Walashek Enterprises Inc.
602 Launa Aloha Place / Kailua, Hawaii 96734
Telephone: (808) 254-4609

To:

U.S. Nuclear Regulatory Commission, Region V
Material Radiation Protection Section
1450 Maria Lane Suite 210
Walnut Creek, CA 94596

Gentlemen,

Please find enclosed application Form 313 for license to use and possess radioactive sealed sources for use in industrial radiography.

Fee of $700.00 is enclosed pursuant to 10 CFR 170.

Yours Truly

Timothy Carroll
General Mgr.

NRC FORM 313
(1-84)
10 CFR 30, 32, 33, 34, 35 and 40

APPENDIX A

APPLICATION FOR MATERIAL LICENSE

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 5-31-87

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

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

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON, AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- [X] A. NEW LICENSE
- [ ] B. AMENDMENT TO LICENSE NUMBER _____
- [ ] C. RENEWAL OF LICENSE NUMBER _____

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

Walashek Enterprises, Inc.
602 Launa Aloha Place
Kailua, HI 96734

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

2298D Alahao Place; Honolulu, HI 96819 For storage only.
Radiography to be conducted at temporary jobs in states subject to NRC Regulatory Authority.

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Timothy A. Carroll

TELEPHONE NUMBER: (808) 847-7095

SUBMIT ITEMS 5 THROUGH 11 ON 8½ x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES *(See 10 CFR 170 and Section 170.31)*
FEE CATEGORY 3-O
AMOUNT ENCLOSED $ 700.00

13. CERTIFICATION. *(Must be completed by applicant)* THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN, IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE–CERTIFYING OFFICER	TYPED/PRINTED NAME	TITLE	DATE
tacarroll	Timothy Carroll	General Manager	8 Apr 85

14. VOLUNTARY ECONOMIC DATA

a. ANNUAL RECEIPTS

- [ ] <$250K
- [ ] $250K–500K
- [ ] $500K–750K
- [ ] $750K–1M
- [ ] $1M–3.5M
- [ ] $3.5M–7M
- [ ] $7M–10M
- [ ] >$10M

b. NUMBER OF EMPLOYEES *(Total for entire facility excluding outside contractors)*

c. NUMBER OF BEDS

d. WOULD YOU BE WILLING TO FURNISH COST INFORMATION *(dollar and/or staff hours)* ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? *(NRC regulations permit it to protect confidential commercial or financial–proprietary–information furnished to the agency in confidence)*

- [ ] YES
- [ ] NO

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	COMMENTS	APPROVED BY
APPL.	April 1 V	30	[redacted]	Frances Brown
AMOUNT RECEIVED	CHECK NUMBER			DATE
$700	00111			4/16/85 4/17/85

PRIVACY ACT STATEMENT ON THE REVERSE

70173

PRIVACY ACT STATEMENT

Pursuant to 5 U.S.C. 552a(e)(3), enacted into law by section 3 of the Privacy Act of 1974 (Public Law 93-579), the following statement is furnished to individuals who supply information to the Nuclear Regulatory Commission on NRC Form 313. This information is maintained in a system of records designated as NRC-3 and described at 40 Federal Register 45334 (October 1, 1975).

1. **AUTHORITY:** Sections 81 and 161(b) of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2111 and 2201(b)).

2. **PRINCIPAL PURPOSE(S):** The information is evaluated by the NRC staff pursuant to the criteria set forth in 10 CFR Parts 30, 32, 33, 34, 35 and 40 to determine whether the application meets the requirements of the Atomic Energy Act of 1954, as amended, and the Commission's regulations, for the issuance of a radioactive material license or amendment thereof.

3. **ROUTINE USES:** The information may be (a) provided to State health departments for their information and use; and (b) provided to Federal, State, and local health officials and other persons in the event of incident or exposure, for their information, investigation, and protection of the public health and safety. The information may also be disclosed to appropriate Federal, State, and local agencies in the event that the information indicates a violation or potential violation of law and in the course of an administrative or judicial proceeding. In addition, this information may be transferred to an appropriate Federal, State, or local agency to the extent relevant and necessary for an NRC decision or to an appropriate Federal agency to the extent relevant and necessary for that agency's decision about you.

4. **WHETHER DISCLOSURE IS MANDATORY OR VOLUNTARY AND EFFECT ON INDIVIDUAL OF NOT PROVIDING INFORMATION:** Disclosure of the requested information is voluntary. If the requested information is not furnished, however, the application for radioactive material license, or amendment thereof, will not be processed. A request that information be held from public inspection must be in accordance with the provisions of 10 CFR 2.790. Withholding from public inspection shall not affect the right, if any, of persons properly and directly concerned need to inspect the document.

5. **SYSTEM MANAGER(S) AND ADDRESS:** U.S. Nuclear Regulatory Commission
Director, Division of Fuel Cycle and Material Safety
Office of Nuclear Material Safety and Safeguards
Washington, D.C. 20555

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LICENSE INFORMATION

NRC FORM 313

ITEM 5

A. Sealed Source-IR-192
Form-solid special form N.O.S.
Maximum strength-maximum of 100 curies to be ordered (120 curies maximum per camera to be on hand at any time.)
Manufacturer-Industrial Nuclear Co.
Model No. 32 and 33

B. Exposure device-Industrial Nuclear Co.
Model No. IR-100

C. Source Changer-Industrial Nuclear Co.
Model No. IR-50

ITEM 6

Licensed material to be used for industrial radiography. All radiographic operations will be conducted at temporary job-sites. No radiography is to be performed "in house" and no permanent radiographic facility other than for storage is proposed in this license.

ITEM 7

Timothy A. Carroll will be responsible for the day-to-day conduct of the radiation safety program and is the designated Radiation Safety Officer and will report to the president of the company. Timothy Carroll recieved radiation safety training and certification as a radiographer from Gordon Finlay,RSO;Finlay Testing Laboratories , 99-940 Iwaena St., Aiea HI 96713.

Formal classroom training was completed in 1980, with subsequent on-the-job training and periodic annual training. Gamma Industries model A-1-A and Tech-Ops model 683 were used. Worked for Finlay Testing Labs as a radiographer and assisted with implementation of the safety program from Mar 1980 until Feb 1985.

ITEM 8

See "Training Program for Radiographic Testing Personnel" Rev 0 8 Apr 85.

ITEM 9

Radiography will not be performed at licensee address. Licensee address will be used for storage only of radioactive material. Licensed material will be stored in a vault fabricated from steel and lead. The vault will be provided with a lock and "radioactive material" signs. Certified radiographers and the RSO will be the only personnel with possesion of vault and source keys.

ITEM 10

See the following procedures-

A. Quality Assurance Manual
B. Emergency and Operating Procedures
C. Recieving, Transporting and Shipping Procedures
D. Semi-annual Audit Checklist
E. Quarterly Maintenance Checklist
F. Radiographic personnel Field Audit
G. Quarterly Audit and Inventory

ITEM 11

Waste management- Sources will be returned to the supplier. Prior to return, the suppliers NRC license will be on file in Honolulu Industrial Testing Co. office.

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DOCUMENT APPROVAL

This document has been approved by Walashek Enterprises, Inc management and no changes will be made without management approval.

TITLE Training Program for Radiographic Test Personnel ITEM NO. 8A

Rev	Date	Change	Appvl
0	4-8-85	Original Issue	FW

70173

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TRAINING PROGRAM FOR RADIOGRAPHIC TESTING PERSONNEL

1.0 Scope

This procedure shall be used to train and certify radiographers and radiographer assistants. No personnel will be permitted to handle or operate exposure devices or source changers nor conduct radiation surveys unless they have been trained and certified per this procedure. Un-certified personnel may not enter the restricted area.

2.0 Training

Training will be conducted in-house by the RSO.

2.1 Radiographer assistants - Personnel who have had no previous training or experience will be given 8 hour classroom training and a written test of 25 questions. See Appendix I for classroom training outline and sample test.

2.2 Radiographer - Personnel who are certified as radiographer assistants may begin thier on-the-job training for certification as radiogrpher. On-the-job training shall be a minimum of 3 months (520 hrs) and shall be documented in thier personnel file. Classroom training shall consist of 40 hours of instruction. Testing shall consist of 50 written questions and a practical test. See Appendix II for course outline and sample written and practical test.

2.3 Personnel with previous training and experiance - Individuals who have been certified under another license will be given the classroom training required for radiographer assistant and the 50 question radiographers written test. In addition a practical test will be given.

2.4 Annual training

All radiographers and radiographer assistants will be given 8 hours of refresher training annualy.

3.0 Certification

3.1 Certified radiographer assistants will be permitted to perform all the functions of a radiographer provided they are under the direct surpervision of a certified radiographer.

3.2 Certified radiographers will be permitted to carry out radiographic operations, change sources and take wipes for leak tests.

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DOCUMENT APPROVAL

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TITLE Classroom Training Outline for Radiographer Asst ITEM NO. 8B

Rev	Date	Change	Appvl
0	4-8-85	Original Issue	FW

Walashek Enterprises Inc.
602 Launa Aloha Place / Kailua, Hawaii 96734
Telephone: (808) 254-4609

APPENDIX I

Classroom training outline for

Radiographer assistant

Subject	Hours
1.0 EMERGENCY AND OPERATING PROCEDURES	1
A. Hazards of Radiation	
a. sources of radiation	
b. harmful doses	
c. permissable doses by NRC	
B. Protection from Radiation	1
a. time - distance - shielding	
b. personnel monitoring	
c. survey meters	
C. Surveys	1
a. required surveys	
b. permitted radiation levels	
D. EOP	2
a. review normal procedures	
b. review emergency procedures	
c. review transport, ship and recieving procedures	
reporting malfunction	
2.0 EQUIPMENT	½
A. Survey Meter and Dosimeter	
a. charger operation	

Subject	HOURS
B. Exposure device	2½
a. construction	
b. equipment inspection	
c. cable connecting	
d. source tube connecting	
e. locking	
f. surveying	

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SAMPLE RADIOGRAPHER ASSISTANT
Written Test
(answers underlined)

1. The maximum permissable radiation level in the passenger compartment of a vehicle transporting radioactive material is
   a. .02 R/HR
   b. .02 MR/HR
   c. 2 MR/HR
   d. 2 R/HR

2. After taking an exposure and returning the source to the exposure device, the first step to be taken is
   a. Lock the exposure device
   b. Read your dosimeter
   c. Survey the source tube
   d. Remove the film

3. The maximum permitted radiation level on contact of an IR-192 exposure device is
   a. 50 MR/HR
   b. 100 MR/HR
   c. 200 MR/HR
   d. 1 R/HR

4. Which of the following would you NOT do if the source cannot be retracted.
   a. Establish a 2 MR/HR boundry
   b. Notify job site supervisory personnel
   c. Call the RSO
   d. Attempt to retrieve the source

5. During radiographic operations you notice your dosimeter off scale. Which of the following would you do.
   a. Re-zero the dosimeter and continue working
   b. continue working and notify the RSO at the end the shift.
   c. Cease operations and have your film badge evaluated immediately.
   d. Ignore it as the dosimeter was probably dropped.

6. Leak tests on sources are performed every
   a. 3 months
   b. 6 months
   c. 12 months
   d. 18 months

7. Survey meters are calibrated every
   a. 3 months
   b. 6 months
   c. 12 months
   d. 18 months

8. During your equipment inspection prior to traveling to the job site you notice a crimp in the source tube. Your action would be to
   a. Repair it and procede to the job.
   b. Notify the RSO and/or management.
   c. Use it as is.
   d. Advise your co-workers.

9. After taking an exposure and retracting the source which of the following must be surveyed?
   a. The full length of the source tube.
   b. The top of the exposure device.
   c. All sides of the exposure device.
   d. All of the above.

10. During radiographic operations you and the radiographer find you must leave the job site momentarily. You would then

    a. Chain and lock the source to a fence post or other available structure.
    b. Have the job site supervisor guard the source.
    c. Secure the source in the transport vehicle.
    d. Lock the source in a contractors gang box.

11. While taking an exposure you observe unauthorized entry into the restricted area. Which of the following actions would you take.

    a. Immediately retract the source.
    b. Continue until your expose is complete.
    c. Enter the restricted area and escort them out.
    d. Shout to advise them they are in a restricted area.

12. It is neccessary to zero your dosimeter prior to traveling to the job site.

    True False

13. You must record your dosimeter reading prior to traveling to the job site.

    True False

14. You notice that your dosimeter readings are high. To reduce your exposure it would be advisable to leave it in the truck.

    True False

15. Cranking the source in and out faster will reduce your exposure.

    True False

16. At the job site you discover that you do not have your dosimeter. As long as you have a calibrated survey meter it is permissable to continue radiography.

True False

17. The permissable radiation level on the side of a vault is 2 MR/HR on contract.

True False

18. Even momentary contact with the source could cause loss of fingers of hand.

True False

19. A vehicle used to transport radioactive material needs "RADIOACTIVE" warning signs on four (4) sides.

True False

20. If your film badge is not available it would be permissable to use someone elses.

True False

21. Any unnecesary radiation is considered excessive.

True False

22. List two specific ways to reduce your exposure.

ans. 1. Crank source in and out faster.
2. Use existing structures for shielding.
3. Use additional lead shielding on the source or larger colimater.
4. Use as long a crank cable as possible.

23. On Tuesday at 11:00 am, a common carrier notifies you of a shipment of radioactive material. What is the latest it can be picked up?

ans. 2:00 pm the same day

24. What is the transport index?
ans. The radiation level at one meter

25. List the claaifications of radioactive shipping labels.
ans. WHT I, YEL II, YEL III

26. What are the basic methods of radiation protection?
ans. Time - Distance - shielding

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DOCUMENT APPROVAL

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TITLE Classroom Training Outline for Radiographer ITEM NO. 8C

Rev	Date	Change	Appvl
0	4-8-85	Original Issue	FW

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Telephone: (808) 254-4609

APPENDIX II

CLASSROOM TRAINING OUTLINE FOR RADIOGRAPHERS

SUBJECT	HOURS
1.0 Origin and nature of radiation	1½
A. Structure of the atom	
B. Periodic table of elements	
C. Isotopes	
D. Curie and Roentgen	
E. Decay and Half-life	
2.0 Characteristics of x-rays and gamma rays	1
A. Energy	
B. Wave length	
C. Intensity	
3.0 Effects of radiation	8
A. Penetration	
1. Half and tenth value layers	
2. Absorption	
3. Scatter	
B. Biological effects	
1. Gamma and x-rays	
2. Alpha and beta rays	
3. Effects on human tissue and organs	
4. REM and RAD	
5. Case histories	
4.0 Radiation doses	1½
A. ALARA concept	
B. Maximum allowable	
5.0 Control of personnel exposure	4
A. Inverse square law	
B. Time-distance-shielding	

SUBJECT	HOURS
6.0 Radiation Dtection	4
A. Dosimeters	
1. Operation	
2. Use	
3. Calibration	
4. Records	
B. Film Badges	
1. Use	
2. Evaluation frequency	
3. Records	
C. Survey Meters	
1. Use	
2. Calibration	
3. Required surveys	
4. Records	
7.0 Radiographic Equipment	6
A. Exposure Devices	
1. Construction	
2. Operation	
3. Leak tests	
4. Records	
B. Source Changers	
1. Construction	
2. Operation	
C. Containers	
1. Storage	
2. Shipping	
3. Transporting	

SUBJECT	HOURS
8.0 Emergency Operating Procedures	6
A. Normal Operations	
1. Prior to travel to job-site	
2. At job-site	
3. Return from job-site	
4. Required reporting	
B. Emergency Operation	
1. Dosimeter off scale	
2. Stolen source	
(a) prevention	
3. Source not retrievable	
(a) radiographers immediate action	
(b) notification	
(c) population protection	
9.0 Shipping, recieving and transporting procedures	3
A. Recieving	
1. Common carrier	
2. At license facility	
3. Documents	
B. Shipping	
1. Preparation	
2. Packaging	
3. Documents	
C. Transporting	
1. Surveys	
2. Placarding	
3. Documents	
10.0 License	1
A. Terms and Conditions	
11.0 NRC Regulations	4
A. 10 CFR 19	
B. 10 CFR 20	
C. 10 CFR 21	
D. 10 CFR 30	
E. 10 CFR 34	
F. 10 CFR 71	

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SAMPLE RADIOGRAPHERS TEST

(ANSWERS UNDERLINED)

1. Leak tests on radioactive sources are required:
   a. Annualy
   b. Every 3 months
   c. Every 6 months
   d. Every month
2. The maximum permissable radiation level on an IR-192 exposure device is:
   a. 200 MR/hr at contact and 10 MR/hr at 1 meter.
   b. 200 MR/hr at contact and 50 MR/hr at 1 meter.
   c. 100 MR/hr at contact and 10 MR/hr at 1 meter.
   d. 100 MR/hr at contact and 50 MR/hr at 1 meter.
3. Prior to use, a survey meter must be checked for:
   a. Battery condition
   b. Calibration
   c. a & b
   d. None of the above
4. The RHM/curie value for IR-192 is:
   a. 55
   b. 5.5
   c. .55
   d. 550
5. An exposed 100 curie IR-192 source is exposed in an open area with no shielding. What is the approximate distance to the 2 MR/hr boundary?
   a. 210 meters
   b. 166 meters
   c. 113 meters
   d. 183 meters

6. After loading the exposure device in the transport vehicle you find the radiation level in the passenger compartment to be 4 MR/hr. Which of the following would you do?
   a. Add more shielding
   b. Change the label on the container.
   c. Do nothing, since you do not have to travel far.
   d. Move the film badge farther from the source.
7. Cranking the source in and out faster will:
   a. Wear the crank out faster
   b. Have no effect
   c. Reduce your exposure
   d. None of the above
8. Since the IR-100 camera has a "source retracted" indicator, it would be acceptable to continue operations without a survey meter.
   a. TRUE
   b. FALSE
9. After taking an exposure, you notice your dosimeter is off scale. You would:
   a. Continue operations as you probably dropped your dosimeter
   b. Cease operations and submit your film badge for evaluation.
   c. Use another dosimeter
   d. Re-charge the dosimeter and continue operations
10. Film badges are evaluated:
   a. Semi-annualy
   b. Quarterly
   c. Weekly
   d. Monthly

11. The NRC must be notified of which of the following?
    a. Packages containing radioactive material with radiation levels in excess of 10 MR/hr at 1 meter.
    b. Loss of film badges.
    c. Malfunctioning equipment.
    d. All of the above.

12. What is the maximum permitted accumulated whole body dose for a radiographer who is 35 years old?
    a. 80 REM
    b. 85 REM
    c. 75 REM
    d. 90 REM

13. What is the maximum whole body dose a radiographer may recieve in any one calendar quarter?
    a. 1¼ REM
    b. 3 REM
    c. 5 REM
    d. 7¼ REM

14. What is the half-value layer of lead for IR-192?
    a. .100 inch
    b. .25 inch
    c. .64 inch
    d. .19 inch

15. If the half-value layer of concrete is 1.9 inches. Approximately how thick must the concrete be to reduce the radiation from a 100 curie IR-192 source to 2 MR/hr? The source is 1 meter from the wall.
    a. 28 inches
    b. 36 inches
    c. 18 inches
    d. 30 inches

16. After taking an exposure and retracting the source, which of the following must be surveyed?
    a. The source tube
    b. The exposure device
    c. The exposure device and the source tube
    d. The 2 MR/hr boundary
17. To reduce your exposure, which of the following would you not do?
    a. Leave your film badge in the truck.
    b. Crank faster.
    c. Use a longer crank cable or source tube.
    d. Use existing structures for shielding.
18. Excessive exposure is considered:
    a. Any in excess of 2 MR/hr
    b. Any unnecessary exposure
    c. An excess of 5 R/year
    d. An excess of 1¼ R/year
19. The greatest source of exposure is:
    a. Nuclear power plants
    b. Industrial radiography
    c. Natural causes
    d. Medical x-rays
20. The unit of measurement for the exposure to humans is:
    a. REM
    b. RAD
    c. Curie
    d. Roentgen
21. The radiation exposure to the whole body that would cause blood changes is:
    a. 10R
    b. 50R
    c. 100R
    d. 200R

22. The radiation exposure to the whole body that would probably cause death is:
    a. 10R
    b. 50R
    c. 100R
    d. 200R

23. The distance to the 2 MR/hr boundary is 50 feet. The distance to the high radiation boundary is approximately:
    a. 12 feet
    b. 3 feet
    c. 7 feet
    d. 1 foot

24. After taking an exposure and retracting the source, the first step is to:
    a. Lock the exposure device.
    b. Read your dosimeter.
    c. Remove the film.
    d. Survey the source tube and exposure device.

25. Which of the following would you not do if the source cannot be retracted?
    a. Establish a new 2 MR/hr boundary
    b. Notify the job-site supervisor
    c. Call the RSO
    d. Attempt to retrieve the source

26. What is the ALARA concept?
    (ans) As Low As Reasonably Acheivable

27. What are the basic methods of radiation protection?
    (ans) Time-Distance-Shielding

28. What is the Transport Index?
(ans)The radiation level of a package for transport at 1 meter.

29. It would be permissable to conduct radiographic operations without a dosimeter, as long as you had a calibrated survey meter.
a. TRUE
b. FALSE

30. It is necessary to zero your dosimeter at the start of each day of radiographic operations.
a. TRUE
b. FALSE

31. The RSO is responsible for maintenance of radiographic equipment.
a. TRUE
b. FALSE

32. In case of any equipment malfunctions you would:
a. Notify the RSO and management
b. Advise your co-workers
c. Correct the deficiency and procede to the job
d. Do nothing as you are a certified radiographer

33. The maximum permitted radiation level in the passenger compartment of a transport vehicle is:
a. .2 MR/hr
b. .2 R/hr
c. 2 MR/hr
d. .02 R/hr

34. Which of the following surveys does not have to be recorded?
    a. Vault survey after storage
    b. Transport vdhicle survey
    c. Survey of exposure device after final exposure
    d. Survey of package for shipment

35. Should you lose your film badge, you would:
    a. Use the control badge
    b. Borrow someone elses
    c. Use your dosimeter and survey meter
    d. Not perform any radiographic operations until you are issued a new one.

36. During an exposure, you notice someone entering the restricted area. You would:
    a. Immediately retract the source
    b. Enter the restricted area and escort them out after retracting the source.
    c. Continue your exposure
    d. Shout for them to leave the area

37. At the job-site you must:
    a. Maintain constant surveillance of the source.
    b. Advise all personnel in the area of the nature of the radiographic operations.
    c. Post a 2 MR/hr boundary
    d. All of the above

38. An assistant radiographer may perform the duties of a radiographer provided:
    a. He has sufficient on-the-job-training
    b. He performs these duties under the direct supervision of a certified radiographer.
    c. He is at least 18 years old
    d. He was a certified assistant radiographer under another license.

39. During radiographic operations, the radiographer and assistant radiographer must leave the job-site for a short time. The exposure device:
    a. May be chained and locked to a permanent structure provided the key is removed.
    b. May be stowed in a construction crews gang box.
    c. May be secured in a properly placarded and locked transport vehicle.
    d. May be left in place in the care of the job-site supervisor, provided the key is removed.

40. The film badge should be worn:
    a. In trouser pocket
    b. On belt
    c. Around neck
    d. In shirt pocket

41. A dosimeter will provide which of the following?
    a. Permanent record of exposure
    b. Immediate indication of dose recieved
    c. Level of radiation in the area
    d. a & b

42. A film badge will provide which of the following?
    a. Permanent record of the exposure
    b. Immediate indication of the dose recieved
    c. Level of radiation in the area
    d. b & c

43. A survey meter will provide which of the following?
    a. Permanent record of exposure
    b. Immediate indication of the dose recieved
    c. Level of radiation in the area
    d. a & c

44. Which of the following must be recorded to comply with NRC regulations?
    a. Vault surveys after storage
    b. Exposure device surveys after the final exposure at the job-site.
    c. Dosimeter readings at the end of radiographic operations.
    d. All of the above

45. Which of the following is not a required survey?
    a. The 2 MR/hr boundary
    b. The top, bottom and sides of the transport vehicle after securing exposure device.
    c. The exposure device and source tube after each exposure.
    d. The 100 MR/hr boundary

46. When surveying a fully retracted source in an eposure device, the survey meter reads zero. This indicates that:
    a. The survey meter is not working
    b. The source is fully retracted
    c. Source still in tube
    d. Source is depleted

47. The Industrial Nuclear Co. Model 2 survey meter reads in the range of:
    a. 0 to 100 MR/hr
    b. 10 MR/hr to 1 R/hr
    c. 0 to 1000 MR/hr
    d. 10 MR/hr to 10 R/hr

48. A collomator should be used:
    a. Whenever possible
    b. In congested areas
    c. For long exposures
    d. All of the above

49. It is necessary to record equipment inspections on the daily utilization logs.

    a. TRUE

    b. FALSE

50. With a properly restricted 2 MR/hr boundary, direct surveillance of the restricted area is not required.

    a. TRUE

    b. FALSE

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Telephone: (808) 254-4609

PRACTICAL TEST FOR RADIOGRAPHERS

NAME _____ DATE _____

RADIOGRAPHER _____

	PASS	FAIL
1. Dosimeter zeroed	____	____
2. Film badge worn	____	____
3. Vault survey prior to opening	____	____
4. Exposure device survey & equipment inspection	____	____
5. Transport vehicle survey and placarding	____	____
6. Restricted area roped	____	____
7. High radiation area established	____	____
8. Dosimeter examined after each exposure	____	____
9. Exposure device and source tube suveyed after each exposure	____	____
10. Exposure device locked after each survey	____	____
11. Restricted area under constant surveillance	____	____
12. All ropes and signs removed	____	____
13. Vault surveyed after storing	____	____
14. Daily utilization log filled out and all required surveys and dosimeter readings recorded	____	____

COMMENTS _____

_____

_____

TESTED BY _____ SCORE _____

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DOCUMENT APPROVAL

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TITLE Annual Refresher Training Outline ITEM NO. 8D

Rev	Date	Change	Appvl
0	4-8-85	Original Issue	FW

Walashek Enterprises Inc.
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ANNUAL REFRESHER TRAINING OUTLINE

Subject	Hours
1.0 Source of radiation	1
a. Naturally occuring	
b. Alpha, Beta, Gamma	
c. Atomic structure	
d. Half-life, decay	
2.0 Radiation protection	2
a. ALARA philosophy	
b. Time - Distance - Shielding	
c. Inverse square law	
d. EOP	
3.0 Radiation monitering	1
a. Dosimeters	
b. Film badges	
c. Survey meters	
d. Leak tests	
4.0 NRC Regulations	1 1/2
a. Required surveys	
b. Required records	
c. Required equipment checks	
5.0 Equipment	1 1/2
a. Exposure devices	
b. Source changers	
6.0 Case Histories	1

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SAMPLE ANNUAL REFRESHER TRAINING TEST
(answers underlined)

1. What is the RHM/curie of IR-192
   a. .55
   b. 5.5
   c. .055
   d. 55

2. A 100 curie IR-192 source is left exposed in an open area with no shielding. What would be the approximate radius of the 2 MR/HR boundry?
   a. **200 meters**
   b. **100 meters**
   c. **166 meters**
   d. **650 meters**

3. To reduce your exposure, it would not be a good idea to-
   a. Leave your film badge in the truck
   b. Crank the source in-and-out faster
   c. Use existing structures for shielding
   d. Use a thicker colimater

4. The 2 MR/HR boundry is established at 50 feet. What will be the distance to the high radiation boundry?
   a. 7 feet
   b. 4 1/2 feet
   c. 6 1/2 feet
   d. 10 feet

5. Physical changes would first be noticed at what level of exposure?
   a. 5R
   b. 50R
   c. 10R
   d. 100R

6. Most radiation to people is from
   a. Industrial radiography
   b. The sun
   c. Nuclear reactors
   d. Medical radiography

7. The maximum radiation level of a stored exposure device in an un-restricted area is
   a. 2 MR/HR on contract
   b. 5 MR/HR at 18 inches
   c. 2 MR/HR at 18 inches
   d. 50 MR/HR at 1 meter

8. It is necessary to check your dosimeter
   a. At the end of the day
   b. After each exposure
   c. At the start of the day
   d. All of the above

9. You notice your dosimeter has gone off scale. You would
   a. Cease operation
   b. Re-zero the dosimeter
   c. Replace the dosimeter
   d. Continue working

10. During your initial equipment inspection you notice that the lock mechanism does not work properly. Whom must you notify?
   a. No one as you are a certified radiographer
   b. Another radiographer
   c. The RSO and management
   d. Your assistant

11. Altho Alpha radiation is 20 times more harmful than Gamma radiation, it is considered less dangerous than Gamma radiation because
   a. It will not penetrate the skin

b. It does not travel far
c. It is of low strength
d. Alpha radiation does emmanate from IR-192

12. Survey meters must be calibrated
a. Every year
b. Every 6 months
c. Every 3 months
d. Prior to each use

13. All radioactive sources are leak tested
a. Every year
b. Every 6 months
c. Every 3 months
d. Prior to each use

14. Film badges are evaluated
a. Weekly
b. Monthly
c. Bi-monthly
d. Quarterly

15. Which of the following is a better shielding material?
a. Steel
b. Concrete
c. Tightly packed earth
d. Lead

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DOCUMENT APPROVAL

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TITLE QA Manual for Radiographic Operations ITEM NO. 10A

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0	4-8-85	Original Issue	FW

Walashek Enterprises Inc.
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Telephone: (808) 254-4609

QUALITY ASSURANCE MANUAL
FOR RADIOGRAPHIC OPERATIONS

1.0 Scope

1.1 This Quality Assurance Manual will delineate the procedures to assure compliance with the applicable 10 CFR regulations to possess and use radioactive material to be used for industrial radiography.

1.2 The responsibility for the quality assurance program lies with Walashek Enterprises Inc.. See Organization Chart. The radiation safety officer (RSO) shall be responsible for the overall administration of the radiation safety program, training and certification, document control and auditing.

The radiographers shall be responsible for handling, storing, inspection, test and operating status, and record keeping.

2.0 Radiation Monitering

2.1 All personnel who work in a restricted area will be supplied with a 0-200 MR dosimeter and their own personal film badge. Film badges will be evaluated monthly and dosimeters shall be calibrated annually.

2.2 At least one calibrated and operating survey meter will be available on site at all radiographic operations. Survey meters will read in a range of 2 MR/hour through 1 roentgen per hour. Survey meters shall be calibrated at least once every three months and tagged with the calibration date and due date. Calibration records shall be maintained for a minimum of two years. Survey meter accuracy shall be $\pm$ 20%.

2.3 Radiation surveys shall be made per the Emergency and Operation Procedures and Shipping, Transporting and Recieving Procedures.

2.4 No person under the age of eighteen shall be permitted to recieve a radiation dose in excess of 10% of the li

DUPE 8505100376

2.4 No person under the age of eighteen shall be permitted to recieve a radiation dose in excess of 10% of the limits specified in 2.5.

2.5 The maximum permitted dose per calendar quarter for anyone eighteen years of age and older shall be as follows.

1. Whole body, head and trunk, active blood forming organs, lens of eyes, or gonads. 1¼ REM
2. Hands and forearms, feet and ankles. 18¾ REM
3. Skin of whole body. 7½ REM

2.6 A total occupational dose of 3 REMs in any calendar quarter may be permitted, provided the total accumulated dose does not exceed 5(N-18) where N is the persons age.

3.0 Internal Inspection

3.1 An internal audit shall be conducted at least once every three months. The audit shall include a field audit of every assistant radiographer and radiographer that performs radiographic operations in that three month period. If an assistant radiographer or radiographer has not been audited for three months, they shall be audited at their first radiographic operation. Internal and field audits shall be conducted by the RSO.

3.2 In addition to the quarterly audits, semi-annual audits will be conducted at least once every six months. Semi-annual audits shall be conducted by someone not directly involved in the radiographic operations.

3.3 Quarterly and semi-annual audits will be performed by the RSO using a checklist.

3.4 An inventory of all radiographic sources shall be performed as a part of the quarterly audit.

3.5 All radiographic cameras, cranks, source tubes, collimators and other equipment shall be inspected using a checklist at the time of the quarterly audit.

3.6 Inventories and equipment inspections shall be performed by certified radiographers.

4.0 Procedures

Detailed procedures shall be prepared that provide step-by-step instructions for normal and emergency operations. Steps to be taken in case of emergency with the names and the telephone numbers of the appropriate management personnel to be notified, shall be included.

Procedures shall also be prepared for recieving, shipping and transporting radioactive material. These procedures shall include required surveys, permissable radiation levels and labeling and placard information.

Each type of camera and source changer shall have a detailed procedure for its operation.

Procedures shall instruct personnel to notify management of any abnormal conditions.

5.0 Leak Tests

Leak tests will be performed on all radiographic sources at least once every six months. Wipes shall be made by certified radiographers and sent to Industrial Nuclear Company for evaluation.

6.0 Outside Service

6.1 Survey meter and dosimeter calibration

Industrial Nuclear Company
1124 Chess Drive
Foster City, CA 94404
License Number 2229-41

Mid Pacific Health Physics
1301 Punchbowl St., Suite 307
Honolulu, HI 96813
License Number 53-23207-01

6.2 Leak Test

Industrial Nuclear Company
1124 Chess Drive
Foster City, CA 94404
License Number 2229-41

7.0 Training

7.1 Training shall be conducted in house by the RSO. No person shall enter a restricted area unless they have recieved the training and testing as outlined in the training program for radiographic testing personnel.

7.2 Radiographer assistants shall have a minimum of 8 hours classroom training in operating the equipment and EOP. Testing shall consist of a written test of at least 25 questions that will demonstrate the applicants knowledge of the EOP and equipment operation.

7.3 Radiographers shall have a minimum of 40 hours classroom training covering the EOP, equipment operation and applicable NRC regulations. Testing shall consist of a written test of a minimum of 50 question and a practical test. The written test will demonstrate the applicants knowledge of the EOP and NRC regulations. The practical test will demonstrate the applicants ability to safely operate the equipment.

Radiographers shall have a minimum experience of three months (520 hours) as a certified radiographers assistant.

7.3 Annual refresher training consisting of 8 hours of classroom instructions will be given to all radiographers and radiographer assistants with a test of at least 15 questions.

8.0 Source Disposal

8.1 All radioactive material will be returned to the supplier. Procedures will be prepared for the recieving, shipping and transporting of radioactive material. Prior to reciept from or delivery to the supplier, their NRC license and certificate of competant authority shall be on file.

9.0 Records

9.1 The RSO shall maintain all documents and records. These records shall include the following.

A. Walashek Enterprises, Inc. NRC licenses
B. The QA manual and all procedures.
C. Calibration records.
D. Leak Tests
E. Personnel exposure reports
F. Termination reports
G. Shipping and recieving records of the radioactive material
H. Internal audits, inventory and equipment inspections
I. Daily utilization logs
J. Annual report to NRC
K. Results of NRC audits
L. Training records

10.0 Notices and Reports to Workers

10.1 Radiation workers will be supplied with the following reports.

10.2 Termination reports shall be provided to the worker within 30 days after the exposure of the individual has been determined or 90 days after the date of termination, whichever is earlier.

10.3 Any exposure in excess of that specified in Par 2.5 or 2.6 shall be reported to the worker as soon as the exposure has been determined.

10.4 Exposure reports shall be given to any worker on request.

10.5 The following documents shall be posted in a sufficient number of places to permit workers to observe them on their way to or from licensed activities.

A. Regulations of 10 CFR parts 19 and 20.

B. The companys NRC license.

C. The EOP.

D. Notices of violations.

E. NRC-3 form "Notice to Workers".

If posting of A, B or C is impractical, a notice may be posted advising workers where they may be examined.

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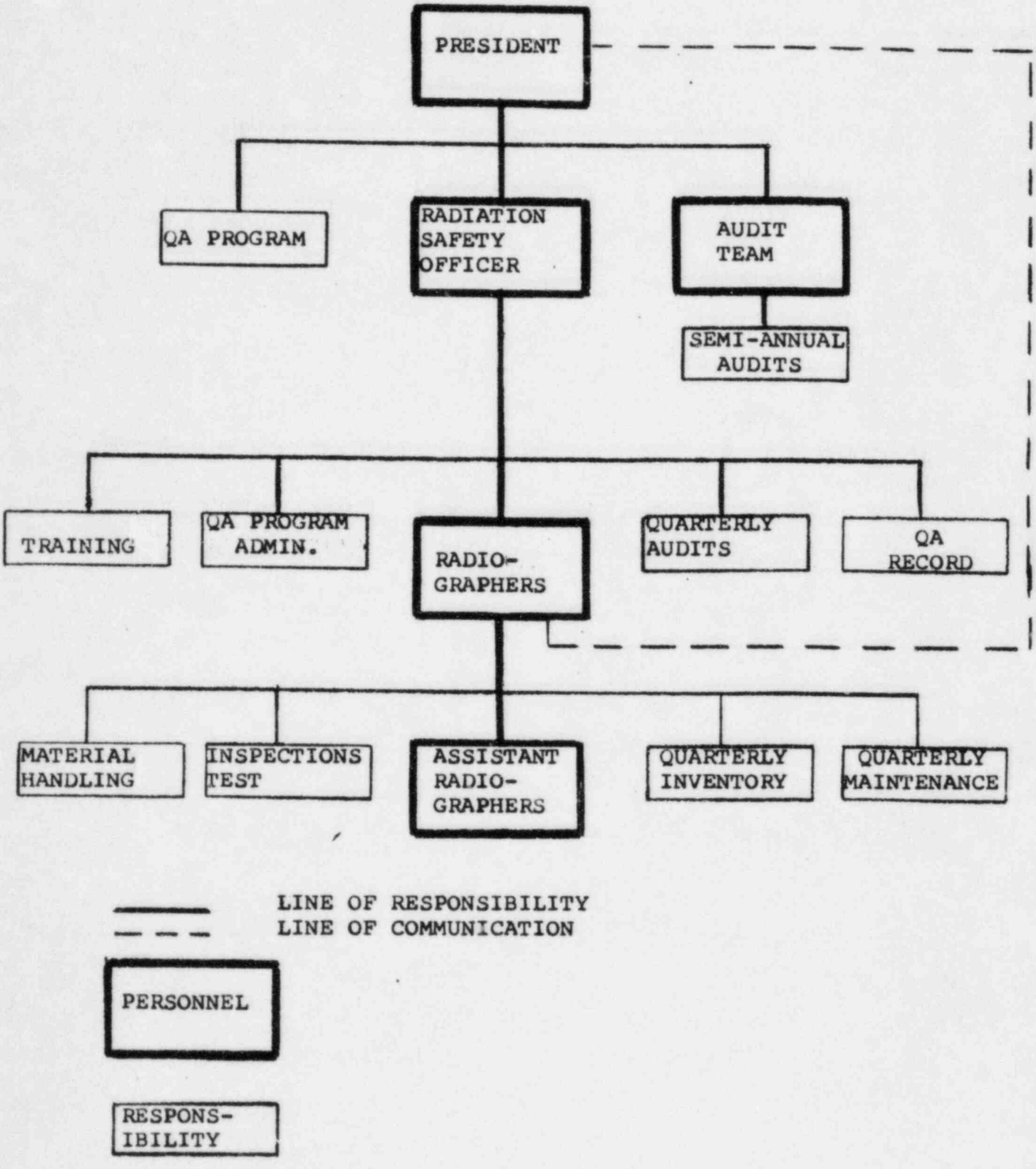
ORGINIZATION CHART



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DOCUMENT APPROVAL

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TITLE EOP ITEM NO. 10B

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EMERGENCY AND OPERATING PROCEDURES

1.0 Scope

1.1 This manual provides instructions for radiographers for normal and emergency operations. All radiographers must be familiar with this procedure and will have a copy in their possesion during all radiographic operations.

2.0 Radiographic Operations

2.1 Prior to travelling to the job-site, the radiographer will perform the following:

1. Charge dosimeter(s) and record reading(s) in daily utilization log.
2. Assure film badge(s) is/are worn. Also insure that all personnel are wearing their own film badge.
3. Check survey meter for battery charge, up to date calibration, and proper functioning.
4. Survey top and sides of storage vault. If the reading is in excess of 2 MR/hr at contact , notify the Radiation Safety Officer (RSO) and management. Do not open the vault until the RSO arrives.
5. Remove exposure device and survey all sides of the exposure device. If radiation is in excess of 200 MR/hr at contact or 10 MR/hr at 1 meter, return the exposure device to the vault and notify the RSO and management.
6. Inspect exposure device connections and lock mechanism.
7. Inspect source tube for cuts, nicks, dents or other conditions that could cause jamming, loss of the source or other hazardous condition.
8. Inspect source crank for ease of operation, condition of cable to pigtail connection and crank connection.
   Note: Record inspections on daily utilization log.
9. Assure that adequate ropes and signs are available and transport vehicle is properly placarded.

10. After the exposure device is properly secured in the transport vehicle, survey all sides top and bottom and the passenger compartment to assure 2 MR/hr or less.
11. Fill out hazardous cargo form and retain in transport vehicle.

2.2 At the job-site the following shall be performed.

1. Notify foreman or other job-site supervisor that radiographic operations are to take place. Also advise all other personnel in the area.
2. Remove exposure device from vehicle and post 2 MR/hr radiation boundary with ropes and signs. Assure that all possible access to the restricted radiation area is roped with radiation signs.
   Note: The exposure device must be kept under the direct surveillence of the radiographer or radiographer assistant until it is secured.
3. Connect crank and source tube to exposure device. Take first exposure and survey the restricted area boundary. Provide continuous surveillance of the restricted area for this and subsequent exposures.
4. Crank source in and examine dosimeter. Survey the source tube for its full length and exposure device on all sides to assure complete retraction of source. Lock exposure device. This is to be done after each exposure.
5. Re-establish the radiation boundary as required and establish the high radiation boundary using the inverse square law.
6. After the last exposure, procede as in Step 4 and record on the daily utilization log the radiation levels of the exposure device at contact and at 1 meter.Disconnect crank and source tube.

7. Remove radiation signs and secure exposure device in transport vehicle. Survey vehicle on all sides and passenger compartment.
8. Advise job-site personnel of end of radiographic operations.

2.3 After returning to the shop the following steps are to be followed.

1. Remove exposure device and hazardous cargo form from vehicle. Remove radiation placards from vehicle.
2. Lock exposure device in vault and survey top and sides. (2MR/hr at 18 inches)
3. Complete daily utilization log including dosimeter reading.

3.0 Emergency Operating Procedures

3.1 In the event the source cannot be retracted or other conditions prevail that would expose the population to excessive radiation, the following will be adhered to.

1. Establish a 2 MR/hr radiation area boundary.
2. Notify all personnel in the area and enlist the assistance of the civil defence or other agency as required to prevent entrance into radiation area.
3. Notify the RSO or his alternate.

RSO- Timothy A. Carroll
Business-2298D Alahao Pl.
Honolulu, HI 96819
Tel. 841-7095
Home- 51-002 Lau Pl.
Kaaawa, HI 96730
Tel. 237-8651

Alternate- Frank Walashek
Business-2298D Alahao Pl.
Honolulu, HI 96819
Tel. 841-6366
Home- 602 Launa Aloha Pl.
Kailua, HI 96734
Tel. 254-4609

4. WARNING: Under no conditions shall the radiographer attempt to retrieve or retract the source. Even momentary contact with the source could cause loss of the hand or fingers.

3.2 In the event that a dosimeter is noted to be off scale, cease all radiographic operations immediatly and submit film badge for emergency evaluation. Notify the RSO. <u>There shall be no exceptions.</u>

3.3 Unauthorized personnel observed in the restricted area will be escorted from the restricted area prior to exposing the source. They shall also be made aware of the restricted area boundary and the nature of the radiographic boundary. Upon observing anyone entering the restricted area during an exposure, immediately retract the source and escort them from the restricted area.

4.0 Management Notification

Any equipment malfunctions or abnormal incidents must be reported to management and the RSO. These reports may be made orally, however, the RSO will investigate all reports and provide written documentation of such to management.

5.0 Camera Operation

5.1 These instructions are for operation of Industrial Nuclear Co. camera model IR-100.

5.2 Connect cables and source tube as follows:

1. Remove dust cap from threads on pigtail connector and store in camera handle.
2. Connect drive cable to pigtail.
3. Remove safety plug and store in camera handle.
4. Connect source tube.
5. Unlock camera.

5.3 Disconnect cables and source tube as follows:

1. Lock camera
2. Remove source tube and install safety plug.
3. Disconnect drive cable from pigtail and install dust cap.

NOTE: The model IR-100 camera has a "safe source" indicator. This is not to be used in lieu of the required surveys. All safety procedures in the EOP must be followed.

6.0 Source Changer Operation

6.1 These instructions are to be used to change sources in a model IR-100 camera using an Industrial Nuclear Co. model IR-50 source changer. All safety requirements of EOP shall be adhered to during source changing operations.

6.2 Remove old source from IR-100 camera and install in IR-50 source changer as follows.

1. Remove dust cap and connect cable to pigtail.
2. Remove safety plug from camera and connect one end of the transfer tube.
3. Connect the other end of the change tube to the empty side of the changer.
4. Unlock camera and the empty side of the source changer.
5. With crank located as far as possible from the camera, quickly crank the old source into the changer.
6. Survey the changer and the camera to assure source change.
7. Lock source changer.
8. Remove change tube from source changer and disconnect cable from pigtail.

9. Re-install dust cap and wire seal the old source name plate to the lock body and dust cap.

6.3 Install the new source in the IR-100 camera as follows.

1. Remove dust cap and new source tag from IR-50 changer.
2. Extend cable end approximately ½" from change tube.
3. Connect cable to source pigtail.
4. Connect change tube to source changer.
5. Unlock the source changer.
6. With crank positioned as far as possible from camera, quickly crank new source into camera.
7. Survey source changer and camera to assure source change.
8. Lock the camera and disconnect change tube.
9. Install safety plugs.
10. Disconnect the cable and install dust cap.

7.0 Leak Tests

7.1 Wipes for leak tests will be taken by certified radiographers. Wipes will be taken at least one week prior to the due date and forwarded to Industrial Nuclear Co; 1124 Chess Drive; Foster City,CA 94404; Tel. (415) 349-6397 for evaluation.

7.2 Wipes will be taken as follows using the model INCA kit supplied by the Industrial Nuclear Co..

1. Moisten swab with detergent.
2. Wipe inside of exposure port.
3. Secure swab in plastic bag.
4. Identify wipe with the following:
   Walashek Enterprises
   Source s/n
   Isotope
   Wipe date
5. Seal wipe and information in envelope.

6. Survey envelope. If radiation level is in excess of .5 MR/hr, contact Industrial Nuclear Co. for instructions immediately by phone.
7. If radiation level is acceptable, forward to Industrial Nuclear Co..

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DAILY UTILIZATION LOG NO. ____

Customer _____ Date _____

Source: Type _____ Curies _____ S/N _____

MFG _____ Date last leak test _____

Survey: meter: MFG _____ Model _____

S/N _____ Date last calibration _____

Location _____ No. of exposures _____

Total exposure time _____

Personnel	Classification	Dosimeter reading Start	End of day total

SOURCE SURVEY: Start of operations Contact _____ 1 meter _____

End of operations Contact _____ 1 meter _____

EQUIPMENT INSPECTION:

Guide tube for cuts, crimps, broken fittings ___ _____

Cables for cuts, nicks, broken fittings ___ _____

Crank for ease of operation, loose hard ware ___ _____

Safety plugs in place ___ _____

Lock mechanism operational ___ _____

Exposure device fittings, labels, hardware ___ _____

Pigtail connection not broken ___ _____

Radiation levels acceptable ___ _____

VAULT SURVEY: End of operation 18" top _____ sides _____

_____
Radiographer

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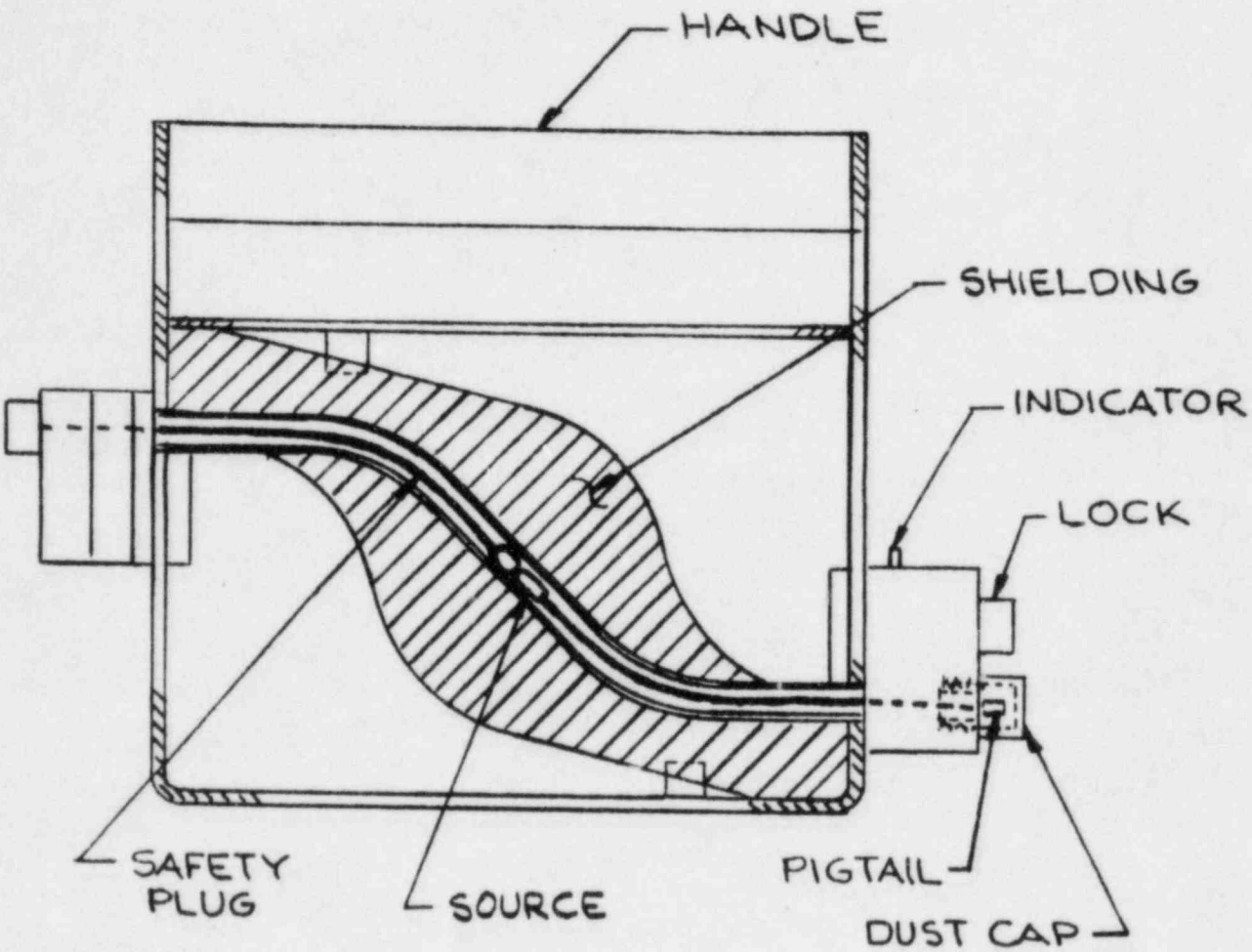
Telephone: (808) 254-4609



INDUSTRIAL NUCLEAR CO
MODEL IR-100 CAMERA

Walashek Enterprises Inc.
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Telephone: (808) 254-4609

DOCUMENT APPROVAL

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TITLE Transporting, Shipping and Recieving Procedure ITEM NO. 10C

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0	4-8-85	Original Issue	FW

Walashek Enterprises Inc.
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TRANSPORTING, SHIPPING & RECIEVING PROCEDURE FOR RADIOACTIVE SOURCES

1.0 Scope

This procedure shall be used for transporting radioactive material to and from job-sites and common carriers.

2.0 Recieving

Upon notification from a common carrier, radioactive sources shall be picked up as soon as possible. On reciept of radioactive material the package must be surveyed for radioactive contamination. This survey shall be performed as soon as practical, but no later than 3 hours after the package is recieved, if recieved during normal working hours, or eighteen hours if recieved after normal working hours. Containers with radiation levels in excess of 200 MR/ hour on contact or 10 MR/hour at one meter shall require immediate NRC notification by telephone and telegraph.

USNRC
1450 Maria Lane, Suite 210
Walnut Creek, CA 94596
Tel. (415) 943-3700

Surveys of containers shall be recorded on Walashek Enterprises Inc. shipping and recieving report.

Prior to ordering radioactive material, verification of the suppliers NRC license and certificate of competant authority will be on file with the RSO.

3.0 Shipping

Prior to preparing radioactive material for return to the supplier, the following will be verified-

1. Current leak test less than 6 months
2. Suppliers NRC license and certificate of competant authority on file.

3. Type B package certification on file.

Prepare the radioactive material for shipping as follows.

1. Survey exposure device. The results of this survey do not have to be recorded.
2. Pack exposure device in an approved type B package. Insure device is locked and key is removed.
3. Attach identification tag and decay chart to exposure device.
4. Seal type B package.
5. Survey type B package at contact and 1 meter (TI). Record the results.
6. Enter type source, source strength and transport index (TI) on proper labels (White I, Yellow II or Yellow III). Two labels are required. See TABLE I for label requirements.

TABLE I

	WHITE I	YELLOW II	YELLOW III
Contact	0.5 max	50 MR/hr max	200 MR/hr max
1 meter	N/A	1 MR/hr max	10 MR/hr max

Complete hazardous material form. Insure that it is marked for "air cargo only". Deliver to common carrier.

4.0 Transportation

Transportation includes pick-up or delivery to a common carrier and carrying radioactive material in a vehicle to and from the job-site.

Radioactive material to be transported to a common carrier shall be prepared as specified in 3.0 Shipping.

Exposure devices to be transported to and from the job-site shall be prepared as follows:

1. Verify leak test performed within past 6 month period.
2. Survey exposure device to assure radiation levels are no more than 200 MR/hr on contact nor more than 10 MR/hr at 1 meter. These readings should be near those of the previous day.

Secure exposure device or type B package and prepare transport vehicle as follows.

1. Secure exposure device or type B package in transport vehicle to prevent movement. Also either the vehicle will be locked or the radioactive material itself will be secured to the vehicle to prevent unauthorized access. When the exposure device is retained in a transport over pack, the over pack shall be properly labelled with Yellow II labels.
2. Placard all four sides of the vehicle with radiation signs.
3. Prepare hazardous material form to be retained in the transport vehicle.
4. Survey all exterior sides and passenger compartment to assure a maximum of 2 MR/hr at any location. Should any radiation level be in excess of 2 MR/hr, either reposition the material in the vehicle or provide additional shielding.

Rev 0
8 Apr 85
Item 10C

Walashek Enterprises Inc.
602 Launa Aloha Place / Kailua, Hawaii 96734
Telephone: (808) 254-4609

SHIPPING-RECIEVING REPORT

Source MFG_____ MOD_____ S/N_____
Type_____ Curies_____ Date last leak test_____
Survey meter MFG_____ MOD_____ S/N_____
Date last calibration_____

CONTAINER SURVEY:
MR/HR at contact_____
MR/HR at 1 meter_____
SHIP __ RECIEVE __
Ship to_____
Address_____
_____
Ship from_____
Address_____
_____
Carrier_____
_____
Remarks_____
_____
_____
_____
_____
_____
_____
_____

Survey by_____ Date_____

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DOCUMENT APPROVAL

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TITLE Semi-annual Audit ITEM NO. 10D

Rev	Date	Change	Appvl
0	4-8-85	Original Issue	FW

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SEMI-ANNUAL AUDIT

		YES	NO
1.	ARE QUARTERLY AUDITS PERFORMED WITHIN 3 MONTHS?	____	____
2.	DO QUARTERLY AUDITS INCLUDE MAINTENANCE AND INVENTORY RECORDS?	____	____
3.	ARE RECORDS OF PERSONNEL EXPOSURE REPORTS MAINTAINED AND REVIEWED?	____	____
4.	ARE CALIBRATION RECORDS OF SURVEY METERS AND DOSIMETERS MAINTAINED AT THE PROPER FREQUENCY? (SURVEY METERS - 3 MONTHS) (DOSIMETERS -- ANNUALY)	____	____
5.	ARE UTILIZATION LOGS PROPERLY FILLED OUT AND IN ROUTINE USE?	____	____
6.	ARE RADIOGRAPHERS AND ASSISTANT RADIOGRAPHERS PROPERLY TRAINED AND CERTIFIED, INCLUDING ANNUAL TRAINING?	____	____
7.	ARE RADIOACTIVE MATERIALS PROPERLY STORED TO PREVENT UNAUTHORIZED ACCESS?	____	____
8.	ARE LEAK TEST RECORDS AVAILABLE TO SHOW LEAKS ARE PERFORMED WITHIN 6 MONTHS?	____	____

		YES	NO
9.	IF APPLICABLE, HAVE TERMINATION REPORTS BEEN SUBMITTED TO NRC AND EMPLOYEE?	___	___
10.	ARE RADIOGRAPHERS AND RADIOGRAPHER ASSISTANTS GIVEN A FIELD AUDIT EVERY 3 MONTHS?	___	___
11.	ARE SHIPPING AND RECIEVING DOCUMENTS FOR RADIOACTIVE MATERIALS MAINTAINED?	___	___
12.	ARE CURRENT LICENSES AND CERTIFICATES OF OF COMPENTENT AUTHORITY ON FILE FOR ALL SUPPLIERS OF RADIOACTIVE MATERIAL?	___	___

NON-COMPLIANCE _____

_____

_____

_____

AUDIT BY _____ DATE _____

CORRECTIVE ACTION _____

_____

_____

_____

APPROVED BY _____ DATE _____

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DOCUMENT APPROVAL

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TITLE Quarterly Maintenance ITEM NO. 10E

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QUATERLY MAINTENANCE

Source MFG _____ MOD _____ S/N _____

Exposure devices	YES	NO
1. Lock mechanism functioning properly.	—	—
2. Warning label affixed.	—	—
3. Identification tag legible.	—	—
4. Safety plugs in place.	—	—
5. Fitting in good condition.	—	—
6. Radiation levels acceptable.	—	—
7. Crank mechanism operates freely.	—	—
8. Loose hardware on crank.	—	—
9. Pigtail connection in good condition.	—	—

Source Tube		
1. Cuts or crimps.	—	—
2. Fitting not broken and secure.	—	—

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	YES	NO
3. Cable lubricated	___	___

Remarks _____

_____

_____

_____

Inspected by _____ Date _____

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DOCUMENT APPROVAL

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TITLE Radiographic Test Personnel Field Audit ITEM NO. 10F

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RADIOGRAPHIC TEST PERSONNEL FIELD AUDIT

Location_____ Control no.____
Radiographer_____
Assistant Radiographer_____
Source type_____Curies_____ MOD_____S/N _____
Date of last leak test_____MFG_____
Survey meter MFG_____MOD_____S/N_____
Date of last calibration_____

	Yes	No
1. Was Radiographer/assistant wearing dosimeter and film badge?	___	___
2. Was restricted area posted with "Radiation Area" signs?	___	___
3. Was perimeter of restricted area surveyed to varify 2 MR/HR boundry?	___	___
4. Was "High Radiation Area" posted?	___	___
5. Was restricted area controlled to prevent unauthorized entry?	___	___
6. Was a properly functioning and calibrated survey meter avaiable?	___	___
7. Was utilization log properly filled out?	___	___
8. Was the dosimeter checked after each exposure?	___	___

	Yes	No
9. Was the source tube and camera properly surveyed after each exposure?	___	___
10. Was camera locked after each exposure? (after survey)	___	___
11. Was a copy of the EOP on hand?	___	___
12. Was the source properly stored at the end of operations?	___	___
13. Was the source properly stored in the transport vehicle?	___	___
14. Was the transport vehible properly surveyed?	___	___
15. Any other non-compliances?	___	___

Remarks_____

_____

_____

_____

_____

_____

_____

_____

Audit conducted by_____Date_____

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DOCUMENT APPROVAL

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TITLE Quarterly Audit ITEM NO. 10G

Rev	Date	Change	Appvl
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QUARTERLY AUDIT

	YES	NO
1. Are "RADIOACTIVE" signs properly posted?	—	—
2. Is license posted?	—	—
3. Is "Notice to Workers" NRC form posted?	—	—
4. Are 10 CFR parts posted in sufficient places? (A notice advising workers where these regulations may be found may be substituted for the actual regulations.)	—	—
5. Are NRC non-compliances posted, if any?	—	—
6. Is radioactive material properly stored?	—	—
7. Are daily utilization logs properly filled out and in use?	—	—
8. Are survey meters and dosimeters calibrated quarterly?	—	—
9. Are leak tests performed every six months?	—	—

	Yes	No
10. Are inventories performed every quarter?	___	___
11. Are records of reciept and transfer of radioactive material properly maintained?	___	___
12. Are radiographers and radiographer assistant field audits performed quarterly?	___	___
13. Are training records maintained for radiographers and assistant radiographers?	___	___
14. Is annual refresher training administered and documented?	___	___
15. Is equipment inspected quarterly?	___	___
16. Are annual exposure reports submitted to the NRC?	___	___
17. Are termination reports supplied as required?	___	___
18. Are exposure records of radiographers and assistant radiographers maintained and reviewed.	___	___

Non-compliance(s) _____

_____

_____

_____

_____

Audit by _____ Date _____

Corrective action _____

_____

_____

_____

Approved by _____ Date _____

QUARTERLY INVENTORY

1. MFG_____ MOD_____ S/N_____ TYPE_____

   CURIES_____ LOCATION_____

2. MFG_____ MOD_____ S/N_____ TYPE_____

   CURIES_____ LOCATION_____

3. MFG_____ MOD_____ S/N _____ TYPE_____

   CURIES_____ LOCATION_____

INVENTORY BY_____ DATE_____

QUARTERLY EXPOSURE REVIEW

Film badge no.	Name	Month			Total

Reviewed by_____ Date_____