

34-03043-03

030-05693

VOID SHEET

TO: License Fee Management Branch

FROM: Region II

SUBJECT: VOIDED APPLICATION

Control Number: 396453

Applicant: Balsack & Wilson Co.

Date Voided: 5-18-94

Reason for Void: In following letter

Dated April 26, 1994, the licensee requested that
the amendment request be switched from their
representative license, Lic. No. 34-03043-03, represented
by the above control number, to their source
Material License SUB-1259 (040-09474).

Loren J. Hunter 5-18-94
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

Final Review of VOID Completed:

- Refund Authorized and processed
- No Refund Due
- Fee Exempt or Fee not Required

Comments: _____

9406170094 940518
PDR ADOCK 03005693
C PDR

Log completed

Processed by: SAC

6/14/94

ML
38 DT

CONVERSATION RECORD

TIME 3:30 P.M. DATE April 25, 1994

TYPE VISIT CONFERENCE TELEPHONE INCOMING OUTGOING

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU: David Butt ORGANIZATION (Office, dept., bureau, etc.): Babcock & Wilcox TELEPHONE NO: 829-7808 216

SUBJECT: Transfer of the Amendment Request to License SUB-1259

SUMMARY: Informed us that his intention is to Amend ~~license~~ Lic. SUB-1259. He Will fax this information to RIII.

ACTION REQUIRED

Transfer of fee to SUB-1259

NAME OF PERSON DOCUMENTING CONVERSATION: Shirley Hutchfield SIGNATURE: [Signature] DATE: April 25, 1994

ACTION TAKEN

SIGNATURE TITLE DATE

MAR 16 1994

Babcock and Wilcox Company
ATTN: David O. Budd, R.S.
Environmental Administrator
1562 Beeson Street
Alliance, Ohio 44601

Gentlemen:

This refers to your letter dated February 7, 1994, for an amendment to Materials License 34-03043-03.

We received your check for \$450. Your request is subject to an application fee of \$2,500 as specified in fee Category 2C of 10 CFR 170.31 of the enclosed July 20, 1993, Federal Register notice. Payment of the additional \$2,050 fee should be made to the U.S. Nuclear Regulatory Commission and mailed to the following address:

U.S. Nuclear Regulatory Commission
ATTN: Shirley Crutchfield
License Fee and Debt Collection Branch, OC/DAF
Mail Stop MNSB 4503
Washington, D.C. 20555

Your application will be processed by the Region III Licensing staff located at 801 Warrenville Road, Lisle, Illinois 60532-4351. The fee, however, is required prior to issuance of the amendment. When submitting the additional fee, please refer to CONTROL NUMBER 396453.

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 by Shirley A. Crutchfield

Shirley Crutchfield
License Fee and Debt Collection Branch
Division of Accounting and Finance
Office of the Controller

Enclosure:
July 20, 1993, Federal Register notice

cc: Region III

DISTRIBUTION
Pending Fee File
OC/DAF R/F
LFDCB R/F (2)

OFFICE: OC/LFDCB *sc* OC/LFDCB *CP*
NAME: SCrutchfield CPhillips
DATE: 3/11/94 3/15/94

AB:\B&WILC.ARC



Babcock & Wilcox

a McDermott company

Research and Development Division

Certified Mail

1562 Beeson Street
Alliance, OH 44601
(216) 821-9110

February 7, 1994

Nuclear Regulatory Commission
Materials Licensing Section
801 Warrenville Road
Lisle, Ill. 60532-4351

Attn: Mr. Loren Hueter

SUBJECT: Amendment To Our Existing Byproduct Material License
#34-03043-03 In Order To Procure A Sealed Source

Dear Mr. Hueter:

Please consider this letter our request to amend our existing Byproduct Material License in order that we may procure a new sealed source that would be outside of the limits of our existing NRC license. Our existing license allows the Alliance Research Center to possess radioactive material with atomic numbers 3 through 83, inclusive and several other specific sealed sources. Our license also limits each isotope activity to 100 uCi or less.

The sealed source which we wish to procure consists of the following primary radioactive isotopes and activity:

Natural Thorium (Th-232, Atomic #90) - 0.17 uCi
Natural Uranium (U-238, Atomic #92) - 0.23 uCi
Natural Potassium (K-40, Atomic #19) - 1.70 uCi

The activity of these isotopes are below the 100 uCi limit stipulated in our existing license. However, the Thorium and Uranium radionuclides are not covered within our license.

The sealed source which we would like to procure is a KUTH Field Verifier for Potassium (u), Uranium (U) and Thorium (Th) and is manufactured by Amersham Corporation (see attached specifications). The radioactive material is sealed within a resin matrix and contained in an aluminum housing.

We would like our license amended to be able to bring in this sealed source and other sources, up to 100 uCi of activity, for future research and development projects. We would like to have the wording in our amendment broadened so we can have the flexibility to procure future sources without the need to go through additional NRC license amendments. Our suggested license amendment wording would be as follows:

CONTROL NO. 396453
RECEIVED

License Fee Information
on Pg. 2

FEB 14 1994
REGION III

FEB 14 1994

"Sealed sources, calibration sources and other source material which contain activities of any radionuclide, regardless of atomic number, which are at or below NRC regulation license exempt levels, subject to the existing activity limit; of this license can be procured for utilization in research and development work"

Enclosed, please find a check for \$450.00 to cover the costs of processing this amendment.

If you should have any questions concerning our license amendment request, please feel free to contact this writer.

Sincerely,

The Babcock & Wilcox Company
Alliance Research Center

David O. Budd

David O. Budd, R.S.
Environmental Administrator

mis
Enclosure

cc: SEReed
LGRudolph
NGSandru
MLSweger

*Fee transferred
to CW
396470
May 20 III*

Log	<i>Jul 11 III</i>
Remitter	
Check No.	<i>1230014888</i>
Amount	<i>\$450</i>
Fee Category	<i>3C 3L</i>
Type of Fee	<i>APPL.</i>
Date Check Rec'd	
Date Completed	
By:	

*adding
2C*

CONTROL NO. 396453

Vertical +4,500
11/30/93

**KUTh Field Verifier
Part No. 188074**

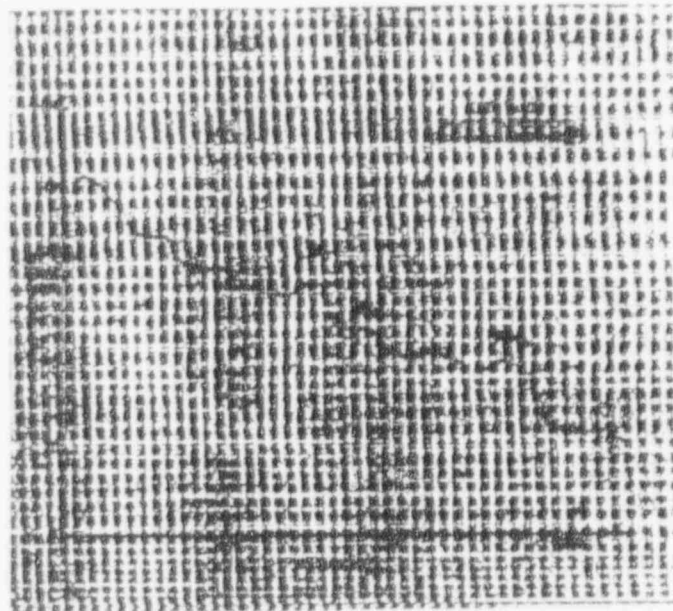
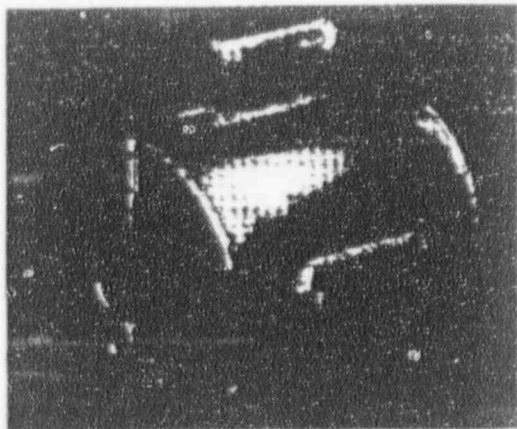
Description

Special gamma ray logs have been used by the oil well logging community for several years to estimate the Potassium (K), Uranium (U), and Thorium (Th) content of geological formations. This technique is referred to as KUTh logging and is most commonly used in mineral exploration and bed correlation studies. With the advent of more sophisticated downhole gamma ray spectroscopy tools, the oil service industry requires a good KUTh field verifier to insure the calibration of gamma ray spectroscopy tools back to API standards. In this way, after the gamma ray spectroscopy tool has been calibrated at the API pit, day to day performance can be verified by using the KUTh field verifier, which gives a stable output of known API units to the tool's detector. Using these criteria, Amersham has developed the 188074 KUTh field verifier.

Amersham's KUTh field verifier is a robust unit made with an aluminum casing constructed in a way to optimize strength in order to survive field conditions, but also minimize weight for easier handling. Each unit is filled with Amersham's unique polymeric resin into which is set the appropriate concentrations of K (Potassium), U (Uranium), and Th (Thorium) (both the Uranium and Thorium are in secular equilibrium). These concentrations have been carefully chosen to both optimize counting statistics for shorter counting times as well as approximate the proper ratios of these nuclides in the KUTh API calibration pit in Houston. Amersham has carefully chosen the ideal polymeric resin to ensure uniform distribution of the active elements throughout the entire volume of the verifier and to maintain stability with time.

The small quantities of radioactive materials used in the KUTh field verifier are naturally occurring so there are no special licensing requirements imposed by NRC or State radiation control agencies.

* Amersham has a supply of Thorium mined in 1906 that is in secular equilibrium.



Amersham Features

- **Clam Shell Design:**
Clam shell design allows for easy handling and mounting onto tool. This design achieves 360° geometry around detector crystal in a very reproducible fashion.
- **Robust Construction:**
Heavy duty welded aluminum construction allows for rough handling in the field.
- **Stable Output:**
Special polymeric resin provides ideal matrix for long term stability of KUTh output by preventing separation of particulates of differing densities.
- **Uniform Output:**
Unique polymeric matrix uniformly distributes the active elements throughout the volume of the verifier. Non-uniformity of output across the active length of the verifier is less than 10%. Reproducibility of the placement of unit over detector crystal also maintains a uniform output.
- **13.5" (343mm) Length:**
13.5" (343mm) length provides resistance against placement errors over standard 2" x 12" NaI(Tl) crystals.

Licensing

The small quantities of radioactive materials used in the KUTh field verifier are naturally occurring so there are no special licensing requirements imposed by NRC or State radiation control agencies.

CONTROL NO. 396458

Product Specifications

Nuclides:

	Content	Activity
Natural Thorium (Th-232)	90ppm	0.17 μ Ci
Natural Uranium (U-238)	40ppm	0.23 μ Ci
Natural Potassium (K-40)	11.7%	1.7 μ Ci

Natural Thorium originates from a separation carried out in 1906. Since this time the growth of daughter nuclides to secular equilibrium has been reached. Radioactive impurities of Th-230 and Ra-226 were measured in 1954 as 8500 pCi/g and 176 pCi/g, respectively. The chemical form of the Thorium is a soluble salt, which is distributed homogeneously throughout the polymeric matrix of the field verifier.

Natural Uranium originates from pitchblend ore which contains approximately 68% by weight of U_3O_8 . The ore contains daughter nuclides in secular equilibrium and the mass ratio of Ra-226 to U-238 has been certificated as 3.44×10^{-2} . The ore is finely divided by grinding and sieving and is homogeneously distributed throughout the polymeric matrix.

Natural Potassium contains 0.0118% of the radioactive isotope K-40. Large quantities of natural potassium are needed to provide sufficient K-40 to be measured. Specialist polymer technology has been developed to enable the required high ratio of potassium to be incorporated into the polymeric matrix without separation or movement with time.

Dimensions:

External length 13.5" (343mm)

External diameter 11.04" (280mm)

*Internal tube diameter 4.05" \pm 0.00 - 0.20

Carrying handle - 3/4" (19mm) diameter x 6" long (152mm)

Handle bracket - 1/4" (6mm) aluminum plate

Base - 3" (76mm) x 2" (51mm) x 3/16" (6mm) aluminum angle

Side clip handle - 1/8" (3mm) aluminum plate

Latch: 2 Heavy duty draw pull catches

Hinge Assembly: 3/8" (9mm) (nominal) aluminum pipe with 7/16" (11mm) steel pin (Type 316 SS)

Licensing: The small quantities of radioactive materials used in the KUTh field verifier are naturally occurring so there are no special licensing requirements imposed by NRC or State radiation control agencies.

Weight: Approximately 17kg

Labelling: Each unit is serialized and labelled with the activity contained of each nuclide.

* Inner tube diameter can be varied on request to fit different tool diameters.

Custom designs can be provided on request. Please inquire.

Nuclear Data:

Thorium-232 containing the following daughter nuclides in secular equilibrium: Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, At-216, Bi-212, Po-212, Tl-208, Pb-208, Bi-212. Principle gamma emissions are 2.62 MeV from Tl-208 and 1.08 MeV and 1.62 MeV from Bi-212.

Half life: 1.41×10^{10} years

Uranium-238 containing the following daughter nuclides in secular equilibrium: Th-234, Pa-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, At-218, Rn-218, Pb-214, Po-214, Bi-214, Tl-210, Pb-210, Bi-210, Po-210, Pb-206, Tl-206.

Principle gamma emissions are:
 750 keV from Pa-234m
 1 MeV from Pa-234m
 1.12 MeV from Bi-214
 1.76 MeV from Bi-214

Half life: 4.5×10^9 years

Potassium-40

Principle emission 1.46 MeV

Half life: 1.26×10^{10} years

Shipping

Shipping the KUTh field verifier is straightforward as the quantity of radioactive materials used in the Verifier and the dose rate on the surface are below the limits specified in the U.S. Department of Transportation regulations for Radioactive material, limited quantity, n.o.s., UN2910.

How to order

Orders may be placed by mail, fax or telephone. Each order should include the following information:

1. Purchase order number and/or contact number and quotation number if applicable.
2. Ship to address.
3. Invoice address description.
4. Catalog number and product description
5. Quantity required.
6. Special product requirements, if any.
7. Delivery date required.
8. Special instructions.

To avoid duplicate shipments written confirmation of orders placed by telephone or fax must be clearly marked "Confirming Order - Do Not Ship."

Caution

Product contains radioactive material. Contents, if ingested, are dangerous. Do not hammer, drill into, saw into or otherwise breach the integrity of the capsule. If in doubt, refer to your institution's standard procedures for radioactive material or contact local authorities.

Density of resin: 1.16g/cm³
 Thickness of clamshell: 1/8" sides
 1/4" ends

CONTROL NO. 896458

**Babcock & Wilcox**

a McDermott company

Research and Development Division

1552 Bacon Street
Alliance, OH 44601
(216) 821-9110

May 17, 1994

Mr. Loren Hueter
Nuclear Regulatory Commission
Materials Licensing Section
801 Warrenville Road
Lisle, Illinois 60532-4351

Subject: Information Request Pertaining To Our Sealed Source And
Licensed Material Individual Supervision Amendments To
Our Source Material License SUB-1259 - Control #396453

Dear Mr. Hueter:

During our May 17, 1994 phone conversation, you requested that I furnish you additional information concerning our above referenced source material license amendment requests. First, I will be sending you, along with this letter, copies of work experience resumes for Mr. Larry Rudolph, Mr. Kevin Andrews and myself. As you correctly indicated, we are the newest members of our Radiological Isotope Committee. For Mr. Rudolph and myself, our resumes contain on hands radiological program training given by Mr. Don Blair, our previous (retired) Radiological Safety Administrator.

On a second matter which you brought to my attention, we do intend to utilize the KUTH Field Verifier sealed source both on site and off site within the United States. Also, we would like to have the amendment indicate that we could possess a maximum of two (2) KUTH Field Verifiers at any one time.

We are in agreement that the amendment will need to be specific to the KUTH Field Verifier sealed sources to avoid triggering additional NRC program requirements at the Alliance Research Center.

It is my understanding that with this information you will be able to proceed with the processing of our amendment requests. Please contact me if any additional questions should arise.

Sincerely,

BABCOCK & WILCOX COMPANY
Alliance Research Center

David O. Budd

David O. Budd
Environmental Administrator

Enclosures
cc: L.G. Rudolph

David O. Budd
3397 Dawley Road
Ravenna, Ohio 44286

(216) 829-7808 (employer)
(216) 297-6507 (residence)

Environmental Program Professional with Experience in solid waste, hazardous waste, wastewater, Radiological, Air and Asbestos program fields.

Employment History

Babcock & Wilcox Company, Alliance Research Center, Safety, Environmental and Hygiene Department Environmental Administrator, 1993 to Present.

The Gikiden Company, Environmental Affairs Corporate Department Environmental Specialist I, 1991 to 1993.

Ohio EPA, Division of Solid and Hazardous Waste Management Environmental Engineer II, 1985 to 1991.

Ohio EPA, Division of Water Pollution Control Environmental Scientist and Environmental Engineer I, 1979 to 1985.

Kent City Health Department, Environmentalist and Health Inspector, 1974 to 1979.

Specialized Training

January 13-17, 1986. Forty hour Hazardous Materials Incident Response Operations Training Course.

January 26, 1987. Four hour Occupational Respiratory Protection Training Course.

May 9, 1990. Eight hour OSHA Hazardous Materials Refresher Workshop.

July 7-9, 1993. Twenty-four hour Environmental Regulation Course.

August 9-13, 1993. Forty hour Radiation Safety Program Management Course.

August 17, 1993. Eight hour Hazardous Materials Transportation Course.

April 20-21, 1994. sixteen hour Hazardous Waste Management: The Complete Course.

* Personalized Radiological Training by D. H. Blair, RSA

March 30-31, 1993. Four hour Alliance Research Center NRC Licensing Requirements Overview.

April 1, 1993. Two hour Radioisotope Committee Functions Overview.

April 6, 1993. Three hour Decommissioning Funding Plan for the Alliance Research Center.

April 8, 1993. Three hour Radiological Swipe Sample Training utilizing the Eberline PAC-46 and GM detection meters.

May 11, 1993. Three hour Alliance Research Center Radiological Safety Manual review.

May 12-13, 1993. Five hour Radiological Detection Meter Calibration and Equipment Maintenance Training.

May 21, 1993. Two hour overview of the Principles of Radiation Covering Time, Distance and Shielding.

June 8, 1993. Three hour Training on How to Handle Radioactive Material Receipts: Swipe Samples and Data Log.

July 24, 1993. Two hour Training on Radioactive Material Shipments: Swipe Samples and Proper Packaging.

August 23, 1993. Two hour training on Room and Equipment Radioactive Material Usage Surveys.

September 6, 1993. Two hour Film Badge Distribution and Record Keeping Overview.

Education

Obtained a Bachelor of Science Degree in 1973 from Kent State University in the field of Conservation of Natural Resources.

Certifications/Registrations

Became a State of Ohio Registered Sanitarian in 1976 and have maintained said registration.

Have possessed a Class I Wastewater Works Certification since 1981 from the State of Ohio.

Larry G. Rudolph
1033 55th St. N.E.
N. Canton, Ohio 44721
(216) 829-7744 (employer)
(216) 497-2022 (residence)

Certified Safety Professional - Certificate Number 3394

Employment History

February 1993 - Present Manager, Safety, Environmental and Hygiene
Babcock & Wilcox
Research and Development Division
Alliance, Ohio

Responsible for the staff section that provides direction, guidance and management support on safety and environmental issues related to the Division employees, facilities, and projects.

January 1992 - January 1993 Consultant
Babcock & Wilcox
Nuclear Environmental Services
Apollo, PA

Wrote procedures and instructions for compliance with regulatory requirements. Conducted employee training on subjects related to the NRC, EPA, and OSHA.

November 1973 - November 1991 Supervisor, Safety and Environmental Affairs
Westinghouse Electric Corp.
Apperetus Service Division
Pittsburgh, PA

Provided safety and environmental support/ training and coordinated major issues with corporate legal and technical staffs for 35 Division plants that employed 6,500.

August 1970 - October 1973 Staff Assistant, Corporate Safety
Westinghouse Electric Corp.
Corporate Headquarters
Pittsburgh, PA

Audited facilities, assessed program activities and advised operations management. Assisted in administering the corporate safety program in support of all domestic Divisions that represented 100,000 employees.

August 1968 - July 1970 Safety Engineer
Westinghouse Electric Corp.
Steam Turbine Divisions
Philadelphia, PA

Implemented the safety program throughout the 8,500-employee plant complex.

Resume of LARRY G. RUDOLPH (continued)

* **Specialized Radiological Training**

Conducted by D. H. Blair, Radiological Safety Administrator, Alliance Research Center

- Time, distance, and shielding principles; May 1993; 2 hours
- Detection, meter calibration, and equipment maintenance; May 1993; 5 hours
- Alliance Research Center Radiological Safety Manual review; May 1993; 3 hours
- Decommissioning Funding Plan review; April 1993; 3 hours
- Radioisotope Committee functions review; April 1993; 2 hours
- Alliance Research Center NRC licensing requirements overview; March 1993; 4 hours

Radiation Safety Training, B&W Nuclear Environmental Services Division;
January 1992; 4 hours. Conducted this course semi-monthly from January 1992 to
January 1993.

Other Training

- Hazardous Materials Transportation; McDermott; August 1993; 8 hours
- Hazmat Transportation Regulations; Coastal Communications; July 1993; 8 hours
- Hazardous Waste Operations & Emergency Response; J. A. Cocciardi Assoc.;
April 1992; 8 hours
- Advanced Environmental Management; Westinghouse; September 1991; 20 hours
- Title III / Media Training; Executive Television Workshop; September 1988; 16 hours
- RCRA Compliance; Westinghouse; September 1987; 16 hours
- Transportation of Hazardous Materials; Westinghouse; November 1981; 20 hours
- Hazardous Waste Control; Westinghouse; May 1981; 20 hours
- Recognition, Evaluation, and Control of Occupational Health Hazards; Industrial Hygiene
Foundation, Inc.; November 1976; 40 hours
- OSHA Compliance; Westinghouse; July 1973; 24 hours
- Accident Prevention for Manufacturing Management; Westinghouse;
January 1969; 40 hours



Babcock & Wilcox

a McDermott company

FAX Number: (216) 829-7328

Quality Assurance and Safety

**Alliance Research Center
1562 Beeson Street, Alliance, Ohio 44601**

TELECOPY COVER LETTER

Date: 5/17/94

To: Loren Huetter

Company: NRC

City/State: Lisle / Illinois

Fax Number: (708) 515-1254

Verification Number: _____

From: David Budd Extension: (216) 829-7804

Number of pages to follow: 5

Comments: Mr Andrews resume will be sent with the hand
copy of this letter. Hopefully now you can process our
two (2) amendment requests

Thanks for your assistance in this matter.

Bob

COMPLETED BY SENDER: After transmission is completed, please —

Discard Return by mail Call extension _____ for pickup

CONVERSATION RECORD

TIME

DATE

5-17-94

VISIT

CONFERENCE

TELEPHONE

INCOMING

OUTGOING

NAME OF PERSON(S) CONTACTED OR IN CONTACT

ORGANIZATION (OFFICE, DEPT. ETC.)

TELEPHONE NO.

David Budd 500

Babcock & Wilcox Co.

216-
829-7808

SUBJECT

CK 96453

SUMMARY

1. I again explained what we couldn't give the ambiguous with requested in their Feb. 7, 1994, letter. i.e. (a) not used to address in a specific license thing items already addressed in the regulations by inscription or general license provisions, (b) used to address precommissioning financial assessment and funding plans based on isotope, sealed or unsealed, and activity and adequacy of facilities, equipment, procedures, possibly criticality considerations, etc.
2. Need to specify how many sources of the specific type requested they want approved for possession.
3. If want approval to use off-site they need to address
4. Need to address his hands on experience with radioisotopes as well as names of 2 proposed new State committee members L. B. Randolph and K. J. Andrews.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Loren Hester

5-17-94

ACTION TAKEN

SIGNATURE

TITLE

DATE



Babcock & Wilcox

a McDermott company

Research and Development Division

1562 Beeson Street
Alliance, OH 44601
(216) 821-9110

May 5, 1994

Mr. Loren Hueter
Nuclear Regulatory Commission
Materials Licensing Section
801 Warrenville Road
Lisle, Illinois 60532-4351

Subject: Information Request Pertaining To Our Sealed Source And
Licensed Material Individual Supervision Amendments To
Our Source Material License SUB-1259 - Control #396453

Dear Mr. Hueter:

During a May 4, 1994 phone conversation, you requested that I furnish you additional information concerning our above referenced source material license amendment requests. First, I will be serving as both the Radiological Safety Administrator (RSA) and Radiological Safety Committee (RSC) Chairperson for our Alliance Research Center radiological program. I have enclosed several sections of our Radiological Safety Manual which overviews the structure and duties of the RSC and RSA. Also, this section of our manual covers the minimum qualifications for the position of the RSA (See Page 6 Item 2.2).

I have enclosed a copy of my employment history, educational background and training. Please note that I have also included a copy of my certificate of achievement certifying that I received 40 clock hours of radiation safety program management training.

Concerning a final issue, we do have access to a Certified Health Physicist. Mr. Carl Yates, CHP, is an active member of our Radioisotope Committee and participates by conference call at our committee meetings. He is employed by our Company and works out of Lynchburg, Virginia. I have enclosed a copy of his employment history and educational background for your reference.

RECEIVED

MAY 09 1994

REGION III

MAY 9 1994

Page 2

I hope this information proves helpful in your review of our SUB-1259 source material license amendment requests. Please feel free to contact me if any questions should arise.

Sincerely,

BABCOCK & WILCOX COMPANY
Alliance Research Center

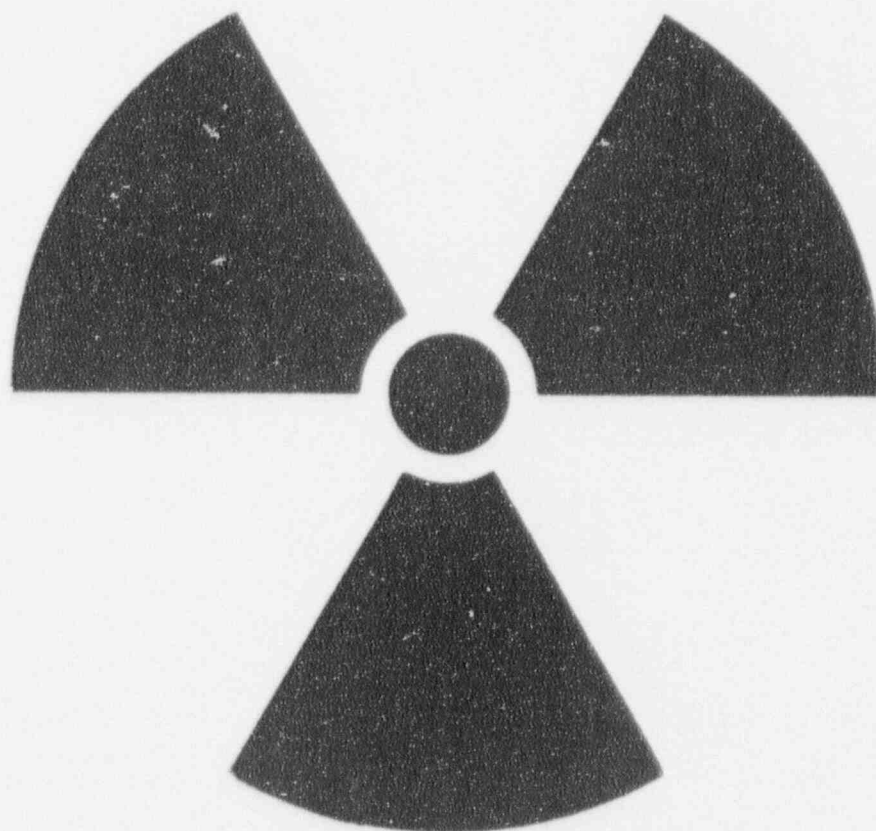
David O. Budd

David O. Budd, R.S.
Radiological Safety Administrator

Enclosures

bcc: L.G. Rudolph
C.R. Yates-NESI, Lynchburg

RADIOLOGICAL SAFETY



MANUAL

Babcock & Wilcox

ALLIANCE RESEARCH CENTER

DRAFT

RADIOLOGICAL SAFETY MANUAL

April 1994
(Revised)

by

David O. Budd, Radiological Safety Administrator
Larry G. Rudolph, Manager, Safety, Environmental & Hygiene

Approved by

The Babcock & Wilcox Company
Alliance Research Center
Radioisotope Committee

THE BABCOCK & WILCOX COMPANY
Research and Development Division
Alliance Research Center
1562 Beeson Street, Alliance, Ohio 44601

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1.0 Radioisotope Committee

1.1 Purpose

To approve radiological procedures and act as a control and oversight committee with regards to the use of ionizing radiation in the areas of:

- a. Radiological Safety
- b. License Provisions
- c. Procurement and Control of All Radioactive Materials
- d. Qualifying Personnel
- e. Others as Necessary

1.2 Composition

Membership shall include a minimum of the following:

- a. Manager of Facilities, QA & Safety
- b. Plant Engineer
- c. Radiological Safety Administrator
- d. Representative from User Community
- e. Any other cognizant individuals that the Committee may wish to include on either a regular or occasional basis.

Representatives of appropriate sections will be selected by the cognizant Laboratory Manager.

Current membership of the Radioisotope Committee is shown listed on Attachment 1.2.1.

Figure 1.2.2 indicates the relationship of the Radioisotope Committee to the technical groups with respect to radiological safety and control.

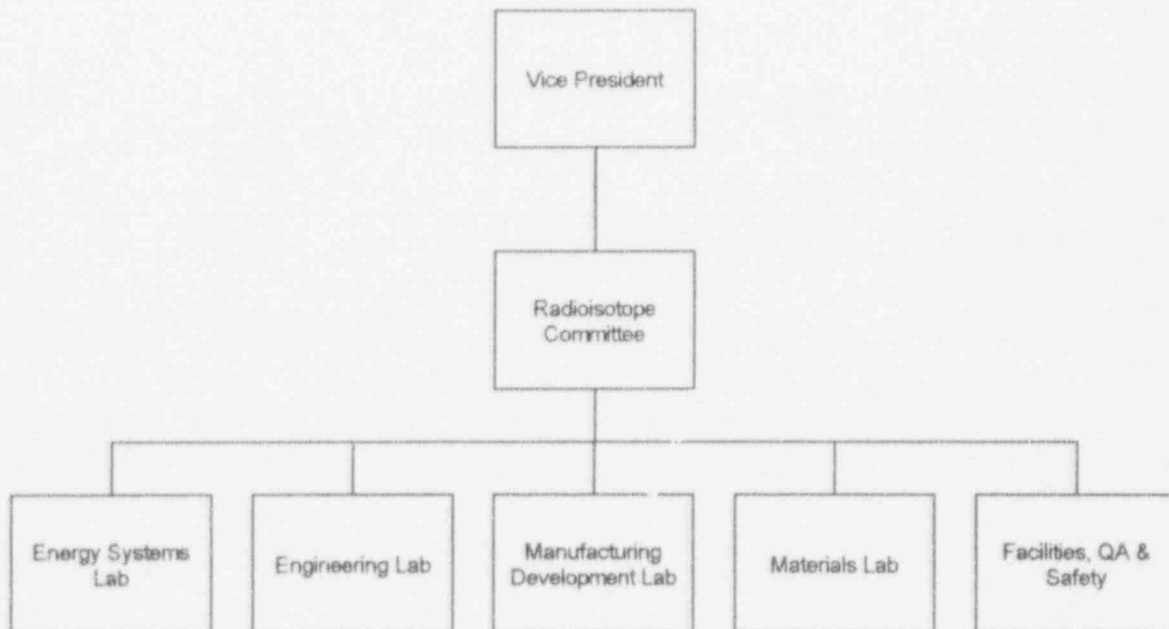
Figure 1.2.1

Membership of the Radioisotope Committee

- N. G. Sandru - Manager, Facilities, QA & Safety
- L. G. Rudolph - Manager, Safety, Environmental & Hygiene
- K. J. Andrews - Plant Engineer
- S. L. Harper - Corrosion
- M. T. Childerson - Steam Generators
- G. R. Taylor - Analytical Chemistry
- D. O. Budd - Radiological Safety Administrator
- C. Yates - NESI, Lynchburg

Figure 1.2.2

Relationship of Radioisotope Committee to the Technical Groups
with Respect to Radiological Safety and Control



1.3 Meetings

Meetings shall be called by the Committee Chairman and/or the Radiological Safety Administrator (RSA) and shall be held at least semi-annually.

The Chairman and/or the RSA may, at his discretion, call special meetings of the Committee.

Any member may ask the Chairman and/or the RSA to call a special meeting of the Committee with the reason of the meeting to be announced in advance.

1.4 Functions

1.4.1 Radiological Safety

The Committee shall be satisfied that general procedures for the safe handling, storage, and disposal of radioisotopes exist and are enforced at the Research Center. Requests for approval of specific procedures and exceptions to the general procedures shall be considered by the committee and approved only on the merits of each individual case. The Radiological Safety Administrator shall be responsible for the enforcement of procedures approved by the Committee.

1.4.2 License Provisions

Committee approval of projected experimental work is the Research Center's assurance that the anticipated work is permissible and within the limitations of the Company's licenses. A periodic review of the radioisotope program shall be conducted to ensure that licenses are adequate to permit Research Center personnel to perform essential work.

The Committee Chairman and/or the RSA shall be responsible for all license applications and for supplying information requested by licensing agencies.

1.4.3 Procurement

All requests for material or devices that are capable of producing ionizing radiation shall be in writing to the Radiological Safety Administrator.

The following outline (I through VII) shall be a guide for writing the "Job Safe Practice" (JSP). This JSP must receive Radioisotope Committee approval prior to ordering or commencing work with the radioactive materials.

Job Safe Practice

Title:

Objective/Analysis:

Author:

Section:

Date Written:

Date RIC Approval:

Date RIC Review:

I. Receiving and Material Acceptance

1. Probable mode of transportation
2. Who will receive, monitor, and control
3. Immediate storage location
4. Assay to accompany

II. Characteristics of the Radioactive Material or Device

1. Physical form, i.e., electronic device, sealed source, deposited source, gas, liquid, etc.
2. Quantity
3. Type of radiation emitted, i.e., alpha, beta, gamma, x-ray
4. Energy of the emitted radiation
5. Total radiation dosage involved in terms of flux, activity, etc.
 - a. Maximum radiation at one foot ($Mr - 6 \times mCi \times Mev$).
6. Evaluation of radiation hazards and radiotoxicity

III. Experimental Procedures

1. Step-by-step description of procedures, including an outline of those areas that may require special handling techniques
2. Equipment to be used in the project with consideration given to the possibility that the equipment or surrounding areas may become contaminate; techniques must be developed to control any possible contamination
3. Methods of protecting against radiation hazard
4. Physical changes to be made to the material after receipt at the Research Center.

IV. Location

1. Area where the work will be done
2. Ability to restrict the area so that personnel not involved in the project will be kept at a safe distance from the radioisotope or equipment
3. Facilities for the controlled storage of the radioisotope
4. Arrangements for establishing safe exposure levels in these areas

V. Responsibility

1. Name of the individual assigned the responsibility for the control of the radioisotope
2. Name of the supervisor of the project
3. Statement as to the awareness of the above individuals to the potential hazards inherent in the use of the specific radiation source

VI. Personnel

1. List of personnel who will work with or near the radiation source; Radiological Safety Administrator (RSA) will establish whether the personnel have been approved to work with sources of ionizing radiation with respect to Company policy (physical exams, safety, training, etc).

VII. Disposal and Storage of Waste

1. Evaluation of the possibilities of uncontrolled radioactive waste being generated, i.e., dust, gas, liquid spills, liquids discharged to the storm or sanitary sewers, etc; inclusion should be made of methods of controlling wastes
2. Method of disposal of radioisotope upon completion of project
3. Method of disposal of controlled radioactive liquids or solid wastes generated:
 - a. If liquid waste is put down sanitary sewer per 10 CFR Part 20 Subpart 20.2003, section personnel must keep records with copy to Radiological Safety Administrator
 - b. Where liquids must be solidified, it shall be done by section personnel; solidified waste and record of amount shall be given to RSA for disposal and/or storage
4. Evaluation of the possibility of required decontamination of equipment because of use or cost factors and projected disposal plans for expendable contaminated equipment.

The Radiological Safety Administrator shall review the project Job Safe Practice outline with the person conducting the work. The Radiological Safety Administrator shall attach his comments and evaluation of the potential hazards involved in the procedure and transmit the composite to the Committee members.

The Chairman may, at his discretion, call a special meeting of the Committee to evaluate the project.

The project supervisor shall review the project procedures to include any changes specified by the Radioisotope Committee.

If the revised procedure outline is subsequently approved by the Committee, the Chairman shall so notify the project supervisor through the Radiological Safety Administrator. The Chairman of the Radioisotope Committee and/or the RSA shall sign all requisitions for materials or devices that are capable of producing ionizing radiation. All radioactive material and radiological equipment shipped to the Research Center shall be marked to the attention of the Radiological Safety Administrator. He shall immediately monitor all arriving material of this type.

Prior to the start of actual work on approved projects, a "dry run" may be required using nonradioactive material to discover any additional potential hazards. The project procedures shall be further revised if necessary. This "dry run" shall be made in the presence of both the Radiological Safety Administrator and the project supervisor. The Committee shall be advised of any significant changes in project procedure.

1.4.4 Reorders

Routine reorders of previously approved materials or services for which JSP's have been established, may be approved by either the Committee Chairman or the Radiological Safety Administrator on behalf of the Committee, provided the reorder does not exceed the amount originally designated in the approved project procedure outline, and/or license limitations. Any such approval shall be reviewed by the Committee at its next meeting.

1.4.5 Records

Formal records of the Committee proceedings, radioisotope procurement, storage and disposal shall be maintained in the Committee files by the Radiological Safety Administrator for periodic examination by Nuclear Regulatory Commission inspectors.

1.4.6 Radioactive Material Users Qualifications

The Radioisotope Committee will certify that personnel may work with material or devices capable of producing ionizing radiation only after the following minimum requirements are met:

- a. The individual has received instructions in the Research Center's radiological safety procedures.
- b. The individual has demonstrated his ability to use the required radiation measuring equipment.
- c. The individual has demonstrated competence in laboratory/equipment manipulation.

2.0 Radiological Safety Administrator

2.1 Positioning in Organization

The Radiological Safety Administrator reports administratively to the Facilities, QA & Safety Manager who, in turn, reports to the Vice President of the Research Center.

In addition, the Radiological Safety Administrator is responsible to the Radioisotope Committee with respect to the procedures and standards established by the Committee.

2.2 Minimum Technical Qualifications

The individual assigned the position of Radiological Safety Administrator shall have been graduated from a school of college level or shall have had equivalent experience.

In addition, he shall successfully complete a formal training in radiological safety such as that provided in the Basic Radiological Health Course offered by the U.S. Department of Health, Education and Welfare.

2.3 Duties of the Radiological Safety Administrator

2.3.1 General

The Radiological Safety Administrator is responsible for seeing that the policies defined in this manual are followed. He shall keep himself up-to-date on all authoritative sources of information on radiological safety as it applies to activities at the Research Center.

2.3.2 Project Procedures

The Radiological Safety Administrator shall, upon request, assist the project supervisor in writing radiological safety procedures for each process or project. These procedures shall in be compliance with State and Federal regulations and Company safety standards in force at the Research Center at the time.

The Radiological Safety Administrator shall review all project procedures prior to submittal to the Radioisotope Committee for approval.

2.3.3 Personnel Exposure Control

The Radiological Safety Administrator shall monitor all activities and projects utilizing sources of ionizing radiation. He will recommend and/or provide instrumentation and protective measures to insure compliance with the appropriate parts of 10 CFR and conditions of our licenses.

He will maintain individual health and exposure records for personnel occupationally exposed to radiation. Personnel exposure dose information will be available to project leaders and section managers.

The Radiological Safety Administrator shall define radiation areas with physical barriers and signs to minimize the possibility of inadvertent exposure of personnel.

3.0 Radiation Protection Program

3.1 Introduction

The nature of the work performed at the Research Center is varied so that only generalized descriptions of projected uses of radioactive materials can be made.

We maintain two licenses which permit us to possess the following radioactive materials:

1. By-Product Material #34-03043-03
 - a. Radioactive material containing isotopes with atomic numbers of 3 through 83 inclusive.
 - b. Sealed sources containing Americium, Nickel, Iron, Curium, and Cesium.
2. Source Material SUB 1259
 - a. Natural Uranium in fuel rod cladding
 - b. Depleted Uranium in fuel rod cladding

Our activities include research and development such as:

- a. Samples from the operation of nuclear reactors or their various structural and functional components. (These samples are used in chemical, metallurgical, or engineering investigations and analyses).
- b. Measurement of physical qualities such as densities, fuel firing rates, etc.
- c. Use of tracers for chemical or engineering studies.
- d. Determination of wear and other physical characteristics of fuel rods.
- e. Developing specific instrumentation for detecting contamination such as used in soil investigation and monitoring projects.

The information contained in this chapter describes, in some detail, the facilities, equipment, and methods currently in use at the Research Center to protect the local populace and employees of the Company from the hazards of radiation.

David O. Budd
3397 Dawley Road
Ravenna, Ohio 44266

(216) 829-7808 (employer)
(216) 297-6507 (residence)

Environmental Program Professional with Experience in solid waste, hazardous waste, wastewater, Radiological, Air and Asbestos program fields.

Employment History

Babcock & Wilcox Company, Alliance Research Center, Safety, Environmental and Hygiene Department Environmental Administrator, 1993 to Present.

The Glidden Company, Environmental Affairs Corporate Department Environmental Specialist I, 1991 to 1993.

Ohio EPA Division of Solid and Hazardous Waste Management Environmental Engineer II, 1985 to 1991.

Ohio EPA, Division of Water Pollution Control Environmental Scientist and Environmental Engineer I, 1979 to 1985.

Kent City Health Department, Environmentalist and Health Inspector, 1974 to 1979.

Specialized Training

January 13-17, 1986. Forty hour Hazardous Materials Incident Response Operations Training Course.

January 26, 1987. Four hour Occupational Respiratory Protection Training Course.

May 9, 1990. Eight hour OSHA Hazardous Materials Refresher Workshop.

July 7-9, 1993. Twenty-four hour Environmental Regulation Course.

August 9-13, 1993. Forty hour Radiation Safety Program Management Course.

August 17, 1993. Eight hour Hazardous Materials Transportation Course.

April 20-21, 1994. sixteen hour Hazardous Waste Management: The Complete Course.

Personalized Radiological Training by D. H. Blair, RSA

March 30-31, 1993. Four hour Alliance Research Center NRC Licensing Requirements Overview.

April 1, 1993. Two hour Radioisotope Committee Functions Overview.

April 6, 1993. Three hour Decommissioning Funding Plan for the Alliance Research Center.

April 8, 1993. Three hour Radiological Swipe Sample Training utilizing the Eberline PAC-46 and GM detection meters.

May 11, 1993. Three hour Alliance Research Center Radiological Safety Manual review.

May 12-13, 1993. Five hour Radiological Detection Meter Calibration and Equipment Maintenance Training.

May 21, 1993. Two hour overview of the Principals of Radiation Covering Time, Distance and Shielding.

June 9, 1993. Three hour Training on How to Handle Radioactive Material Receipts: Swipe Samples and Data Log.

July 24, 1993. Two hour Training on Radioactive Material Shipments: Swipe Samples and Proper Packaging.

August 23, 1993. Two hour training on Room and Equipment Radioactive Material Usage Surveys.

September 6, 1993. Two hour Film Badge Distribution and Record Keeping Overview.

Education

Obtained a Bachelor of Science Degree in 1973 from Kent State University in the field of Conservation of Natural Resources.

Certifications/Registrations

Became a State of Ohio Registered Sanitarian in 1976 and have maintained said registration.

Have possessed a Class I Wastewater Works Certification since 1981 from the State of Ohio.

CERTIFICATE OF ACHIEVEMENT

This is to certify that

David Budd

has completed the short course entitled:

Radiation Safety Program Management
August 9-13, 1993

Sponsored by:

TECHNICAL MANAGEMENT SERVICES, INC.

Robin Rued

Director — Course Development

Carl R. Yates, CHP
2437 Hawthorne Road
Lynchburg, Virginia 24503

(804) 384-6836 (Home)
(804) 522-5325 (Work)

EMPLOYMENT HISTORY

08-88 to Present	Babcock & Wilcox, NESI P.O. Box 11165 Lynchburg, Virginia 24505
10-86 to 06-88	Science Applications International Corp. 3 Choke Cherry Road Rockville, Maryland 20850
12-81 to 10-86	NUS Corporation 910 Clopper Road Gaithersburg, Maryland 20879 and 5350 Campbell's Run Road Pittsburgh, Pennsylvania 15205
08-79 to 12-81	West Virginia University Morgantown, West Virginia 26506

SECURITY CLEARANCE

B&W, NESI	DOE "L" Clearance, Active
NUS	DOE "Q" Clearance, Active through October 1986

EXPERIENCE SUMMARY

•B&W, NESI

As Certified Health Physicist, responsibilities include implementing the revised 10 CFR 20 radiation protection regulations, tracking and reviewing work area and environmental dosimetry data and the personnel dosimetry records of the Nuclear Environmental Services, Inc. Lynchburg Technology Center (NESI-LTC) employees, managing the environmental monitoring program, and coordinating all radioactive waste shipments to Barnwell, South Carolina. This includes classification of wastes for compliance with 10 CFR 61 and preparing waste manifests and all other shipment records. The NESI-LTC site is a Nuclear Regulatory Commission (NRC) licensed facility (NRC License Number SNM-778).

Technical procedures are prepared, and updated as program changes become effective, for each of these disciplines. Other routine health physics responsibilities include writing Radiation Work Permits and helping to coordinate, through a radiation protection perspective, the various projects of the group. Also act as Health Physics Supervisor when necessary.

Member of two B&W committees, the Naval Nuclear Fuel Division (NNFD) ALARA Committee (Lynchburg, Virginia) and the Alliance Research Center (ARC) Isotope Committee (Alliance, Ohio). Each of these committees ensures that work with radioactive materials is done safely and according to the principles of ALARA.

●SAIC

As Radiological Scientist, responsibilities included Project Management, Assistant Division Manager, 10 CFR 61 related field activities, in-house special studies projects, and procedure preparation.

Project Management activities involved coordinating operations within the laboratory to help numerous nuclear power plants comply with the requirements of 10 CFR 61. Annual data summary reports and scaling factor reports were prepared in support of this work. Responsibilities as Assistant Division Manager were related to overseeing the operations of the radiochemistry laboratory from a QA/QC perspective and compiling the QA/QC data into a semi-annual report. Acted as back-up member of the USCEA/NBS Steering Committee, which directed the new intercomparison program being used by laboratories and utilities to help verify their QA/QC programs.

The on-site work involved using remote gamma spectroscopy, dose-rate profiling, and sampling to categorize fuel pool stored components and low level radioactive waste containers for compliance with 10 CFR 61. In-house special studies included (1) studying the behavior of radioiodine in sampling lines duplicated from commercial power plants, and (2) isolating radioactive "hot" particles obtained from clothing and smears in order to photograph and perform dimensional inspections.

●NUS CORPORATION

Responsibilities as Radiological Analyst (Gaithersburg, Maryland) included conducting radiological portions of environmental surveys and audits; design and evaluation of Radiological Environmental Monitoring Programs (REMP's) for nuclear power plants, a proposed high-level waste repository, and other fuel cycle facilities; preparing annual reports for commercial nuclear power plants' REMP's; writing technical procedures for conducting field work; analyzing environmental data for compliance with regulations; and performing dose calculations.

Member of a team conducting environmental surveys for various DOE facilities, including the Feed Materials Production Center (Fernald, Ohio) and Hanford (Richland, Washington). The purpose of each survey was to identify, categorize, and place in order of priority, existing and potential environmental problems. Included in each survey was an examination of processes, effluent and environmental monitoring, laboratory operations, and dose calculations. Assisted in the preparation of the Environmental Impact Statement on Alternative Cooling Water Systems for the Savannah River Plant. Prepared report entitled "Background Radiation in Two Locations in Deaf Smith and Swisher Counties Within the Palo Duro Basin" for the Salt Repository Project. Also developed the Environmental Study Plan on background environmental radioactivity for the Deaf Smith County Site for the Site Characterization Phase, which included an extensive series of technical procedures on collection of environmental samples.

As a Project Manager (Pittsburgh, Pennsylvania), was responsible for coordinating the activities of numerous commercial nuclear power plants' REMP's. This involved interacting with the activities of the power plant personnel, the sample collectors, and the radiochemistry laboratory. The sample collectors were trained and then audited on a semi-annual basis. Prior to being promoted to Project Manager, worked as a Senior Radiochemistry Technician performing I-131, Sr-89/90, Ra-226, Ra-228, and H-3 analyses on a variety of environmental media. Also responsible for setting up and maintaining the gas proportional counters, liquid scintillation counters, and the thermoluminescent dosimetry system.

●WEST VIRGINIA UNIVERSITY

As Graduate Research Assistant, conducted research on acid precipitation which included in-situ bioassay, chemical analyses of lake and precipitation samples, statistical analyses of data, experimental design, and field sampling. Responsibilities included completion of Master's thesis and reporting of data and findings at the Annual Meeting of the American Society of Limnology and Oceanography.

EDUCATION (TRANSCRIPTS AVAILABLE UPON REQUEST)

- 12-81 West Virginia University
Morgantown, West Virginia 26506
Master of Science in Biology
- 04-79 University of Pittsburgh at Johnstown
Johnstown, Pennsylvania 15904
Bachelor of Science in Biology
(Minor degrees in Chemistry and Fine Arts)

SHORT COURSE WORK

- 12-03 to 12-07-90 Technical Management Services
"Internal Dose Assessment"
- 08-20 to 08-24-90 Chem-Nuclear Systems, Inc.
"Radioactive Waste, Transportation and Disposal"
- 05-20 to 05-24-89 Technical Management Services
"Radioactive Sample Analysis"
- 05-86 to 06-86 DOE/NUS Short Courses for Survey Team
• Survey Procedures/ Environmental Regulations
• Environmental Sampling and Analysis
• Radiation Principles and Health & Safety
• DOE Environmental Survey Course
- 01-84 to 04-84 NUS Corporation, Quality Education System
"Quality Improvement through Defect Prevention"
- 06-11 to 06-15-83 Harvard University, School of Public Health
"Environmental Radiation Surveillance"

PROFESSIONAL AFFILIATIONS

Health Physics Society
American Nuclear Society

REFERENCES

- Charles Marcinkiewicz, President
CONTECH
8992 Grape Creek Road
Walkersville, MD 21793
(301) 845-4959 (work)
- Patrick T. Kelly, Health Physicist
SCTA, Inc.
St. Louis, MO
(314) 727-5525 (work)
- David Dougherty, Vice President
Haliburton NUS
5950 North Course Drive
Houston, TX 77272
(713) 561-1556 (work)
- Steven W. Schilthelm, CHP
3616 Willow Lawn
Lynchburg, VA 24503
(804) 384-3779 (home)

CONVERSATION RECORD

TIME

DATE

4-25-94

 VISIT CONFERENCE TELEPHONE INCOMING OUTGOING

NAME OF PERSON(S) CONTACTED OR IN CONTACT

ORGANIZATION (OFFICE, DEPT. ETC.)

TELEPHONE NO.

David L. Budd

Labovack & Wilson Co.

SUBJECT

CN 96453

SUMMARY

Mr. Budd called to state that they had discussed options available to them. They have decided that even though they can obtain the specific sealed source device containing submicroscopic quantities of natural uranium, natural thorium and natural potassium ^(the latter which we do not license) under the general license provisions of 10 CFR 40.22 "Small Quantities of Loose Material" they do not wish to do so. Instead they want to amend their existing Source Material License SUB-1259 to include this source material, contrary to their initial request by letter dated February 9, 1994, requesting the subject sealed source be added to their existing Export License No. 34-03043-03. They also said they wanted to change RSO on Lic. SUB-1259 at the same time. I told them I had no problem if they addressed with "FSO" and obtained their approval as well as provide qualifications of proposed RSO. Mr. Budd said he would promptly FAX letters to this effect (followed by hard copy) as additional info to CN 96453.

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Loren Hauster

4-25-94

ACTION TAKEN

SIGNATURE

TITLE

DATE

CONVERSATION RECORD

TIME

DATE

4-20-94

VISIT

CONFERENCE

TELEPHONE

INCOMING

OUTGOING

NAME OF PERSON(S) CONTACTED OR IN CONTACT

Larry Rudolph

ORGANIZATION (OFFICE, DEPT. ETC.)

Babcock & Wilcox

TELEPHONE NO.

216-
829-7808

SUBJECT

CN 96453

SUMMARY

I called Larry (in absence of Dave Budd) in response to our 4-13-94 telecon. I confirmed that they could obtain source material under a general license per 10 CFR 40.22 (a) even though they may already have source material under a specific license (either a byproduct license or a source material license). However, as clearly stated in 10 CFR 40.22 (b), the exemption to parts 19, 20, and 21 would not apply to the general license source material. Larry said they should be able to FAX a response by Friday, 4-22-94, as to their intent on the 2-7-94 amendment request i.e. to withdraw/void the request or pursue adding the specific sealed source to either of the existing licenses, 34-03043-03 or SVS-1259.

Regarding the queries as to whether they could transfer the 1000 kilogram quantities of source material on their existing part 40 license to their existing part 30 license, I informed them that Region III had not made a policy of doing so in the past except for small quantities or possibly source material used in shielding. However if they wished to proceed it they would do so in writing.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Loren Hartman

4-20-94

ACTION TAKEN

SIGNATURE

TITLE

DATE

CONVERSATION RECORD

TIME

DATE

4-14-94

VISIT

CONFERENCE

TELEPHONE

INCOMING

OUTGOING

NAME OF PERSON(S) CONTACTED OR IN CONTACT

ORGANIZATION (OFFICE, DEPT. ETC.)

TELEPHONE NO.

Joe Wang

NMSS/IMAB

501-
504-2611

SUBJECT

CN 96453

SUMMARY

In the absence of Jose Sincora, I left a message for Janet Lubliner to call me about 10 CFR Part 40 licensing questions. Joe Wang said Janet asked him to address the Part 40 questions. Joe took the questions and said he wanted to confer with others before responding. We did so and called me back with affirmative answers to both questions.

1. Joe confirmed that a licensee who has source material under a specific license (either a byproduct license or a source material license) pursuant to 10 CFR 40.22 (b) may also obtain source material under the general license provisions of 10 CFR 40.22 (a). ^{However,} as clearly stated in 10 CFR 40.22 (b), the exemption to Parts 19, 20, and 21 would not apply to the general license source material. He pointed out that the top of the "Materials License" Form (NRC Form 374) referenced 10 CFR Parts 40.170 and others in addition to Part 30, and therefore may include source and SNM material.

(over)

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Lois Hunter

4-14-94

ACTION TAKEN

SIGNATURE

TITLE

DATE

2. I also inquired whether a licensee such as Babcock and Wilcox could have, at their request, significant quantities of source material (i.e. 1,000 - 2,000 kilograms) transferred from their source material license to an existing byproduct license (in order to terminate the source material license) or if we had a policy limiting such transfers to some small quantity. Joe stated the manner of licensing (Part 3 or Part 4) was for "convenience" and we have no established policy regarding quantity of source material that can be placed on a byproduct license. Therefore there should be no problem if B&W wishes to transfer their ^{multiple} kilogram source material authorization to their byproduct license. He also confirmed that depleted U₂₃₅ is by definition source material.

CONVERSATION RECORD

TIME

DATE

4-13-94

VISIT

CONFERENCE

TELEPHONE

INCOMING

OUTGOING

NAME OF PERSON(S) CONTACTED OR IN CONTACT

ORGANIZATION (OFFICE, DEPT. ETC.)

TELEPHONE NO.

Howe Budd & Larry Rudolph Babcock & Wilcox

216-

829-7808

SUBJECT

CN 96 453

SUMMARY

I called to discuss their application dated Feb 7, 1994, which was ambiguous. They wanted to procure a sealed source containing fractional microcurie amounts of both natural thorium and Nat. U. as well as 1.7 MCi natural K-40. However they had requested that they be given a much broader authorization for sealed sources, calibration sources and other source material of any radionuclide regardless of atomic number which are at or below NRC regulatory license exempt levels. I pointed out that there are not exempt levels for sources, SA or Transuranes. After that discussion, they asked for clarification on whether they could obtain source material under Gen. Lic. Provision of 10 CFR 40.22 even though they have an existing source material license and if so they may have to withdraw (void) the amendment request. I told them that could help was that they could but I wanted to confer with senior regional and/or HQ personnel. They also inquired whether they could transfer their 1500 kilogram quantities of source material on their existing Part 40 license to their existing Part 20 license and then terminate the Part 40 license. I agreed to answer these inquiries and call back.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Loren Hunter

4-13-94

ACTION TAKEN

SIGNATURE

TITLE

DATE

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 39, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

<p>Licensee</p> <p>1. Babcock & Wilcox Alliance Research Center</p> <p>2. 1562 Beeson Street Alliance, OH 44601</p>	<p>In accordance with letter dated April 26, 1994</p> <p>3. License number SUB-1259 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date May 31, 1994</p> <hr/> <p>5. Docket or Reference No. 040-08474</p>
---	---

<p>6. Byproduct, source, and/or special nuclear material</p> <p>A. Uranium - depleted in uranium-235</p> <p>B. Uranium (Natural)</p> <p>C. Uranium (Natural)</p> <p>D. Thorium (Natural)</p>	<p>7. Chemical and/or physical form</p> <p>A. Pellets in fuel rod clodding</p> <p>B. Pellets in fuel rod clodding</p> <p>C. Sealed sources (Amersham Model 188074)</p> <p>D. Sealed sources (Amersham Model 188074)</p>	<p>8. Maximum amount that licensee may possess at any one time under this license</p> <p>A. 1820 kilograms</p> <p>B. 1000 kilograms</p> <p>C. Two sources not to exceed 0.23 microcuries per sources</p> <p>D. Two sources not to exceed 0.17 microcuries per sources</p>
--	---	---

9. Authorized Use:
- A. and B. To be used for non-destructive testing of fuel rod assemblies and individual fuel rods.
 - C. and D. To be used in an Amersham KUTH field verifier.

COPY

4

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SUB-1259

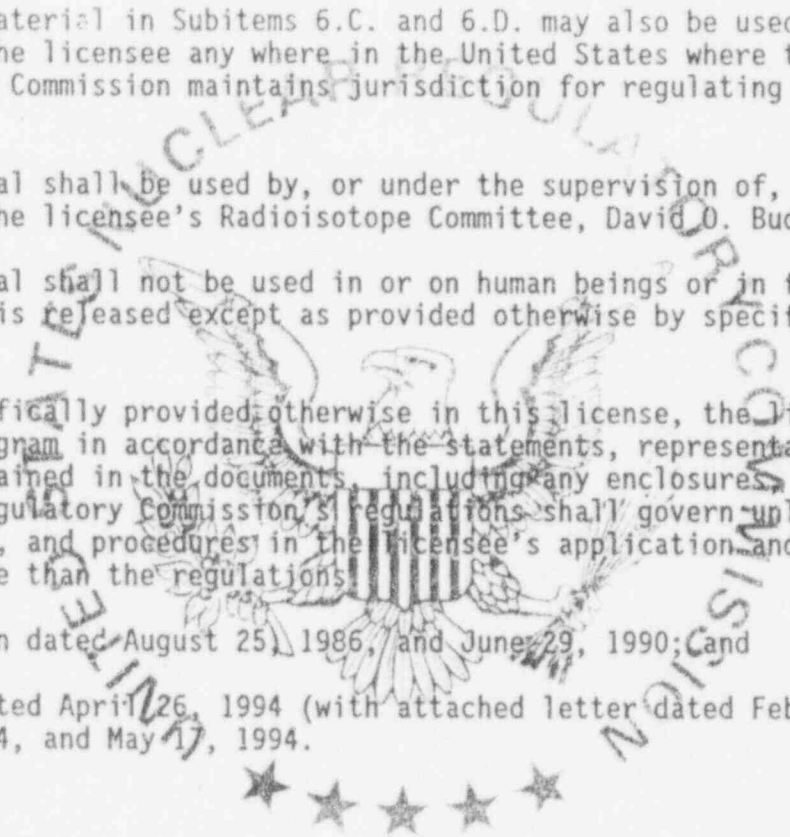
Docket or Reference number

040-08474

Amendment No. 05

CONDITIONS

- 10. A. Licensed material shall be used only at the licensee's facilities located at Alliance Research Center, 1562 Beeson Street, Alliance, Ohio.
- B. Licensed material in Subitems 6.C. and 6.D. may also be used at temporary job sites of the licensee any where in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.
- 11. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radioisotope Committee, David O. Budd, Chairman.
- 12. Licensed material shall not be used in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.
- 13. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
 - A. Application dated August 25, 1986, and June 29, 1990; and
 - B. Letters dated April 26, 1994 (with attached letter dated February 7, 1994), May 5, 1994, and May 17, 1994.



FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date JUN 01 1994

By Loren J. Hester
Materials Licensing Section, Region III

COPY

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 39, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

396970

<p>Licensee</p> <p>1. Babcock & Wilcox Alliance Research Center</p> <p>2. 1562 Beeson Street Alliance, OH 44601</p>	<p>In accordance with letter dated April 26, 1994</p> <p>3. License number SUB-1259 is amended in its entirety to read as follows:</p> <hr/> <p>4. Expiration date May 31, 1994</p> <hr/> <p>5. Docket or Reference No 040-08474</p>
---	--

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A. Uranium - depleted in uranium-235	A. Pellets in fuel rod clodding	A. 1820 kilograms
B. Uranium (Natural)	B. Pellets in fuel rod clodding	B. 1000 kilograms
C. Uranium (Natural)	C. Sealed sources (Amersham Model 188074)	C. Two sources not to exceed 0.23 microcuries per sources
D. Thorium (Natural)	D. Sealed sources (Amersham Model 188074)	D. Two sources not to exceed 0.17 microcuries per sources

9. Authorized Use:

A. and B. To be used for non-destructive testing of fuel rod assemblies and individual fuel rods.

C. and D. To be used in an Amersham KUTH field verifier.

COPY 2 ML 374 DH

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SUB-1259

Docket or Reference number

040-08474

Amendment No. 05

CONDITIONS

- 10. A. Licensed material shall be used only at the licensee's facilities located at Alliance Research Center, 1562 Beeson Street, Alliance, Ohio.
- B. Licensed material in Subitems 6.C. and 6.D. may also be used at temporary job sites of the licensee any where in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.
- 11. Licensed material shall be used by, or under the supervision of, individuals designated by the licensee's Radioisotope Committee, David O. Budd, Chairman.
- 12. Licensed material shall not be used in or on human beings or in field applications where activity is released except as provided otherwise by specific condition of this license.
- 13. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
 - A. Application dated August 25, 1986, and June 29, 1990; and
 - B. Letters dated April 26, 1994 (with attached letter dated February 7, 1994), May 5, 1994, and May 17, 1994.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date JUN 01 1994

By Loren J. Hester
Materials Licensing Section, Region III

COPY

(FOR LFMS USE)
INFORMATION FROM LTS

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

PROGRAM CODE: 11300
STATUS CODE: 2
FEE CATEGORY: 2C
EXP. DATE: 19940531
FEE COMMENTS:
DECOM FIN ASSUR RECD: Y
.....

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
APPLICANT/LICENSEE: BABCOCK & WILCOX COMPANY
RECEIVED DATE: 940517
DOCKET NO: 4008474
CONTROL NO.: 396970
LICENSE NO.: SUB-1259
ACTION TYPE: AMENDMENT

2. FEE ATTACHED
AMOUNT:
CHECK NO.: *-----

3. COMMENTS
* SEE CN# 396453-Void-
3L (2C) 450.00
230014888 SIGNED Deborah Hersey
DATE 5-19-94

B. LICENSE FEE MANAGEMENT BRANCH (CHECK WHEN MILESTONE 03 IS ENTERED) ✓

1. FEE CATEGORY AND AMOUNT: 2C \$450.00

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:
AMENDMENT ✓
RENEWAL _____
LICENSE _____

3. OTHER _____

SIGNED SC
DATE 6/1/94

1994 MAY 27 PM 12:07

RECEIVED

JUN 06 1994

REGION III



Babcock & Wilcox

a McDermott company

Research and Development Division

1562 Beeson Street
Alliance, OH 44601
(216) 821-9110

- Certified Mail -

April 26, 1994

Nuclear Regulatory Commission
Materials Licensing Section
801 Warrenville Road
Lisle, Illinois 60532-4351

Attn: Mr. Loren Hueter

Subj: Sealed Source and Licensed Material Individual Supervision Amendments to
Our Source Material License SUB-1259.

Dear Mr. Hueter:

In a letter dated February 7, 1994, we made a request to amend our existing By-Product Material License #34-03043-03. Our amendment request and fee payment of \$450 was assigned Control Number 396453.

During phone conversations on April 13th and April 25th, 1994, we informed you that we would like to switch our amendment request to our existing Source Material License SUB-1259. Please consider this letter our formal request for this amendment consideration.

In summary, we would like to purchase a sealed source which contains natural Thorium, Uranium and Potassium. Our letter of February 7, 1994 (copy attached) provides details on the radioactive isotopes and their activity. Our letter also offers suggested license amendment wording to allow our Research & Development Center the flexibility to bring in future sealed sources for testing purposes.

On a second matter, we request that SUB-1259 License Amendment Number 3, Condition eleven (11) be changed to reflect our new Radiological Safety Administrator (RSA). Mr. D.O. Budd will now supervise the use of licensed radioactive material at the Alliance Research Center. Our RSA will function under the direction of our Radioisotope Committee as did our previous RSA.

Log	May 20 III
Remitter	
Check No.	1230014888
Amount	\$450.00
Fee Category	2C
Type of Fee	Amendment
Date Check Rec'd	5/27/94
Date Completed	6/1/94
By:	AC

RECEIVED

MAY 2 1994

REGION III CONTROL NO. 396970

Page 2

In a phone conversation on April 25, 1994, Ms. Shirley Crutchfield of the NRC License Fee Branch indicated that the fee to amend our SUB-1259 license would be \$450. This fee (which has already been paid) would cover both the source material and licensed material individual supervision amendment requests. Ms. Crutchfield indicated that she would be informing your office of this fact.

As we have indicated to you, over the phone, we have greatly appreciated your assistance in the above matters. We look forward to receiving our requested amendments as soon as you can process them.

If any additional information is needed, please feel free to contact this writer at (216) 829-7808.

Sincerely,

THE BABCOCK & WILCOX COMPANY
Alliance Research Center



David Budd, R.S.
Environmental Administrator

mls
Attachment

CONTROL NO. 396970



Babcock & Wilcox

a McDermott company

Research and Development Division

Certified Mail

1562 Beeson Street
Alliance, OH 44601
(216) 821-9110

February 7, 1994

Nuclear Regulatory Commission
Materials Licensing Section
801 Warrenville Road
Lisle, Ill. 60532-4351

Attn: Mr. Loren Hueter

SUBJECT: Amendment To Our Existing Byproduct Material License
#34-03043-03 In Order To Procure A Sealed Source

Dear Mr. Hueter:

Please consider this letter our request to amend our existing Byproduct Material License in order that we may procure a new sealed source that would be outside of the limits of our existing NRC license. Our existing license allows the Alliance Research Center to possess radioactive material with atomic numbers 3 through 83, inclusive and several other specific sealed sources. Our license also limits each isotope activity to 100 uCi or less.

The sealed source which we wish to procure consists of the following primary radioactive isotopes and activity:

Natural Thorium (Th-232, Atomic #90) -	0.17 uCi
Natural Uranium (U-238, Atomic #92) -	0.23 uCi
Natural Potassium (K-40, Atomic #19) -	1.70 uCi

The activity of these isotopes are below the 100 uCi limit stipulated in our existing license. However, the Thorium and Uranium radionuclides are not covered within our license.

The sealed source which we would like to procure is a KUTH Field Verifier for Potassium (u), Uranium (U) and Thorium (Th) and is manufactured by Amersham Corporation (see attached specifications). The radioactive material is sealed within a resin matrix and contained in an aluminum housing.

We would like our license amended to be able to bring in this sealed source and other sources, up to 100 uCi of activity, for future research and development projects. We would like to have the wording in our amendment broadened so we can have the flexibility to procure future sources without the need to go through additional NRC license amendments. Our suggested license amendment wording would be as follows:

CONTROL NO. 396970

"Sealed sources, calibration sources and other source material which contain activities of any radionuclide, regardless of atomic number, which are at or below NRC regulation license exempt levels, subject to the existing activity limits of this license can be procured for utilization in research and development work"

Enclosed, please find a check for \$450.00 to cover the costs of processing this amendment.

If you should have any questions concerning our license amendment request, please feel free to contact this writer.

Sincerely,

The Babcock & Wilcox Company
Alliance Research Center

David O. Budd

David O. Budd, R.S.
Environmental Administrator

mls
Enclosure

cc: SEReed
LGRudolph
NGSandru
MLSweger

JUN 09 1994

Babcock & Wilcox Company
Alliance Research Center
ATTN: Mr. David O. Budd, R.S.
Radiological Safety
Administrator
1562 Beeson Street
Alliance, OH 44601

Dear Mr. Budd:

Enclosed is Amendment No. 05 to your NRC Material License No. SUB-1259 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office so that we can provide appropriate corrections and answers.

Please note that we did not list the small potassium-40 source on your license as it is natural occurring and as such we do not regulate it. Also, please note per our telecon on May 17, 1994, we have not amended Items 6, 7, 8 and 9 of your license to authorize the ambiguous request in your letter dated February 7, 1994. As we discussed, there is no need to address in a specific license those sources that are already addressed in the regulations by exemption or general license provisions. Further, our knowledge of the specific radionuclide(s) requested, form of the source (sealed or unsealed) and possession limits are necessary to evaluate such things as adequacy of facilities, equipment and procedures to safely handle the material, and to address decommissioning financial assurance requirements. For example, greater than 10 microcuries total of several radionuclides, such as plutonium-239 in an unsealed form requires a licensee to provide decommissioning financial assurance in the amount of \$150,000. Greater than 100 microcuries total of these same radionuclides requires not only financial assurance in the amount of \$750,000, but also a Funding Plan at the time of license renewal. Therefore, requests for material should be individually identified by radionuclides, source model number, if applicable, activity and intended use.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Unless your license has been terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

396970

JUN 09 1994

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Notify NRC, in writing, within 30 days when the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).
3. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license when you decide to terminate all activities involving materials authorized under the license.
4. Request and obtain a license amendment before you:
 - a. Change Radiation Safety Officers;
 - b. Order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;
 - c. Add or change the areas of use or address or addresses of use identified in the license application or on the license; or
 - d. Change ownership of your organization.
5. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and

JUN 09 1994

Babcock & Wilcox Company

-3-

Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C. Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Sincerely,

Original Signed By
Loren J. Hueter
Nuclear Materials Licensing Section

Enclosures:

1. NRC Form 313
2. Amendment No. 05

R111

LJH
Hueter/jaw
06/01/94



Babcock & Wilcox

a McDermott company

Research and Development Division

1562 Beeson Street
Alliance, OH 44601
(216) 821-9110

May 17, 1994

Mr. Loren Hueter
Nuclear Regulatory Commission
Materials Licensing Section
801 Warrenville Road
Lisle, Illinois 60532-4351

Subject: Information Request Pertaining To Our Sealed Source And
Licensed Material Individual Supervision Amendments To
Our Source Material License SUB-1259 - Control #396453

Dear Mr. Hueter:

During our May 17, 1994 phone conversation, you requested that I furnish you additional information concerning our above referenced source material license amendment requests. First, I will be sending you, along with this letter, copies of work experience resumes for Mr. Larry Rudolph, Mr. Kevin Andrews and myself. As you correctly indicated, we are the newest members of our Radiological Isotope Committee. For Mr. Rudolph and myself, our resumes contain on hands radiological program training given by Mr. Don Blair, our previous (retired) Radiological Safety Administrator.

On a second matter which you brought to my attention, we do intend to utilize the KUTH Field Verifier sealed source both on site and off site within the United States. Also, we would like to have the amendment indicate that we could possess a maximum of two (2) KUTH Field Verifiers at any one time.

We are in agreement that the amendment will need to be specific to the KUTH Field Verifier sealed sources to avoid triggering additional NRC program requirements at the Alliance Research Center.

It is my understanding that with this information you will be able to proceed with the processing of our amendment requests. Please contact me if any additional questions should arise.

Sincerely,

BABCOCK & WILCOX COMPANY
Alliance Research Center

David O. Budd

David O. Budd
Environmental Administrator

Enclosures
cc: L.G. Rudolph

RECEIVED

MAY 31 1994

REGION III

MAY 31 1994

David O. Budd
3397 Dawley Road
Ravenna, Ohio 44266

(216) 829-7808 (employer)
(216) 297-6507 (residence)

Environmental Program Professional with Experience in solid waste, hazardous waste, wastewater, Radiological, Air and Asbestos program fields.

Employment History

Babcock & Wilcox Company, Alliance Research Center, Safety, Environmental and Hygiene Department Environmental Administrator, 1993 to Present.

The Glidden Company, Environmental Affairs Corporate Department Environmental Specialist I, 1991 to 1993.

Ohio EPA, Division of Solid and Hazardous Waste Management Environmental Engineer II, 1985 to 1991.

Ohio EPA, Division of Water Pollution Control Environmental Scientist and Environmental Engineer I, 1979 to 1985.

Kent City Health Department, Environmentalist and Health Inspector, 1974 to 1979.

Specialized Training

January 13-17, 1986. Forty hour Hazardous Materials Incident Response Operations Training Course.

January 26, 1987. Four hour Occupational Respiratory Protection Training Course.

May 9, 1990. Eight hour OSHA Hazardous Materials Refresher Workshop.

July 7-9, 1993. Twenty-four hour Environmental Regulation Course.

August 9-13, 1993. Forty hour Radiation Safety Program Management Course.

August 17, 1993. Eight hour Hazardous Materials Transportation Course.

April 20-21, 1994. sixteen hour Hazardous Waste Management: The Complete Course.

* Personalized Radiological Training by D. H. Blair, RSA

March 30-31, 1993. Four hour Alliance Research Center NRC Licensing Requirements Overview.

April 1, 1993. Two hour Radioisotope Committee Functions Overview.

April 6, 1993. Three hour Decommissioning Funding Plan for the Alliance Research Center.

April 8, 1993. Three hour Radiological Swipe Sample Training utilizing the Eberline PAC-46 and GM detection meters.

May 11, 1993. Three hour Alliance Research Center Radiological Safety Manual review.

May 12-13, 1993. Five hour Radiological Detection Meter Calibration and Equipment Maintenance Training.

May 21, 1993. Two hour overview of the Principals of Radiation Covering Time, Distance and Shielding.

June 9, 1993. Three hour Training on How to Handle Radioactive Material Receipts: Swipe Samples and Data Log.

July 24, 1993. Two hour Training on Radioactive Material Shipments: Swipe Samples and Proper Packaging.

August 23, 1993. Two hour training on Room and Equipment Radioactive Material Usage Surveys.

September 6, 1993. Two hour Film Badge Distribution and Record Keeping Overview.

Education

Obtained a Bachelor of Science Degree in 1973 from Kent State University in the field of Conservation of Natural Resources.

Certifications/Registrations

Became a State of Ohio Registered Sanitarian in 1976 and have maintained said registration.

Have possessed a Class I Wastewater Works Certification since 1981 from the State of Ohio.

Larry G. Rudolph
1033 55th St. N.E.
N. Canton, Ohio 44721
(216) 829-7744 (employer)
(216) 497-2022 (residence)

Certified Safety Professional - Certificate Number 3394

Employment History

February 1993 - Present Manager, Safety, Environmental and Hygiene
Babcock & Wilcox
Research and Development Division
Alliance, Ohio

Responsible for the staff section that provides direction, guidance and management support on safety and environmental issues related to the Division employees, facilities, and projects.

January 1992 - January 1993 Consultant
Babcock & Wilcox
Nuclear Environmental Services
Apollo, PA

Wrote procedures and instructions for compliance with regulatory requirements. Conducted employee training on subjects related to the NRC, EPA, and OSHA.

November 1973 - November 1991 Supervisor, Safety and Environmental Affairs
Westinghouse Electric Corp.
Apparatus Service Division
Pittsburgh, PA

Provided safety and environmental support/ training and coordinated major issues with corporate legal and technical staffs for 35 Division plants that employed 6,500.

August 1970 - October 1973 Staff Assistant, Corporate Safety
Westinghouse Electric Corp.
Corporate Headquarters
Pittsburgh, PA

Audited facilities, assessed program activities and advised operations management. Assisted in administering the corporate safety program in support of all domestic Divisions that represented 100,000 employees.

August 1968 - July 1970 Safety Engineer
Westinghouse Electric Corp.
Steam Turbine Divisions
Philadelphia, PA

Implemented the safety program throughout the 8,500-employee plant complex.

Resume of LARRY G. RUDOLPH (continued)

* Specialized Radiological Training

- Conducted by D. H. Blair, Radiological Safety Administrator, Alliance Research Center
- Time, distance, and shielding principles; May 1993; 2 hours
- Detection, meter calibration, and equipment maintenance; May 1993; 5 hours
- Alliance Research Center Radiological Safety Manual review; May 1993; 3 hours
- Decommissioning Funding Plan review; April 1993; 3 hours
- Radioisotope Committee functions review; April 1993; 2 hours
- Alliance Research Center NRC licensing requirements overview; March 1993; 4 hours

Radiation Safety Training, B&W Nuclear Environmental Services Division;
January 1992; 4 hours. Conducted this course semi-monthly from January 1992 to
January 1993.

Other Training

- Hazardous Materials Transportation; McDermott; August 1993; 8 hours
- Hazmat Transportation Regulations; Coastal Communications; July 1993; 8 hours
- Hazardous Waste Operations & Emergency Response; J. A. Cocciardi Assoc.;
April 1992; 8 hours
- Advanced Environmental Management; Westinghouse; September 1991; 20 hours
- Title III / Media Training; Executive Television Workshop; September 1988; 16 hours
- RCRA Compliance; Westinghouse; September 1987; 16 hours
- Transportation of Hazardous Materials; Westinghouse; November 1981; 20 hours
- Hazardous Waste Control; Westinghouse; May 1981; 20 hours
- Recognition, Evaluation, and Control of Occupational Health Hazards; Industrial Hygiene
Foundation, Inc.; November 1976; 40 hours
- OSHA Compliance; Westinghouse; July 1973; 24 hours
- Accident Prevention for Manufacturing Management; Westinghouse;
January 1969; 40 hours

KEVIN J. ANDREWS

5485 Ashbrook Ave., N. E.
Louisville, OH 44641

(216) 456-0356

EDUCATION:

UNIVERSITY OF AKRON, Akron, OH
Master of Business Administration (MBA) - 1994

CLEVELAND STATE UNIVERSITY, Cleveland, OH
Bachelor of Electrical Engineering (B.E.E.) - 1985

LORAIN COUNTY COMMUNITY COLLEGE, Elyria, OH
Associate of Science (Pre-Professional Engineering) - 1982

EXPERIENCE:

BABCOCK & WILCOX COMPANY (11/87 to Present)
Alliance Research Center
Alliance, OH

Manager, Plant Engineering & Maintenance (10/93 to Present)

Responsible for management of Plant Engineering and Maintenance section (25 people) at a facility that covers more than 23 acres in total area. Responsible for development and administration of a \$2 million budget to run and maintain the physical facility and utility systems.

Assistant Plant Engineer, Plant Engineering (12/91 to 10/93)

Responsible for providing backup and assistance to Plant Engineer in the administration of his functions. Worked on developing budgets, making labor and utility usage forecasts, salary planning, and assisted in performance appraisals of Plant Engineering personnel. Design Engineer duties were maintained during this time.

Design Engineer, Plant Engineer (11/87 - 12/91)

Responsible for design and maintenance of electrical systems at the research facility. Designed power distribution systems from 4160V down to 120V. Designed lighting in both office and industrial areas. Developed cost estimates for system design and installation. Responsible for metering of test facility electric utility usage, performing PCB transformer inspections and maintaining records, and assisted in energy conservation efforts for the facility.

R.E. WARNER AND ASSOCIATES (3/86 to 11/87)
Westlake, OH

Project Engineer, Electrical Engineering Department

Responsible for design and drafting on a variety of projects in both commercial and industrial areas. Designed complete electrical distribution and lighting systems for 10,000 square foot office building. Worked on control and power distribution systems for steel companies in Michigan and Ohio. Responsible for developing cost estimates for installation of above mentioned systems.