030-31572

VOID SHEET

I (96)

Nov 7
31
122418

TO: License Fee Management Branch

FROM: Region I

SUBJECT: VOIDED APPLICATION

Control Number: 122418

Applicant: Professional Service Industries, Inc.

Date Voided: 4/10/96

Reason for Void: One-Time Extension of expiration date of certain byproduct, source and special nuclear material licenses by five years has been granted for License No. 20-28489-01 (030-31572). Before review.

M. A. Perkins 4/10/96
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

Final Review of VOID Completed:

✓ Refund Authorized and processed ($720)

No Refund Due

Fee Exempt or Fee Not Required

120071

Comments: License extended by rulemaking

Log completed

Processed by: RAS

OFFICIAL RECORD COPY

ML 10

OCT 17 1995

John T. Thornton
Radiation Safety Officer
Professional Service Industries, Inc.
905 Turnpike Street - Suite H
Canton, MA 02021

SUBJECT: LICENSE RENEWAL APPLICATION

Dear Mr. Thornton:

This is to acknowledge receipt of your application for renewal of materials(s) license identified below. 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 below.

Sincerely,

Original Signed By:
Cheryl K. Buracker

Sheryl Villar
Licensing Administrative Specialist
Division of Nuclear Materials Safety

License No. 20-28489-01
Docket No. 030-31572
Control No. 122418

DOCUMENT NAME: S:\PENDING\PROFSERV.DTL
To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI	N				
NAME	Brown/gxc		Villar					
DATE	10/17/95		10/17/95		10/ /95		10/ /95	

OFFICIAL RECORD COPY ML 10

PSI Environmental Geotechnical Construction
Consulting • Engineering • Testing

Corporate Office

October 11, 1995

030-31572

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, Pennsylvania 19406

Attention: Materials Licensing Section

Re: USNRC License No. 20-28489-01
License (Renewal) Application

Gentlemen:

Professional Service Industries, Inc. (PSI) requests renewal of USNRC Radioactive Materials License No. 20-28489-01 in accordance with the attached license (renewal) application. Please note that the attached license (renewal) application has been prepared in accordance with DRAFT REGULATORY GUIDE DG-0008, APPLICATIONS FOR THE USE OF SEALED SOURCES IN PORTABLE GAUGING DEVICES.

PSI requests that this license action be deemed "timely filed" to allow licensed activities to continue during the license renewal process.

A check in the amount of $720 is enclosed to cover the license renewal fee.

Your attention to this matter is appreciated. Should you have any questions, please contact me at 708/691-1490 (x 320).

Sincerely,

John T. Thornton
Radiation Safety Director

JTT/ACA
Attachment(s) - 5
cc: T. Bowker - Canton, MA
L. Titus - Worcester, MA
R. Burns - New Haven, CT
File

OFFICIAL RECORD COPY ML 10

122418
OCT 13 1995

Information To Build On

PSI Environmental Geotechnical Construction
Consulting • Engineering • Testing

Corporate Office

August 2, 1995

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, Pennsylvania 19406

Attention: Radioactive Materials Licensing

Re: USNRC RAM License No. 20-28489-01
Signatory Authorization

Gentlemen:

Mr. John T. Thornton and Mr. Adam Ackermann, who currently serve Professional Service Industries, Inc. (PSI) as Corporate Radiation Safety Director and Assistant Corporate Radiation Safety Director, respectively, are hereby authorized to sign license applications, amendment requests and compliance correspondence on behalf of Professional Service Industries, Inc. (PSI). All matters concerning Professional Service Industries, Inc. (PSI) radioactive materials licensing and/or compliance should be directed to Mr. Thornton or Mr. Ackermann.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

Michael Kesselmayer

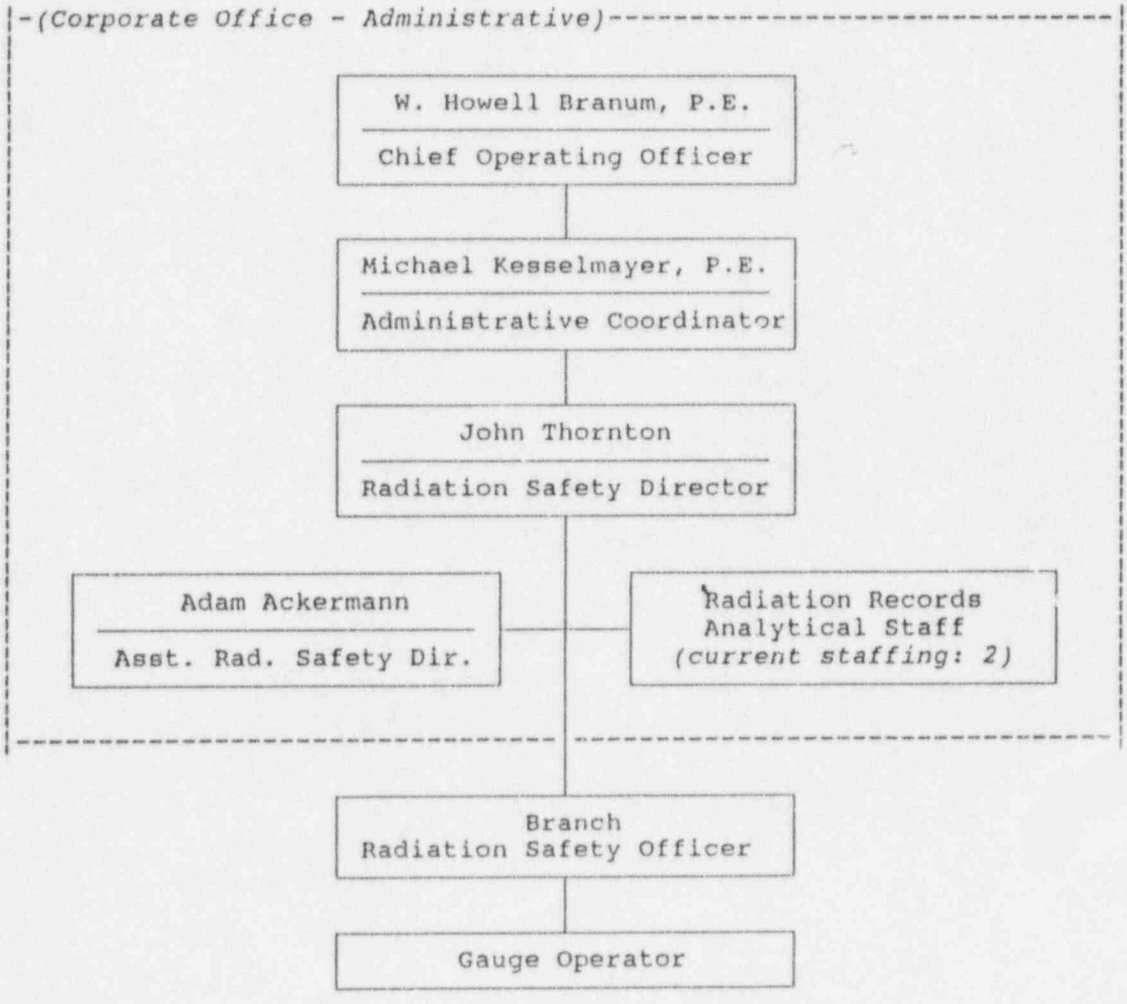
Michael Kesselmayer, P.E.
Administrative Coordinator

MSK/JTT

cc: File

PSI • 510 East 22nd Street • Lombard, IL 60148 • Phone 708/691-1490 • Fax 708/691-1498

PROFESSIONAL SERVICE INDUSTRIES, INC.
Radiation Safety Program Management
Organizational Structure



1/17/94

RESUME

John T. Thornton
1403 Colony Court
Lombard, Illinois 60148

CURRENT POSITION: Corporate Radiation Safety Director
Professional Service Industries, Inc., (Corporate Office)
Lombard, Illinois

PROFESSIONAL SERVICE INDUSTRIES, INC., LOMBARD, ILLINOIS: (6/88 to Present)

- Corporate Radiation Safety Director: Responsibilities include oversight and administration of corporate radiation safety program(s), maintenance of 75+ USNRC and Agreement State radioactive materials licenses and registrations, and training of radiation safety management personnel.

- Assistant Radiation Safety Director/Radiation Records Officer: Responsibilities include administration of corporate radiation safety program for 125+ Branch offices, maintenance of 75+ USNRC and Agreement State radioactive materials licenses, collection and maintenance of dosimetry records, supervision of corporate leak test program, support to Branch offices in satisfying transportation requirements, radioactive material inventory control and assisted Corporate RSO with emergency response.

HEALTH PHYSICS TRAINING:

Radiation Safety Training Course Northwestern University (10/26/92)	40 hrs.
Radiation Training Program (Spectrum Analyzer) SCIFEC Corporation (3/31/92)	8 hrs.
Radiation Safety Training Workshop University of Wisconsin - Madison (12/11/91)	20 hrs.
Radiation Safety Training (X-Ray Fluorescence) Princeton Gamma-Tech, Inc. (2/26/91)	8 hrs.
Radiation Safety Officer/Instructor Training Professional Service Industries, Inc. (11/6/90)	16 hrs.
Radiation Safety Training (Industrial Radiography) MQS Training Group (3/2/90)	40 hrs.
Radiation Safety Training and Management Stan A. Huber Consultants, Inc. (10/21/88)	16 hrs.
Moisture/Density Gauge Operator Training Troxler Electronic Laboratories, Inc. (6/3/88)	8 hrs.

Adam C. Ackermann
1290-A Pleasant Avenue
Glendale Heights, Il. 60139
708/545-0572

PROFESSIONAL EXPERIENCE

09DEC92 to present — Assistant Radiation Safety Director
Professional Service Industries, Inc.
Assist in the administration of a radiation safety program for over 125 offices, maintenance of over 75 radioactive materials licenses (USNRC and Agreement State), and records pursuant to PSI's corporate radiation safety program. Provide assistance to offices in emergency response as well as daily operations.

06JUL90 to 08OCT92 — Naval Nuclear Power Plant Staff Instructor
Idaho National Engineering Laboratories (INEL)
A1W Nuclear Power Plant

15OCT90 to 08OCT92 — Radiological Control Point Access Watch
Idaho National Engineering Laboratories (INEL)
A1W Nuclear Power Plant

11DEC91 to 08OCT92 — Environmental Monitor
Idaho National Engineering Laboratories (INEL)
A1W Nuclear Power Plant

EDUCATION & TRAINING

28NOV94 to 02DEC94 — Radiation Safety Training (Industrial Radiography)
MQS Training Group

15APR93 — Moisture/Density Gauge Radiation Safety Officer/Instructor
Professional Service Industries, Inc.
16 hour course

18DEC92 — Moisture/Density Gauge Operator
Professional Service Industries, Inc.

27APR91 to 17MAY91 — Prototype Radiological Controls Maintenance
Idaho National Engineering Laboratories (INEL)

08JAN90 to 05JUN90 — Naval Nuclear Prototype Operations
Idaho National Engineering Laboratories (INEL)

03JUL89 to 21DEC89 — Naval Nuclear Power School
Naval Training Station Orlando

AFFILIATIONS

04MAY94 to present — Active member of Illinois Emergency Services & Disaster Agency (ESDA)

MISC

Approved as Assistant Corporate Radiation Safety Director on several USNRC and Agreement State licenses including Texas Radioactive Materials License No. L00931.

APPENDIX A

NRC FORM 313 (10-94)
10 CFR 30, 32, 33
34, 35, 36, 39 and 40

U. S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIAL LICENSE

APPROVED BY OMB: NO. 3150-0120
EXPIRES 6-30-96

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 9 HOURS. SUBMITTAL OF THE APPLICATION IS NECESSARY TO DETERMINE THAT THE APPLICANT IS QUALIFIED AND THAT ADEQUATE PROCEDURES EXIST TO PROTECT THE PUBLIC HEALTH AND SAFETY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0120), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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. 030-31592

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

DIVISION OF INDUSTRIAL AND MEDICAL NUCLEAR SAFETY
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

LICENSING ASSISTANT SECTION
NUCLEAR MATERIALS SAFETY BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION II
101 MARIETTA STREET, NW, SUITE 2900
ATLANTA, GA 30323-0199

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
801 WARRENVILLE RD.
LISLE, IL 60532-4351

X

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING, SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING SECTION
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TX 76011-8064

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 JURISDICTIONS.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*
   - [ ] A. NEW LICENSE
   - [ ] B. AMENDMENT TO LICENSE NUMBER _____
   - [X] C. RENEWAL OF LICENSE NUMBER 20-28489-01

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include Zip code)*

Professional Service Industries, Inc.
905 Turnpike Street, Suite H
Canton, Massachusetts 02021

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED

(Please see attachments.)

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

John T. Thornton

TELEPHONE NUMBER

708/691-1490 (x 320)

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 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 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 3.P.
    AMOUNT ENCLOSED $ 720.00

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, 36, 39 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.

CERTIFYING OFFICER – TYPED/PRINTED NAME AND TITLE
John T. Thornton, Radiation Safety Director

SIGNATURE John T. Thornton

DATE 10/11/95

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED	CHECK NUMBER	COMMENTS
			$		
APPROVED BY				DATE	

NRC FORM 313 (10-94)

PRINTED ON RECYCLED PAPER

122418

ATTACHMENT TO NRC FORM 313 (10-94)
PAGE ONE

3. Licensed material shall be stored at the following (permanent) locations:

PSI
905 Turnpike Street
Suite H
Canton, MA

PSI
1200 Millbury Street
Suite 7D
Worcester, MA

Licensed material may also be stored at temporary job sites throughout the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction.

5. The licensed (radioactive) material to be possessed is as follows:

Element & mass #	Chemical/physical form	No single source to exceed
Cesium-137	Sealed sources registered either with NRC under 10 CFR 32.210 or with an Agreement State and incorporated in a compatible portable gauging device as specified in Item 6.	11 millicuries
Americium-241	Sealed sources registered either with NRC under 10 CFR 32.210 or with an Agreement State and incorporated in a compatible portable gauging device as specified in Item 6.	300 millicuries
POSSESSION LIMIT COMMITMENT: The number of source/device combinations shall be limited so as not to exceed the quantities of byproduct material specified in 10 CFR 30.35(d) requiring financial assurance for decommissioning.		

6. The material listed in Item 5. of this application shall be used in compatible portable gauging devices for the measurement of moisture, density or asphalt content of construction materials as appropriate for the individual device(s). Measurements at depths exceeding three (3) feet are not anticipated.

7. The Radiation Safety Officer (RSO) for the license shall be Mr. Robert Burns. Mr. Burn's qualifications are as follows (please reference the last paragraph of Item 8.2 on page 16 in DG-0008):

Education:	A.S. degree, Business Administration, Champlain College
Experience:	Approximately fifteen and one half (15.5) years of experience with the management of moisture/density gauge radiation safety programs.
Instruction Materials:	Please refer to Item 8 for a description of the training materials used in the PSI "in-house" moisture/density gauge operator training program, including a description of materials were prepared by highly qualified individuals (PSI's Corporate Radiation Safety Director).
Evaluation of Exams:	Moisture/density gauge operator exams are not graded by the RSO/Instructor. All such exams are graded by PSI's Corporate Radiation Safety Department under the direction of Corporate Radiation Safety Director.
Training:	The RSO/Instructor shall be certified as a moisture/density gauge operator, and complete PSI's sixteen hour training course for moisture/density gauge RSO/Instructors.
Evidence:	Copies of the RSO/Instructor's current resume and training certificates are attached.
Duties & Responsibilities	A statement describing the duties and responsibilities of the RSO/Instructor is attached.

8. A description of training provided to individual moisture/density gauge users is attached.

9. All facilities listed in Item 3. currently exist. None of the facilities are private residences. Attached is a description of the PSI facilities and equipment for the storage and security of licensed material.

10. Attached is a description of PSI's radiation safety program.

11. Attached is a statement regarding waste disposal.

(SAMPLE)

DUTIES & RESPONSIBILITIES OF THE RADIATION SAFETY OFFICER 06/95

The Radiation Safety Officer (RSO) is responsible for implementing the radiation safety program and ensuring that radiation safety activities are performed in accordance with approved procedures and regulatory requirements.

The RSO's duties and responsibilities include ensuring that:

1. licensed material possessed by the licensee is limited to the kinds (e.g., cesium-137 as a sealed source) and quantities of byproduct material listed on the license;

2. individuals using gauges: are properly trained; receive refresher training at least annually to include a review of operating and emergency procedures and Department of Transportation (DOT) requirements; and are designated by the RSO;

3. personnel monitoring devices are used if required;

4. gauges are properly secured against unauthorized removal at all times when gauges are not in use;

5. appropriate persons are notified in case of accident, damage to gauges, fire, or theft;

6. all incidents, accidents, and personnel exposure to radiation in excess of regulatory limits are reported to the appropriate persons;

7. results of audits and inspections and corrective actions are documented and maintained on file, copies provided to management for review;

8. licensed material is transported in accordance with all applicable DOT requirements;

9. he/she has up-to-date copies of NRC's regulations, reviews new or amended NRC regulations, and complies with NRC regulations;

10. the appropriate person(s) is/are notified whenever there are changes in: licensed activities, responsible individuals, or information or commitments provided to NRC in the licensing process so that appropriate license action may be initiated.

Radiation Safety Program Management
Qualifications Summary

10/11/95

Name: Robert L. Burns

Title: Senior Vice President

Current Position:	Senior Vice President
Number of Years:	7 years
College Degree(s):	Business Administration (Associate Degree)
Professional Affiliation(s):	ACIL, ASQC
Number of Years with PSI:	7 years
Number of offices managed:	10 offices
Number years experience with Radiation Safety Program:	15.5 years
Additional comments:	Mr. Burns served as Radiation Safety Manager (responsible for four industrial radiography Radiation Safety Supervisors) for Conam, a division of Nuclear Energy Services, Inc. Mr. Burns has also completed the Conam Radiation Safety Course.

ROBERT L. BURNS

PROFESSIONAL SERVICE INDUSTRIES, INC.

EDUCATION:

Business Administration - Champlain College, Burlington, Vermont

EMPLOYMENT HISTORY

Professional Service Industries, inc.
New Haven, Connecticut

1992 to Present - Senior Vice-President
Duties expanded to include New York State offices. Services include asbestos as well as maintaining the core business. Expansion of environmental and engineering. Twenty-eight cost centers in seventeen locations. One additional acquisition.

1988 to Present - Vice-President
Manage all aspects of the company's business in New England with an emphasis on expansion thru internal growth and acquistion. Key role in sales and marketing. Successful merger of five acquistions in the period. Growth from three offices and three special projects to fourteen offices and twenty-three cost centers.

ERCI, Inc.
Fairfax, Virginia

1986 to 1988 - Director - Northeast Operations
Started northeast operation for the company. The New London, Connecticut office was responsible for QA/QC support to the nuclear industry. Marketing/sales and facility management.

NUCLEAR ENERGY SERVICES
Danbury, Connecticut

1980 to 1986 - Vice-President - Technical Services
Initially hired as Group Manager of Construction Inspection. Promoted to General Manager of Quality Assurance Services. Supervised over 150 personnel at six locations providing NDT, QA and QC services. In 1982 promoted to Vice-President of NES Division. In 1983 founded the Plant Betterment Services Business Unit. In 1984 Staff Augmentation Services was conceived and begun. Responsible for all profit and loss activities, sales and marketing.

Professional Service Industries

Resume of Robert L. Burns
Page Two

Schneider, Inc.
Pittsburgh, Pennsylvania

1977 to 1980 - Project Quality Assurance Manager
Assigned to Rochester Gas & Electric GINNA Station Nuclear Plant. Developed a Quality Assurance program and implementing procedures to meet ANSI and NRC requirements. Directed the QA/QC Department in vendor survey and qualification, procedure review and approval, receipt, in-process and final inspection of piping and structural modifications. Additional assignment as Corporate QA Manager for projects at Beaver Valley, Nine Mile Point and Limerick.

General Dynamics
Electric Boat Division

1974 to 1977 - Supervisor Quality Assurance Engineering
S8G Site, W. Milton, New York. Prepare for and participate in ASME Survey. Vendor surveys; source inspections; structural fabrication; welding materials; personnel qualifications, process control.

Shippingport, Pennsylvania. ASME survey; program development; training; vendor control. Set up and supervised multi-shift mechanical/electrical inspection.

Groton, Connecticut. Various QA Engineering assignments.

CNY Fasteners
Liverpool, New York

1973 to 1974 - Sales Engineer
Commissioned sales to industry and the construction trade of stapling and nailing systems and equipment.

Coleco Industries, Inc.
Amsterdam and Gloversville, New York

1970 to 1973 - Plant Manager
Responsible for controlling all phases of plant operations; hire and fire; warehousing; moving, setting up, and operating manufacturing and pack-out facilities. Establish attendant QC, production control, and standards systems.

Shelburne Industries, Inc.
Shelburne, Vermont

1965 to 1970 - Assistant Plant Manager
Responsible for cost estimating, manufacturing methods, tooling, and plant operation. Set up QC program: tool inspection, first piece and in-process inspection and equipment calibration. Additional assignments for purchasing, budgets and manpower. Sales/marketing to expand customer base.

For the several years prior to 1965, held positions with National Cash Register Co. and GE Company in cost estimating, accounting and sales.

PROFESSIONAL/TECHNICAL SOCIETIES:

American Nuclear Society
American Society for Quality Control

Professional Service Industries, Inc.

RADIATION SAFETY TRAINING PROGRAM

FOR

RADIATION SAFETY OFFICERS

FOR

MOISTURE DENSITY GAUGES

THIS IS TO CERTIFY THAT

ROBERT L. BURNS

Has Successfully Completed the Approved Corporate Radiation Safety Training Program for Radiation Safety Officers/Instructors.

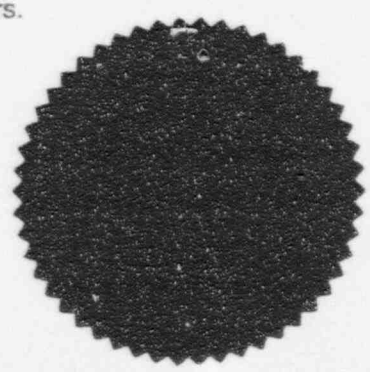
Subjects included in the course were as follows:

REGULATIONS:

1. Security and Control
2. License Conditions
3. Records
4. Transportation
5. Personnel Training

RADIATION SAFETY

1. Principles of Radiation Safety
2. Radiation Dosage Calculations
3. Radiation Detection and Measurement
4. Biological Effects
5. Emergency Procedures



Corporate Radiation Safety Director

11/06/90
Date

•(SAMPLE)

PSI TRAINING PROGRAM FOR MOISTURE/DENSITY GAUGE OPERATORS 06/95

Licensed material shall be used only by individuals who have received specific training in the use of the device and who have successfully completed the manufacturer's training course or PSI's "in-house" radiation safety training program. Radiation safety training and equipment instruction is provided to trainees at the Branch office using training materials (notes, slides, etc.) prepared by PSI's Corporate Radiation Safety Director, and the exam is administered by the Branch RSO. Once completed, the exam is sent to the Corporate Radiation Safety Department for grading. Upon successful completion, a certificate is issued from the Corporate Radiation Safety Department in the operator's name.

- Trainees will receive five (5) to six (6) hours of formal ("classroom") radiation safety training provided by a PSI certified RSO/Instructor. (An outline of required topics is attached. Specific times per topic may vary depending on particular trainee needs.)

- Trainees will receive two and a half (2½) hours of equipment ("hands-on") instruction which shall, at a minimum, include the following:

  - Proper storage and removal procedures.

  - Transportation and transportation security requirements.

  - Security and control of the gauge while in use, including restrictions for members of the public.

  - Device/transportation case maintenance, including charging, cleaning, leak testing, etc.

- A written, closed book exam of no less than fifty (50) questions shall be administered at the end of the training. A minimum score of 80% is required to pass. A sample exam is attached.

- Course Instructors shall have successfully completed PSI's Moisture/Density Gauge RSO/Instructor training program.

(SAMPLE)

TOPICS FOR GAUGE OPERATOR CLASSROOM TRAINING

06/95

The following is a list of topics to be covered in the five (5) to six (6) hours of formal "classroom" radiation safety training provided to moisture/density gauge trainees by the RSO/Instructor. Specific times per topic should be varied to meet the needs of the individual trainee(s).

- General
  - Definitions
  - History of Radiation
  - Atomic Structure
  - Types of Radiation
- Moisture/Density Gauge Materials
  - "Normal Form"
  - "Special Form"
  - Gamma (Cesium-137)
  - Neutron (Americium-241:Be)
- Reduction of Radiation Exposure
  - Time
  - Distance
    - Divergence
    - Inverse-Square Law
  - Shielding
    - For Gamma Sources
    - For Neutron Sources
  - ALARA
    - Philosophy
    - PSI Policy
- Operator Responsibilities
  - Safety
  - Regulatory Compliance
  - PSI Procedure Compliance
  - Disciplinary Action
- Emergency Response
  - Loss
  - Accident
  - Hazards
  - Immediate Actions
  - The Human Factor
  - Case Histories
- Regulatory Control
  - Government Agencies
    - USNRC
    - Agreement States
    - USDOT
  - "Byproduct Material"
  - Regulations
    - 10 CFR 19 or State Equivalent
    - 10 CFR 20 or State Equivalent
    - 10 CFR 30 or State Equivalent
    - 10 CFR 71 or State Equivalent
  - Occupational Exposure Limits
  - Personnel Monitoring
  - License Authorizations
    - Materials
    - Storage
    - Use
    - Specific Conditions
    - Commitments
  - Reciprocity
  - Radiation Area
  - Restricted/Unrestricted Areas
  - Posting of Signs
  - Sealed Source Leak Testing
    - Requirements
    - Sample Collection
  - Security
    - In Storage
    - In Use
  - Transportation
    - Packaging
      - "Type A Package"
    - Radiation Limits
    - Marking
    - Labelling
  - Paperwork
  - Transport
  - Shipping
- Records & Documentation
- Operations
  - Safety
  - Supervision
  - Use of Equipment
  - Records

(SAMPLE)

PROFESSIONAL SERVICE INDUSTRIES, INC.
MOISTURE/DENSITY GAUGE OPERATOR RADIATION SAFETY TEST

FULL NAME: KEY (PLEASE PRINT) DATE: / /

SOCIAL SECURITY NO: - - D.O.B.

OFFICE (CITY and NO.): ( ) SEX:

145 pts total
116 pts to pass (80%)

CLOSED-BOOK FORMAT

Please print legibly. Be specific and give as much detail as possible.

1. Describe radiation in general terms:

3pts Spontaneous emmission of energy from the nuclei of unstable material or the interaction of electrons "orbiting" the nuclei.

2. What are the two major categories of ionizing radiation?

2pts Particulate (1pt) and electromagnetic (1pt)

2pts 3. True or (False:) Man can detect ionizing radiation with his senses.

4. What are the three (3) basic ways to reduce exposure to radiation?

A. Time

3pts B. Distance

C. Shielding

5. What are the two most common radioisotopes installed in moisture/density gauges?

2pts Cesium 137 (Cs-137) (1pt) & Americium 241 (AM-241) (1pt)

6. What are the two types of radiation emitted from the radioactive sources installed in moisture/density gauges?

2pts Gamma (photon) (1pt) and neutron (1pt)

7. Define the term "Half-Life" in general terms as it relates to the decay of radioactive materials?

Amount of time required for one half of the unstable atoms to decay to stable form.

3pts

8. Radioactivity is measured in what units?

Curies (or Becquerels)

2pts

9. What does the term "REM" stand for and what does it represent?

2pts 1—0 2pts

Roentgen Equivelant Man: Measure of the biological damage caused by radiation dose to animal tissue.

4pts

10. Define the prefix "*milli*" (as it applies to "*milli*curie" and "*milli*rem").

1/1000 <— or —> 1000 mCi = 1 Ci, 1000 mRem = 1 Rem

2pts

11. What is the annual whole body exposure limit for adult radiation workers in Rem and ***milli*rem**, as set by the Nuclear Regulatory Commission. **(WATCH UNITS)**

2pts

1pt: 5 rem = 1pt: 5000 millirem

12. What does the acronym "ALARA" stand for and what does it pertain to?

1pt: Keeping radiation exposure - 2pts: As Low As Reasonably Achievable

3pts

13. Which of the following areas of the body is the least sensitive to the effects of ionizing radiation?

a. bone and other blood forming organs
b. reproductive organs (gonads)
(c.) feet and hands (extremities)
d. eyes

2pts

14. (True) or False: Personnel dosimetry (i.e., film badge, TLD, etc.) is required for all individuals who will receive or are likely to receive 10% of the annual occupational exposure limits, or who are not specifically exempted by submittal or license condition.

2pts

15. A film badge measures which of the following:

a. dosage rate
(b.) accumulated dose

2pts

16. Which of the following actions contribute to false readings of a film badge? (Choose all that apply.)

(a.) heat
(b.) direct sunlight
c. cold
(d.) color television radiation and/or microwave ovens
(e.) getting badge wet
(f.) storing badge with or near radiation sources (gauge)

5pts

17. At what intervals are sealed sources leak tested?

2pts 1pt
At intervals not to exceed six months or when suspicion warrants.

3pts

2pts 18. True or (False): A radiation source installed in a moisture/density gauge emits radiation only when the gauge is turned on.

19. Circle answer: Radiation levels emitted from a moisture/density gauge will ((increase) - decrease) when the source rod is protracted (moved out of the fully retracted position).

2pts

20. If the *encapsulated* source installed in a gauge should come in direct contact with your hand or the ground, you will have:

a. radioactive contamination on your hand or the ground
(b.) radiation exposure to your hand
c. both a and b
d. none of the above

2pts

21. (True) or False: A gauge operator is required to maintain "constant surveillance and immediate control" of a gauge at all times when not secured in storage or during transport.

2pts

22. Which of the following documents are you required to have with you at all times when using or transporting a gauge? (Choose all that apply.)

5 pts

(a) copy of last leak test certificate
(b) copy of complete license
c. bill of lading
(d) "In Event of an Accident" sheet
(e) certification card
(f) completed "Shippers Declaration of Dangerous Goods" form

23. As a general rule, at what distance from the gauge should all unauthorized persons be kept at all times when the gauge is in operation?

2 pts

15 feet

24. Indicate the manner in which moisture/density gauges are required to be "packaged" and secured for transportation in the following vehicles:

5 pts

Pick-Up Truck: ½ pt In "Type A" package, ½ pt source rod & case locked, ½ pt package secured, ½ pt and locked in right rear

Passenger Car: ½ pt In "Type A" package, ½ pt source rod & case locked, ½ pt package secured, ½ pt and locked in right rear or trunk.

25. How often should the sliding shield on a moisture/density gauge be cleaned and lubricated? Once a week - more if necessary

2 pts

2 pts ∅ pts

2 pts 26. True or (False): A gauge may be stored at an individual's residence or in a hotel room.

2 pts 27. True or (False): The electronic components of a gauge may be removed or disassembled in the field.

2 pts 28. True or (False): A gauge may be transported without the shipping case.

2 pts 29. True or (False): A gauge may be left unattended at the job site as long as it is not in use.

2 pts 30. True or (False): A gauge transported in a personal vehicle is exempt from the Department of Transportation (DOT) requirements.

2 pts 31. (True) or False: A gauge may be stored overnight at a job site so long as it is secured within a job site trailer.

2pts 32. True or (False): A job site safety foreman is responsible for the security of all gauge(s) while at the job site.

2pts 33. True or (False): A completed "Shipper's Declaration for Dangerous Goods" form does not have to accompany each gauge while being transported.

2pts 34. True or (False): A gauge damaged in an incident may be immediately removed from the site to allow for the continuance of site work.

2pts 35. (True) or False: During transportation, each gauge must be "triple-locked"

2pts 36. (True) or False: Most common substances are slightly radioactive to some degree.

MATCHING: Write the letter of the respective passage on the right in the space next to the corresponding term.

2pts 37. F REM

2pts 38. I Agreement State

2pts 39. J license ("RAM")

2pts 40. H ionizing radiation

2pts 41. C sealed source

2pts 42. B curie

2pts 43. A 

2pts 44. E radioactive material

2pts 45. G photon

2pts 46. D atom

A. The symbol to denote radiation

B. 3.7×10^{10} disintegrations per second

C. Encapsulated ("special form") radioactive material

D. The smallest unit of an element, comprised of a nucleus and orbital electron(s)

E. An unstable substance that decays by emitting radiation

F. A unit of estimated biological effect (damage) that radiation has on tissue

G. A "bundle" of electromagnetic energy

H. High energy electromagnetic radiation capable of damaging biological tissue

I. A type of regulatory agency that regulates radiation within a specific state

J. A document that authorizes the possession and use of radioactive material

Answer the following questions in detail.

47. Explain how to dry out a moisture/density gauge if moisture builds up internally.

5 pts

1 Return gauge to storage location. 2 pts

2 Remove scalar unit. 1 pt

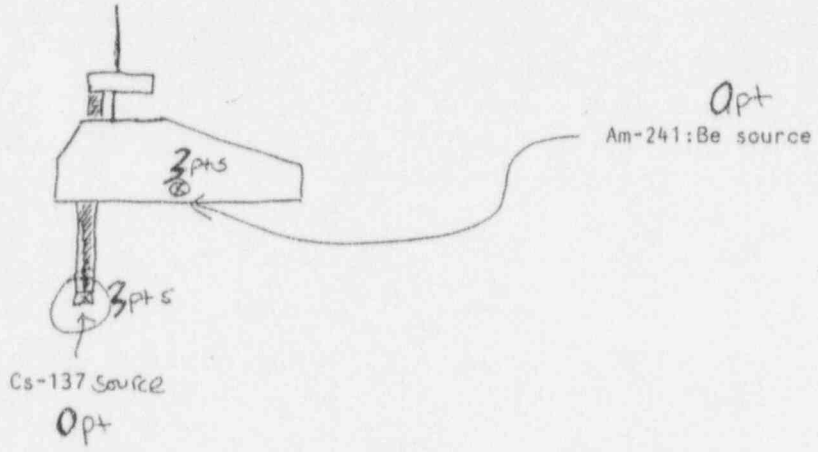
3 Charge overnight (or use hair dryer). 2 pts

48. Explain where the Information Pouch should be kept when transporting and using a gauge.

During Transportation: In plain view, in reach of driver. 2 pts

4 pts During usage: On person. 2 pts

49. Dra a sketch of a gauge and indicate where the radioactive source(s) is/are.



6 pts

50. Scenario: A moisture/density gauge you are using is stolen. Explain in detailed steps what should be done.

1 Immediately notify job site foreman. 2pts

2 Immediately contact Branch RSO, ARSO or others on "In Event of an Accident" form. 2pts

3 Remain on site to assist in search and recovery efforts. 1pt

6pts 4 Prepare a written statement. 1pt

51. Scenario: A moisture/density gauge you are using is run over and crushed. Explain in detailed steps what should be done in this type of accident.

1 Stop all operations in the area of the gauge, stop and isolate all vehicles and equipment involved in the accident. 2pts

7pts 2 Establish a 15' radius boundary - restrict access to PSI RSO, ARSO & emergency medical personnel only. 2pts

3 Stay with the gauge. 1pt

4 Immediately send someone else to notify RSO or others on "In Event of an Accident" form. 2pts

52. Describe in detail the security and control provision for moisture/density gauges in storage, during transport and during use.

In storage: Source rod locked (1pt), case locked (1pt), storage enclosure locked (1pt).

9pts During transport: Source rod locked (1pt), case locked (1pt), package secured and locked in right rear of vehicle (1pt).

During use: Immediate control and constant surveillance. 1pt 1pt

Professional Service Industries, Inc.
Training Confirmation Form

To: Corporate Radiation Safety Officer (CRSO)

I, _____,:
(PRINT FULL LEGAL NAME)

- have viewed and completed "The Story of Radiation" video and corresponding study guide (copies available from the Corporate Radiation Safety Department),
- have read and fully understand the training section of the PSI Moisture/Density Gauge Manual (S.O.P. SF-9),
- have had all of my questions regarding the PSI moisture/density gauge program answered to my satisfaction,
- do hereby affirm that I will comply with all PSI procedures and regulations pertaining to the use of moisture/density gauges,
- understand that I may consult with my Branch Radiation Safety Officer (BRSO) or PSI's Corporate Radiation Safety Officer (CRSO) concerning any questions I may have.
- do hereby affirm that the information provided on this form is complete and true to the best of my knowledge.

Date	Type of instruction	No. of hours provided	Trainee Initial	RSO Initial
	Radiation Safety Instruction (2 1/2 hours required)	≥ 2½ hrs		
	Operating Procedures Instruction (2 1/2 hours required)	≥ 2½ hrs		
	Exam	Not Applicable		

All blocks complete

_____ _____
(TRAINEE SIGNATURE) (DATE)

Trainee's film badge should be assigned to: _____
(OFFICE [CITY])

_____ _____
(BRSO SIGNATURE) (DATE)

(SAMPLE)

RSO/INSTRUCTOR TRAINING PROGRAM

06/95

The PSI Moisture/Density Gauge RSO/Instructor training program is a sixteen (16) hour course consisting of a combination of self-study material and formal "classroom" instruction. The self-study portion combines text and videotape information prepared by the Corporate Radiation Safety Director and is estimated to require a minimum of eight hours for completion. The "classroom" portion utilizes materials prepared by the Corporate Radiation Safety Director and is presented under the direct supervision of either the Corporate Radiation Safety Director or the Assistant Radiation Safety Director.

The prerequisites for the Moisture/Density Gauge RSO/Instructor training program are as follows:

- A degree in Engineering or Science, or equivalent.
- Certification as a moisture/density gauge operator, either by the manufacturer or through PSI's "in-house" training program.
- At least one week of experience in the use of moisture/density gauges.

At the end of the training program, a minimum 50 question test is administered with a minimum passing grade of 80%. The exams are evaluated by the Corporate Radiation Safety Director or the Assistant Radiation Safety Director.

Upon successful completion of the program, a certificate will be issued to the RSO/Instructor by the Corporate Radiation Safety Director.

An outline of the topics covered during the program is attached, including an approximate timetable for the "classroom" portion. (A [sample] test with answers is attached.)

(SAMPLE)

COURSE SCHEDULE

Radiation Safety Officers Training
(Portable Moisture/Density Gauges)

8:00 AM — Welcome and Introductions

8:30 AM — Introduction to Radiation
- Definition of Terms
- Periodic Properties of Elements
- Early Models of Atomic Structure
- Bohr Atom
- Isotopes
- Environmental Radiation
  - Cosmic
  - Terrestrial
- Man-made Radiation
- Consumer Products

9:00 — Types of Radiation
- X-Rays
- Alpha
- Beta
- Gamma
- Neutron

9:30 — Radioactive Material Sealed Sources
- "Normal Form"
- "Special Form"
- Gamma
  - Radium-226
  - Cesium-137
- Neutron
  - Radium/Beryllium
  - Americium/Beryllium

9:45 — BREAK

10:00 — Radiation Interactions
- Radioactive Decay
- Half-Life
- Attenuation
- Ionization
- Units of Measurement
- Detection
  - Survey Meter
  - Dosimeter

10:30 Radiation Exposure
- Units
- Dose & Dose Rates
- Biological Effects & Hazards
  - Contamination
  - Exposure
  - Internal Hazards
    - Biological Half-Life
    - Effective Half-Life
  - External Hazards
  - Prompt Effects
    - Radiation Injury
    - Acute Exposure
  - Delayed Effects
    - Cancer
    - Genetic Defects
  - Exposure of Pregnant Women
  - Occupational Exposure
- Risk vs. Benefit

12:00 NOON LUNCH

1:00 PM Reduction of Radiation Exposure
- Time
- Distance
  - Divergence
  - Inverse-Square Law
- Shielding
  - Materials
    - For Gamma Sources
    - For Neutron Sources
  - Half-Value Layer
- ALARA - Philosophy & Application

1:30 Regulatory Control
- Governmental Agencies
  - U.S. Nuclear Regulatory Commission
  - Agreement States Program
  - U.S. Department of Transportation
- Byproduct Material
- Regulations
  - "Notices, Instructions and Reports to Workers"
  - "Standards for Protection Against Radiation"
  - "Rules of General Applicability to Domestic Licensing..."
  - "Packaging of Radioactive Material for Transport..."
- Occupational Exposure Limits
- Personnel Monitoring

Regulatory Control (continued)
- License Authorizations
  - Materials
    - Transfer
    - Inventory
  - Storage
  - Use
  - Personnel
  - Service
  - Commitments
- Reciprocity
- Radiation Area
- Restricted/Unrestricted Areas
- Posting of Signs
- Sealed Source Leak Testing
  - Requirements
  - Sample Collection
- Security
  - In Storage
  - In Use
- Transportation
  - Packaging
    - "Type-A Package"
    - Radiation Limits
    - Marking
    - Labeling
  - Paperwork
  - Transport
  - Shipping
- Records & Documentation
- Operations
  - Safety
  - Supervision
  - Use of Equipment
  - Records
- Governmental Inspections

2:45 BREAK

3:00 Occupational Responsibilities
- Individual Users
- Radiation Safety Officer
- Corporate Officers
- Legal Considerations
- Liability vs. Benefit

3:15 Training & Instruction of Operators
- Topics
- Examination
- Certification
- Documentation

3:30 Emergency Response
- Loss
- Accident
- Hazards
- Immediate Action
- Recovery
- The Human Factor
- Overexposure
- Case Histories

4:00 EXAMINATION

total pts: 114
80% passing: 80%
↳ (min pts: 91)

TO BE COMPLETED BY EXAMINER:

Final Score: _____

Certification Date: ___/___/___

(SAMPLE)

PROFESSIONAL SERVICE INDUSTRIES, INC.
RADIATION SAFETY EXAMINATION
REV 03/18/94

_____ Key
DATE NAME

SS# ___-___-___

DATE OF BIRTH ___/___/___

(Choose best answer for multiple-choice questions, T or F for True - False questions.)

1. The smallest part of an element that retains the properties of that element is called:

(a) atom
b. electron
2pts c. alpha particle
d. proton

2. High energy, short wavelength electromagnetic radiation emitted during radioactive decay is called a (an):

a. alpha particle
b. beta particle
2pts. c. x-ray
(d) gamma ray

3. The number of disintegrations that occur for a given radioisotope during a given length of time is a measurement of the:

a. average gradient
b. latitude
2pts. (c) activity
d. ionization

4. Compton scatter, pair production and the photoelectric effect are all processes by which electromagnetic radiation is absorbed.

(a) True
2pts b. False

5. In comparing the wave length of x- and gamma rays to the wave length found in the visible light spectrum, it is noticed that the wave lengths of x- and gamma rays are:

a. longer by comparison
2pts b. higher by comparison
c. lower by comparison
(d) shorter by comparison

6. The term ALARA, when dealing with radiation safety stands for:

a. At last, a Roentgen analyzer
(b) As low as is reasonably achievable
c. As low as regulations allow
d. As long as readings allow

2pts.

7. When x and gamma rays pass through matter, the matter becomes radioactive for a few minutes.

a. True
(b) False

2pts.

8. What is the proper posting required to denote storage of moisture/density gauges?

(a) "Caution - Radioactive Materials"
b. "Caution - Radiation Area"
c. "Caution - High Radiation Area"

2pts

9. The abbreviation "rem" represents:

a. "radiation effect on man"
(b) "roentgen equivalent man"
c. "regulations equivalent man"
d. "milliroentgen equivalent man"

2pts.

10. Alpha particles are considered to be more highly ionizing than x- or gamma rays.

(a) True
b. False

2pts.

11. X-rays were discovered in Germany in 1895 by:

(a) Wilhelm Roentgen
b. Almer Conrad
c. Marie Curie
d. Henri Becqueral

2pts.

12. Which of the following is not <u>required</u> to be posted?:

2pts

a. Appropriate "Notice to Employees"
b. Applicable regulations, or notice as to their location
c. Radioactive material storage sign
(d.) Leak test certificate

13. The Code of Federal Regulations in Title 10 Part 20 establishes the maximum permissible occupational dose limits in rem per calendar year for different parts of the body. These limits apply to individuals 18 years of age or older in restricted areas. In an individual's lifetime, these limits allow a maximum permissible occupational dose of radiation that is not expected to cause appreciable body injury. The whole body, head and trunk may receive no more than _____ rem per calendar year:

2pts

a. 50 rem/year
b. 1 1/4 rem/year
c. 1 rem/year
(d.) 5 rem/year

14. A moisture/density gauge operator is in compliance with the regulations so long as he maintains visual surveillance of a gauge, regardless of whether the device is in his immediate control.

2pts

a. True
(b.) False

15. Describe the basic structure of the atom:

3pts

Nucleus comprised of protons (+) (1 AMU) and Neutrons (0) (≈ 1 AMU) (which determine element and isotope, respectively), orbital electrons (-) (1/1840th AMU) in orbital (energy) shells e⁻ + Protons (+) determine charge

16. Which of the following is <u>not</u> true for requirements of reciprocity:

a. must notify state prior to entry
b. must remain only at jobsite location
c. may store gauge at jobsite
2pts d. must operate in accordance with the license
(e) must adhere to regulations of "home" state

17. Elements with common atomic numbers but with different atomic weights are called:

a. Ions
(b) Isotopes
2pts c. Radioactive
d. Elements

18. The radiation dose that will result in the death of 50 percent of the people exposed is called the:

a. maximum permissible dose
b. daily occupational dose
2pts (c) median lethal dose
d. maximum lethal dose

19. The presence of unwanted radioactive matter, or the tainting of objects with radioactive "dust" or "dirt", is referred to as:

a. high risk area
b. occupational hazard
(c) contamination
2pts d. none of the above

20. Regulations <u>require</u> that personnel monitoring be provided to:

a. only individuals who work at nuclear power plants
b. all employees whether certified or not
(c) all individuals likely to receive 10% of annual limit
2pts d. only individuals under 18 years of age and pregnant women

21. When x and gamma rays pass through the human body, the primary cause of damage is a direct result of ionization:

2pts. (a) True
b. False

22. The term "somatic effect" applies to:

(a) the physical effects on the human body, as a result of cell damage
2pts. b. mutation caused by genetic damage
c. the physical effects on the iris of the eye, as a result of cell damage
d. none of the above

23. Which of the following is <u>not</u> correct regarding incidents involving moisture/density gauges?

a. contact corporate office immediately
b. only authorized personnel may be involved in gauge recovery
2pts c. assume contamination is present until it is determined that no contamination exists
d. Radiation Safety Officer shall personally handle device recovery
(e) remove device from site without precautions for contamination

24. The <u>attenuation</u> (reduction) in the radiation as it passes through material is caused by:

(a) absorption
2pts. b. osmosis
c. backscatter
d. epidemiology

25. Leak tests of sealed sources of radioactive material are performed:

a. every three years
2pts. b. only if a leak is suspected
(c) at intervals not to exceed six months by certified individual(s) only
d. daily

26. The total number of protons in the nucleus of an atom represents the:

a. number of subatomic particles
b. the neutrons
2pts. (c) the atomic number
d. the atomic weight

27. An electrically balanced atom containing two protons in the nucleus would contain how many orbital electrons:

a. 3
b. 4
2pts. c. 1
(d) 2

28. All isotopes are unstable and therefore radioactive.

a. True
2pts. (b) False

29. Radiation from nuclear <u>decay</u> may be found in three basic types of emission. They are:

a. alpha, beta and x
b. gamma, alpha and x
2pts. c. beta, x and alpha
(d) gamma, beta and alpha

30. What term is used as a measure of the activity of a radioisotope?:

(a) curies
b. ions
2pts. c. isotopes
d. electrons

31. Which of the following statements is not correct regarding shipping and transportation of moisture/density gauges?

a. Gauges are to be shipped in D.O.T. approved "TYPE A", "YELLOW II" packages.
b. Gauges in transit must be secured to prevent unauthorized removal.
2 pts. (c.) Gauges transported in personal vehicles are exempt from D.O.T. Regulations.
d. Gauges may not be shipped on passenger aircraft.

32. The time required for one half the atoms in a radioactive substance to disintegrate is called the:

a. specific activity
(b.) half-life
2 pts. c. shelf life
d. wave length

33. The shorter the wave length of electromagnetic radiation, the lower the energy level.

a. True
2 pts. (b.) False

34. One of the most critical factors when considering human safety when working with x- and gamma rays is:

a. that they can only be detected by smell
b. they may be detected only by touch
2 pts. (c.) they cannot be detected by human senses
d. there is no critical factor

35. The abbreviation of "rad" is representative of:

a. roentgen absorbed data
(b.) radiation absorbed dose
2 pts. c. 1/100 of a roentgen
d. 1/10th of a roentgen

36. Dosimetry (film badge) reports must be retained on file:

a. for 1 year
b. for 3 years
c. for 5 years
(d.) indefinitely

2 pts.

37. Any area for which an access is controlled for purposes of protection of individuals from exposure to radiation and radioactive materials is called:

a. a quiet area
b. a hazardous area
c. a vacated area
(d.) a restricted area

2 pts.

38. List four characteristics of x-rays and gamma rays:

a. Electromagnetic radiation, travel in straight lines.
b. No charge, No mass, Not effected by electricd/or magnetic field
c. Short wave length, high fregreney, penetrate matter, may ionize matter
d. Can not be detected by human senses, may not be reflected or refract (may "scatter").

4 pts.

39. An ion is a (an) _____ with either a positive or negative charge.

(a.) Particle, or combination of particles
b. excess neutrons
c. gamma ray
d. high energy x-ray

2 pts.

40. Which of the following may be completely absorbed by a piece of paper?

(a.) alpha particles
b. beta particles
c. gamma rays
d. high energy x-rays

2 pts.

41. The symbol "R" stands for:

a. radiation absorbed dose
b. relative biological effectiveness
c. roentgen equivalent man
(d.) none of the above

2pts

42. Relatively speaking, which of the following types of radiation has the greatest biological effect?

a. x-rays
b. gamma rays
(c.) alpha particles
d. beta particles

2pts

43. To determine rem (roentgen equivalent man) values, one would multiply:

a. roentgen times rad
b. roentgen times ICE
(c.) rad times RBE
d. RBE divided by rad

2pts

44. Regulations require that individuals under 18 years of age receive no more than 10% of 5 rem per calendar year (whole body).

(a) True
b. False

2pts

45. Cell damage due to radiation exposure increases as cell reproduction rate increases.

(a.) True
b. False

2pts

46. When one looks at the human cell sensitivity, it may be noted that the most sensitive cells in the human body are the:

2 pts.

a. digestive system lining cells
b. cells of the gonad
c. blood vessel cells
(d.) white blood cells

47. It is expected that a dose of over 1,000 rem in any 24 hour period will result in:

2 pts.

(a) 100% fatalities
b. 50% fatalities
c. 25% fatalities
d. 10% fatalities

48. List the primary factors that determine a <u>cell's</u> sensitivity to radiation damage.

3pts

Cell age (i.e. maturity)

rate of reproduction (regeneration).

degree of differentiation or specialization.

49. What are the two general categories of cellular damage? (Pick two)

2 pts.

a. cancer
(b.) somatic effects
(c.) genetic effects
d. radiation burns

50. Which of the following doses is likely to be the most damaging?

2 pts.

(a) 25 rem over a 24 hour period
b. 25 rem over a 1 year period
c. 25 rem over a 5 year period
d. 25 rem over a 10 year period

51. What is the likely effect to an individual if the individual were to receive 1000 mrem in less than 24 hours? (watch units)

(a) No obvious injury
b. Possible disability
c. Possible death
d. Certain death

2 pts.

52. Regulations require that radioactive material, while in storage, must be:

a. kept warm and dry
b. accessible to all employees whether certified or not
(c) secured against unauthorized removal at all times
d. kept in office lab

2 pts.

53. The dose rate at 4 feet from a Cesium-137 source is 16 R/hr. What would the dose rate be at 100 feet? (Note difference in units of exposure.)

a. 16 mR/hr
(b) 26 mR/hr
c. 160 mR/hr
d. 260 mR/hr

$\frac{I_1}{I_2} = \frac{(D_2)^2}{(D_1)^2} = \frac{16{,}000 \text{ mR/hr}}{x} = \frac{(100)^2}{(4)^2}$ or $\left(\frac{10{,}000}{16}\right)$,

So, $16{,}000 \text{ mR/hr} \cdot 16 = 10{,}000\, x$

$256{,}000 \text{ mR} = 10{,}000\, x$

$25.6 \text{ mR} = x$ 26 mR/hr

2 pts.

54. The dose rate indicated on your survey meter is 25 mR/hr. If you were to stay in that location for 5 minutes, 15 minutes, 1 hour or 8 hours, what would your dose be?

a. 5 minutes $25 \text{ mR/hr} \cdot \frac{5}{60} = 2.08\overline{3} \text{ mRem/5 min}$

b. 15 minutes $25 \text{ mR/hr} \cdot \frac{15}{60} = 6.25 \text{ mrem/15 min}$

c. 1 hour $25 \text{ mR/hr} \cdot 1\left(\frac{60}{60}\right) = 25 \text{ mrem/hr}$

d. 8 hours $25 \text{ mR/hr} \cdot 8 = 200 \text{ mrem/8 hrs.}$

FACILITIES AND EQUIPMENT

06/95

A annotated diagram of the location(s) included in Item 3. is/are attached.

The following security measures will be taken with devices in storage:

- Devices with extendable source rods will be stored with the source rod locked in the "safe" position.

- The storage room/cabinet shall be locked at all times not under the immediate control of a certified operator.

Licensed material transported by PSI, or delivered by PSI to a carrier for transport, shall be packaged in accordance with the provisions in 10 CFR 71 (Packaging of Radioactive Materials for Transport) and Title 49 Code of Federal Regulations. These provisions require:

- Moisture/density gauges shall be transported in USDOT "Type A Package" transport cases.

- For shipment of packages that are not excepted, proper shipping paper, certification, marking and labelling in accordance with 49 CFR.

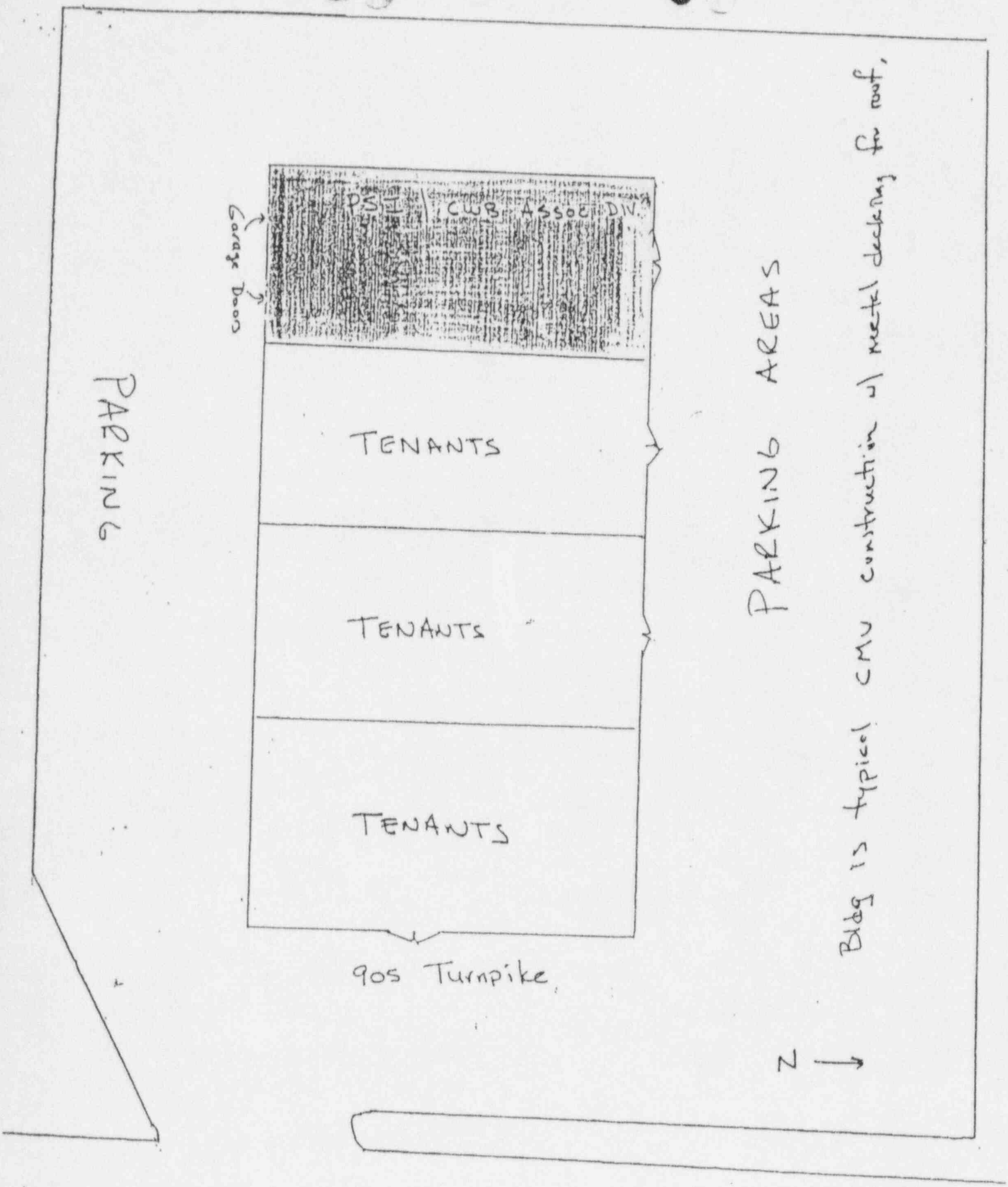
- Placement of the package as far from the driver's position as practical (in the interest of ALARA).

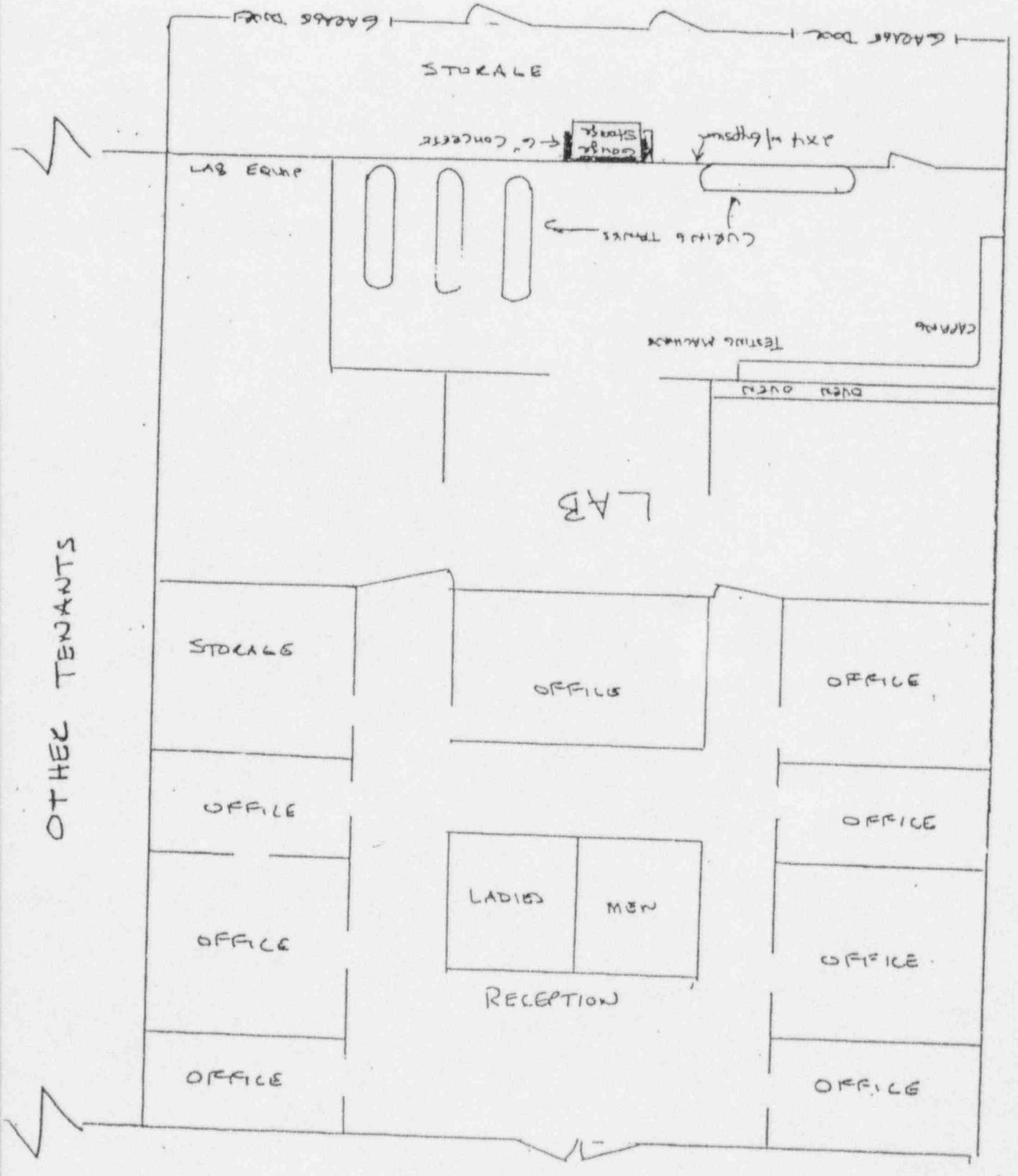
- Accessibility of shipping paper and emergency response information within reach of a seat-belted driver of the vehicle.

- Source rod locked, transport case (tightly) secured to right rear of vehicle.

Licensed material not in storage shall be under the constant surveillance and immediate control of a certified operator.

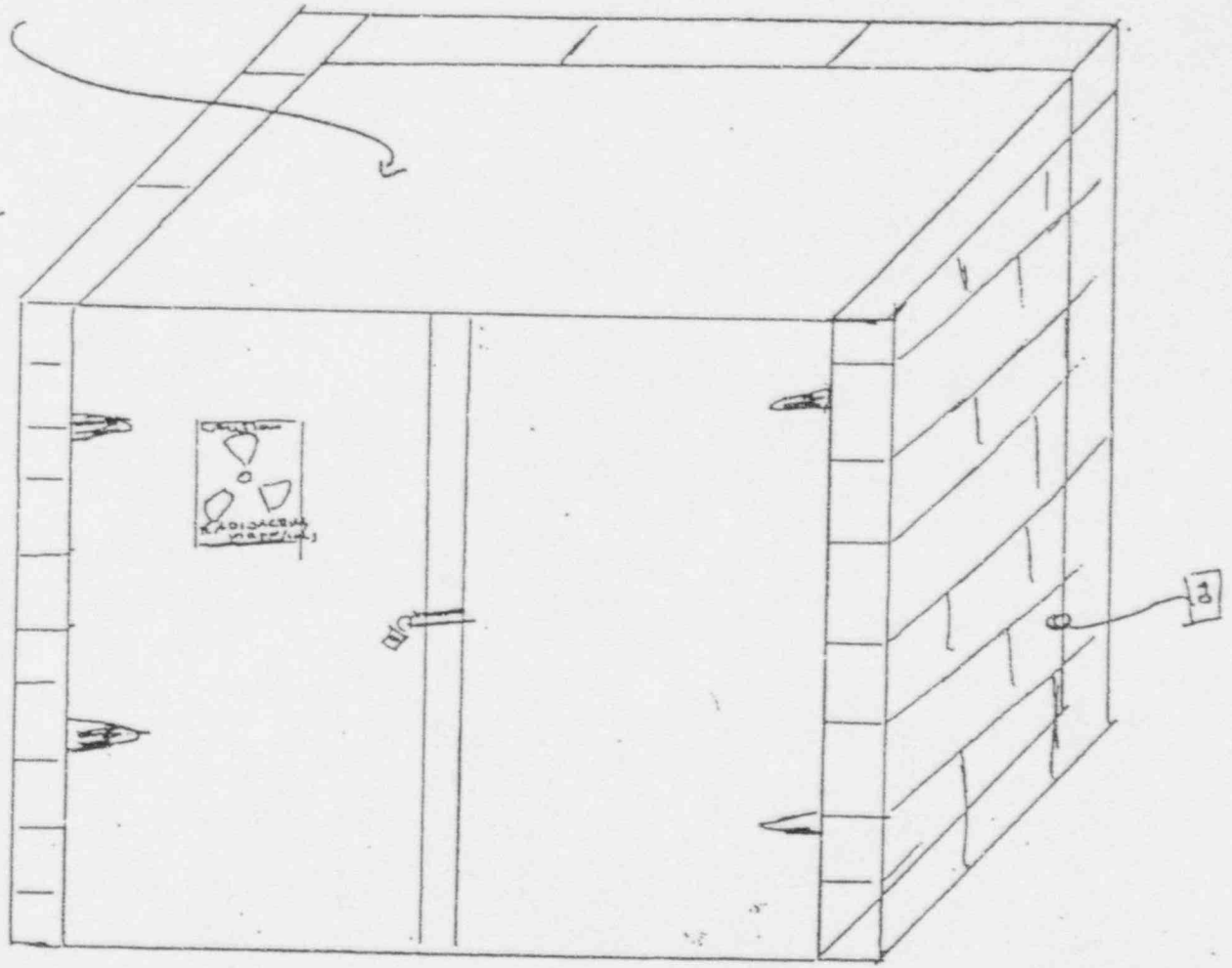
In some cases, the return of licensed material to one of the permanent storage locations listed on the license is not practical. In such cases, storage of licensed material at temporary job sites shall be in accordance with the attached temporary job site storage instructions, or stored in the transport vehicle overnight.


PSI
CWB ASSOC DIV.
Garage Doors
PARKING
TENANTS
TENANTS
TENANTS
905 Turnpike
PARKING AREAS
Bldg is typical CMU construction w/ metal decking for roof,
N
TURNPIKE ST (RTE 138)


STORAGE
LAB EQUIP
LAB
STORAGE
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
LADIES
MEN
RECEPTION
OTHER TENANTS

Top is covered w/ 1/16" Lead

6"x6"x21"
Concrete beams are stack on both sides and back



CABINET IS WOOD (
w/ 1/2" Plywood

Security – Cabinet bolted to wall, locked w/ Hasp & padlock,

Posted w/ appropriate sign

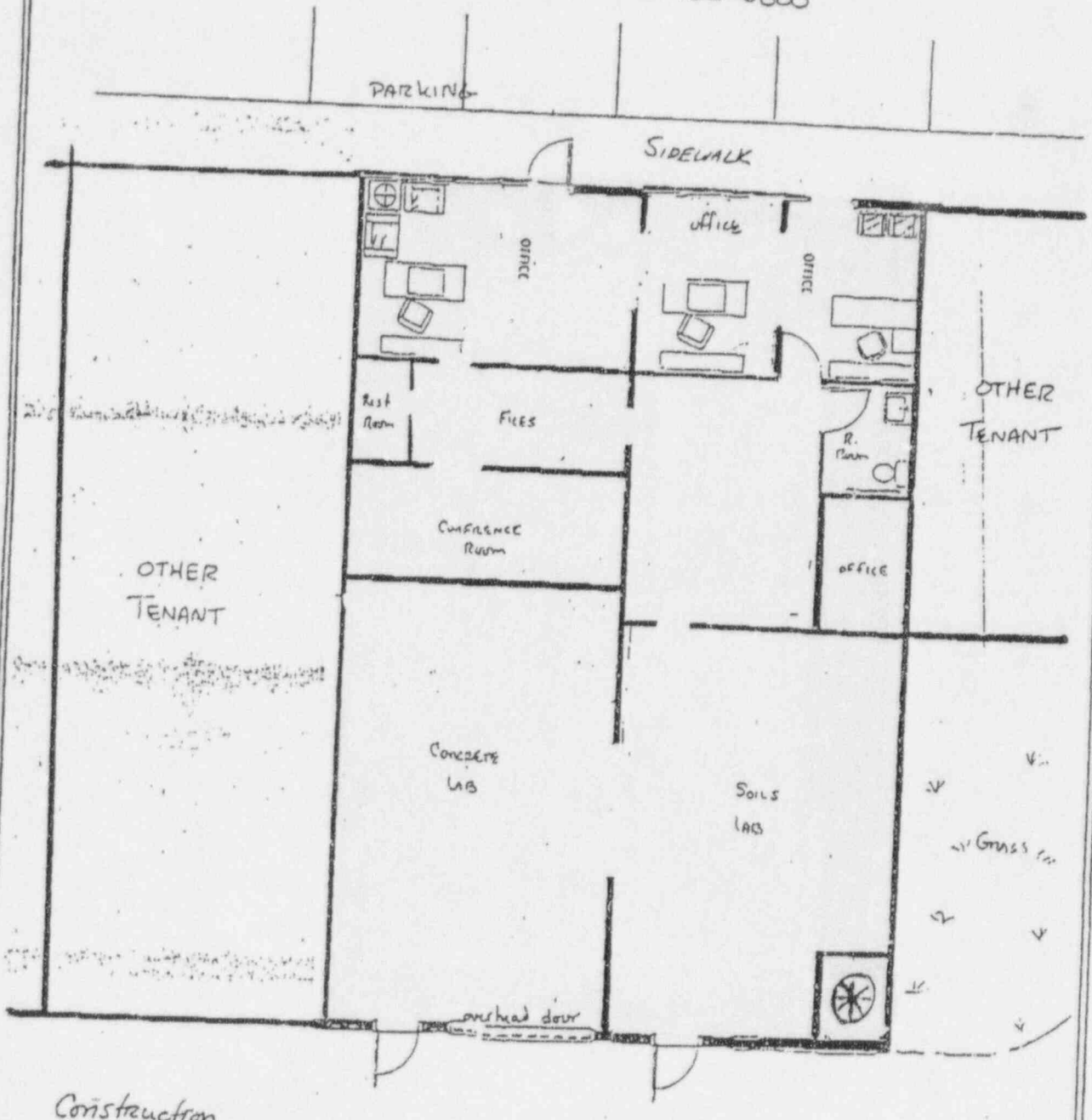
Gauge Storage.

- All gauge are stored in transport cases, w/ only certified operators w/ keys

Professional Service Industries

(*) = Gauge Storage

ADDRESS: PSI
1200 Millbury ST #7D
Worcester, MA 01607
508-756-0800

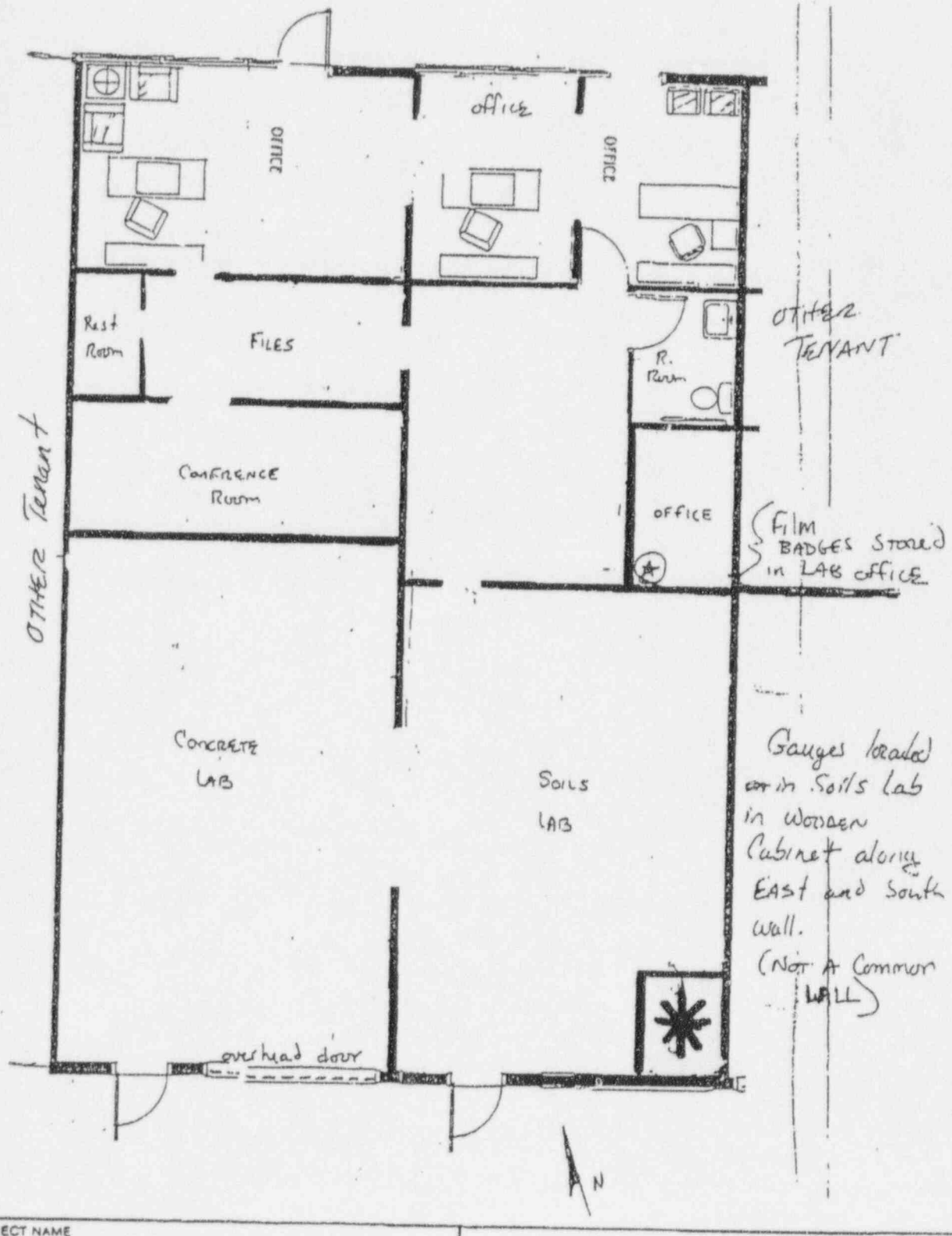


Construction Materials:
- Masonry
- Sheetrock

PROJECT NAME		
	PROJECT NO.	DATE

PSI A-300-1

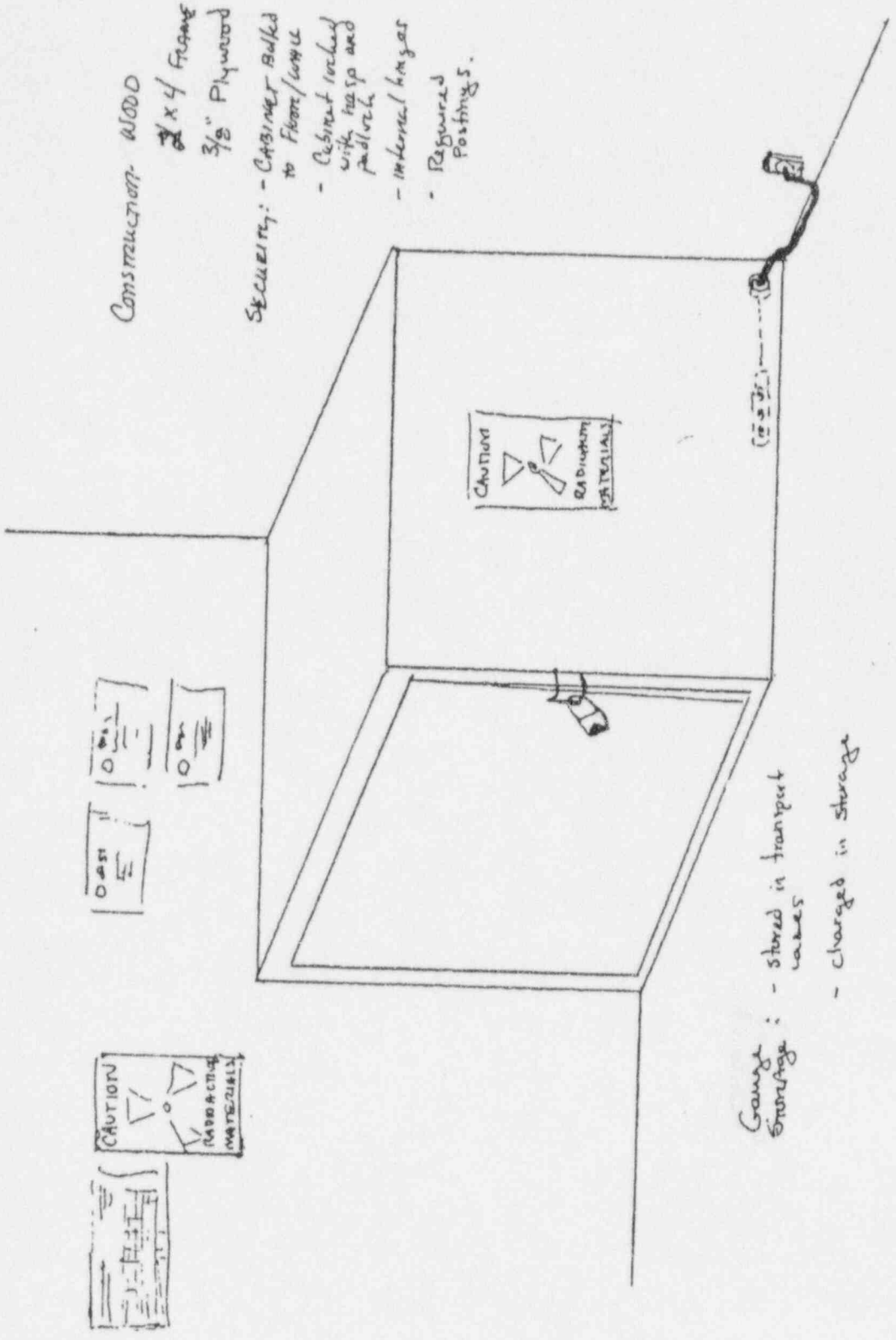
Professional Service Industries



PROJECT NAME		
	PROJECT NO	DATE

PSI A-300-4

Professional Service Industries



PROJECT NAME		
	PROJECT NO.	DATE

PSI A-300-4

(SAMPLE)

TEMPORARY JOB SITE STORAGE

The use of portable moisture/density gauges often involves storage at remote locations (job sites) due to long distances between the licensed storage facility and the job site. Gauges stored at the job site on a temporary basis must be used only at the specific site where stored, and must be returned to the licensed location upon completion of activities at the job site. Gauges may not be stored at an individuals' residence or in a hotel room. Temporary job sites may not be used as a "base of operations" for servicing other customers or performing work at other jobs in the area.

Device(s) stored at temporary job sites must be stored in the following manner:

1. All gauge(s) stored at job sites must be secured with a padlock inserted into the source rod handle or trigger mechanism to prevent extension of the source rod (if applicable).

2. All gauge(s) stored at job sites must be stored in a Department of Transportation (DOT) approved shipping case. (Storage of the gauge(s) in the shipping case provides the necessary distance to decrease to radiation levels to below regulatory limits in an unrestricted area [less than 2 mR/hr or 100 mR in 7 consecutive days].)

3. All gauge(s) stored at temporary job sites must be secured against unauthorized removal at all times. Gauge(s) stored in a trailer at the job site must be secured in a locked enclosure, such as a cabinet or a closet. (In the event a lockable storage cabinet or closed is unavailable, the gauge(s) stored in its shipping case may be chained to an immovable object within a job site trailer.) Only individuals certified in accordance with licensed procedures are to have keys to the storage cabinet. A "Caution-Radioactive Materials" sign must be posted on the door of the cabinet or closet.

4. A copy of the complete, unexpired radioactive materials license must be available for review at the job site. A copy of the appropriate "Notice to Employees" and a statement as to where a copy of the current regulations and licensed procedures may be reviewed must be posted at the job site.

Storage of the gauge(s) in a manner other than that described above must be pre-approved by the Corporate Radiation Safety Director. To obtain approval, contact the corporate office prior to storing the gauge(s) at the job site.

(SAMPLE)

RADIATION SAFETY PROGRAM

06/95

Professional Service Industries, Inc. (PSI) maintains a Corporate Radiation Safety Oversight Program to monitor PSI's activities involving licensed (radioactive) material. The aspects of PSI's Corporate Radiation Safety Oversight Program include, but are not limited to, the following:

- personnel monitoring program
- leak testing monitoring
- inventory control
- device maintenance
- procedure development
- annual audit program

PSI's Corporate Radiation Safety Program is the responsibility of PSI's Corporate Radiation Safety Director and Assistant Radiation Safety Director, both of whom may be reached at PSI's Corporate office.

The use of radioactive material and daily management of the radiation safety program at the individual Branch offices are the responsibility of the License Radiation Safety Officer. The License Radiation Safety Officer is responsible for:

- State/Federal regulatory compliance
- adherence to PSI radiation safety procedures
- operator training
- assurance of proper utilization of licensed material as prescribed by the manufacturer or PSI procedures

Individual operators (field personnel) are responsible for safe use of licensed material and adherence to PSI and State/Federal regulations.

PERSONNEL MONITORING PROGRAM

06/95

In 1994, PSI conducted a study of moisture/density gauge operator personnel monitoring results. With over 1,000 monitored moisture/density gauge users company wide, PSI has a large base for study data.

The study (copy attached) clearly demonstrates that PSI moisture/density gauge users are not likely to receive in excess of 10 percent of the allowable regulatory limits; therefore, PSI requests a specific exemption to the requirements for personnel monitoring.

In the event that the exemption is not granted, PSI shall provide monthly personnel dosimetry (film badge[s]) capable of detecting X-, Gamma, Beta, and Neutron radiation to moisture/density gauge operators for whom personnel monitoring is required. Dosimetry will be contracted through a NAVLAP accredited dosimetry supplier. (PSI currently uses Landauer, Inc. in Glenwood, Illinois, but requests that a dosimetry provider not be specified on the license.)

Summary of 1994 personnel monitoring data for PSI gauge operators at PSI offices conducting licensed moisture/density gauging activities.

Reported whole body exposure (millirem per year)	Number of exposures in each range
No measurable exposure ("M")	781
10 mrem	96
20 mrem	58
30 mrem	38
40 mrem	15
50 mrem	11
60 mrem	7
70 mrem	8
80 mrem	4
90 mrem	4
100 mrem	3
110 mrem	4
120 mrem	1
130 mrem	3
140 mrem	1
150 mrem	1
160 mrem	1
170 mrem	1
180 mrem	0
190 mrem	0
200 mrem	0
210 mrem	1
220 mrem	0
230 mrem	0
240 mrem	0
250 mrem	0
260 mrem	0
270 mrem	0
280 mrem	1
290 mrem	0
300 mrem	0
310 mrem	0
320 mrem	0
330 mrem	0
340 mrem	0
350 mrem	0
360 mrem	0
370 mrem	0
380 mrem	0
390 mrem	0
400 mrem	0
410 mrem	0
420 mrem	0
430 mrem	1
↓	0
790 mrem	1
TOTAL	1041

Supplier: Landauer, Inc.
2 Science Road
Glenwood, Illinois 60425

Exchange period: monthly

Dose equivalents below the minimum measurable quantity are reported as "M". The assigned film badge worn by PSI operators (type "B1" badge) has a minimum reporting value of 10 mrem for x-ray, gamma, beta and fast neutron radiation.

PSI corporate radiation safety staff investigates film badge exposure reports exceeding 40 millirem per month (the "wear period"). In a 40+ mrem exposure, investigation typically reveals an exposure to the badge(s) stored in elevated radiation levels adjacent to radioactive material storage, or badges temporarily stored in the gauge transportation case. No personnel exposure over 40 mrem has been substantiated. PSI gauge operators following proper procedures typically receive a minimal ("M") exposure.

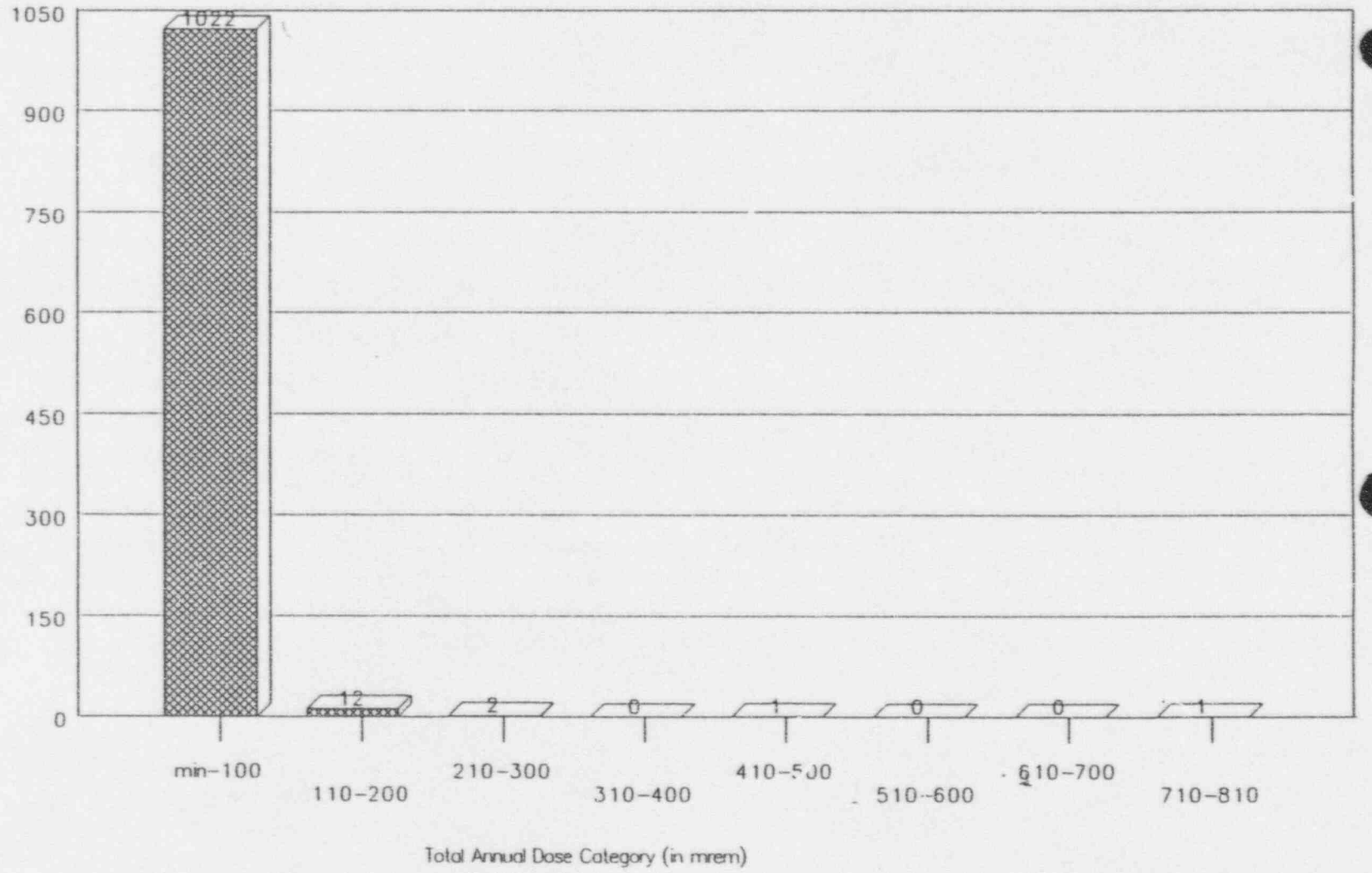
- Highest "verifiable" annual exposure: 170 mrem

- > 99% of all annual exposures reviewed were less than 140 mrem/year; > 98% were <100 mrem/year.

- < .2% of all annual exposures reviewed were above 300 mrem/year.

1994 Annual Dose Summary

(1041 personnel monitored)



RADIATION DETECTION INSTRUMENTS

06/95

Radiation survey instruments (survey meters) used in conjunction with moisture/density gauge operations (emergency response, etc.) shall be an NDS Products model ND-500A, capable of detecting X- and gamma rays in a range of 0.1 mR/hr to 500 mR/hr, or equivalent meter.

Survey meters for use in conjunction with the moisture/density gauge program shall be calibrated at intervals not to exceed twelve (12) months or after servicing. Calibration shall be performed by persons specifically licensed by the USNRC or an Agreement State Agency to provide such services.

At least one calibrated, operable survey meter shall be maintained by the Radiation Safety Officer for use during routine surveys or emergency response.

Survey meters will not normally be maintained at each temporary job site. The Radiation Safety Officer, the Corporate Radiation Safety Department staff or a licensed consultant will normally conduct all surveys. Field technicians (moisture/density gauge operators) do not normally conduct radiation surveys.

LEAK TESTING

06/95

Each gauge containing licensed material will be tested for leakage and/or contamination at intervals not to exceed six months with the following exception:

Sources in storage will not be tested. When a source is removed from storage that has not been leak tested within the last six months, it shall be leak tested before being placed in service or shipped.

Leak test samples will be analyzed by individual(s) specifically licensed by the USNRC or an Agreement State Agency to provide such services. (PSI currently uses Microtec Services, Inc. in Pasadena [Texas RAM License No. L04656], but requests that the license condition not specify one leak test vendor.)

The following safety precautions will be followed when taking leak test samples:

1. Assigned dosimeters will be worn.

2. The instructions provided in the leak test kit will be followed in collection of the wipe sample. (A copy of the instructions are attached, and a sample leak test kit is enclosed.)

INSTRUCTIONS FOR LEAK TEST KIT

GENERAL

1. Perform all work quickly and safely. Handle cotton swab applicator by screw cap only!
2. Film badge must be worn at all times during the leak testing procedures.

BEFORE THE TEST

3. Survey the area and the device with a calibrated survey meter to insure that the source is in the "SAFE" position.
4. Complete the self-adhesive test tube label and the leak test form (PSI B-900-140) with a ball point pen. Make two photocopies of the completed form. Attach the completed label to the side of the test tube and the mailing label to the outside of the box.
5. Remove the screw cap swab applicator from the test tube and check to see that it is still moist. If the swab has dried out, moisten the tip with water.

MOISTURE/DENSITY GAUGE

A. Follow steps 1 and 2 above (GENERAL).
B. Follow steps 3, 4 and 5 above (BEFORE THE TEST).
C. Stand gauge on end. Face gauge bottom away from your body. **LEAVE THE SOURCE ROD LOCKED IN THE "SAFE" POSITION; DO NOT EXTEND THE SOURCE ROD.**
D. With the moistened swab, wipe around the inside of the source rod hole at the bottom of the gauge. **DO NOT OPEN THE SLIDING "SHUTTER MECHANISM" (SHIELD) OR WIPE THE SOURCE ROD ITSELF.**
E. Next, set the gauge upright and remove the screws holding the electronic face plate. Move the electronic panel aside.
F. With the same swab, wipe the circular area in the base of the device identified by the radiation label (inside the device).
G. Replace the electronic face plate.
H. Follow steps 6, 7 and 8 below (AFTER THE TEST).

RADIOGRAPHIC EXPOSURE DEVICE

A. Follow steps 1 and 2 above (GENERAL).
B. Follow steps 3, 4 and 5 above (BEFORE THE TEST).
C. Remove the safety plug from the source tube end ("outlet nipple") of the exposure device.
D. Wipe around the interior of the device opening by inserting the moist cotton swab tip two to three inches and rotating the swab around the interior upper portion of the "S" tube. Remove the swab and replace the safety plug.
E. Follow steps 6, 7 and 8 below (AFTER THE TEST).

(SCITEC) X-RAY FLUORESCENCE (XRF) SPECTRUM ANALYZER

A. Follow steps 1 and 2 above (GENERAL).
B. Follow steps 4 and 5 above (BEFORE THE TEST).
C. **VERIFY THAT THE "SHUTTER MECHANISM" IS CLOSED AND REMOVE THE KEY.** Wipe around the outer edges of the metal plate (inside the black rubber boot) on the front end of the device ("face scanner").
D. Follow steps 6 and 8 below (AFTER THE TEST).

(PGT) X-RAY FLUORESCENCE (XRF) PAINT ANALYZER

A. Follow steps 1 and 2 above (GENERAL).
B. Follow steps 4 and 5 above (BEFORE THE TEST).
C. **DO NOT DEPRESS THE HANDLE ("SHUTTER MECHANISM").** Wipe around the outer edges (perimeter) of the bottom and top surfaces.
D. Follow steps 6 and 8 below (AFTER THE TEST).

AFTER THE TEST

6. Place the swab applicator back into the test tube and securely tighten the cap. Place the test tube and completed PSI B-900-140 form in the box. Send one copy of the leak test form to the Corporate Radiation Safety Department and maintain the second copy for your records.
7. Perform a survey of the box with a calibrated survey meter in an area away from the device storage. If the survey is greater than 0.5 Mr/hr, **DO NOT MAIL THE BOX! CALL THE CORPORATE RADIATION SAFETY DEPARTMENT FOR INSTRUCTIONS.**
8. Apply appropriate postage to the leak test kit box and mail.

INVENTORIES

06/95

A physical inventory of licensed material shall be performed at intervals not to exceed six (6) months. Records shall include the radionuclide, activity, manufacturer's name, model and serial number of each device containing licensed material. Records of physical inventories shall be kept on file for three years from the date of inventory.

MAINTENANCE

06/95

The licensee shall not perform any maintenance or repairs involving removal of sealed sources from the device, removal or extension of the source rod.

The licensee may perform maintenance and repairs on the device(s) including replacement of batteries, repair and/or replacement of electronic components, leak test sample taking and cleaning and lubricating bearings. All other repairs shall be provided by individuals specifically licensed by the USNRC or an Agreement State Agency to provide such services.

TRANSPORTATION OF DEVICES TO FIELD LOCATIONS

06/95

In accordance with 10 CFR Part 70, the transportation of licensed (radioactive) materials is conducted in accordance with U.S. Department of Transportation (DOT) regulations (49 CFR Parts 172, 173 and 177).

SAMPLE

OPERATING AND EMERGENCY PROCEDURES

06/95

PSI's Corporate Radiation Safety Department develops and implements operating and emergency procedures for PSI offices that utilize licensed (radioactive) material. A copy of the procedures will be distributed to moisture/density gauge operators before they begin using licensed material and a copy will be available at each temporary job site.

PSI commits that the operating and emergency procedures will include the following instructions as a minimum:

Use of utilization logs with date(s) of use, name(s) of users, job site(s) of use, and indication of return of gauge(s) to storage.

To maintain licensed material under constant surveillance and immediate control when not locked in storage.

To follow transportation requirements listed in procedure manual (to include USDOT requirements).

To not unnecessarily expose any portion of the body to the source(s) in the device(s).

To always wear assigned personnel dosimetry (if applicable) when using a gauge.

To not store personnel dosimetry in close proximity to the device(s).

To keep unauthorized individuals away from the area where the device(s) are being used.

To place the device(s) in a secured storage location when not in use or under constant surveillance and immediate control of an authorized user.

In the event of emergency circumstances (source rod will not fully retract, device is struck by a vehicle, etc.) to:

To immediately secure the area around the device.

To prevent unauthorized individuals from entering the area.

To isolate any equipment involved in the accident.

To notify appropriate persons in accordance with the most current version of PSI's "In Event of an Accident" sheet, copy attached.

To follow the instructions of individual(s) contacted in the step above.

NOTE: PSI's Corporate Radiation Safety Department will normally handle notification of regulatory agencies and "follow-up" reporting requirements.

(SAMPLE)

IN EVENT OF AN ACCIDENT

ACTIONS TO BE TAKEN BY THE DEVICE OPERATOR (In order!) (07/14/95)

1. Evacuate and isolate entire accident area. Keep all unauthorized individuals away from the entire area of accident. Maintain constant surveillance of the accident site.
2. Do not move device or other equipment involved in the accident.
3. Do not leave area *but remain at restricted area boundary (~ 15 feet* for moisture/ density gauges). Send someone else to call your **Manager (RSO)** to report the incident.

Manager's (RSO's) name:	
Local office telephone number:	/ -
Manager's (RSO's) home telephone number:	/ -

4. If your Division Manager is unavailable, contact the Radiation Safety Director at the Corporate Office.

Corporate Office telephone number - 708/691-1490
or - 800/426-2897

5. If the **Radiation Safety Director** is unavailable, ask for the **Assistant Radiation Safety Director** or **Administrative Coordinator**.
6. If the incident occurs during non-business hours and you cannot contact the above, please contact the **SKYTALK PAGER NUMBER** listed below and enter the personal identification number (**PIN**), then press "#" button.

SKYTALK PAGER NUMBER - 800/759-8255
ENTER PIN NUMBER - 5132816, then "#"

Please leave a clear, detailed voice message including the phone number from where you are calling, than hang up. (Please remain near the phone, and do not allow others to use the phone. You will immediately be contacted by a member of the Corporate Radiation Safety Department.)

7. If you are not contacted within fifteen (15) minutes, please repeat step six, or contact the Radiation Safety staff at home at:

John Thornton, Radiation Safety Director - 708/495-2836
Adam Ackermann, Assistant Radiation Safety Director - 708/545-0572
Michael Kesselmayer, Administrative Coordinator - 708/393-0306

8. If you are unable to reach PSI management, call the appropriate government agency number for the State in which you are working. (Most are 24-hour numbers.)

Alabama	334/613-5391	Louisiana	504/765-0160	Ohio	301/816-5100
Alaska	301/816-5100	Maine	207/624-7000	Oklahoma	301/816-5100
Arizona	602/223-2212	Maryland	401/631-3300	Oregon	503/731-4014
Arkansas	501/661-2136	" N:	401/922-7609	Pennslyvania	301/816-5100
California	916/445-0931	Massachusetts	301/816-5100	Rhode Island	401/621-1600
California N:	800/825-7550	Michigan	301/816-5100	S. Carolina	803/737-7400
Colorado	303/756-4455	Minnesota	301/816-5100	" N:	803/698-2990
Connecticut	301/816-5100	Mississippi	601/354-6657	South Dakota	301/816-5100
Delaware	301/816-5100	" N:	601/352-9100	Tennessee	615/532-0364
Florida	904/488-1320	Missouri	301/816-5100	" N:	615/741-0001
Georgia	404/624-7222	Montana	301/816-5100	Texas	512/458-7460
Hawaii	301/816-5100	Nebraska	402/471-2168	Utah	801/536-4250
Idaho	301/816-5100	" N:	402/471-4545	" N:	801/536-4123
Illinois	217/785-9900	Nevada	702/687-5300	Vermont	301/816-5100
Indiana	301/816-5100	New Hampshire	603/271-3636	Virginia	301/816-5100
Iowa	515/281-3478	New Jersey	301/816 5100	Washington	206/682-5327
" N:	515/993-5386	New Mexico	505/827-9329	W. Virginia	301/816-5100
Kansas	913/296-3176	New York	518/457-2200	Wisconsin	301/816-5100
Kentucky	502/564-7815	N. Carolina	919/733-3861	Wyoming	301/816-5100
		North Dakota	701/328-2121	** N: AFTER	- HRS NUMBER **

9. If you cannot contact persons listed in items 3 through 7 above, call the State Police, Hazardous Materials Unit.

State Police telephone number / -

ANNUAL AUDIT OF RADIATION SAFETY PROGRAM

06/95

The individual Branch offices are to be audited annually by the respective Vice President using an audit form prepared by the Corporate Radiation Safety Director. The audit shall include a review of documents and records required by regulations and licensed conditions. The records shall include, but will not necessarily be limited to, the following:

- Training
- Surveys
- Leak test records
- Transfer/receipt records
- Utilization logs
- Personnel dosimetry records
- Instrument calibrations

The audit will be designed to verify compliance with NRC and DOT regulations, conditions of the license, compliance with PSI's radiation safety program.

One copy of the audit is maintained on file at the audited Branch office for three years and one copy is forwarded to the Corporate Radiation Safety Department for review. The Corporate Radiation Safety Department typically writes a letter to the Branch office and the auditing Vice President regarding the audit findings.

POSSESSION LIMIT COMMITMENT: The number of source/device combinations shall be limited so as not to exceed the quantities of byproduct material specified in 10 CFR 30.35(d) requiring financial assurance for decommissioning.

PSI does not anticipate the generation of any radioactive waste of any kind. Any "waste" (e.g., device involved in an accident) generated may be returned to the manufacturer or another individual or entity specifically licensed to receive such material (e.g. ADCO, etc.).

4/24/96

ACTION: R TABLEID: ARCL USERID: AL30
*** ACCOUNTS RECEIVABLE CASE HISTORY LINE INQUIRY TABLE ***
KEY IS PAYER CODE, BILLING DOC ID, TRANS DATE, BD LINE NO

PAYER CODE: 202848901 L BILLING DOC ID: LD AM0501-95
PAYER NAME: PROFESSIONAL SERV. IND., INC.

	TRANS DATE	BD LINE NO	AC CD	TR TP	ACTN OUT	REF DEST	TRANSACTION AMOUNT	BALANCE
01-	07 22 95	001	BD	FE			1,700.00	1,700.00
					DOCUMENT ID: LD AM0501-95		LINE #: 001	
02-	07 27 95	001	CR	FE			-1,700.00	0.00
					DOCUMENT ID: CR LB467053005		LINE #: 001	
03-								
					DOCUMENT ID:		LINE #:	
04-								
					DOCUMENT ID:		LINE #:	
05-								
					DOCUMENT ID:		LINE #:	

03-*L009 HEADER CHANGE

DIVISION OF ACCOUNTING AND FINANCE
REQUEST FOR REFUND TO EMPLOYEE/VENDOR

JUN 11 1996

THE EMPLOYEE/VENDOR IDENTIFIED BELOW HAS OVERPAID THE NUCLEAR REGULATORY COMMISSION FOR GOODS AND/OR SERVICES PROVIDED AND IS DUE A REFUND

EMPLOYEE/VENDOR/PAYEE CODE: _____

NAME: PROFESSIONAL SERVICES INDUSTRIES, INC.

ADDRESS: ATTN: JOHN T. THORNTON, RADIATION SAFETY OFFICER

ADDRESS: 405 TURNPIKE STREET, SUITE H

CITY: CANTON STATE: MA ZIP: 02021

TRANS CODE: PX

TRANS TYPE:	FE	FUND:	X5280	JOB CODE:		AMOUNT:	$720.00
TRANS TYPE:	IR	FUND:	R1435	JOB CODE:	INTR	AMOUNT:	
TRANS TYPE:	IR	FUND:	R1099	JOB CODE:	ADCH	AMOUNT:	
TRANS TYPE:	IR	FUND:	R1099	JOB CODE:	FINE	AMOUNT:	

TOTAL REFUND AMOUNT: $720.00

COMMENTS: Lic 20-28489-01 5yr ext/ck 849448/RFND

(Limit comments to 40 characters, including spaces)

PREPARED BY: Brenda Brown DATE: 5/15/96

AUTHORIZED BY: Sandra Hamilton DATE: 6/11/96

ORIGINAL INV. NO: _____ DATE PAID: _____ AMOUNT: _____

REFUND ENTERED INTO COLLECT BY: _____

REFUND DETERMINED BY: _____ DATE: _____

PLEASE ATTACH APPROPRIATE SUPPORTING DOCUMENTATION

RNT 7 I (96)
APPL DTD 10/11/95
REN 3P FEE CAT
SUBMITTED $720.00
Lic EXTENDED BY RULEMAKING
(12241P)

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

(FOR LFMS USE)
INFORMATION FROM LTS

PROGRAM CODE: 03121
STATUS CODE: 2
FEE CATEGORY: 3P
EXP. DATE: 19951130
FEE COMMENTS: ____
DECOM FIN ASSUR REQD: N

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
   APPLICANT/LICENSEE: PROFESSIONAL SERV. INDUSTRIES, INC.
   RECEIVED DATE: 951013
   DOCKET NO: 3031572
   CONTROL NO.: 122418
   LICENSE NO.: 20-28489-01
   ACTION TYPE: RENEWAL

2. FEE ATTACHED
   AMOUNT: $720.00
   CHECK NO.: 849448

3. COMMENTS

SIGNED Rebecca J. Brown
DATE 10/16/95

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

1. FEE CATEGORY AND AMOUNT: 3P $720

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

3. OTHER ____

SIGNED Brenda Brown
DATE 11/6/95

I (96)

Log: [illegible] 7
Remitter
Check No: 849448
Amount: $720
Fee Category: 3P
Type of Fee: REN
Check Rec'd: 11/6/95
Completed
Brenda Brown

5/15/96

→ License extended 5 years by rulemaking. Licensee refunded renewal fee of $720.
BB

95 OCT 20 AM 8:06