 35

N. For use as fission chambers in the testing calibration of Boron measuring devices and for distribution to persons holding operating reactor licenses and/or to persons authorized to receive the licensed material pursuant to the terms and conditions of specific licenses issued by the Nuclear Regulatory Commission or an Agreement State.

* Device Model WL-6376A manufactured by Imaging and Sensing Technology Corp. Herseheads, NY.

ITEM 9

FACILITIES AND EQUIPMENT

Item 9 FACILITIES AND EQUIPMENT

Combustion Engineering's Windsor site is a 556 acre tract of land located in the township of Windsor, Connecticut. The Farmington River flows along the northern boundary of the site. The land adjacent to the North, East, South and West Boundaries of the site consists of heavily wooded sections and open fields cultivated for the production of broad leaf tobacco and other farm products. The land area within five miles of the site is predominantly rural and is characterized by rolling farmlands interspersed among sizeable woodland tracts. Attachment 9.0 shows the buildings and facilities presently located on the C-E Windsor site.

Radioactive materials are used primarily in five (5) buildings: The following descriptions and plans indicate where radioactive materials are normally used and controlled.

ATTACHMENT 9.0

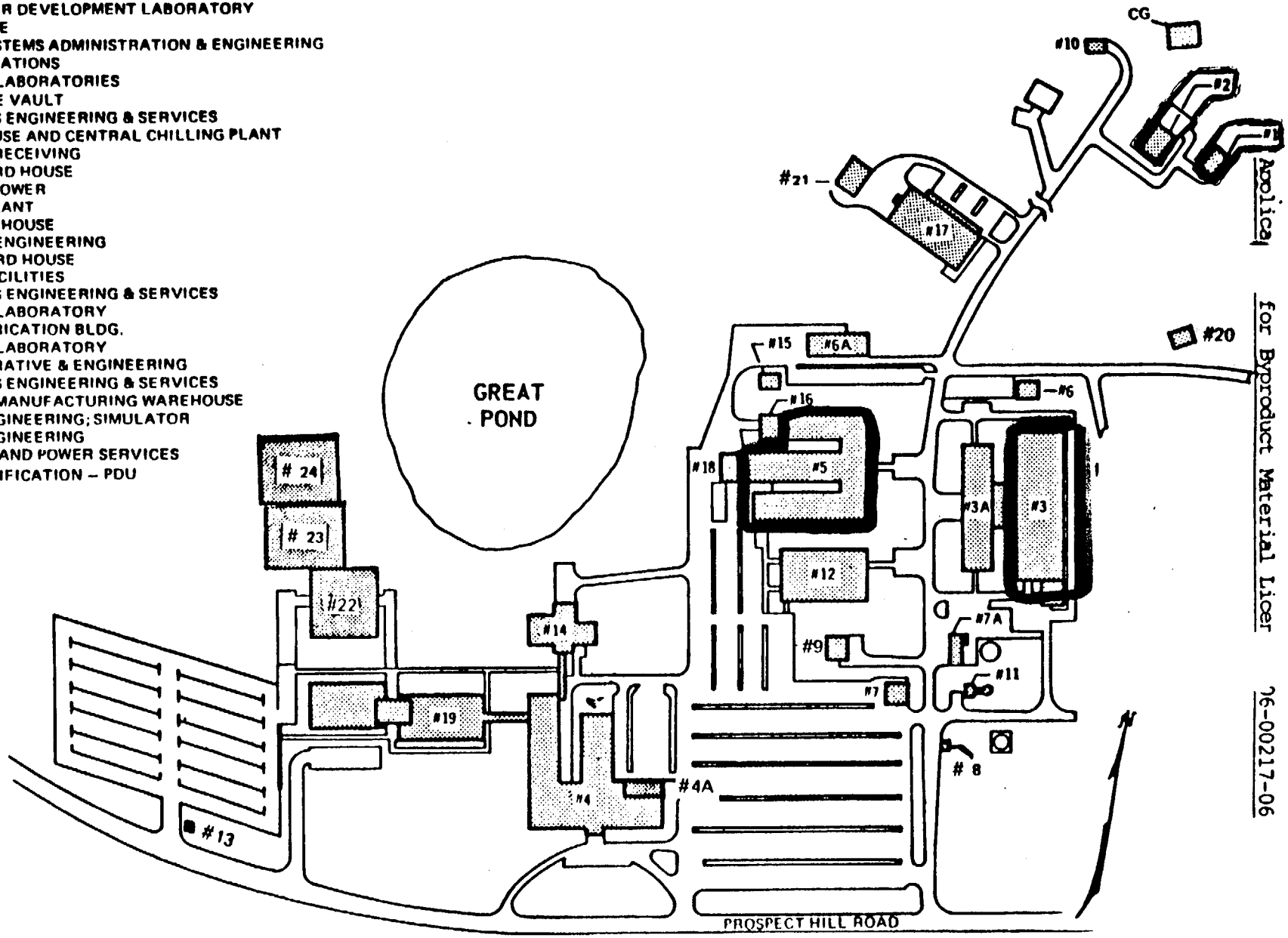
COMBUSTION ENGINEERING, INC.

WINDSOR, CT

SITE PLAN

DING IDENTIFICATION

1 STORAGE
2 NUCLEAR TEST BLDG.
3 KREISINGER DEVELOPMENT LABORATORY
3A KDL OFFICE
4 POWER SYSTEMS ADMINISTRATION & ENGINEERING
4A COMMUNICATIONS
5 NUCLEAR LABORATORIES
6 HOT WASTE VAULT
6A FACILITIES ENGINEERING & SERVICES
7 POWERHOUSE AND CENTRAL CHILLING PLANT
7A CENTRAL RECEIVING
8 EAST GUARD HOUSE
9 COOLING TOWER
10 SEWAGE PLANT
11 FIRE PUMP HOUSE
12 NUCLEAR ENGINEERING
13 WEST GUARD HOUSE
14 DINING FACILITIES
15 FACILITIES ENGINEERING & SERVICES
16 NUCLEAR LABORATORY
17 FUEL FABRICATION BLDG.
18 NUCLEAR LABORATORY
19 ADMINISTRATIVE & ENGINEERING
20 FACILITIES ENGINEERING & SERVICES
21 NUCLEAR MANUFACTURING WAREHOUSE
22 FOSSIL ENGINEERING; SIMULATOR
23 FOSSIL ENGINEERING
24 NUCLEAR AND POWER SERVICES
CG COAL GASIFICATION – PDU



AREAS/BUILDINGS WHERE RADIOACTIVE MATERIAL IS NORMALLY USED OR STORED

ATTACHMENT 9.0

Item 9 Page 4 of 59

Applica for Byproduct Material Licer 26-00217-06

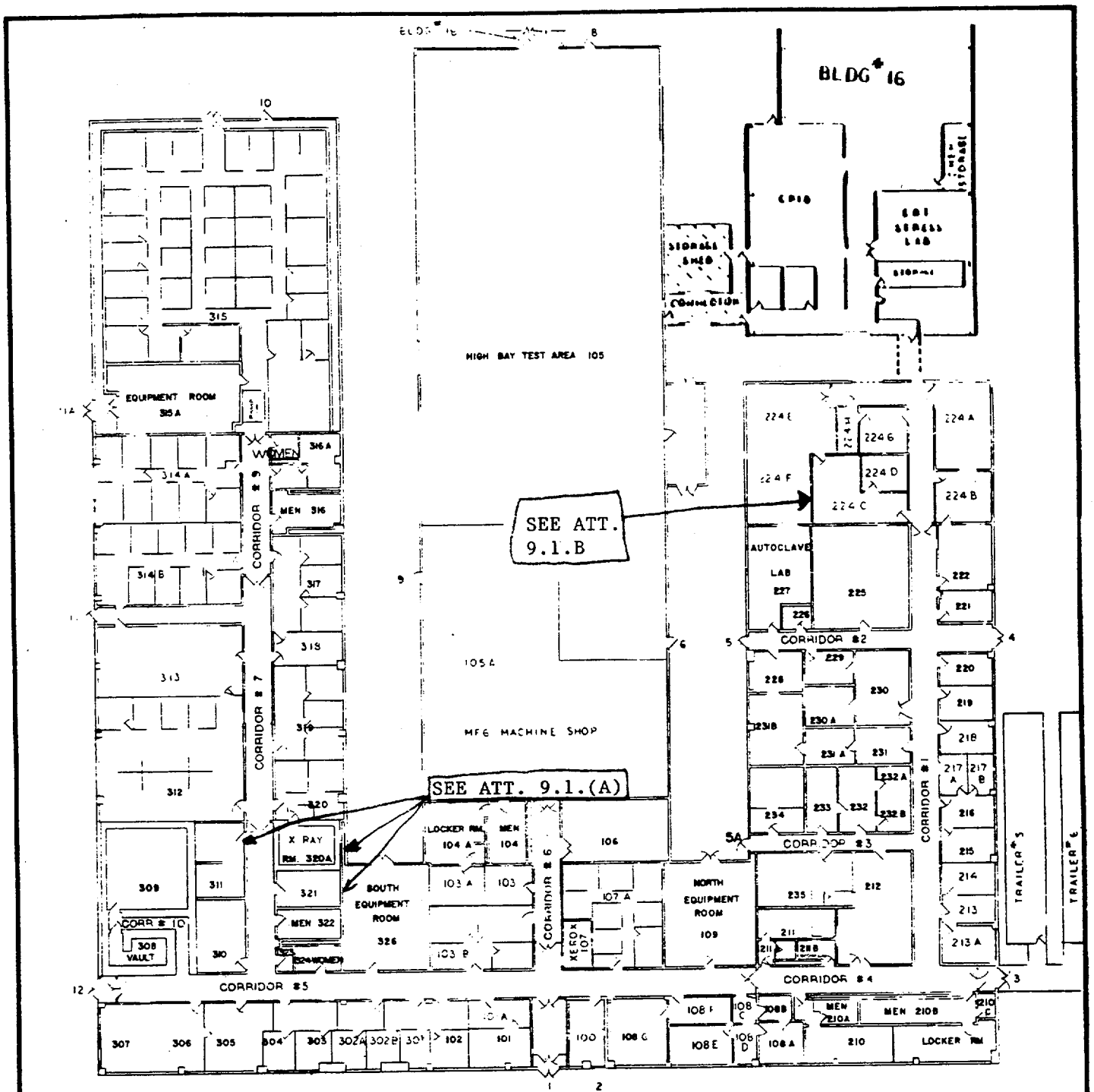
ITEM 9

FACILITIES AND EQUIPMENT

BUILDING 5

RESEARCH AND DEVELOPMENT

LABORATORIES



AREAS IN WHICH RADIOACTIVE MATERIALS ARE NORMALLY USED AND/OR STORED.

REV	DESCRIPTION	DATE
1	UPDATED	8-31-1982

BLDG # 5 KEY PLAN
DEVELOPMENT LABORATORY
COMBUSTION ENGINEERING INC.
WINDSOR CONN.

SCALE: 1/16" = 1'-0" DRAWN BY: J. SHEA DATE: DRAWING NUMBER: PEM—5

9.1 Building 5 - Research and Development Laboratories

The R&D laboratories contain approximately 60,000 square feet of floor space. The main bay and each of the three wings of the structure contain office space which occupies a total of 27,000 square feet of the facility. The balance of the building is used for mechanical testing and research/development. Work in the laboratory areas is evenly divided among activities that require the handling of nonradioactive materials. Each area that uses radioactive materials; such as the radiochemistry laboratory, metallography laboratory, mechanical testing laboratories, Boronometer test area, etc.; is established and maintained as a separate restricted area.

Air from work areas in which radioactive materials with greater than 5000 DPM/100 cm^2 loose activity are used, is exhausted via stack lines equipped with single banks of HEPA (99.97 percent efficient for 0.3 micron particles). Each of the exhaust stacks is equipped with an isokinetic probe and sample collection system. Each exhaust system is tested in accordance with ANSI N510-1980 following HEPA filter replacement. The air exhaust and sampling air for each area are shown in Attachment 9.1.(A) & (B).

9.1 Building 5 - Research and Development Laboratories (cont'd)

Radioactive liquid wastes generated are collected and sampled prior to release from the building. The liquids are collected then evaporated in fume heads which discharge to the sampled, filtered exhaust stacks as previously described.

ATTACHMENT 9.1.(A) & (B)

AIR EXHAUST AND

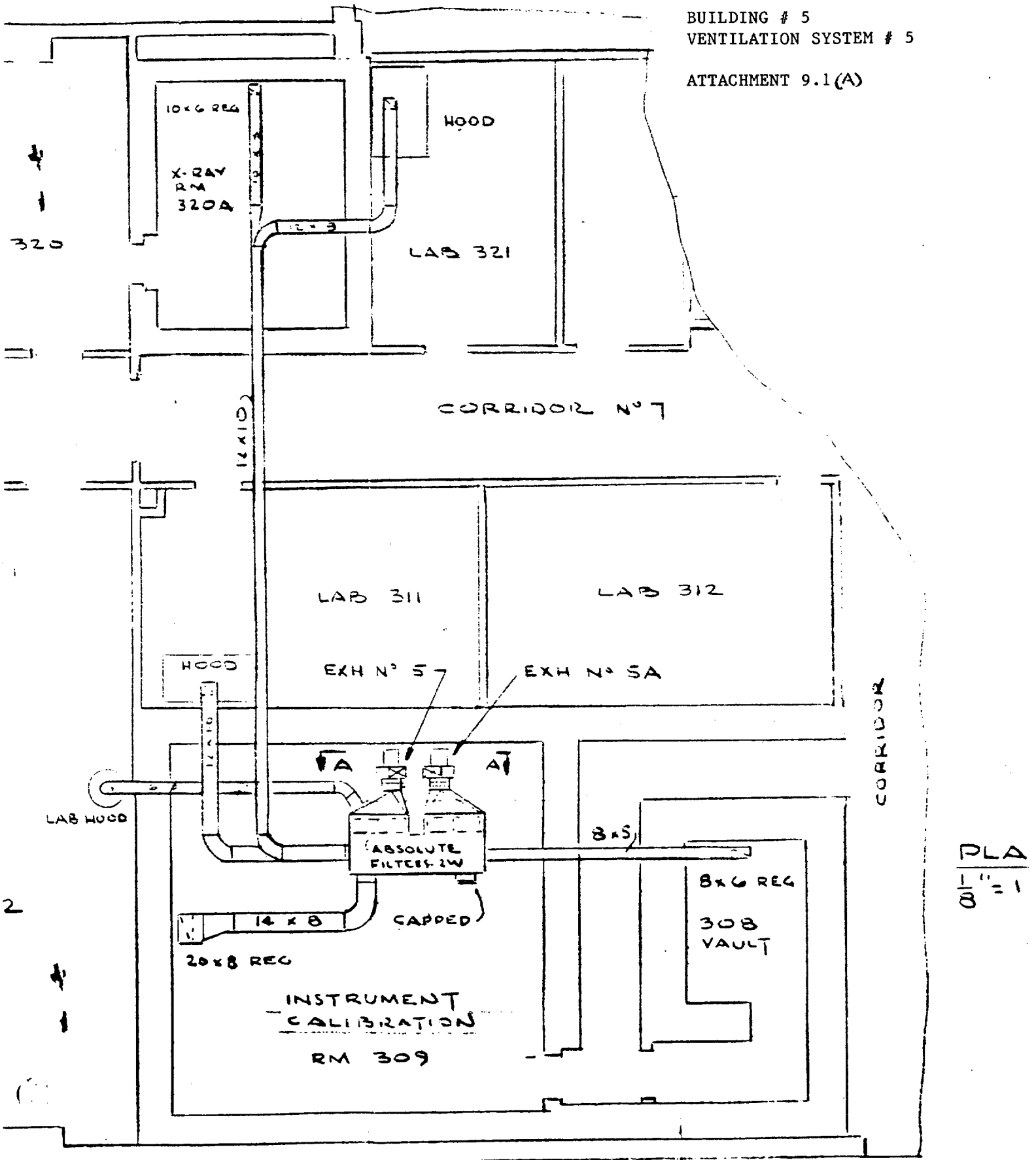
SAMPLING SYSTEMS

BUILDING #5

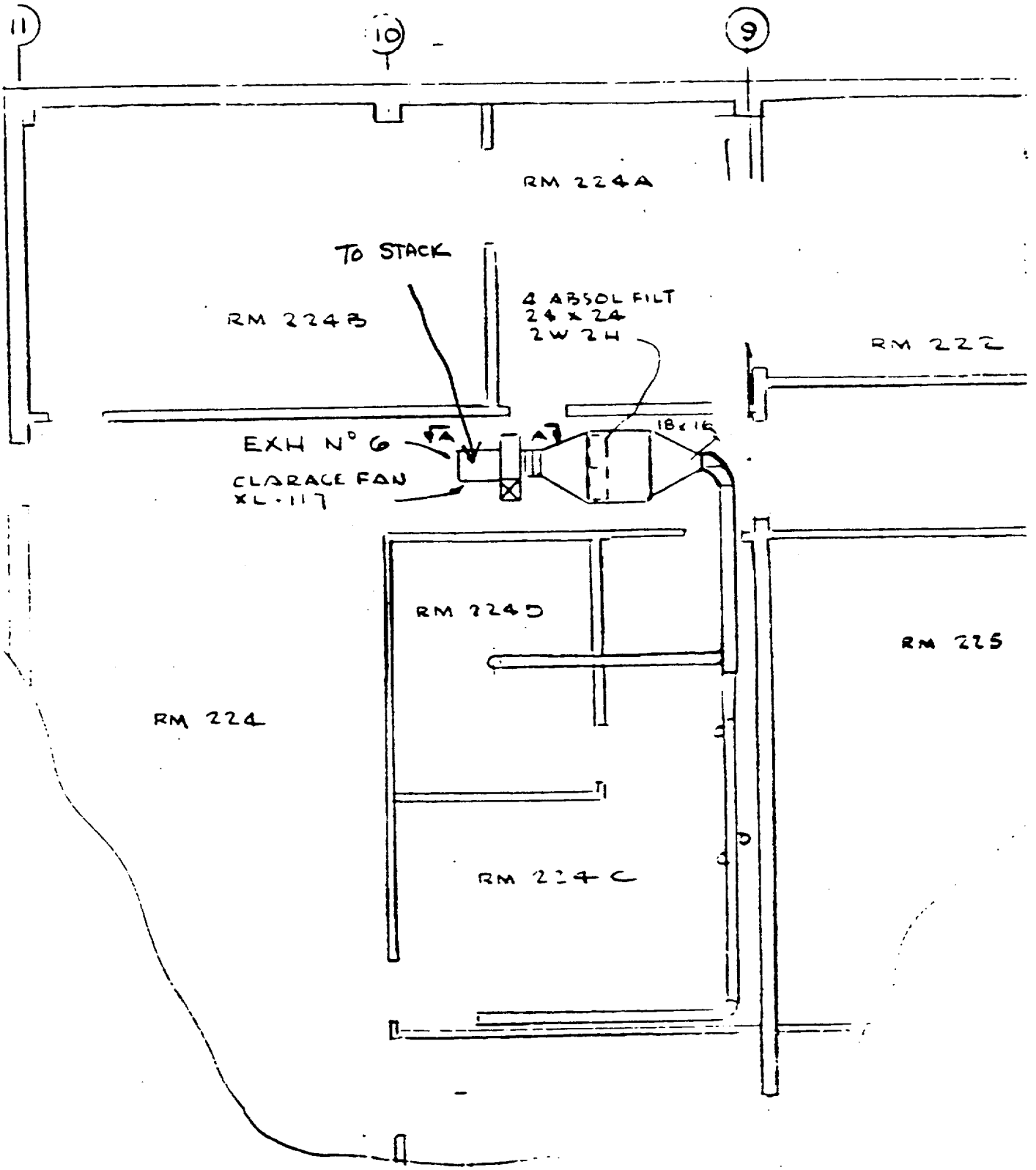
SAMPLING TUBE N° 5
6" = 1'-0"

BUILDING # 5
VENTILATION SYSTEM # 5

ATTACHMENT 9.1 (A)



BUILDING # 5
VENTILATION SYSTEM # 6
ATTACHMENT 9.1.(B)

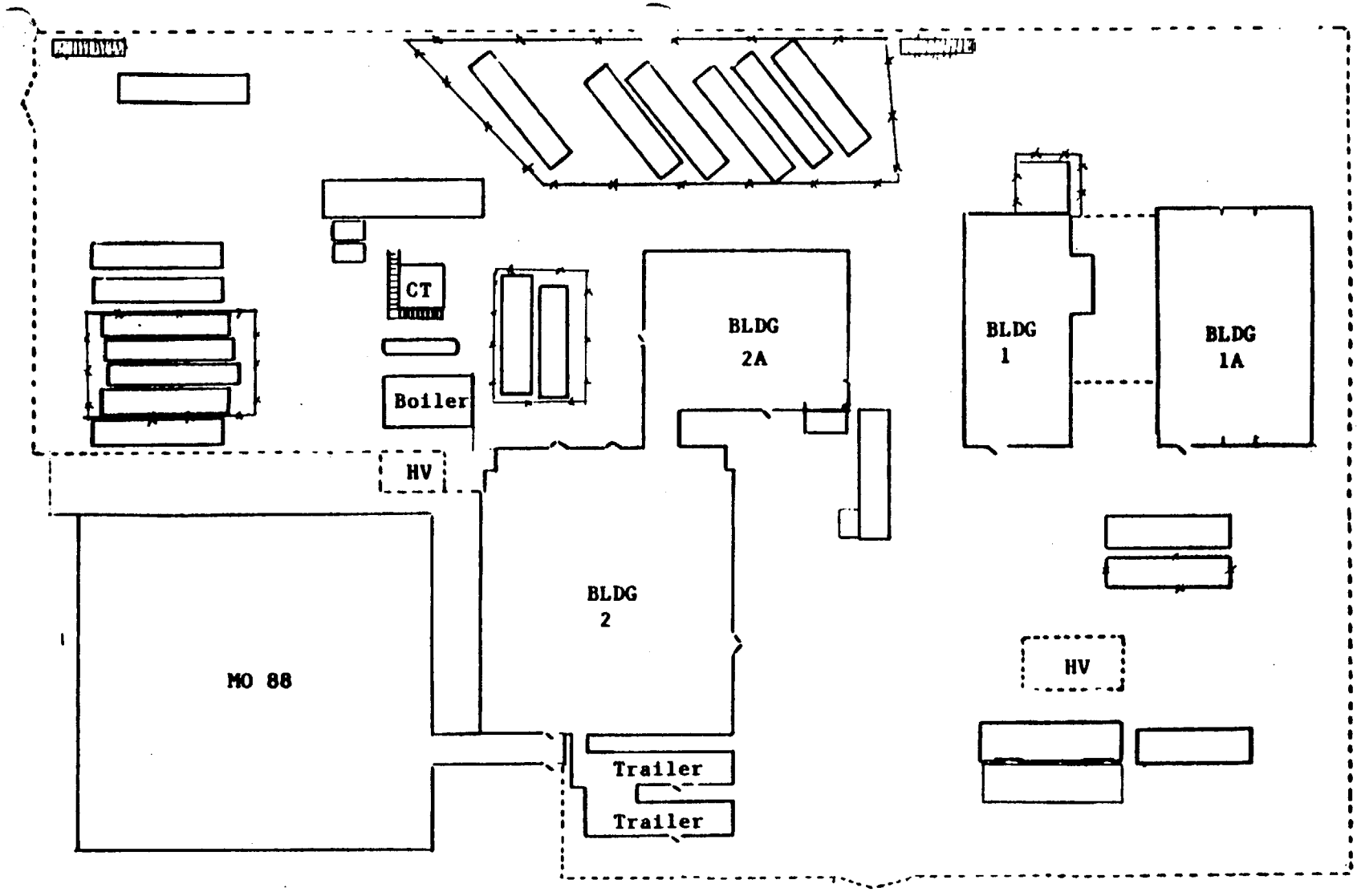


ITEM 9

FACILITIES AND EQUIPMENT

OUTAGE SERVICES FACILITIES

BUILDINGS 1, 1A, 2, 2A



OUTAGE SERVICES
FACILITIES

ITEM 9

FACILITIES AND EQUIPMENT

9.2

BUILDING #1

9.2. Building No. 1 - High Radiation Storage & Refurbishment

(Drawing of this building is Attachment 9.2.0)

This building is used for three (3) basic purposes.

A. High Radiation Storage - The North East Corner of the building contains a high density concrete walled cell. The area is used to store contained materials with dose rates of approximately 100 mr/hr or greater. Drawing of the area is detailed in Attachment 9.2.1.

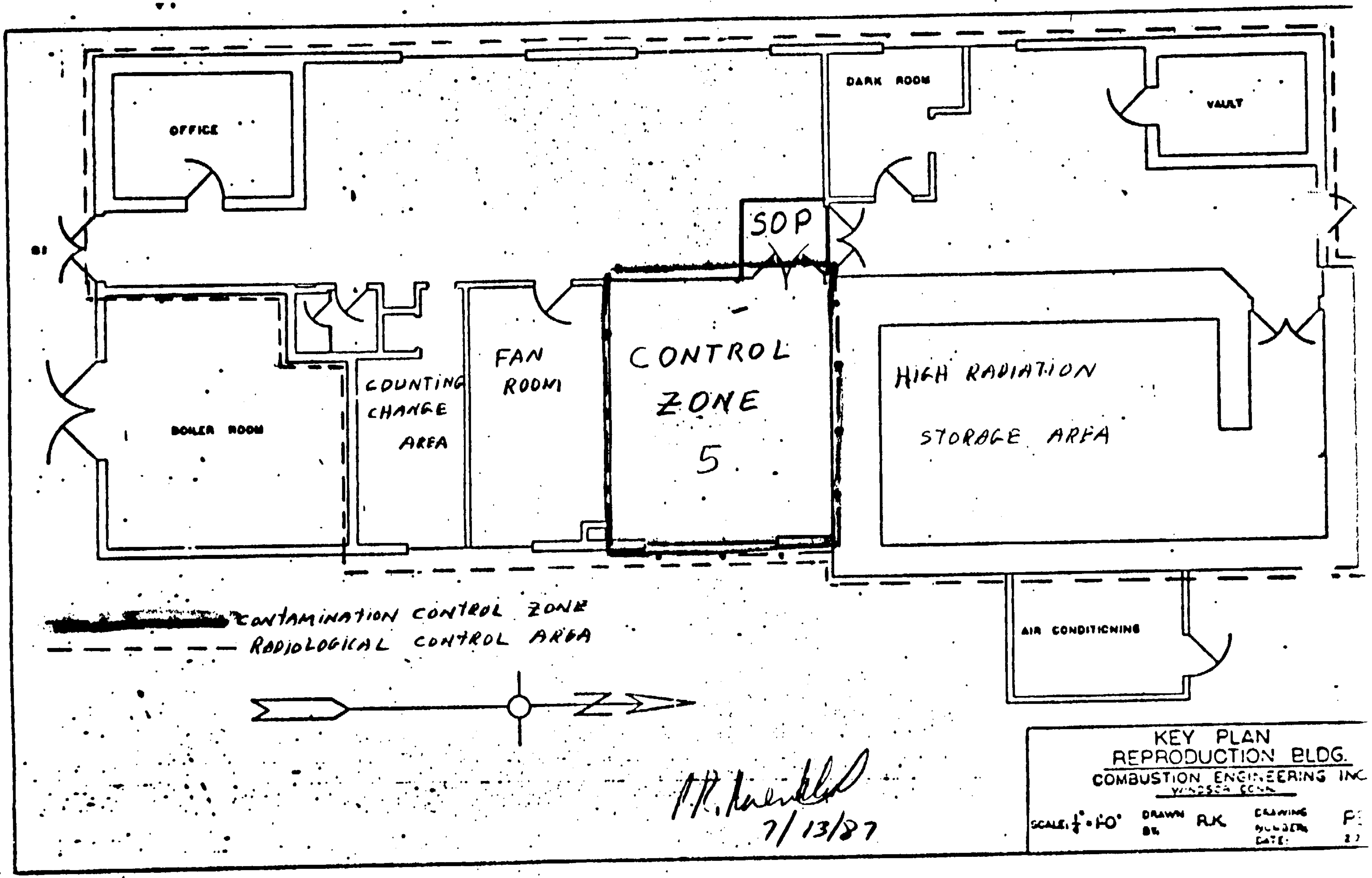
B. Control Zone #5 - The east section of Building# 1 contains a work zone with a double - HEPA filtered exhaust system. This zone is monitored by an isokinetic sample probe and continuous air monitor designed to shut down the ventilation if an alarm condition (approx. 20% mpc for Co^{60}) is detected between the filter sets. There is also an alarm light inside the zone to alert personnel of an abnormal condition. This exhaust system recirculates air back into the building. A drawing of the control zone, ventilation and sampling system is shown in Attachment 9.2.2.

ATTACHMENT 9.2.0

BUILDING #1

PLAN

BUILDING # 1



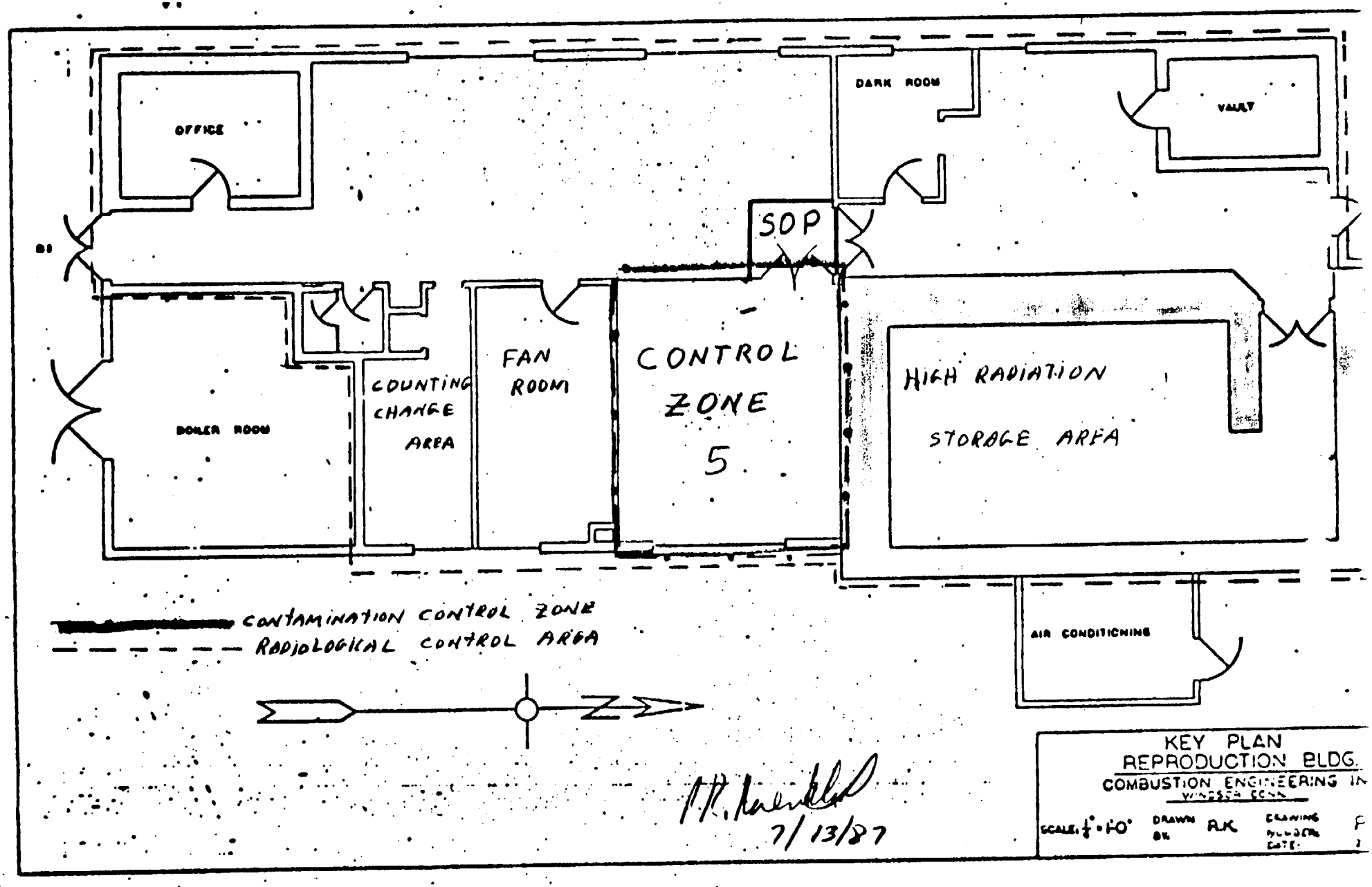
ATTACHMENT 9.2.0

ATTACHMENT 9.2.1

BUILDING #1

HIGH RADIATION STORAGE AREA

BUILDING # 1



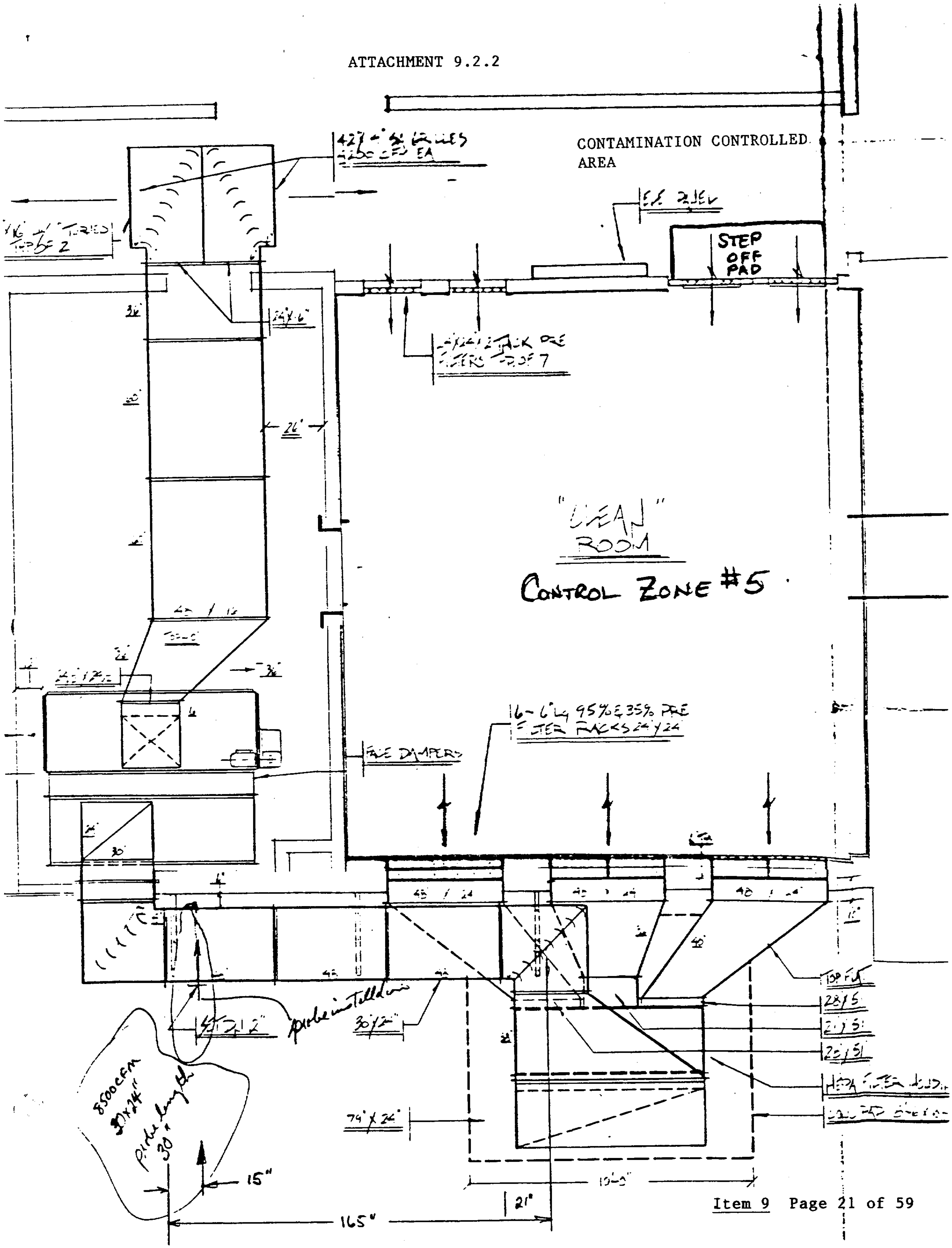
ATTACHMENT 9.2.1

ATTACHMENT 9.2.2

BUILDING #1

CONTROL ZONE #5

ATTACHMENT 9.2.2



EQUIPMENT SCHEDULE

AH-1 - TRANE VERTICAL DRAW THUR CLIMATE CHANGER SIZE 17, ARRANGEMENT 5, 10 HP, 460 60/3. LEFT HAND MOTOR MOUNTING [redacted] @ 4½" SP. W/ FACE DAMPERS

FILTERS -
- (1) HEPA SIDE LOAD FILTER HOUSING WITHOUT PREFILTER TRACT WITH EPOXY COATING AND WEATHER PROOF SIZE 2 X 3 (2 FILTERS HIGH-3 FILTERS WIDE)
- (6) 2000 CFM HEPA FILTERS FOR USE @ 1500 CFM EA. 99.97% DOP SIZE 24 X 24 X 11½ WITH NEOPRENE GASKETS DOWNSTREAM
- (6) BEST-AIRE 495 - 95% PREFILTERS SIZE 23½ X 23½ X 3-7/8
- (13) BEST AIRE 240 - 35% PREFILTERS FOR 95% FILTERS ABOVE AND HALL FILTERS 23½ X 23½ X 1-7/8
- (38) SNAP SPRING CLIPS FOR 13 FILTER FRAMES
- (6) 24 X 24 X 6 FRAMES W/GASKETS
- (7) 24 X 24 X 2 FRAMES W/GASKETS
- (1) FOR HEPA FILTER HOUSING
  DWYER #2004 MAGNEHELIC GAGE RANGE 0-2"
- (1) FOR EXHAUST PREFILTER RACK
  DWYER #2002 MAGNEHELIC GAGE RANGE 0-4"
- (1) FOR OCCUPIED SPACE TO MEASURE NEGATIVE ROOM PRESSURE
  DWYER #2301 MAGNEHELIC GAGE RANGE .50-00.50 (.02)
- (2) ACCESSORIES
  A-605 AIR FILTER KITS

REGISTERS - (2) 42" X 14" H400 4D DUCT MOUNTED SUPPLY GRILLES W/VERTICAL & HORIZONTAL DEFLECTION

SCOPE OF WORK

1.) INSTALLATION OF VERTICAL DRAW THRU CLIMATE CHANGER W/SUP. & RETURN AIR DUCTWORK.

2.) INSTALLATION OF 13 PREFILTER RACKS & 1-HEPA FILTER CASING.

3.) CONCRETE PAD, CUTTING & PATCHING BY COMBUSTION ENGINEERING.

4.) RETURN AIR DUCTWORK FROM FILTER FRAMES TO HEPA FILTER HOUSING SHALL BE 16 GA BLACK IRON LIQUID TIGHT WELDED CONSTRUCTION, COVERED BY INSULATION CONTRACTOR.

5.) SUPPLY AIR & RET. AIR DUCTWORK SHALL BE MED. PRESSURE GALVANIZED SHEET METAL WITH NEXUS 4 BOLT CONNECTION SYSTEM. COVERED BY INSULATION CONTRACTOR.

ITEM 9

FACILITIES AND EQUIPMENT

BUILDING #1A

9.3. Building 1A - Storage

The southern half of this building is used primarily as an inventory and storage area for packaged radioactive materials.

There is a temporary tented controlled area located in the southeast corner of the building that is maintained under negative pressure by a portable HEPA filtered fan unit that exhausts back into the building via a stack. The stack contains an isokinetic sample probe which is attached to a constant air monitor. The alarm bell and light are activated if the air downstream of the HEPA filter reached 20% MPC for Co^{60}. The tented area is used for visually inspecting containers containing radioactively contaminated equipment.

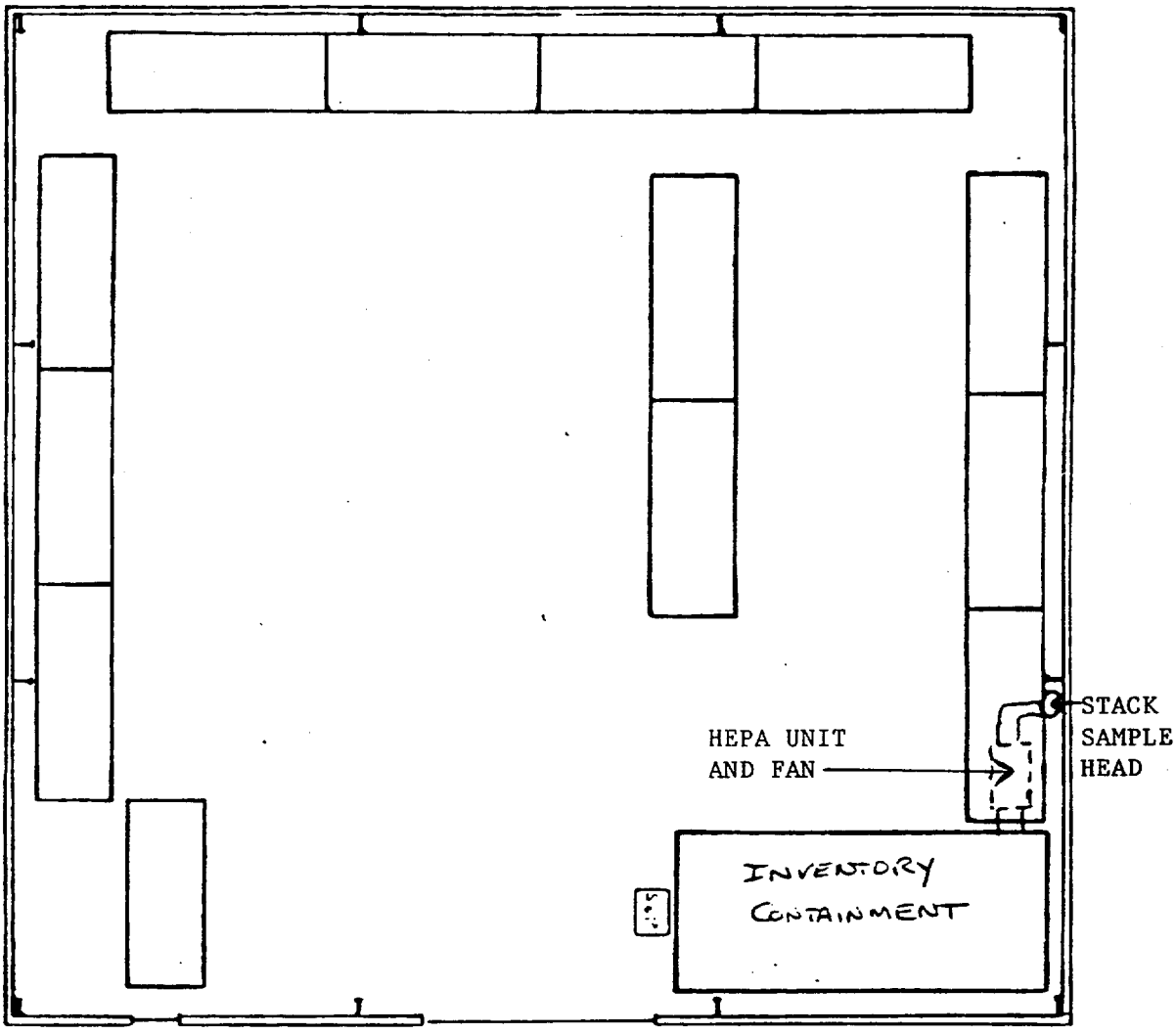
The layout and sampling systems for this building is shown in Attachment 9.3.

ATTACHMENT 9.3

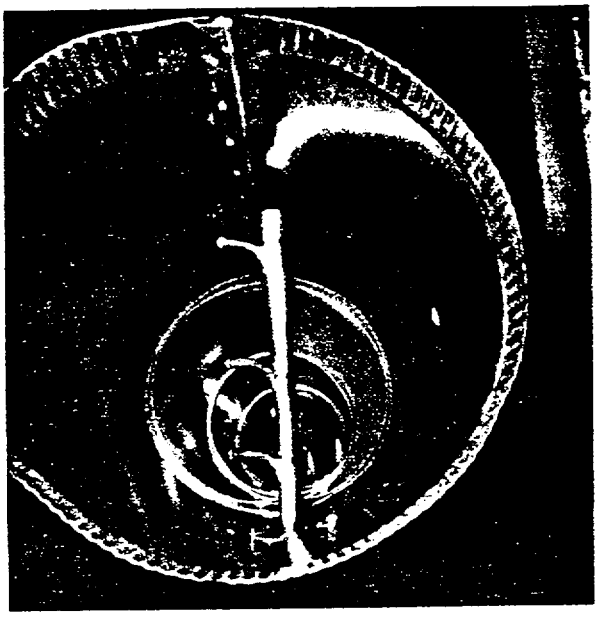
BUILDING 1A

INVENTORY AND CONTROL AREA

BUILDING 1A
INVENTORY AND CONTROL AREA
ATTACHMENT 9.3



CONTAMINATION CONTROL AREA



Stack Sampler Bldg 1A
Sample head turned ≈ 120° for photo

BUILDING 1A - STACK SAMPLER

ATTACHMENT 9.3

ITEM 9

FACILITIES AND EQUIPMENT

BUILDING 2/2A

9.4. Building 2/2A - Outage Services Facility

(Layout is Attachment 9.4.0)

This building consists of approximately 15,000 square feet of floor space. The southern half of the building is a two story structure with the second floor devoted entirely to office space, see Attachment 9.4.1. A shielded health physics counting room is located in the South-West corner of the first floor.

A high density concrete vault is located in the center of the building. See Attachment 9.4.2 for layout. The purpose of this area is for calibration of instruments and Thermoluminescent Dosimeters utilizing sealed sources. The single entrance to this vault is controlled by a combination vault door lock controlled by health physics. The North-East corner of the facility is comprised of a concrete walled area identified as Cell 2 and an interconnecting wing identified as Building 2A. Cell 2, both the ground level and subterranean level, and Building 2A has been established as one restricted area, see Attachment 9.4.3. The subterranean level of Cell 2 is used primarily for decontamination and repair of reactor inspection equipment.

9.4. Building 2/2A - Outage Services Facility

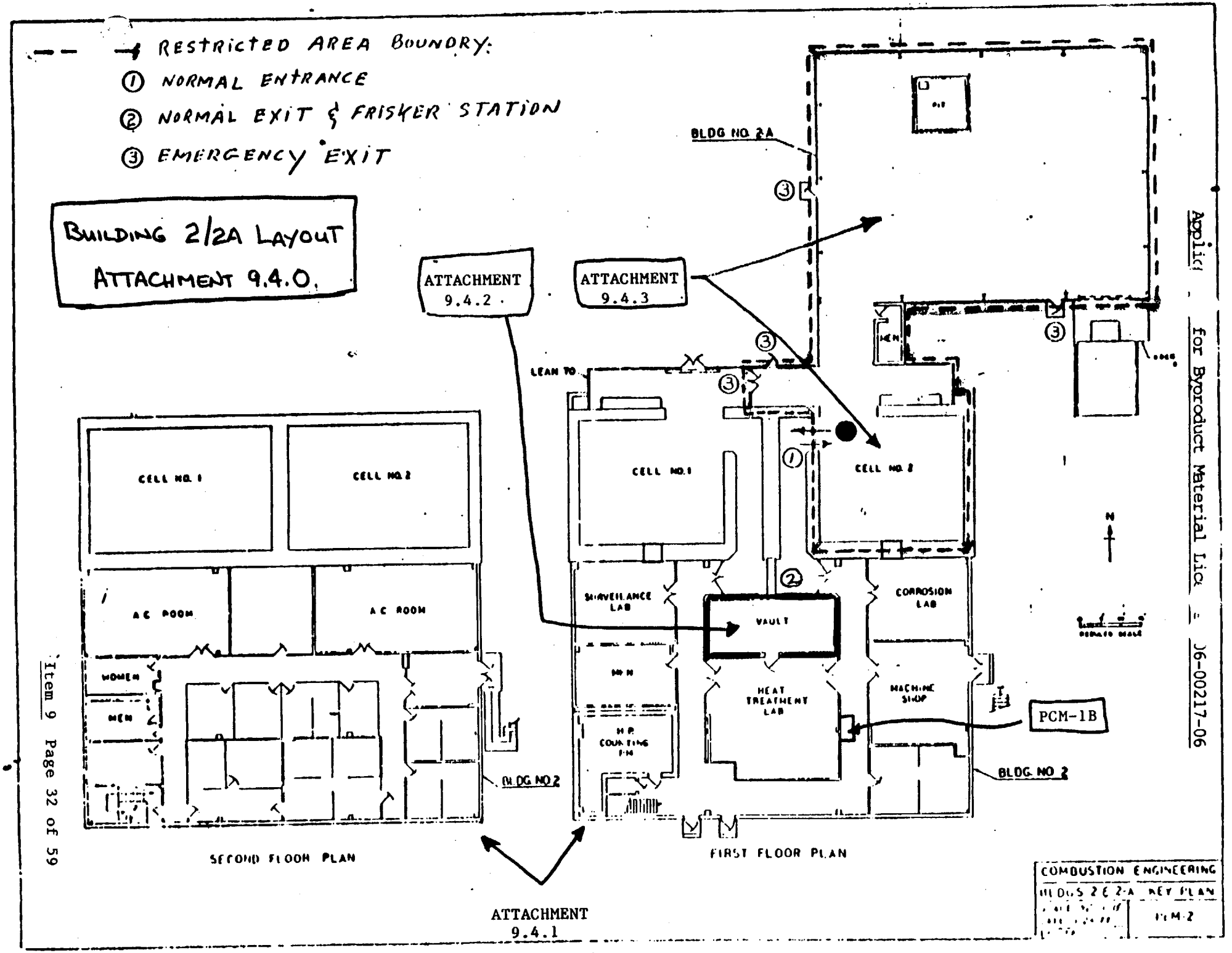
Airborne radioactive material in the cell is processed through a self-contained, HEPA filtered air cleaning system. A portion of the air in the cell exhausted outside the building via a single band of HEPA filters. The system is continuously monitored whenever it is in operation. Please see Attachment 9.4.3 for layout.

A ground level of Cell 2 and Building 2A are used to refurbish, inspect, develop and store reactor servicing equipment and to train personnel in the use of the equipment. Controlled zones are established to handle uncrated radioactive equipment. The controlled zones are of modular construction erected to accommodate the equipment and personnel. Each controlled zone is serviced by a circulating air system designed to move air from the controlled zone and discharge back into the building after it has been filtered by two banks of HEPA filters. One set of filters is located at the controlled zone, the other set is located just prior to the system discharge. The air between the two banks of HEPA filters is sampled through a isokinetic probe and connected to a continuous air monitor which will alarm if radioactive material is detected downstream of the first set of filters. Please see Attachment 9.4.3.

ATTACHMENT 9.4.0

BUILDING 2/2A

PLAN


RESTRICTED AREA BOUNDRY:
① NORMAL ENTRANCE
② NORMAL EXIT & FRISKER STATION
③ EMERGENCY EXIT
BUILDING 2/2A LAYOUT
ATTACHMENT 9.4.0
ATTACHMENT 9.4.2
ATTACHMENT 9.4.3
BLDG NO. 2A
LEAN TO
MEN
CELL NO. 1
CELL NO. 2
A C ROOM
A C ROOM
WOMEN
MEN
SURVEILLANCE LAB
VAULT
CORROSION LAB
H P COUNTING RM
HEAT TREATMENT LAB
MACHINE SHOP
PCM-1B
BLDG NO. 2
SECOND FLOOR PLAN
FIRST FLOOR PLAN
ATTACHMENT 9.4.1
COMBUSTION ENGINEERING
BLDGS 2 & 2-A KEY PLAN
PCM-2

ATTACHMENT 9.4.1

BUILDING 2

OFFICE SPACES/HEALTH PHYSICS

COUNTING ROOM

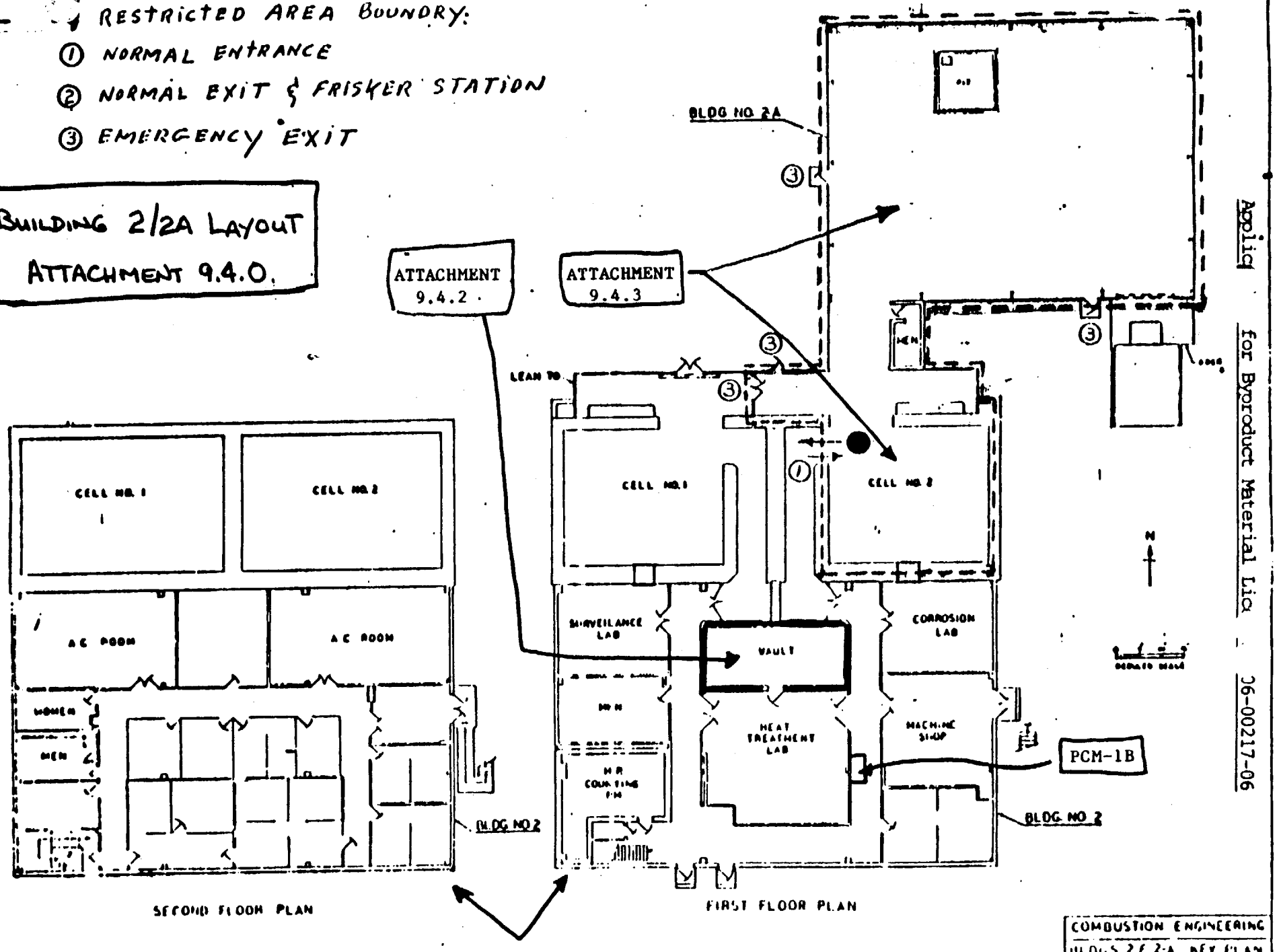
RESTRICTED AREA BOUNDRY:

① NORMAL ENTRANCE

② NORMAL EXIT & FRISKER STATION

③ EMERGENCY EXIT

BUILDING 2/2A LAYOUT ATTACHMENT 9.4.0.



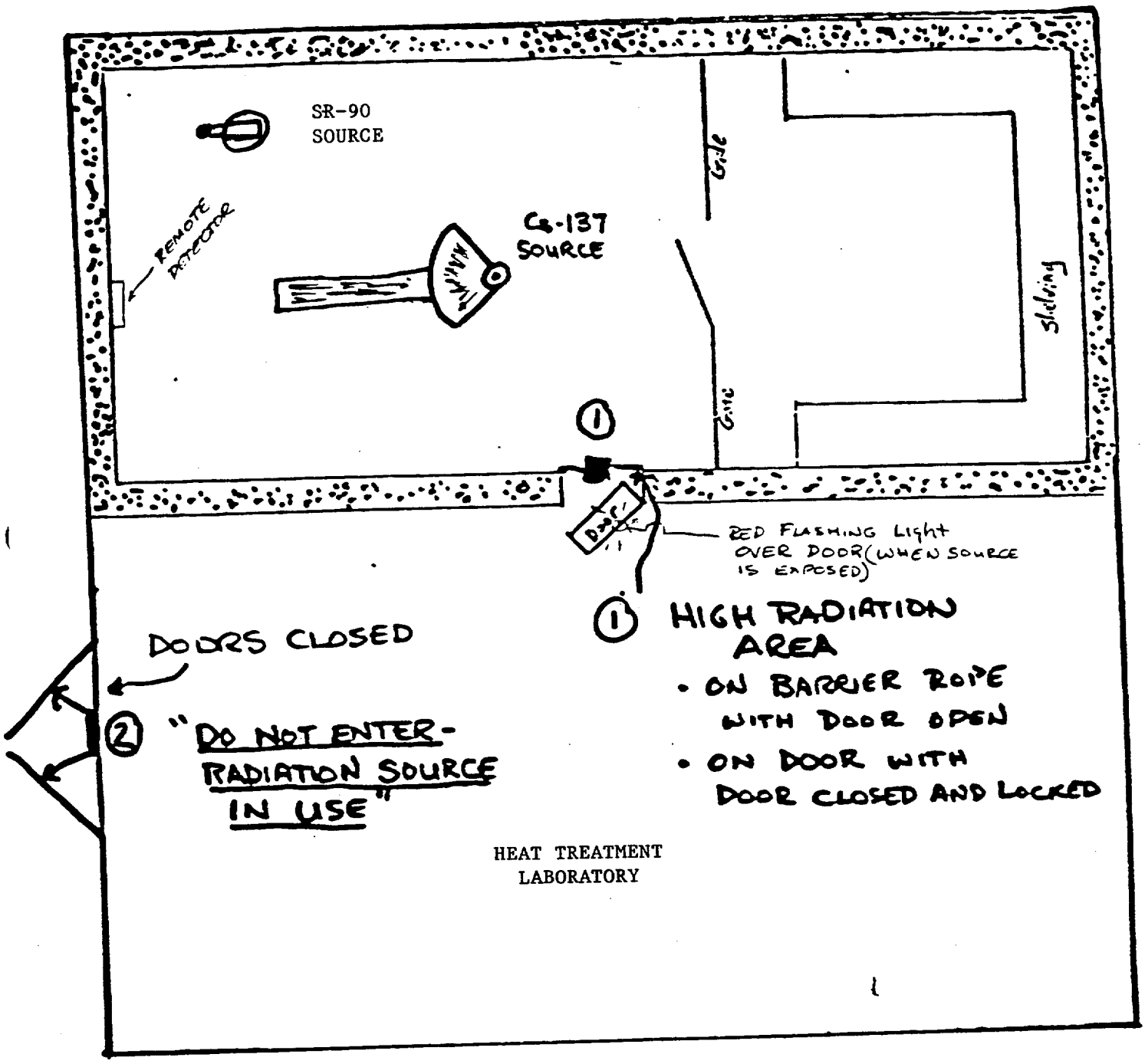
COMBUSTION ENGINEERING	
WINDSOR, CONN. BLDGS 2 & 2-A KEY PLAN	
	FIG. 2

ATTACHMENT 9.4.2

BUILDING # 2

CALIBRATION VAULT DETAIL

BUILDING # 2
CALIBRATION VAULT

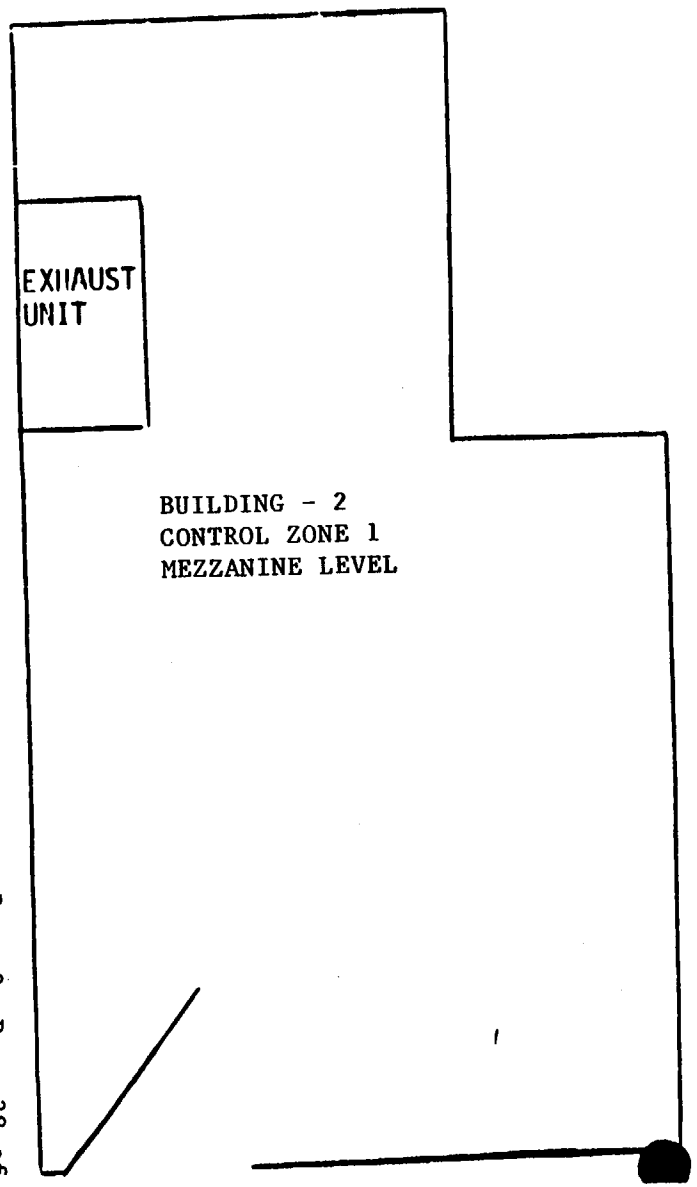


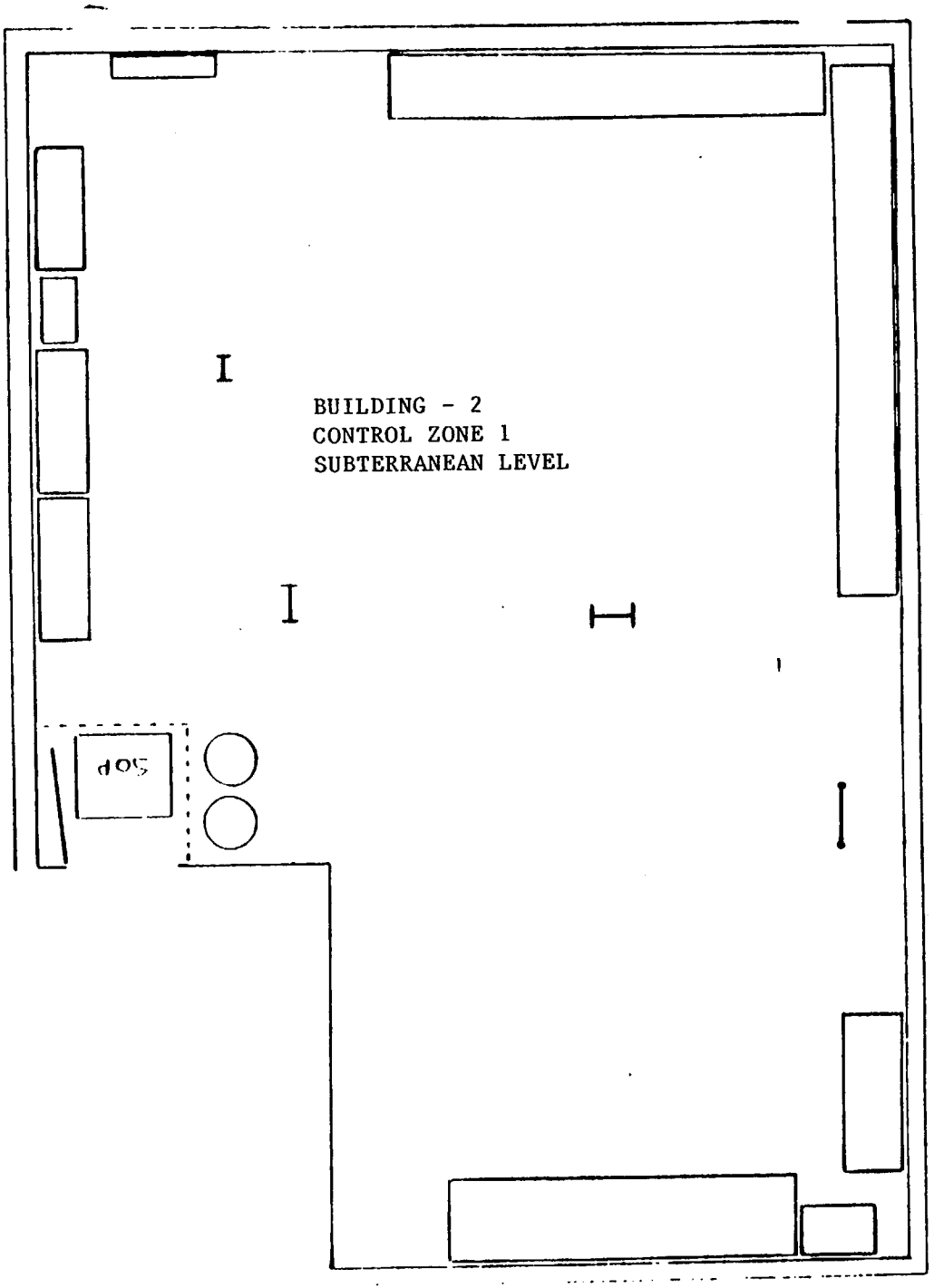
ATTACHMENT 9.4.3

CELL 2/BUILDING 2A

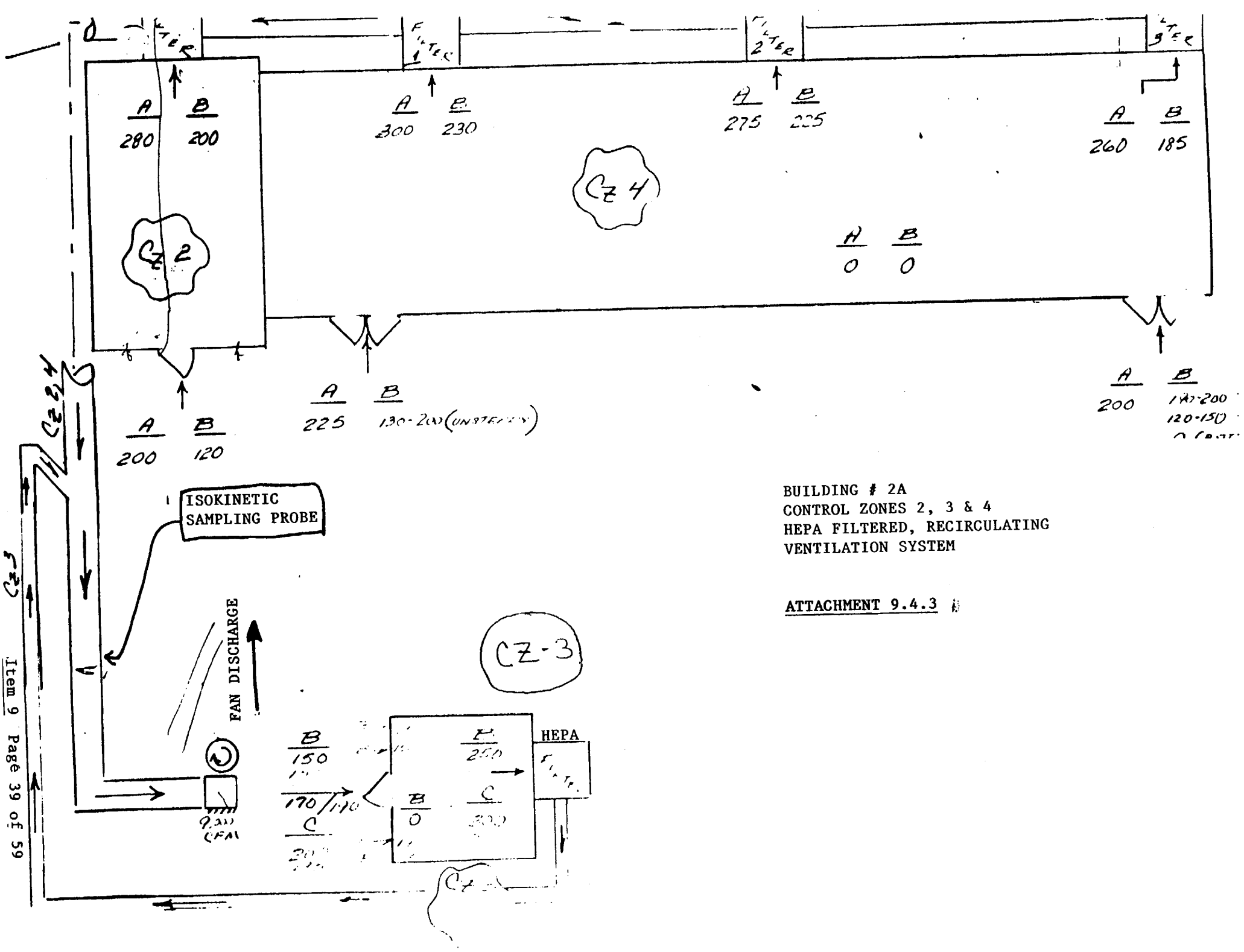
CONTROL ZONE LAYOUT

WITH AIR HANDLING SYSTEMS





ATTACHMENT 9.4.3



BUILDING # 2A
CONTROL ZONES 2, 3 & 4
HEPA FILTERED, RECIRCULATING
VENTILATION SYSTEM

ATTACHMENT 9.4.3

ITEM 9

FACILITIES AND EQUIPMENT

9.5

BUILDING #3

KDL LABORATORY

9.5. Building 3 - KDL Laboratory

This building consists of approximately 60,000 square feet used for the research and development of fossil fuels, boilers, and pollution control equipment. all radioactive materials used in this building will be encapsulated; either in the form of sealed sources as part of densitometer projectors or as materials sealed for x-ray diffraction analysis.

ITEM 9

FACILITIES AND EQUIPMENT

9.6

FACILITIES AND EQUIPMENT

GENERAL

9.6 Facilities and Equipment - General

It is a practice of the Nuclear Services Department that whenever unclad radioactive materials are used in the various research laboratories, the equipment involved is enclosed, where practical, for protection of personnel and the environment. Generally, all laboratory or equipment areas where loose contamination may exceed 10,000 DPM/100CM^2 are candidates for protective enclosures. These enclosures may be of permanent construction or semi-permanent controlled zones. Typical examples of restricted areas utilizing permanent enclosures or controlled zones may be seen in Attachments 9.6. (1) & (2).

ATTACHMENT 9.6 (1) & (2)

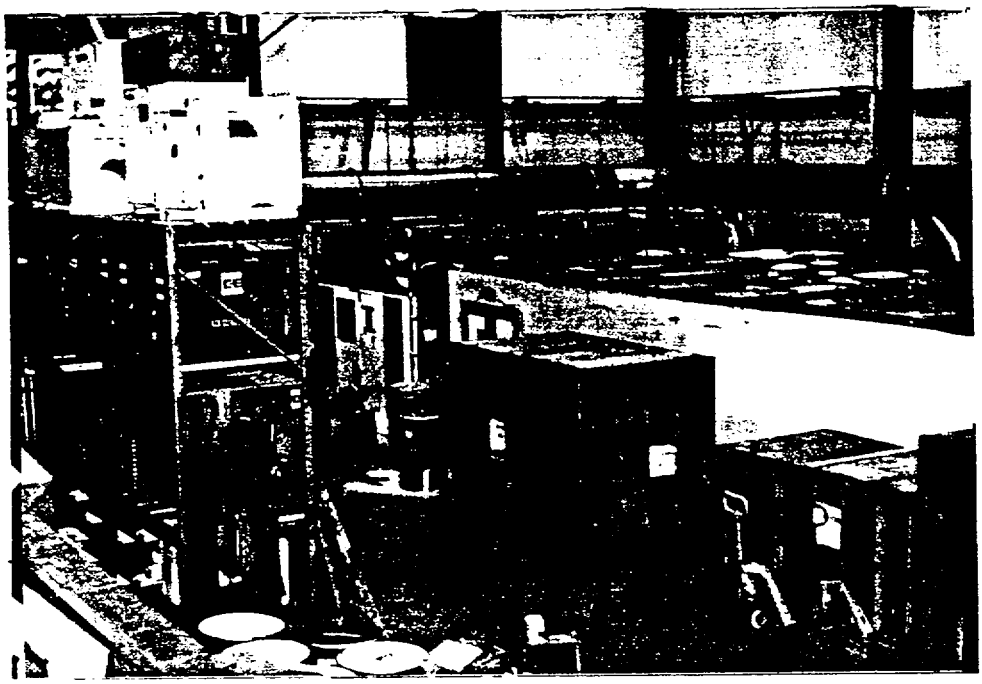
TYPICAL ENCLOSURES

AND

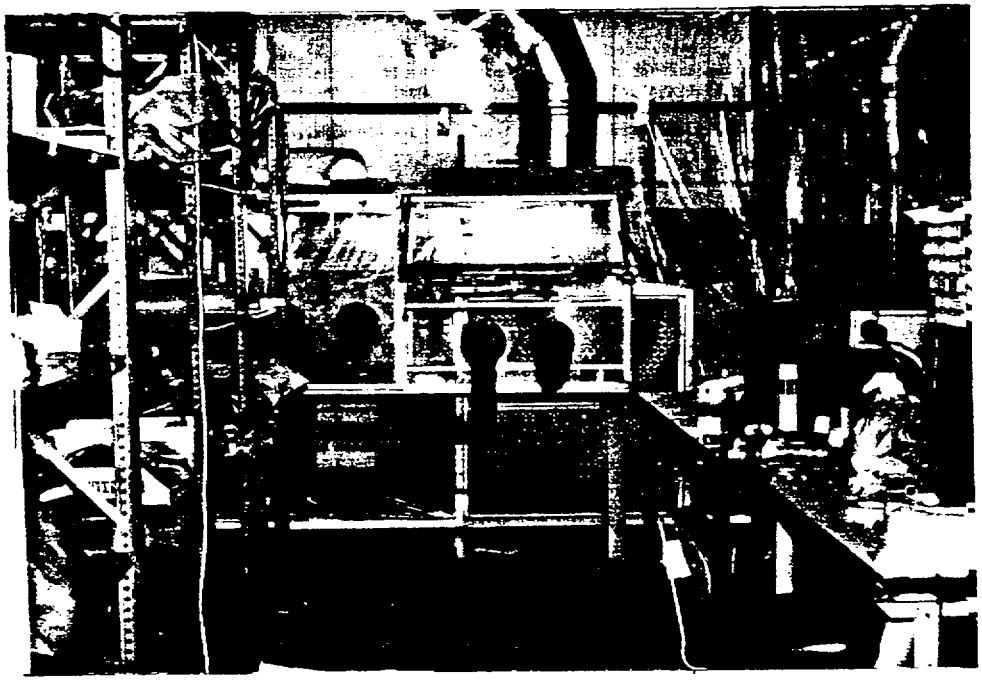
CONTROL ZONES

UTILIZED FOR WORK WITH

UNCLAD RADIOACTIVE MATERIALS



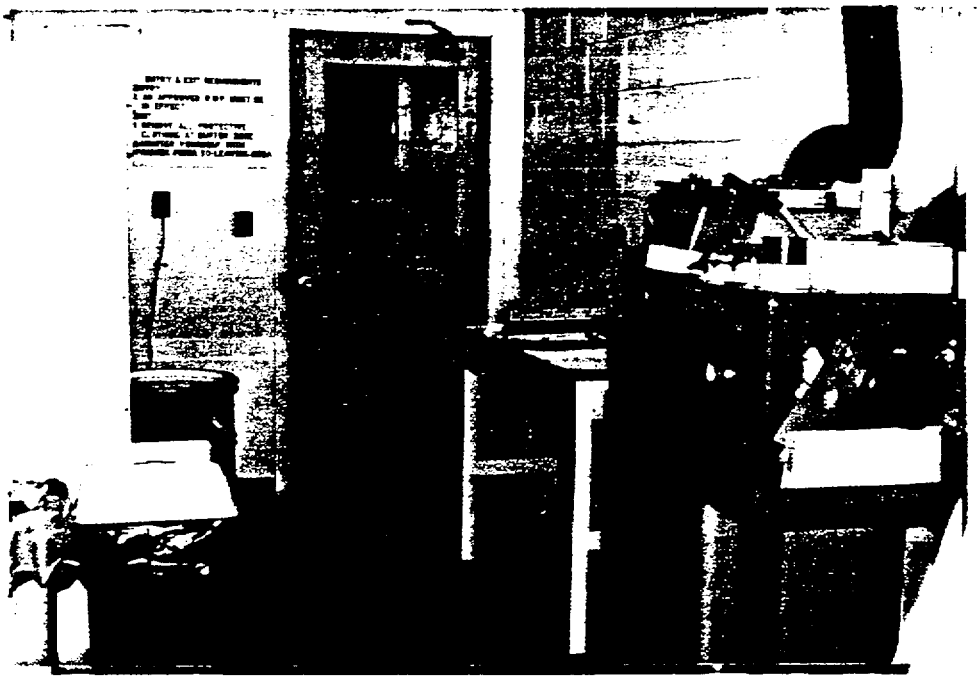
Semi-permanent controlled zones used during decontamination, refurbishment and repair of reactor inspection equipment.



Interior view of semi-permanent controlled zone showing glove box enclosure used during repair of highly contaminated equipment.

ATTACHMENT 9.6.(1)

Glove box enclosure used to prepare and polish radioactive samples for metallurgical examination.



Glove box enclosure used for analytical weighing and measuring of radioactive samples.

ATTACHMENT 9.6.(2)

ITEM 9

FACILITIES AND EQUIPMENT

9.7

SURVEY AND COUNTING EQUIPMENT

9.7 Survey and Counting Equipment

The attached (9.7.1) is a current listing of radiation survey, counting, and sampling equipment used under the license. Calibration procedures are developed and used in accordance with ANSI N323-1980 and Manufacturer's Technical Manuals as required. Equipment additions or deletions from this complement may be made as necessary without prior notification to the NRC as long as these changes are reviewed and approved by the RSO or his designee. A generic calibration procedure is shown in Attachment 9.7.2.

Note: This sub item is a change from the previous license submittal.

ATTACHMENT 9.7.1

RADIATION SURVEY, COUNTING AND SAMPLING EQUIPMENT

ATTACHMENT 9.7.1

MANUFACTURER	MODEL#	TYPE	RANGE	#
EBERLINE	RM 14	B^- FRISKER	0-50K CPM	13
LUDLUM	177	B^- FRISKER	0-500K CPM	1
EBERLINE	RM-20	B^- FRISKER (GASFLOW)	0-500K CPM	2
EBERLINE	E-520	DOSE RATE	0-2R/HR	3
LUDLUM	14C	DOSE RATE	0-2R/HR	2
EBERLINE	6112B	DOSE RATE	0-1000R/HR	1
EBERLINE	RO-2	DOSE RATE	0-5R/HR	6
EBERLINE	MS-3	B SCALER	0-999999 CPM	4
EBERLINE	MS-2	B SCALER	0-999999 CPM	1
EBERLINE	PNR-4	DOSE RATE	0-5R/HR	1
LUDLUM	125	UR METER	0-3000 UR/HR	1
LUDLUM	19	UR METER	0-5000 UR/HR	1
CANBERRA	2404	B SCALER	0-999999 DPM	1
EBERLINE	PCM1B	B PERSONAL FRISKER	N/A	1
VICTOREEN	08-430	PERSONAL AIR SAMPLER	N/A	40
NMC	AM-2B	CONTINUOUS AIR MON.	10-1MCPM	2
NMC	AM-3D	CONTINUOUS AIR MON.	50-50KCPM	2
DOSIMETER CORP.	862	POCKET ION CHAMBER	0-200 MR	50
DOSIMETER CORP	611	POCKET ION CHAMBER	0-1 R	10

NOTE: EACH OF THE ABOVE INSTRUMENTS/SYSTEMS WILL BE CALIBRATED ON A QUARTERLY BASIS OR MORE FREQUENTLY, IF REQUIRED BY THE TECHNICAL MANUAL OR PROCEDURE.

ATTACHMENT 9.7.2

GENERIC CALIBRATION PROCEDURE

CALIBRATION PROCEDURE FOR

EBERLINE MODEL RO-2 ION CHAMBER

PREPARED BY Robert B Clark

APPROVED BY

RPS CAL-03
REV-0

OFFICIAL RECORD COPY ML 18

11/18/88

111757

1.0 Introduction

The Eberline Model RO-2 is a portable air ion chamber used to detect Beta, Gamma and x-ray radiation..

2.0 References

2.1 Eberline Technical Manual for Ion Chamber Model RO-2.

2.2 American National Standards Institute ANSI N323-1978.

2.3 Radiological Protection Instruction RPI-22: General Safety Precautions for the use of the Shepherd Calibrator.

2.4 Radiological Health Handbook.

2.5 NRC By-Product License 06-00217-06 as amended.

3.0 Equipment Requirement

3.1 NBS traceable Cs^{137} encapsulated source with sufficient activity to produce a field of 4000 mr/hr.

3.2 NBS traceable depleted uranium slab.

4.0 Instructions

4.1 Primary Calibration and Performance Test Frequency

4.1.1 Eberline Model R02 shall be calibrated on intervals not to exceed three (3) months or after any repair or maintenance has been performed on the unit. Note: This does not include battery change out.

4.1.2 Periodic Performance Test. To assure proper operation of the instrument between calibrations, the instrument shall be tested with the check source during operation and prior to each intermittent use.

Reference readings shall be obtained on each instrument when exposed to a check source in a constant and reproducible manner at the time of, or promptly after, primary calibration. If at any time the instrument response to the check source differs from the reference reading by more than ± 20 percent, the instrument shall be returned to the calibration facility for calibration or for maintenance, repair, and recalibration, as required.

4.2 Precalibration. The following conditions shall be established prior to exposing the instrument to a source for adjustment and calibration:

(1) The instrument should be free of significant radioactive contamination.

(2) The meter shall be adjusted to zero or the point specified by the manufacturer using the adjustment or adjustments provided.

(3) The batteries or power shall comply with the instrument manufacturer's specification.

(4) The instrument shall be turned on and allowed to warm up for the time period specified by the manufacturer - 5 minutes for these instruments.

(5) Geotropism shall be known for orientation of the instrument in the three mutually perpendicular planes, and this effect shall be taken into account during calibration and performance testing.

4.3 Primary Calibration

4.3.1 Gamma Source Calibration

4.3.1.1 Calculate the distances from the Cs^{137} source to produce a reading of 1/4, 1/2 and 3/4 scale for each range (attachment 3).

4.3.1.2 For the 0-5 mr/hr scale place the center line of the detector (effective center of the detector is marked by case indentations) in a Gamma field corresponding to mid scale (2.5 mr/hr). Adjust the calibration control for the 0-5 mr/hr range until the meter reading agrees with the radiation field strength (± 10%). Record this information on the Certificate of Calibration (attachment 1).

4.3.1.3 Repeat 4.3.1.2 for 0-50 mr/hr, 0-500 mr/hr and 0-5000 mr/hr ranges.

4.3.1.4 Perform a calibration check by placing the instrument in radiation fields corresponding to 1/4 and 3/4 scale for each range. The instrument reading must be within 10% of the actual radiation field for every point checked. Record this information on the Certificate of Calibration.

4.3.2 Beta Source Calibration

4.3.2.1 After completion of the Gamma Source Calibration move the instruments to a low background radiation area (<1.0 mr/hr). Insure that the Beta Shield on the bottom of the instrument is closed. Place the vertical centerline of the detector squarely over and in contact with the depleted Uranium slab. Take a contact Gamma dose rate of the Uranium slab and record on the Certificate of Calibration. Open the Beta shield, take a contact Beta Gamma dose rate. Subtract the gamma dose rate from the Beta Gamma dose rate, this gives the uncorrected Beta dose rate. Record this information on the Certificate of Calibration.

4.3.2.2 Calculate the Beta correction factor by dividing the actual Beta dose rate obtained from the source activity certification sheet, (Note: The RO2 with the Beta slide open has two layers of mylar .001" each. between the source and the detection chamber. Combined the two mylar layers produce an absorber thickness of 7 mg/cm^2) by the uncorrected Beta dose rate from 4.3.2.1. Record the Beta correction on the Certificate of calibration and on the instrument calibration sticker.

4.4 Calibration Records

4.4.1 Calibration Certificate - Maintenance/Repair Log. A record shall be maintained of all calibration, maintenance, repair, and modification data for each instrument. The record shall be dated and shall identify the individual performing the work. These records shall be filed in the appropriate instrument file.

Attachment 1 - Calibration Certificate

Attachment 2 - Maintenance/Repair Log

Attachment 3 - Source Activity & Dose Rate vs. distance calculations.

4.4.2 Calibration Labels

4.4.2.1 Each instrument shall be labeled with the following information:

(1) Date of most recent calibration

(2) Initials or other specific identifying mark of calibrator.

(3) Instrument response to an identified check source (to be provided either by calibrator or user).

(4) Date that primary calibration is again required.

(5) Beta correction factor.

4.5 Receipt Of Out Of Calibration Instruments

If any instrument received for calibration that does not meet the acceptance criteria of Sections 4.2 or 4.3; the RSO or Manager, RPS shall then review all surveys where that instrument was used since its last successful performance test and determine if actual conditions under survey are represented correctly. If not, the RSO or Manager, RPS shall investigate the occurrence and provide correctional actions.

5.0 Quality Assurance

5.1 Annually, an audit of instrument records and procedures shall be performed by the Manager, RPS; RSO or Quality Assurance .

COMBUSTION ENGINEERING

CERTIFICATE OF CALIBRATION

Instrument Type _____ Calibration Date _____
Manufacturer _____ Calibration Due Date _____
Range _____ Accuracy _____ Calibration Document:
Mfg. Serial No. _____ [ ]Procedure _____ Rev. _____
C-E ID No. _____ [ ]Manufacturer's Specifications

Test Equipment Used to Perform Calibration

Test Equipment	Serial or ID No.	Test Equipment	Serial or ID No.

INSTRUMENT CALIBRATION INFORMATION

	Instrument Range	Calibration Standard Value	Instrument Response Before Calib.	Instrument Response After Calib.	Comment
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

CALIBRATION HAS BEEN PERFORMED UTILIZING MEASUREMENT DEVICES WHICH HAVE KNOWN RELATIONSHIPS TO NBS STANDARDS WHERE SUCH STANDARDS EXIST. WHERE SUCH STANDARDS DO NOT EXIST, AN APPROVED PROCEDURE WRITTEN IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS HAS BEEN USED AND THE STANDARDS DOCUMENTED.

REMARKS: _____

[ ] ACCEPTED [ ] REJECTED CALIBRATED BY: _____

ORGANIZATION: _____

STRUMENT MAINTENANCE & REPAIR RECORD

EG: _____ MODEL _____ SERIAL NO. _____ RAD: _____

DATE _____ DESCRIPTION:

PERFORMED BY _____

DATE _____ DESCRIPTION:

PERFORMED BY _____

DATE _____ DESCRIPTION:

PERFORMED BY _____

DATE _____ DESCRIPTION:

PERFORMED BY _____

DATE _____ DESCRIPTION:

PERFORMED BY _____

TE _____ DESCRIPTION:

PERFORMED BY _____

Attachment 2

SOURCE ACTIVITY AND DOSE RATE VS DISTANCE CALCULATIONS

1.0 Source Activity

1.1 To determine the decay corrected activity of a calibration standard, use the following equation:

$A = A_o e^{-xt}$

A = activity remaining after time interval, t

A_o = activity of standard at some original time (from source activity certification sheet)

e = base of natural logarighms; 2.718

x = decay constant $\frac{.693}{t1/2}$

t = elapsed time from A_o
note: t & t1/2 must be calculated using the same units (i.e. days, years etc)

2.0. Dose Rate vs. Distance (Cs^{137})

2.1 To determine the doserate at 1 meter from the calibration standard use the following equation:

2.1.1 1 curie of Cs^{137} gives a gamma doserate of 330mr/hr at 1 meter.

2.1.2 Source Strength (Ci) x 330 mr/hr/ci = dose rate (mr/hr) at 1 meter from source.

2.2 To deterime the distance from the calibration standard to acheive the required dose rates use the following equation:

$R_1 \ D^2_1 = R_2 \ D_2^{\ 2}$

R_1 = dose rate at 1 meter (100cm)

$D_1^{\ 2}$ = 1 meter distance squared

R_2 = dose rate required for calibration

$D_2^{\ 2}$ = distance from standard to achieve dose rate R_2 (squared).

ITEM 10

RADIATION SAFETY PROGRAM

Item 10 RADIATION SAFETY PROGRAM

10.1 Previous Licenses - This application requests continuation of the use of Radioactive Materials under License Number 06-00217-06 as renewed on January 31, 1984 under Control Number 16364 and Docket Number 030-03754 as amended through Amendment Number 35 dated October 30, 1987.

10.2 Organization - Receipt, acquisition, possession, use and transfer of licensed radioactive materials shall be under the control of Nuclear Power Business - Nuclear Services. The Vice-President, Nuclear Services has delegated through the Director, Outage Services to the Manager, Radiological Protection Services the responsibility for all Radiological Protection activities associated with Materials License 06-00217-06. The Manager and/or The Radiation Safety Officer have full authority to halt any operation which could violate License Conditions, Federal, State or Local applicable laws and/or safety standards.

Attachment 10.1 shows the current organization chart.

10.3 Radiation Safety Committee - The Radiation Safety Committee described in item 7.2 shall meet at the discretion of the RSO (Chairman) any time proposed changes in the handling of Licensed Material are considered.

10.3 The Committee shall perform an audit at least annually, of operations involving licensed material. The scope of this audit will depend upon the changes in proposed uses and handling of licensed materials within the previous year.

The Committee shall audit the Radiation Safety Officer in accordance with his job description and responsibilities.

The Radiation Safety Committee has the authority delegated by the Vice President - Nuclear Services, to halt any operation that is found to be a threat to Health, Safety or property.

10.4 Radiation Safety Officer - Job description is Attachment 10.2.

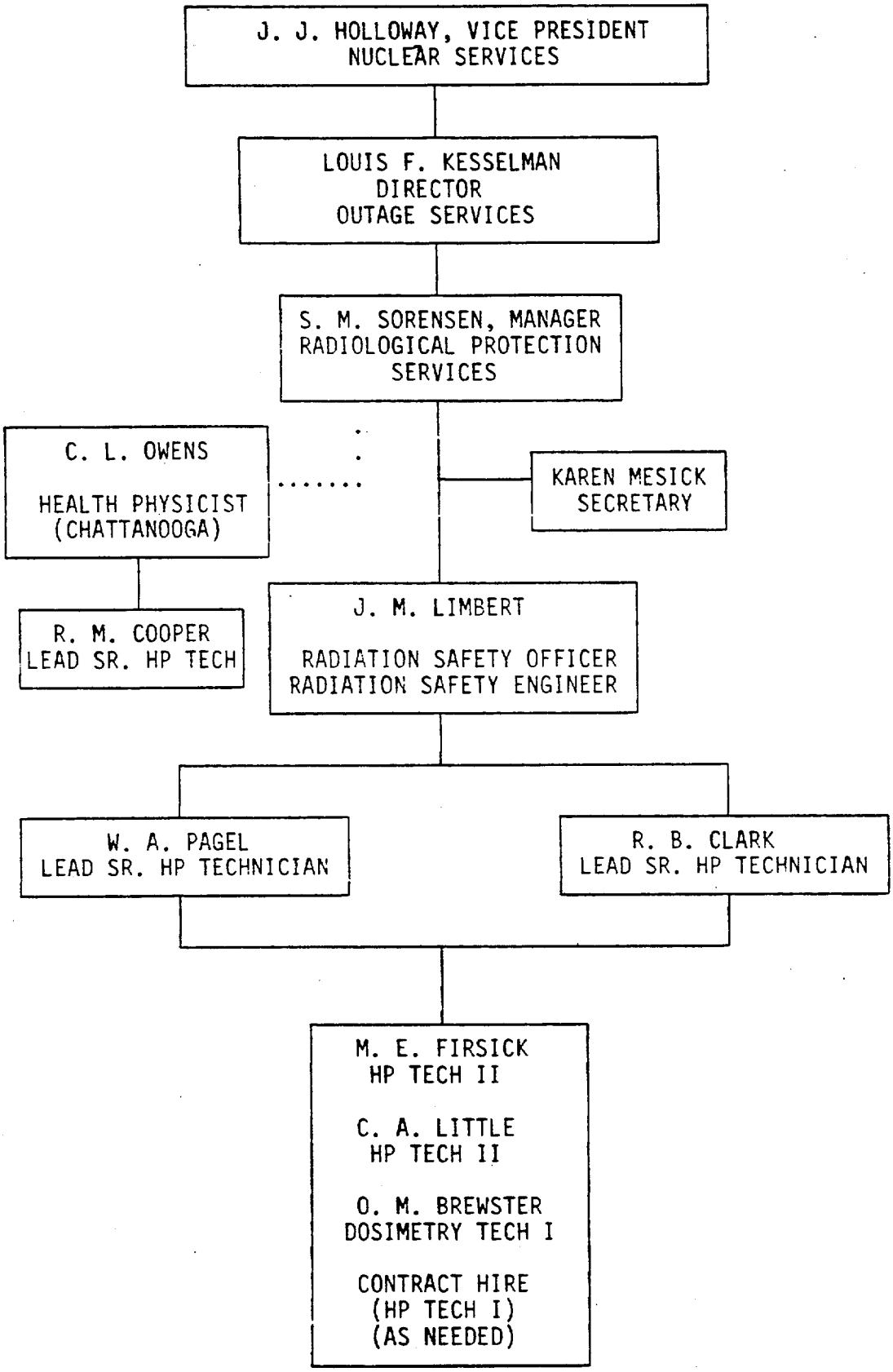
ATTACHMENT

10.1

NUCLEAR SERVICES ORGANIZATION

CHART

ATTACHMENT 10.1



12/4/89

ATTACHMENT 10.2

RADIATION SAFETY OFFICER

JOB DESCRIPTION

ATTACHMENT 10.2

JOB DESCRIPTION

RADIATION SAFETY OFFICER

The Radiation Safety Officer reports to the Director, Outage Services through the Manager, Radiological Protection Services. The Radiation Safety Officer has the authority as granted by the Vice President of Nuclear Services, to halt any operation involving radioactive materials, which he deems unsafe to personnel, property or the environment.

Specifically the Radiation Safety Officer is responsible for the following:

1. Supervising the personnel health physics program for all operations involving radioactive materials and non-radioactive hazardous substances.

2. Reviewing the environmental health physics and effluent monitoring program to ensure compliance with procedures for safeguarding the environment.

3. Developing, implementing and maintaining current procedures pertaining to radiation protection, hazardous materials and toxic substances.

4. Ensuring the NRC license conditions for the use of Radioactive Materials are met.

ATTACHMENT 10.2

(CONTINUED)

5. Scheduling and maintaining an inspection program to ensure compliance with NRC and other applicable requirements.

6. Ensuring the personnel dosimetry program is maintained adequately to ensure NVLAP certification.

7. Ensuring that employees are properly and adequately trained to work with radioactive, hazardous and toxic substances.

8. Ensuring that the procedures for calibration of radiation detection equipment are properly executed.

9. Ensuring the packaging of radioactive and other hazardous materials for shipment meet applicable requirements.

10. Supervising and maintaining in readiness; radiological emergency procedures.

COMPLEXITY OF TASKS

The Radiation Safety Officer must ensure that all procedures associated with a good radiological and hazardous materials health and safety program are implemented and maintained in a timely and efficient manner.

ATTACHMENT 10.2

(CONTINUED)

The Radiation Safety Officer shall execute the proper controls to ensure that the Company's license to use and handle radioactive and other materials is not jeopardized. To be found in non-compliance with Regulatory requirements could result in fines ranging from a few thousand to a million dollars. Of more significance, Company operations could be shut down, resulting in much greater commercial consequences. The Radiation Safety Officer is responsible for coordinating health physics and associated activities and procedures for all NPS Windsor organizations involved with field services and site support activities (e.g., training, personnel radiation exposure records, etc.). Radiation Safety Officer's experience and qualifications are established as an NRC license condition.

EDUCATION, EXPERIENCE, AND SPECIAL SKILLS REQUIRED

(a) University Degree in Sciences or Equivalent with advanced training in Health Physics and personnel management.

(b) Ten years experience in nuclear power technology with a thorough working knowledge of health physics.

(c) Requires mature approach, very often independent decision-making, initiative and integrity.

ITEM 10

RADIATION SAFETY PROGRAM

10.5 ADMINISTRATIVE PROCEDURES

10.5.1 RADIATION WORK PERMITS

Item 10 Radiation Safety Program (Cont'd)

10.5 Administrative Procedures

10.5.1 Radiation Work Permits- All work with radioactive materials is controlled by Radiation Work Permit(s). Attachment 10.3 presents the procedure applicable to the use of these permits.

ATTACHMENT 10.3

RADIATION WORK PERMITS

COMBUSTION ENGINEERING, INC.

RADIOLOGICAL PROTECTION INSTRUCTION

RPI-4

RADIATION WORK PERMITS

PREPARED BY: _____ DATE: 1/6/88.

APPROVED BY: _____ DATE: 1/19/88

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DEC 16 1989

1.0 Introduction

The purpose of this Radiological Protection Instruction (RPI) is to provide a method for implementation of the Radiation Work Permit (RWP) system. This system is used to maintain radiological control of personnel and work associated with radioactive materials.

Deviations from this RPI are not permitted without authorization of the Manager, Radiological Protection Services (RPS) or RSO.

2.0 References

2.1 RPI-1, Whole Body Exposure
2.2 RPI-2, Monitoring for Skin Exposure
2.3 RPI-3, Extremity Monitoring
2.4 RPI-9, Monitoring for Radiation and Contamination

3.0 Scope

3.1 Conditions Requiring an RWP

An RWP is required for any work with Radioactive Materials unless otherwise authorized by the Lead Senior Health Physics Technician or RSO.

4.0 Instruction

4.1 Initiating an RWP

4.1.1 The job coordinator shall complete the following sections on the RWP (numbering as shown - Appendix A): (1.) Requestor, (2.) Date Start, (5.) Work Area, (6.) Job Description, (7.) Authorized Personnel. Additional authorized personnel may be entered on RWP Continuation sheet (Appendix B) as required. (9.) Initial (see implementing an RWP section 4.2.1)

4.1.2 The job coordinator then submits the RWP to Health Physics.

4.1.3 Health Physics will complete the following sections: (3.) Date Expire, (4.) RWP No., (8.) "T" - Training, (11.) Allowable Weekly Exposure (as appropriate), (12.) H.P. Initial and Date, (13.), (14.) Radiation Levels, (15.), (16.) Contamination

Levels, (17) Requirements, (18) Special Instructions, (19) Approved by. Item 20 is filled in when RWP is terminated see 4.3.
These items are explained in detail below:

4.1.3.1 Date Expire (3)

RWP's are in effect for a 24 hour period and may be extended on a daily baisis up to 7 days.

4.1.3.2 RWP. No. (4)

RWP numbers make each RWP unique. This allows tracking of specific jobs and RWP's. The RWP Log (copy provided in Appendix C) is used to track RWP's and RWP numbers. The Log is used to note whether an RWP has been terminated and it provides the sequential RWP numbers. RWP numbers use the following format:

Xy-z-abc
where: Xy is the current year
z is the building number
abc is a sequential number

4.1.3.3 "T"-Training (8)

H.P. initials block to indicate that the person listed has current (within one (1) year) training in Health Physics.

4.1.3.4 Allowable Weekly Exposure (10)

Personnel are typically limited to 100 mrem per week. This level may be increased (see reference 2.1 for details) or decreased based upon the individuals current exposure and job requirements. The 100 mrem limit is a weekly limit regardless of the number of RWPs authorized. For example: an individual who receives 30 mrem under an RWP worked on Monday and Tuesday will only be authorized 70 mrem for an RWP to be worked during the balance of the 7 day week.

4.1.3.5 Daily Allowable Exposure (11)

100 mrem minus any previous exposure that week. This figure is calculated from the daily dosimeter log sheet (Appendix E).

4.1.3.6 HP/Date (12)

To be initialed and dated for each day an RWP is to

be used, up to seven (7) consecutive days, prior to start of work each day.

4.1.3.7 Radiation and Contamination Levels (13.) (14.) (15.) & (16.)

Radiation and Contamination levels are provided on the RWP to inform personnel of the typical radiological environment which can be expected. These levels are based upon the results of meter and smear surveys of the areas and items impacted by the RWP. Reference 2.4 provides guidelines on dose rate and contamination level restrictions applicable to RWP's and the associated action.

4.1.3.8 Requirements (17.)

Requirements specify the use of physical protection (eg. - protective clothing, gloves, booties, etc.) and administrative controls (eg. - BZ air samplers, TLD's, dosimeters, etc.)

4.1.3.9 Special Instructions (18.)

Special instructions are used when additional controls are necessary. Examples of special instructions include calculation of expected skin or extremity doses (References 2.2 and 2.3) prior to start of work. Special ventilation requirements may also be mandated.

4.1.3.10 Approved By (19.)

The RWP must be approved; as a minimum, by a Senior Health Physics Technician prior to issue. This applies only to RWP's lasting 7 days or less. RWP's with duration up to one month requires approval of the Mgr, RPS or RSO.

4.1.3.11 Terminated by (20.)

See section 4.3

4.2 Implementing an RWP

4.2.1 Prior to starting the work stated on the RWP, authorized personnel, listed on the RWP, must read and initial the RWP signifying that the individual has read and understands all requirements. Any individual failing to do so, may be restricted from any or all RWP work until the matter is resolved.

4.2.2 The original of the RWP as well as any associated surveys shall be posted near the work area. A copy of the RWP is placed in the active file in the Health Physics office.

4.2.3 Prior to the start of each day's RWP work, the health physics technician shall update the daily allowable exposure (12.) for all personnel listed on the RWP. The technician shall date and initial the proper column for daily exposure.

4.2.4 All authorized personnel, prior to entry in, departure from the control zone or area must make the proper entries on the Control Zone Entry Log sheet (copy provided in Appendix D). This allows the health physics technician to accurately track individual exposure to radiation and airborne contamination, on a job specific basis.

4.2.5 At the end of each working day, personnel authorized by the RWP shall update the weekly Dosimeter Log sheet (copy provided in Appendix E) in the space for the appropriate day. The total net increase on the pocket dosimeters are recorded, on a daily basis. This sheet is used to update the daily allowable exposure on the RWP.

4.3 Terminating an RWP (20.)

To terminate an RWP, it must be signed and dated by the cognizant H.P. Technicians in the "Terminated By" section. The termination date is entered on the RWP Log, and the RWP copy removed from the active file. The original and a copy, continuation sheets and related surveys shall be placed in the terminated RWP file for storage. They shall be kept until the Mgr, RPS authorizes disposition. Daily Dosimeter Log sheets and Control Zone Entry Log sheets shall also be kept until disposition is authorized by the Mgr, RPS.

4.4 RWP Restrictions

4.4.1 Only radiation workers with training recognized by the C-E Training Coordinator may be listed as authorized personnel.

4.4.2 No individual will be allowed to work on an RWP if that individual's BZ air sample results are four (4) MPC-hrs or greater within a seven (7) consecutive day period unless approval is authorized by the Manager RPS or the RSO.

4.4.3 Any daily BZ results greater than 1 MPC-hr shall be analyzed for isotopic identification, and recalculated for the most restrictive isotope. An investigation shall be performed to determine the reason(s) for the high BZ results.

Appropriate corrective action shall be taken prior to that individual resuming work on any RWP. The corrective action shall be decided by the Mgr. RPS or his designee.

RADIATION WORK PERMIT

estor (1)	Date Start (2)	Date Expire (3)	R.W.P. No. (4)
a (5)	Job Description (6)		

R.W.P. MUST BE INITIALED BY ALL AUTHORIZED PERSONNEL PRIOR TO STARTING WORK.

orized Personnel (7)	T (8)	Initial (9)	Allowable Weekly Exposure (10)	HP Date (12)	HP Date	HP Date	HP Date	HP Date	HP Date	HP Date
						(11)				

liation Levels Mrem/Hr

Contact - (13)

(

.8" - (14)

Contamination Levels DPM/100 cm^2 Beta Alpha

Equipment - (15)

General Area - (16)

irements (17)

TLD - Whole Body
Dosimeter
B-Z Air Sampler
Lab Coat
Beta/Safety Glasses
Ventilation in operation

- ☐ Full PC's
- ☐ Cloth/Plastic Booties
- ☐ Cloth Hood
- ☐ Rubbers
- ☐ Plastic Gloves
- ☐ No cutting, drilling, grinding without HP approval

- ☐ Rubber Gloves
- ☐ Cotton Gloves
- ☐ Plastic Suit
- ☐ Finger Ring - TLD
- ☐ Handling Estimate
- ☐ Approved Procedure
- ☐ Other (specify below)

cial Instructions:

(18)

proved By: (19) Date

Terminated By: (20) Date

Appendix B
RWP Continuation Sheet

rk Area						RWP#				
thorized Personnel	T	Initial	Allowable Weekly Exposure	HP Date	HP Date	HP Date	HP Date	HP Date	HP Date	HP Date

No names are to be added to this list without prior approval from H.P. and the job Supervisor

Appendix C

RWP RECORD LOG

RWP No.	Date Approved	Date Terminated	Job Description

CONTROL ZONE ENTRY LOGSHEET

CONTROL ZONE NO. _____ DATE: _____

NAME	RWP NO.	IBZ No. DIGITS	TIME IN	DOSE IN	TIME OUT	DOSE OUT	TOTAL DOSE

RP1-4

NAME	DOSE IN MILLIREM							
	SUN.	MON.	TUS.	WED.	THR.	FRI.	SAT.	TOTAL

ITEM 10

RADIATION SAFETY PROGRAM

10.5 ADMINISTRATIVE PROCEDURES

10.5.2 PROCUREMENT

10.5.3 A.L.A.R.A.

10.5.4 SEALED SOURCES

10.5 Administrative Procedures

10.5.2 Procurement- All procurement of radioactive materials is controlled by the Manager, Radiological Protection Services or the RSO through a controlled purchasing agent system.

10.5.3 As Low As Reasonably Achievable (ALARA)- In accordance with 10CFR20.I.(c) "As Low As Reasonably Achievable" provision Combustion Engineering, Inc. has an ALARA Program - See Attachment 10.4 which, in concert with, specific procedures and safety reviews meets the intent of the provision.

10.5.4 Sealed Sources are inventoried and leak tested semi-annually, upon receipt or transfer, and prior to use if no leak test had been required or performed within six (6) months. (Sources in storage are excepted from periodic leak tests until just prior to withdrawal from storage). If a leak test shows greater than .005 microcuries activity, the source shall be withdrawn from service until repaired and successfully tested.

ATTACHMENT 10.4

A.L.A.R.A. PROGRAM

COMBUSTION ENGINEERING, INC.

1000 PROSPECT HILL ROAD

WINDSOR, CT 06095-0500

RADIOLOGICAL PROTECTION STANDARD

RPS-01

A.L.A.R.A. PROGRAM

FOR MATERIALS LICENSE

NO. 06-00217-06

PREPARED BY — DATE 11/28/89

APPROVED BY — DATE 11/28/89

11/28/89
REV-0
Item 10 Page 26 of 56

OFFICIAL RECORD COPY ML 10

111757

ALARA POLICY STATEMENT

"The management of Combustion Engineering, Inc. is committed to keep occupational radiation exposures as low as reasonably achievable (ALARA) with regard to operations conducted under U.S.N.R.C. Materials License No. 06-00217-06 as renewed or amended. The following program is adopted as the method to achieve this commitment."

Louis F. Kesselman
Director, Outage Services
Date: 11-28-89

I. Management Audit

A. "Management shall perform an annual audit to determine how exposures might be lowered."

B. As a minimum the following areas shall be reviewed and evaluated for ALARA:

1. Annual Exposure Report
2. Weekly Dosimeter Log Sheets
3. Radiation Work Permits
4. Radiation and Contamination Surveys
5. Whole Body Count Results

II. Radiation Protection Capability

A. "Management shall ensure that there is a well-supervised radiation protection capability with well-defined responsibilities."

B. This is accomplished by the following:

1. A formal organization chart (updated as necessary)
2. Formal Job descriptions for the positions identified in the organization.
3. Periodic professional training or retraining of the Radiation Protection Staff.

III. Worker Training

A. "Management shall see that Radiation Workers and other site personnel receive appropriate and sufficient training."

B. This is accomplished by the following methods:

1. Radiological Protection Instruction Number - 20 formally specifies various training procedures for individuals who work with radioactive materials.

2. Radiological Protection Instruction Number - 4 specifies the training required to work on a Radiation Work Permit (RWP).

3. RPI-1 - "Whole Body Exposure" specifies monitoring and training Requirements.

IV. Radiation Safety Officer Authority (RSO)

A. The Radiation Safety Officer RSO or his/her designee shall have the authority to enforce safe operations and has the authority to halt any work that he/she deems not in accordance with this program.

V. Modifications to Operating Procedures

A. Modifications to Operating Procedures should be made where they will substantially reduce exposures at a reasonable cost.

B. This is accomplished by the following:

1. Radiological Protection Instruction
Number - 1 "Whole Body Exposure"

(a) Administratively and Operationally limits Whole Body Exposure.

2. Radiological Protection Instruction
Number - 2 "Monitoring for Skin Exposure"

(a) Administratively and Operationally limits Skin Exposure.

3. Radiological Protection Instruction
Number - 3 "Extremity Monitoring"

(a) Administratively and Operationally limits Extremity Exposure.

4. Radiological Protection Instruction
Number - 4 "Radiation Work Permits"

(a) Administratively and Operationally provides for review of radiological conditions, operation reviews, and personnel exposure review.

5. Radiological Protection Instruction
Number - 9 "Monitoring for Radiation and Contamination"

(a) Administratively and Operationally specifies controls and action levels for Radiation and Contamination levels in the workplace.

C. Any operation that falls outside the scope of the above mentioned instructions shall be reviewed by the RSO as a minimum.

ITEM 10

RADIATION SAFETY PROGRAM

10.5 ADMINISTRATIVE PROCEDURES

10.5.5 RADIOLOGICAL SURVEYS

Item 10 Radiation Safety Program (Cont'd)

10.5 Administrative Procedures

10.5.5 Radiological Surveys- are conducted, on a routine basis, in and adjacent to, restricted areas. Attachment 10.5 provides the minimum frequency for performing these surveys.

ATTACHMENT 10.5

RADIOLOGICAL SURVEYS

COMBUSTION ENGINEERING, INC.

Windsor, Connecticut

Radiological Protection Instruction

RPI-9

Monitoring for Radiation and Contamination

Prepared by: W. A. Tagel Date: 11/15/89

Approved by: O M Brenan Date: 11/16/89

Control Copy No. 4

Subject: Monitoring for Radiation and Contamination

1.0 INTRODUCTION

This Radiological Protection Instruction (RPI) establishes the minimum requirements pertaining to monitoring of radiation and contamination in support of NRC License 06-00217-06.

This RPI details survey frequency and location, documentation requirements, and action levels corresponding to survey results.

For purposes of this instruction any of the following is considered to be equal to one (1) REM:

(1) A dose of 1r due to X or gamma radiation.
(2) A dose of 1 rad due to X-, gamma or beta radiation.
(3) A dose of 0.1 rad due to neutrons or high energy protons

2.0 REFERENCES

2.1 NRC By Product License 06-00217-06 as amended
2.2 RPI-7, Freon Decontamination Equipment
2.3 RPI-2, Monitoring for Skin Exposure
2.4 RPI-3, Extremity Monitoring

3.0 INSTRUCTIONS

3.1 Survey locations and frequencies

3.1.1 Routine radiation and contamination surveys are required by the references of section 2.0., Tables 1 and 2, provide information on routine survey locations, type and frequency. Appendix A provides the current survey maps (or sheets) applicable to Table 1 and Appendix B provides those for Table 2.

NOTE: Appendix A and B provide the survey maps and sheets used in the weekly reports for Building 2 (Nuclear Service buildings) and 5 (Nuclear Laboratory) surveys, respectively.

3.1.2 Radiation and contamination surveys shall only be performed by qualified health physics personnel. Qualifications of individuals shall be determined by the Manager, Radiological Protection Services or his authorized designee.

3.1.3 Instruments utilized for radiation and contamination surveys shall be calibrated according to the requirements in Reference 2.1.

3.1.4 Instruments used for radiation surveys shall be source response checked and battery checked at a minimum, daily.

3.1.5 Nonroutine surveys include package (or shipment) receipt surveys, equipment surveys, release surveys, and any special surveys. Forms for these surveys are provided in Appendix C along with guidelines for proper use.

3.1.6 Sealed Source Leak Tests

Each sealed source or detector cell acquired from another person and containing licensed material, other than hydrogen 3, with a half-life greater than 30 days and in any form other than gas shall be tested for contamination and/or leakage before use. In the absence of a certificate from a transferor indicating that a test has been made within 6 months before the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.

Notwithstanding the periodic leak test required by this condition, any licensed sealed source or detector cell is exempt from such leak tests when the source or detector cell contains 100 microcuries or less of beta and/or gamma emitting materials or 10 microcuries or less of alpha emitting material.

Except for alpha sources, the periodic leak test required by this condition does not apply to sealed sources that are stored and not being used. The sources excepted from this test shall be tested for leakage before any use or transfer to another person unless thay have been leak tested within 6 months before the date of use or transfer.

Each sealed source or detector cell fabricated by the licensee shall be inspected and tested for contruction defects, leakage, and contamination prior to use or transfer as a sealed source or a detector cell. If the inspection or test reveals any construction defects or 0.005 micorcurie or greater of contamination, the source shall not be used or transferred as a sealed source or detector cell until it has been repaired, decontaminated and retested.

Each sealed source containing licensed material, other than hydrogen 3, with a half-life greater than 30 days and in any form other than gas shall be tested for leakage and/or contamination at intervals not to exceed 6 months except that each source designed for the purpose of emitting alpha particles shall be tested at intervals not to exceed 3 months.

The test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. The test sample shall be taken from the sealed source or detector cell or from the surfaces of the device in which the sealed source or detector cell is permanently or semipermanently mounted or stored on which one might expect contamination to accumulate. Records of leak test results shall be kept in units of microcuries and maintained for inspection by the Nuclear Regulatory Commission.

If a leak test reveals the presence of 0.005 microcurie or more of removable comtamination, that source shall be withdrawn from use and the Mgr. RPS or RSO immediately notified.

A list of all sealed sources for testing is located in the Source Accountability Book. The form used to track and record leak tests is located in Appendix D.

3.2 Documentation Requirements

All surveys records shall be kept indefinitely or until the Manager of Radiological Protection Services (Mgr., RPS) authorizes disposal.

3.3 Administrative Controls

Administrative controls and action levels are summarized in Table 3. Table 3 is not all inclusive but provides information sufficient for general health physics operations on this site. Health physics personnel must be familiar with all issued RPIs.

Table 1
Building 2 Complex (Nuclear Service Buildings) Survey Requirements

Survey Location	Frequency	Contamination Survey	Radiation Survey
1. Control Zone Buffer Zones	Daily[1,2]	X	
2. Building 2 Office Spaces	Weekly	X	
3. Building 2 Restricted Areas	Weekly	X	X
4. Building 2 Lower Mezzanine	Weekly[1]	X	X
5. Building 2A Restricted Area	Weekly	X	X
6. Control Zone 1	Weekly[1,4]	X	X
7. Control Zone 2	Weekly[1,4]	X	X
8. Control Zone 3	Weekly[1,4]	X	X
9. Control Zone 4	Weekly[1,4]	X	X
10. Control Zone 5	Weekly[1,4]	X	X
11. Building 1 Restricted Area	Weekly	X	X
12. Building 1 High Radiation Storage	Monthly	X	X
13. Building 1A Radiation Storage	Monthly	X	X
14. Building 1A Multi-Purpose Area	Weekly[1,4]	X	X
15. Trailer Storage Area	Monthly		X
16. Yard Storage Area	Monthly		X
17. Waste Pad	Monthly		X
18. Vault	Monthly	X	X
19. Freon Decon Machine	Daily[1,3]		X

[1] When in use, monthly when not in use.

[2] No map required, health physics personnel perform the required surveys and acceptability of survey results is acknowledged on the weekly report.

[3] See Reference 2.2 for details.

[4] Prior to a new RWP being issued for change of work scope when radiological conditions could materially change.

Table 2
Building 5 (Nuclear Laboratories) Survey Requirements

Survey Location	Frequency	Contamination Survey	Radiation Survey
1. Laboratory Buffer Zones	Daily[1,2]	X	
2. Building 5 General Area	Weekly	X	X[3]
3. Warm Metallography Lab - Room 224C	Weekly[1]	X	X
4. Radiochemistry Labs - Rooms 305 & 306	Weekly[1]	X	X
5. Radiochemistry Lab - Room 321	Weekly[1]	X	X
6. Boronometer Test Area - Building 16	Weekly[1]	X	X

[1] When in use - monthly when not in use.

[2] No map required, health physics personnel perform the required surveys and acceptability of survey results is acknowledged on the weekly report.

[3] Monthly - Survey to be performed adjacent to areas where work with radioactive materials is being performed.

Table 3
Action Levels and Administrative Controls

Action Level		Administrative Control
1.	Radiation Surveys - General	
a)	.1 mR/hr - Contact (100 DPM/100cm^2 fixed contamination by RM.14 or equivalent).	Unconditional Release of Eqiupment (and requirements of 3a) of this table
b)	.6 mR/hr - area	Maximum allowable dose rate at perimeter of restricted area
c)	2.0 mR/hr - area	Dosimetry required
d)	2.0 mR/hr - area	Posted as a "RADIATION AREA"
e)	100 mR/hr - area	Posted as a "HIGH RADIATION AREA" and locked, guarded and/or alarmed

2. Radiation Surveys - for RWP Controls

a) Greater than 14 mrem/hour. Beta - @ 18".

1) Requires dose estimate for skin exposure. (See Reference 2.3)

b) Greater than 50 mrem/hour - Gamma - on contact.

1) Requires handling estimate for extremity exposure. (See Reference 2.4)

c) Greater than 100 mrem/hour - Beta plus gamma on contact.

1) Limit for freon decontamination machine work. (See Reference 2.2)

d) Greater than 500 mrem/hour - Beta - @ 18".

1) Requires dose estimate for skin exposure and additional RWP approvals. (See Reference 2.3)

e) Greater than 1000 mrem/hour Gamma - contact.

1) Requires handling estimate, extra extremity dosimetry and additional RWP approvals. (See Reference 2.4)

Table 3 (Cont.d)
Action Levels and Administrative Controls

Action Level		Administrative Control
3. Contamination Surveys		
a)	200 dpm/100 cm^2-beta/gamma 10 dpm/100 cm^2-alpha	Limits for unrestricted area and for unconditional release (see 1a above)
b)	200 dpm/100 cm^2-beta/gamma 10 dpm/100 cm^2-alpha	area controlled as contaminated area, equipment must have proper controls in restricted area
c)	1000 dpm/100 cm^2 - beta/gamma items/equipment	B.Z.'s required only if grinding, cutting, or drilling performed on equipment or items
d)	10,000 dpm/100 cm^2-beta/gamma items/equipment	B.Z.'s required when working on items or equipment, no grinding, cutting or drilling unless approved by Health Physics
e)	10,000 dpm/100 cm^2-beta/gamma general area 1	Area cleanup required within 24 hours
f)	11,100 dpm (.005 microcuries) sealed sources	Source must be removed from use and Mgr. RPS or RSO notified immediately.

[1] Action levels are based on smear averages, not individual smears.

NOTE: Limits for unconditional release may be increased to 1000 dpm/100cm^2 beta/gamma upon written approval by RSO or Mgr. RPS., however a reasonable effort must be made to decontaminate items to less than 200 dpm/100cm^2 beta/gamma.

NOTE: If any smear reveals the presence of more than 100,000 dpm/100cm^2 beta/gamma removable contamination that smear will be counted for alpha. If the alpha contamination is greater than 1% of the beta/gamma count, the BZ's used in that work area shall be counted for alpha.

ITEM 10

RADIATION SAFETY PROGRAM

10.5 ADMINISTRATIVE PROCEDURES

10.5.6 FORMAL TRAINING IN RADIATION SAFETY

10.5 Administrative Procedures

10.5.6 Formal Training in Radiation Safety- Prior to working with radioactive materials, each new employee is given a Radiation Workers Training Program. Each person who actively works with radioactive materials is given an annual refresher training program. The Radiation Workers Training Program meets the requirements of USNRC Regulatory Guide 8.27 "Radiation Protection Training for Personnel at Light Water Cooled Nuclear Power Plants, "Reg. Guide 8.29 " Instruction Concerning Risks from Occupational Radiation Exposure," and INPO 82-004 Guidelines for General Employee Training." This training program consists of approximately 16 hours of classroom instruction and 8 hours of practical applications. A copy of the lesson plans which comprise the training program is shown in Attachment 10.6.

ATTACHMENT 10.6

RADIATION WORKERS TRAINING

PROGRAM

COMBUSTION ENGINEERING, INC.

RADIOLOGICAL PROTECTION INSTRUCTION

RPI-20

RADIATION WORKERS TRAINING PROGRAM

PREPARED BY: _____ DATE: 8/29/88

APPROVED: _____ DATE: 8/29/88

CONTROL COPY NO. _____

I. INTRODUCTION

This RPI establishes a procedure and controls for training and qualifying radiation workers. This RPI also specifies a program for maintaining the training current and provides a method for certifying previously trained or experienced radiation workers.

II. SCOPE

This instruction applies to all workers whose job requires on site exposure to radiation or radioactive materials associated with NRC License 06-00217-06. This instruction also applies to personnel who wish to take advantage of the Experienced Radiation Workers program at power plants.

III. REFERENCES

1. Initial Radiation Workers Training Course, DDH-83-129
2. Annual Refresher Course, DDH-87-660
3. Challenge Course, DDH-88-709
4. NRC Regulatory Guides 8.13, 8.27, 8.29
5. NRC License 06-00217-06, as amended
6. 10 CFR 19 and 10 CFR 20
7. INPO 82-004 General Employee Training (GET)
8. INPO 87-005

IV. DEFINITIONS

A. Certified Trained Radiation Worker	A worker whose training as a radiation worker may be certified to meet the requirements of INPO 82-004 Ref. #7 by attendance at a course and passing an exam as well as performing the required practical demonstration
B. GET-RP-Challenge Exam	A 50 question multiple choice test covering prescribed areas of knowledge in the field of Radiation Protection and Nuclear Radiation Theory
C. Site Specific Course	A course of study designed to cover information which applies only to a specific site.

D. Annual Refresher Course — A course of study used to extend a Radiation Worker's qualifications for 12 months.

V. INSTRUCTIONS

A. Initial training requirements for a radiation worker

1. Prerequisites and Restrictions

a. All prospective radiation workers must complete a course of study as specified in Reference #4 or equivalent. The Initial Radiation Workers Course will be given to all new employees who will be required to work with radiation or radioactive materials. The course will be considered complete only with a passing score of 80% or better and completing a practical exercise check out sheet as specified in Reference #1. The test and check out sheet will be retained in the person's training history as documentaion of training requirements. This course will be considered as certification for Trained Radiation Workers for one year (12 months).

b. Any training course which can be documented as being equivalent to the Reference #4 requirement may be accepted in lieu of the Initial Radiation Workers Course provided the signed documentation is presented and the course was not completed more than 12 months previous to the date the person requests training.

c. In addition to the requirement for signed documentation of equivalent training, the respective radiation worker must pass, with a score of 80% or better, a Radiation Worker Challenge Course (Ref. 3) which includes the requirement of a site specific course and quiz. The successful completion of these requirements will certify the candidate for one year (12 months) as a Trained Radiation Worker.

2. Program Description

a. The Initial Radiation Workers Training Course (Ref. 1) was designed to meet the training objectives of References 4, 5, 6, and 7. The course consists of approximately 20 hours of lecture time and four hours of practical exercises as specified in Reference 1.

The course lecture and reference materials will be made consistent with current industry and regulatory standards and will be revised as these standards change. The Radiological Protection Group will also provide input to insure the site specific sections of this course is consistent with work practices in effect at the time of instruction.

B. Refresher Training requirements for a radiation worker

1. Pre-requisites and restrictions

a. Only radiation workers who can provide documentation of successfully completing either CE's Initial Radiation Workers Course or an equivalent course as specified in Section V.A., may be accepted for the Annual Refresher Course. No more than 24 months can elapse after completing an Initial Radiation Workers or an Annual Refresher Course to qualify an individual as a candidate for the Annual Refresher Course.

b. If more than 24 months has elapsed since the successful completion of an Initial Radiation Workers or Annual Refresher Course, an Initial Radiation Workers Course must be completed to requalify an individual as a Certified Trained Radiation Worker

2. Course Description

The Annual Refresher Course covers the same basic objectives as the Initial Radiation Workers Course but is designed to emphasize changes and new ideas to the employee as well as reinforce those already presented.

The Radiological Protection Group has established this training course as its standard refresher course for all radiation workers on the Windsor site who work with radioactive materials. This course was developed from USNRC Regulatory Guides 8.27 (Radiation Protection Training for Personnel at Light Water Cooled Nuclear Power Plants), 8.29 (Instruction Concerning Risks from Occupational Radiation Exposure), INPO 82-004 (Guidelines for General Employee Training Section 5.4.), and 8.13 Rev. 2 (Instruction Concerning Prenatal Radiation Exposure).

The course includes approximately 6 hours of classroom instruction and 1 hour of practical exercises in basic radiation protection practices.

Instructions are designed to present both a generic type of information which is applicable to any radiation worker, as well as specific information and procedures which deal with Windsor's unique requirements.

The Refresher Course will requalify an individual for one year (12 months) and may be repeated as often as necessary to maintain this qualification.

The course is considered successful only with a passing score of 80% or better and having the practical exercises signed off. Documentation is provided by retaining the test in the person's training file along with any documentation of previous training.

C. Challenge Course requirements for Radiation Workers

1. Prerequisite and Restrictions

a. Any candidate for the Challenge Course must provide Proof of Previous Training of either the CE Initial Radiation Workers Training Course or the CE Annual Refresher Course, within the last 24 months. The only alternative would be if the candidate could provide proof of previous training from a course which meets the requirement of Ref. #7 from another licensee within the last 12 months.

b. The Challenge Course can only be taken <u>once</u> to qualify the individual for work with Radiation or Radioactive materials. The course is only good for one year (12 months). If that person fails to complete an Annual Refresher course within that year, the individual must take and pass the Initial Radiation Workers course in order to be recertified as a radiation worker.

2. Course Description

The Challenge Course is composed of the following components:

a. A 50 question Challenge Test containing multiple choice answers based on INPO 87.005 exam questions. The test will be administered by the Radiation Protection Department and a passing score of 80% or better is required.

b. Complete a site specific lecture as per Ref. #3 and pass quiz with a score of 80% or better.

c. Complete a CE Radiation Workers Practical Exercises check out as per Ref. #3.

D. Instructions for providing documentation of Certification of Training

1. CE personnel may request to participate in a utility sponsored Experienced Radiation Workers Training Program. Only personnel who successfully complete the CE Initial Radiation Workers Training Course Ref. #1 and maintains his qualifications current (passes Annual Refresher Course) may request this service. When the request is received, the individuals training record will be reviewed and a letter issued to the utility and site being visited specifying the person's name, date, social security number, and last training date. The letter will also specify that the course meets INPO and NRC guidelines for Radiation Worker Training.

2. Non CE personnel who have completed and kept current their CE Initial Radiation Workers Training Program may also request this service, but the request must be in writing and must specify which utility and plant is being visited as well as date of arrival at the requested site.

3. No individual may be certified as a Trained Radiation Worker to participate in any experienced worker program if their Annual Refresher Training has lapsed (greater than 12 months). Passing the Challenge Program will not qualify an individual for this service.

E. Instructions for notification of imminent loss of qualifications as a Trained Radiation Worker

1. Monthly the R.P.S. Training Coordinator or his designee will issue a letter specifying who will lose their qualification or has already lost their qualifiation, for the coming month. The letter will also specify a date for a Refresher Course. Should someone not be available for training, the individual or his supervisor must notify the R.P.S. Training Coordinator or his designee as soon as possible to make arrangments for an alternate date.

VI. RECORDS

A. CE Employees

1. A record of training for all personnel classified as Trained Radiation Workers will be provided by the R.P.S. Staff monthly or when requested, giving: name, social security number and date of training.

2. An individual file containing all test and information concerning trained Radiation Workers will be maintained until the employee has terminated. The records will be placed in storage until the Manager, R.P.S. authorizes their disposal.

3. A Statement of Training will be provided to utilities or customers requiring documentation of training. This statement must specify as a minimum: name, Social Security Number, date of training, and criteria used to prepare the Initial Radiation Workers Training Course. The Training Coordinator will be required to provide these statements upon request of the individuals or supervisor of individuals being sent off site.

B. Visitors

1. A record of all training received to qualify visitors as Trained Radiation Workers will be maintained for two years after their last visit, and a letter of training will be sent to the individual or the individual's company upon request of the individual.

VII. QUALITY ASSURANCE

A. Annually the RSO and Lead Senior Health Physics Technician shall audit the Initial Radiation Workers Training Course and the Annual Refresher Course to insure the material being presented meets the intent and quality of the RPIs and NRC Guidelines.

B. The RSO and the Lead Senior Health Physics Technician shall submit a report to the Training Coordinator and Manager RPS which specifies any additions, deletions, or changes to the training course.

C. Annually, the Health Physics Training Coordinator shall audit the training records to determine if the following items are current:

1. All terminations have been logged and dropped from the active roll

2. All personnel have been offered refresher courses if they are due for requalification

3. Provide a list of radiation workers whose training has lapsed to their supervisors

ITEM 10

RADIATION SAFETY PROGRAM

10.5 ADMINISTRATIVE PROCEDURES

10.5.7 PERSONNEL DOSIMETRY

Item 10 Radiation Safety Program (Cont'd)

10.5 Administrative Procedures

10.5.7 Personnel Dosimetry- is accomplished using an in-house, NVLAP accredited Panasonic TLD System in accordance with 20.202(c). The certificate of accreditation is Attachment 10.7.

In the event that either the in-house system is disabled or Combustion Engineering, Inc. no longer is eligible for accreditation arrangements are available to have our dosimeters processed according to regulations.

ATTACHMENT 10.7

NVLAP ACCREDITATION

PERSONNEL DOSIMETRY PROCESSING

National Institute of Standards and Technology

NVLAP

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION

PERSONNEL DOSIMETRY PROCESSING

NVLAP LAB CODE 0563

COMBUSTION ENGINEERING, INC.
1000 Prospect Hill Road, Windsor, CT 06095-0500
Stephen M. Sorensen Phone: 203-285-5285

Accreditation Renewal Date: October 1, 1990

This facility has been evaluated and deemed competent to process the radiation dosimeter listed below through employing a Panasonic Automatic reader model UD710A and Panasonic Manual reader UD702A.

This facility is accredited to process the following dosimeter by virtue of actual demonstration of compliance with ANSI-N13.11-1983 through testing.

Panasonic TLD model UD802 for ANSI-N13.11 category VII.

DEPARTMENT OF COMMERCE • UNITED STATES OF AMERICA •

For the National Institute of Standards and Technology

ITEM 10

RADIATION SAFETY PROGRAM

10.5 ADMINISTRATIVE PROCEDURES

10.5.8 ENVIRONMENTAL MONITORING

10.5.9 PERSONNEL MONITORING

10.5.10 WHOLE BODY COUNTS

10.5.11 URINALYSIS

10.5.8 Environmental Monitoring- is accomplished by the Windsor Site Environmental Monitoring Program. This program examines uranium content, alpha radioactivity and beta radioactivity in surface and well waters, river sediment, soil, vegetation, and atmospheric fallout. Additionally, PH, fluoride, and nitrate levels are determined in well water, surface water, and river sediment. A gamma spectrum is performed on selected river sediment, soil, vegetation, and atmospheric fallout samples. Fourteen (14) on-site routine sampling stations have been established at designated points for collection of quarterly atmospheric fallout samples and twenty-seven (27) semi-annual soil and vegetation samples.

10.5.9 Personnel Monitoring- Breathing Zone Air Samplers. Personnel intake of radioactive materials is monitored by the use of breathing zone air whenever work with loose contamination exceeds 10,000 dpm/100 cm2. Restrictions are enforced if breathing zone air samples indicate an intake of radioactive material equivalent to four (4) MPC hours.

10.5.10 Whole Body Counts- for mixed fission and corrosion products are performed twice per year.

10.5.11 Urinalysis- is performed in cases where Breathing Zone Air Sampling indicates possible ingestion of 50% of a body burden.

ITEM 11

WASTE MANAGEMENT

Item 11 Waste Management -

All solid radioactive waste is packaged and shipped, in accordance with applicable regulations, to a licensed Radioactive Waste Reduction Facility for treatment by compaction, shredding, decontamination for unrestricted release, or incineration. Combustion Engineering, Inc. currently, has an agreement with Scientific Ecology Group Inc. of Oak Ridge Tennessee for waste processing and ultimate disposal. Scientific Ecology Group, Inc. is licensed by the State of Tennessee under License Number R-73008-E94.

Any liquid radioactive waste produced by operations at the Windsor Site are evaporated in fume hoods which exhaust to HEPA Filtered and Monitored Stacks. The remaining materials are then handled as solid waste.

Combustion Engineering Inc. reserves the right to utilize alternate waste brokers without prior notification to the NRC.